City of Ukiah

2020

URBAN WATER MANAGEMENT PLAN

City of Ukiah, CA







WEST&ASSOCIATES
ENGINEERING, INC.

2020

URBAN WATER MANAGEMENT PLAN

City of Ukiah, CA

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ACRONYMS

AF	Acre-Feet
AFY	Acre-Feet per Year
AMI	Automatic Metering Infrastructure
AMR	Automatic Meter Reading
AP	Allocation Plan
BDCP	Bay-Delta Conservation Plan
BMP	Best Management Practice
CDP	Census Designated Place
CDPH	California Department of Public Health
CFS	Cubic Feet per Second
CII	Commercial Industrial Institutional
CIMIS	California Irrigation Management Information System
City	City of Ukiah
County	County of Mendocino
CUWCC	California Urban Water Conservation Council
CalWEP	California Water Efficiency Partnership
CDPH	California Department of Public Health
DBPs	Disinfection Byproducts
DDW	Division of Drinking Water
DMM	Demand Management Measure
DOE	Department of Energy
DWSAP	Drinking Water Source Assessment and Protection
DWR	Department of Water Resources
EPA	Environmental Protection Agency
ETo	Evapotranspiration
GPCD	Gallons per Capita per Day
GPM	Gallons per Minute
HEN	High Efficiency Nozzle
HET	High Efficiency Toilet
HEW	High Efficiency Washer
IPR	Indirect Potable Reuse
IRP	Integrated Resources Plan
MAF	Million Acre-Feet
MBR	Membrane Bioreactor

MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MG	Million Gallons
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
µg/L	Micrograms per Liter
MOU	Memorandum of Understanding
ng/L	Nanograms per Liter
NPDWR	National Primary Drinking Water Regulations
NTU	Nephelometric Turbidity Units
PCA	Possible Contaminating Activities
PHG	Public Health Goal
PPCPs	Pharmaceuticals and Personal Care Products
PVP	Potter Valley Powerhouse
RHNA	Regional Housing Needs Assessment
SDWA	Safe Drinking Water Act
SB	Senate Bill
SBx7-7	Senate Bill x7-7
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solid
ULFT	Ultra-Low-Flow Toilet
USACE	US Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UVBGSA	Ukiah Valley Groundwater Sustainability Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus & Drought Management Plan
WSS	Watershed Sanitary Survey
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Section 1
Introduction

Since 1983, the State of California requires urban water agencies to prepare Urban Water Management Plans (UWMPs). The City's 2020 UWMP is a collaborative effort involving its own staff, outside agencies, and the general public.





Section 1

INTRODUCTION

In accordance with the Water Code, an Urban Water Management Plan is required to be updated every five years.

1.1 PURPOSE AND SUMMARY

This is the 2020 Urban Water Management Plan ("UWMP" or "Plan") for the City of Ukiah (hereinafter "City"). This Plan has been prepared in compliance with the Urban Water Management Planning Act (Act), which was established in 1983 and has been codified into the California Water Code sections 10610 through 10657. A copy of the Act can be found in **Appendix B** to this 2020 UWMP.

As part of the Act, the legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The Act requires "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt, in

accordance with prescribed requirements, an Urban Water Management Plan." These plans must be filed with the California Department of Water Resources (DWR) every five (5) years, describing and evaluating reasonable and practical efficient water uses, reclamation, and conservation activities. The Water Code mandates that each water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one.



Figure 1.1: UWMPs are Governed by State Law

The Act has been amended multiple times since its initial passage in 1983. A summary of the amendments is provided in **Figure 1.2** on the following page. The intent of the amendments was to broaden the scope of the UWMPs, encourage public participation, and add financial incentives to the UWMPs. A significant amendment to the Act was a 2009 amendment (Senate Bill SBx7-7) signed by former Governor Arnold Schwarzenegger. The Senate Bill, also known as the "Water Conservation Act" required that per capita water use within an urban water supplier's service area decrease by 20 percent by the year 2020 in order to receive grants or loans administered by DWR or other state agencies. Each urban retail water supplier developed water use "targets" for 2015 and for 2020. The "target" date for 2020 just passed on December 31, 2020. Urban water suppliers whose 2020 actual water use does not meet the target requirements established by this bill are not eligible for state water grants or loans This included, but was not limited to, the following funding sources:

Amendments to the Act have added financial incentives to UWMPs

- **Drinking Water State Revolving Fund**
  Primarily a source for funds to help correct deficiencies
- **Proposition 1**
  Primarily a source for funds related to supplies & infrastructure
- **Proposition 50**
  Primarily a source for funds related to security & treatment technology
- **Proposition 84**
  Primarily a source for funds related to protection from pollution

Agencies that submit their UWMPs past the July 2021 deadline are still technically eligible for grants or loans, provided that the UWMP addresses the requirements of

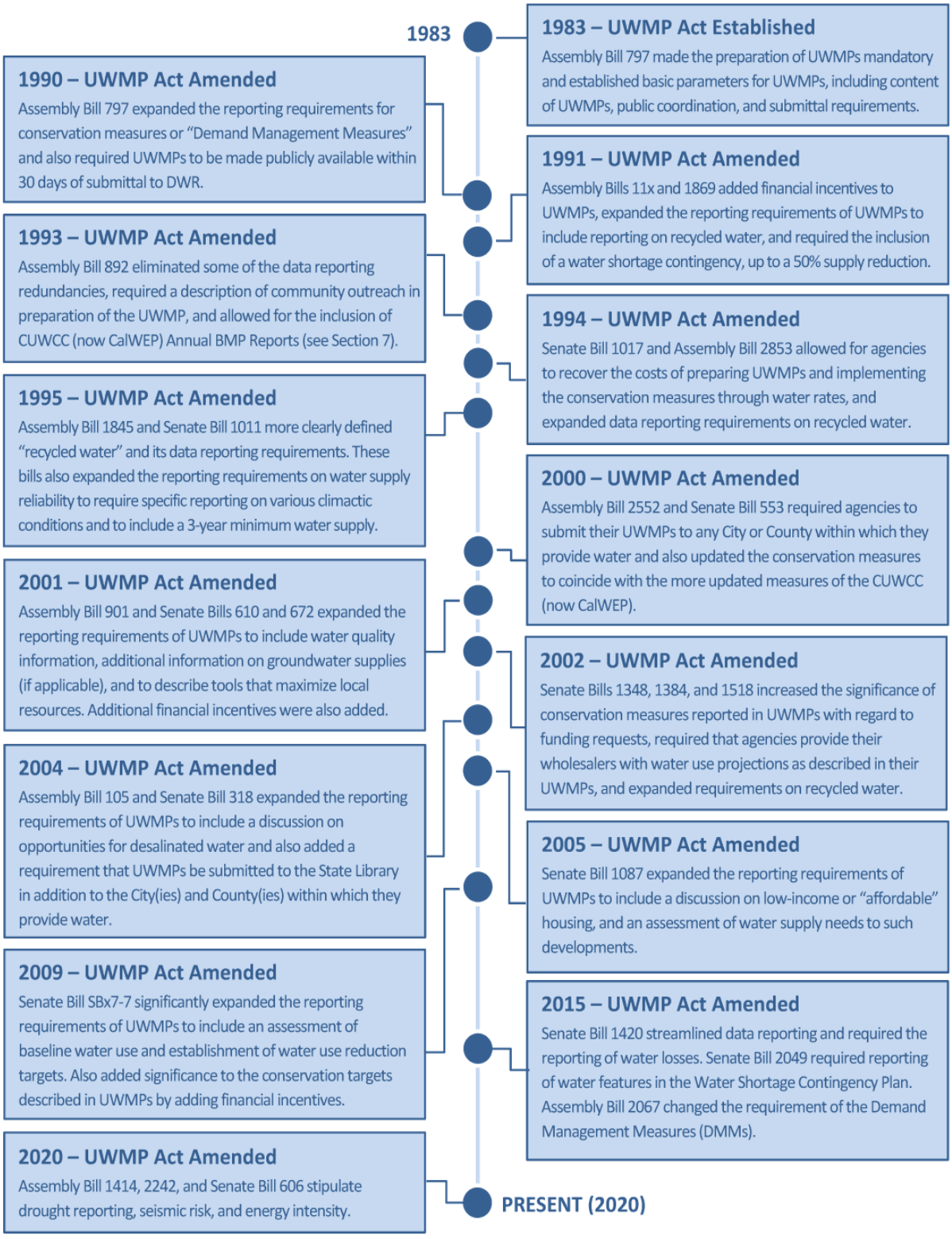


Figure 1.2: UWMP Act Establishment and Amendment

the Act. However, applications for such funds are subject to legal challenges coming from competing agencies for the same funding, if the competing agencies become aware of the timeframe in which an UWMP was submitted.

UWMPs are considered to be a foundation document and a source of information for Water Supply Assessments (Senate Bill 610) and Written Verifications of Water Supply (SB 221). In addition, a UWMP may serve as a long-range planning document for water supply, a source of data for development of a regional water plan, and a source document for cities and counties as they prepare their General Plans. These planning documents are linked, and their accuracy and usefulness are interdependent.

One of the primary objectives of the Act is the assessment of demands and supplies over a 20-year or a 25-year planning horizon under normal rainfall conditions as well as various under drought conditions. The Act also requires water shortage contingency planning and drought response actions be included in a UWMP. In short, this Plan is a management tool, providing a general, long-term framework for action, rather than a detailed blueprint for supply and demand management. This Plan evaluates the City's supply and demand projections over a 25-year planning horizon, and what mix of programs should be explored for making this water available. As part of the City's past and current water conservation policies, the City is currently implementing many facets of this plan already to achieve its water conservation goals.

1.2 COORDINATION

The process of preparing and submitting an UWMP is a transparent process that requires opportunities for outside-agency and general public involvement. In preparing this 2020 Plan, the City has encouraged community participation. The City notified the thirteen (13) agencies that the City interacts with more than 60 days in advance of the City Council's adoption of the Plan. The City also made the draft Plan available at City Hall and on the City's website, leading up to a public hearing on the Plan. Notices of the public hearing were published in the local press and on the City's website for a two-week period. On June 2, 2021, the City held a noticed public hearing to review and accept comments on the UWMP. Following the public hearing, the City officially adopted the 2020 Plan through Council resolution. A copy of the council resolution adopting this UWMP is included in **Appendix A.**

The City's 2020 UWMP is a collaborative effort involving its own staff, outside agencies, and the general public.

Table 1.1
Coordination and Public Involvement

Agency	Participated in Plan Preparation	Contacted for Assistance	Commented on Draft	Notified of Public Hearing	Attended Public Hearing
City Water Staff	x	x	x	x	x
Greater Ukiah Chamber of Commerce				x	
Mendocino County				x	
Mendocino Local Agency Formation Commission				x	
Mendocino Environmental Center				x	
Mendocino County Water Agency				x	
Russian River Flood Control and Water Conservation District				x	
Ukiah Valley Sanitation District				x	
Capella County Water District				x	
Millview County Water District				x	
Redwood Valley Count Water District				x	
Rogina Water Company				x	
Sonoma Water				x	
Willow County Water District				x	
General Public				x	x

Notes:

1. "60-Day" notice letters were sent out to agencies as required by CWC § 10621(b).
2. 2-week and 1-week notices were published in the local press.
3. Appendix contains copies of the 60-day notice and the 2-week and 1-week notices.

As required by the Act, the 2020 UWMP is being prepared by the City and will be submitted to DWR, the California State Library, and any city or county within which it provides water to no later than 30 days after adoption. The 2020 UWMP will be available to the public during normal business hours within 30 days of submitting the 2020 UWMP to DWR.

1.3 DWR UPDATES FOR THE 2020 UWMPS

There have been significant changes to the Water Code affecting the 2020 UWMPs. The changes include the following:

- **Water Reliability Planning:** UWMPs must extend drought planning of water sources (supplies) for periods of up to five (5) consecutive dry years. (CWC § 10635 (a))

- **Drought Risk Assessment:** UWMPs must assess water supply reliability over five (5) consecutive dry years that takes into consideration demands. (CWC § 10635(b))

- **Seismic Risk:** UWMPs must address seismic risks in the Contingency Section in the UWMP, or refer to local or regional hazard mitigation plans. (CWC § 10632.5 (a) (b) and (c))

- **Contingency Plans:** Water Shortage Contingency Plans (WSCPs) must include six (6) Standard Stages. CWC § 10632(a)(3)

- **Groundwater Supply Projections:** If a Groundwater Sustainability Plan has been completed by an agency, groundwater pumping projections in the UWMP must be consistent with those Plans. (CWC § 10631(A)(B))

- **Lay Description:** UWMPs must include a less-technical summary of water service reliability, challenges, and strategies which could be read as a go-to synopsis for new staff, new governing members, customers, and the media. (CWC § 10630.5)

- **Energy Intensity:** UWMPs must report on the energy intensity of water supplies. (CWC § 10631.2 (a))

- **Land Use:** UWMPs must Include current and projected land uses in addition to population estimates. (CWC § 10631 (a))

- **Water Supply Projects:** UWMPs must include a description of potential water supply projects that may be implemented during droughts of up to five (5) years. (CWC § 10631 (f))

Of the above-listed changes to the UWMPs by DWR, the contingency planning changes (i.e., changes to the City's WSCP) are the most significant updates affecting the 2020 UWMPs. These contingency planning changes were written into the Water Code in 2018, in response to the severe drought of 2012-2017. While overlapping aspects of the prior law, the new requirements have several prescriptive elements that a Water Supplier's WSCP must include.

In addition to the above, there are several optional or voluntary categorical and data reporting changes to the UWMP Act. These include an optional Planning Tool that Suppliers can use to report and assess water use and supply in order to better conduct the Reliability Assessment and Drought Risk Assessment, Potable and Non-Potable Planning Tool, and Potable and Non-Potable Submittal Tables, as well as various optional data reporting.

1.4 UPDATES TO THE CITY'S UWMP

In addition to required updates described in the previous section, the City's 2020 UWMP has undergone several changes from the 2015 UWMP. A summary of the key changes to the UWMP are as follows:

- **New Format:** Format of the UWMP has been changed to include a new look and new arrangement of sections. The new arrangement helps the discussion of certain topics which precede other topics. See **Section 1.5** for the format of this 2020 UWMP.

- **DWR & Water Code:** A listing of DWR-required UWMP updates (see previous Section).

- **City Development Growth:** An updated look at development which took place in the City since the 2010 UWMP.

- **Water Sources and Supplies:** A broader, more in-depth discussion of water sources and supplies.

- **Recycled Water:** An updated look on recycled water opportunities in the vicinity and in the City.

- **Water Quality:** A broader, more in-depth discussion of water quality and treatment.

- **Water Use:** Updated information on recent water use quantities and a deeper discussion on water use parameters. Also, an updated look at SBx7-7 targets.

- **Supply v Demand:** Updated information on projected supplies vs demands, and a discussion on recent regional droughts affecting the City. There is also an expansion on the discussion of the City's source water reliability.

- **Contingency Planning:** Updated information on the City's contingency plans, including the City's Ordinances.

- **Conservation Measures:** Updated information on the City's conservation measures, which reflect the previous (2015) changes by DWR.

In addition to the above changes, there are multiple minor changes. The changes reflect both those that are required by the Water Code and those that are voluntarily included for the benefit of the City.

1.5 FORMAT OF THE 2020 UWMP

The information contained in this 2020 UWMP correspond to the items in the UWMP Act and other amendments to the Water Code. The sections of the UWMP are as follows:

Section 1 - Introduction

This section describes the UWMP Act, the UWMP preparation and adoption process, updates to the UWMP, and a lay description of this entire document.

Section 2 – Service Area Description

This section outlines the history and development of the City and the City's water supply system, a description of its existing service area, the local climate, population served, and some basic statistics on the City's water distribution system.

Section 3 – Water Sources & Supplies

This section describes the existing water supplies available to the City, including surface water from the Russian River and groundwater from the Ukiah Valley Groundwater Basin (Basin). Production volumes of surface water and groundwater over the past five (5) years are tabulated in this section. In addition, this section discusses potential future water supplies

Section 4 – Recycled Water Opportunities

This section describes the City's wastewater collection and treatment at the Ukiah Wastewater Treatment Plant (UWWTP), and the uses and benefits of the City's new recycled water system. In addition, this section discusses the future outlook for the City on potential recycled water users.

Section 5 – Water Quality

This section discusses the quality of the City's potable water supply sources, including imported, surface, and groundwater. This section also discusses drinking water standards and the effect that water quality has on management strategies and supply reliability.

Section 6 – Water Use

This section describes past, current and projected water usage within the City's service area. This chapter also discusses the requirement of the Water Conservation Act (SBx7-7), including the 2020 Water Use Targets.

Section 7 – Reliability Planning

This section presents a drought risk assessment of the City's water system. The drought risk assessment is an assessment of the reliability of the City's water supplies by comparing projected future water demands with expected available water supplies under three different hydrologic conditions: normal year; a single dry year; and multiple dry years. This 2020 Plan concludes that if projected imported and local supplies are developed as anticipated, no water shortages are anticipated in the City's service area during the planning period.

Section 8 – Contingency Planning

This section describes the City's response plan to water shortages, as well as those efforts that will be utilized in the event of water supply interruptions, such as power outages, earthquakes, or droughts. This section also describes regional response efforts to water supply interruptions.

Section 9 – Conservation Measures

This section addresses the City's compliance with water conservation measures that correspond to the seven (7) Demand Management Measures (DMMs) described in the 2020 UWMP Guidebook, which were previously the 14 DMMs listed in the Act. The DMMs also correspond to the current Best Management Practices (BMPs) from the California Water Efficiency Partnership (CalWEP).

Appendices

The appendices contain references and specific documents that contain reference data used to prepare this 2020 Plan.

1.6 LAY DESCRIPTION

To facilitate effective and efficient management of water supplies, and in compliance with the UWMP Act and the Water Conservation Act of 2009, the City has prepared this 2020 UWMP. This UWMP includes background information regarding the City's history, water system, and water supplies. This UWMP also analyzes recent water demands and projects future water supply capacity and water demands through 2045. The effects of water quality, drought, and emergencies on the City's water supply reliability are also analyzed.

The City currently has left a net-positive water footprint. That is, water re-use and recharge exceeds overall demands by the City's metered customers. This has been the case since the City began using recycled water in 2019. Recycled water (water re-use) has taken the place of potable water for 700 acres of landscapes and agriculture, which also provides indirect recharge to the groundwater basin. This UWMP recommends that the City continue its current operations that leave a net-positive water footprint for the City. This UWMP also recommends conservation tools that will enable the City's residents to conserve water and maximize water use efficiency. These methods are described in **Section 9**.

The City has a net-positive water footprint, with more water recycled and recharged than consumed on an annual basis.

As indicated by **Section 7** of this UWMP, the City does not expect to have a water supply shortage through 2045. Furthermore, this UWMP concludes that the City's water supplies are resilient to droughts. If the water consumption rates in the City decrease as this UWMP projects, the City can expect to have a lower total water use in the year 2045 than in the current year (2021). This is in spite of a 10% total population growth over the next 25 years.

In the event that a catastrophe causes a sudden water supply interruption, the City can follow the criteria of the Water Shortage Contingency Plan (WSCP), as described in **Section 8** of this UWMP. The WSCP provides the City with a phased response plan, depending on the severity of the water shortage. The WSCP is both a stand-alone document and a part of this UWMP.

This 2020 UWMP will be implemented as described herein. Since UWMPs are due for revision every five years, this UWMP is projected to be in effect until the year's end of 2025. At that time the City's 2025 UWMP will begin development and adoption.

Section 2
Service Area Description

The City provides water service to about 99 percent of the City limits through 5,030 active water service accounts, including residential, commercial, and institutional accounts. The City's water service area population is approximately 16,000 persons.





Section 2

SERVICE AREA DESCRIPTION

The City's Water Service Area is roughly 3,000 acres or 4.7 square miles in size.

2.1 CITY AND WATER SYSTEM HISTORY

The City of Ukiah was incorporated on March 8, 1876. Currently, the City is a general-law City per the State of California Govt Code § 34102. Per the US Census Bureau, the City qualifies as an "urban area", but currently falls under the "urban cluster" category which is a Census category for small to mid-size cities. The City operates under a City Council/City Manager form of government. The City Council consists of five (5) Council Members elected to four-year terms, one of which is appointed mayor by Council for a one-year term. The City Manager, who serves on behalf of the City Council, runs the day-to-day operations of the City. Under the City Manager's general oversight, the City's Director of Water and Sewer Utilities runs the City's Water Resources Department. The City's Water Resources Department performs all activities related to the water system.

2.1.1 Early Stages

Prior to the City's incorporation, Ukiah was part of a Mexican Land Grant, and the City began its history as a valley settlement in 1856. Lumber production became a major industry by the end of the 1940s because of the City's moderate climate and productive soil; currently, agriculture is the largest industry in Ukiah and the rest of Mendocino County. Ukiah is home to wineries, grape vineyards, pear orchards, wood production plants, and non-agricultural manufacturers.

2.2 CURRENT WATER SERVICE AREA

The City of Ukiah is located in the southeastern portion of Mendocino County, approximately 60 miles north of Santa Rosa, 20 miles south of Willits, and 5 miles south-west of Lake Mendocino. The City is bounded by the Mendocino Range to the west and the Mayacamas Mountains to the east. Interstate Highway 101 runs north and south through the City along its eastern boundary. The Russian River flows from north to south through the Ukiah area. The City's total land area is roughly 3,000 acres or 4.7 square miles. The City is also the county seat for Mendocino County. See **Figure 2.1** for the City's Service Area Map.

The City's water service area comprises nearly 100 percent of the population residing within the City limits, with a small amount (less than 1 percent) of City residents being served by other water purveyors. The City's Water Service Area is predominantly equivalent to the City's total land area mentioned above.

The City's "Sphere of Influence" (SOI) is a large, unincorporated area surrounding the City. The SOI is included in the City's General Plan. The City is anticipating an update to the SOI this year, which is reflected in **Figure 2.2** of this Section. For planning purposes, this UWMP analyzes potential growth in the City's SOI (see **Sections 6 and 7**).

The City is a retail agency within the Ukiah Valley Groundwater Basin (Basin). The City draws water from the Russian River and the Ukiah Valley Groundwater Basin. The City shares these water sources with several agencies including: Redwood Valley County Water District, Willow County Water District, Millview County Water District, Calpella County Water District, Rogina Water Company, Mendocino County Russian River Flood Control and Water Conservation District (Flood Control District), and Sonoma County Water Agency.

The City is also a member of the Russian River Watershed Association (RRWA), which is a coalition of eleven cities, counties and special districts in the Russian River watershed that have come together to coordinate regional programs for clean water, habitat restoration, and watershed enhancement. RRWA was formed in 2003 to create opportunities for member agencies to expand their stewardship role in the watershed. These member agencies include the Cities of Cloverdale, Cotati, Healdsburg, Rohnert Park, Santa Rosa, Sebastopol, and Ukiah, as well as Mendocino and Sonoma County, Sonoma Water, and the Town of Windsor.

Finance Department staff read water meters monthly for billing purposes and recommend change-outs of damaged water meters in order to keep accurate accounts of

water consumed by customers. The City's Water Resources Department staff are certified by the State of California to operate, maintain and repair the water distribution system, the City's wells, the Water Treatment Plant (WTP), and the Wastewater Treatment Plant (WWTP).

The Water Resources Department's key objectives can be summarized as the following:

- Respond to all water quality complaints
- Flushing mains
- Efficiently operate groundwater facilities and the Water Treatment Plant
- Maintain and make repairs to all components of the water distribution system
- Comply with Division of Drinking Water (DDW) regulations, including laboratory testing
- Promote water certification and safety training

Most of the water consumption is by residential users, with an even amount distributed to both single-family and multi-family residences, and the remaining water users in the City include, commercial/ institutional, industrial, landscape irrigation, and other. Water use by the fire service is reported under the other category. In 2020 residential users accounted for about 55% of the City's total water usage.

2.3 LAND USE & ECONOMY

The City is one of four (4) incorporated cities located in Mendocino County. Mendocino County encompasses an area of 3,510 square miles or 2.2 million acres, and is bordered on the west by the coast, on the north by Humboldt County, on the South by Sonoma County, and on the east by Lake and Glenn County. According to a County Report, nearly 500,000 acres are used for agriculture in Mendocino County, including acreage in both unincorporated and incorporated County. Overall, Mendocino County's agricultural production consists of more than 120 types of commodities. In addition, timber cut in the County have significant economic impact. In fact, according to County Agricultural Reports, timber accounts for the second highest-ranking value at over $188 million gross. Total combined agricultural production in Mendocino County is just under $321 million.

In addition to agricultural and livestock production, the County has a substantial manufacturing economy. According to

County estimates, total manufacturing production in Mendocino County is estimated to be over $453 million.

The Mendocino County General Plan, updated August 2009, identifies fourteen (14) Specific Area Plans within Mendocino County. This includes a mixture of suburban residential, rural community, industrial, and agricultural lands. No specific developments are identified within the City in the current version of the County's Plan because the City is governed by its own general plan.

Table 2.1 on the following page provides some basic statistics on current land use and economy for Mendocino County and the City. **Figure 2.3** in this Section shows the Mendocino County General Plan Land Use Map, which includes the agricultural, open space, and community areas.

Table 2.1
Current Land Use & Economic Statistics for Mendocino County and City of Ukiah

Land: Total (sq. miles)		
Item	**Mendocino County**	**City of Ukiah**
Land Area (sq. miles)	3,510 square miles	4.68 sq. miles
Land Area (acres)	2,246,000 acres	2,989 acres
Agricultural Land (acres)	497,000 acres	20 acres*
Developed Land (acres)	7,500 acres	2,240 square miles
Population		
Item	**Mendocino County**	**City of Ukiah**
Population	87,946	16,061
Housing		
Item	**Mendocino County**	**City of Ukiah**
Housing Units	41,027	6,572
Median Home Price	$378,000	$358,000
Owner Occupancy Rate	60%	42%
Economy		
Item	**Mendocino County**	**City of Ukiah**
Employed (16yrs +)	58%	62%
Unemployment Rate	5.2%	7.1%
Median Household Income	$51,400	$49,900
Percent in Poverty	14%	19%
Retail & Wholesale Sales	$1.1 Billion	$442 Million
Agriculture/Crops	$321 Million	N/A**

** Does not include surrounding Ukiah Valley. Within City Boundaries only. Some of these lands are designated in the City's current Zoning Map (http://www.cityofukiah.com/documents-and-maps/) for pending development.*

*** The areas immediately surrounding the City contribute to the County's agricultural production.*

2.3.1 Development in City

The City General Plan is currently being updated by City staff with direction from the City Council and input from the Planning Commission and the community, and is anticipated to be completed by May 2021. The development of the General Plan Update is being led by City staff from the Community Development Department. To assist in the development of the Update, the City has also hired a team of advanced planning specialists that include community planners and technical specialists.

The Ukiah General Plan contains the following elements, as mandated by Government Code Section 65302: Open Space and Conservation, Noise, Safety, Energy, Airport, Parks & Recreation, Historic and Archeological Resources, Community Facilities & Services, Circulation & Transportation, Housing, Community Design, Economic Development, and Land Use.

In addition to the mandated elements, CEQA Guidelines stipulate that the City's General Plan Environmental Impact Report (EIR) identify the potential environmental impacts associated with the implementation of the General Plan. This analysis will assess and, if necessary, include measures to mitigate potential impacts related to CEQA-required topics for proposed developments.

The City's Land Use Element separates land within the City limits into four (4) main zones as shown on **Figure 2.3**, which is described below:

Resource Lands

- Agriculture (AG)
- Range and Resource (RL)
- Remote Residential (RMR)

Residential

- Rural Density (RR)
- Low Density Residential (LDR)
- Medium Density Residential (MDR)
- High Density Residential (HDR)

Economic Development

- Commercial (C)
- Industrial (I)
- Rural Community

Recreation and Public (P)

- Open Space

Within each of the zone districts listed above, there are several types of individual developments that are included. For instance, churches are included in the CG Zone and some apartment buildings are included in the DTSP. The Land Use Element included in the Ukiah General Plan was meant to promote an orderly pattern of development in the City (including the City's ability to provide water service to the development).

2.3.2 Recent Developments

The City has recently experienced minor developments in recent years. Some of these developments are listed in **Table 2.2**:

Table 2.2
Recent Developments in City of Ukiah
(Since 2015 UWMP)

No.	Development
1	Costco
2	Sun House Senior Apartments
Total	**Two (2) Developments**

The Costco is a 141,000 SF warehouse building located on the south end of town, at 1275 Airport Park Blvd. The Sun House Senior Apartments is a new development consisting of thirty-six (36) 1-bedroom units and five (5) 2-bedroom units for low-income seniors. The Sun House Senior Apartments is located next to the Grace Hudson Museum.

2.4 CLIMATE

The City is influenced by the Pacific Ocean and is divided into wet and dry seasons. The City is considered a "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall. The area has average summer temperature of about 71°F with winters of about 47°F. The average annual rainfall for the region is 37.26 inches. Evapotranspiration (ETo) in the region averages approximately 52.15 inches annually. **Table 2.3** lists the historical average rainfall for the City:

Table 2.3
Historical Climate (1893-2013)
(www.wrcc.dri.edu)
Station: Ukiah, California (049122)

Month	Rainfall (in)	Avg. Temp (°F)
Jan	7.85	46
Feb	6.52	49.2
Mar	4.75	51.8
Apr	2.35	55.7
May	1.07	61.1
Jun	0.35	67.3
Jul	0.04	73.1
Aug	0.08	72.2
Sep	0.45	68
Oct	1.9	60.5
Nov	4.66	51.6
Dec	7.24	46.2
Totals:	**37.26**	**58.6**

As the State of California has undergone a several-year drought, rainfall has been lower in the City. Recent ETo and rainfall data in the past year indicate that rainfall totals for all months, except for May, July, and August are lower than the historical levels. **Table 2.4** on the following page shows the recent data for the region.

Table 2.4

Recent Climate Characteristics (2021)
CIMIS Station 106 (Sanel Valley)
(cimis.water.ca.gov)

Month	Rainfall (in)	ETo (in)
Jan (2021)	3.77	1.42
Feb (2021)	2.02	2.17
Mar (2021)	2.55	3.62
Apr (2020)	0.71	5.01
May (2020)	1.61	5.84
Jun (2020)	0.29	7.47
Jul (2020)	0.53	8.25
Aug (2020)	0.80	6.68
Sep (2020)	0.23	4.62
Oct (2020)	0.70	3.87
Nov (2020)	1.26	1.83
Dec (2020)	2.83	1.37
Totals:	**17.3**	**52.15**

The recorded rainfall in the City for Calendar year 2020 was 11.32 inches, which amounts to 31% of the average rainfall (37.01 inches). This was the second lowest rainfall recorded since 1893. It is important to note that despite the recent drought, local rainfall has limited impacts on surface water and groundwater replenishment within the City. Due to the low population density of Mendocino County compared to the quantity of water flowing through the Russian River and held in the Basin, the City is not concerned with recent fluctuations.

2.4.1 Climate Change

The DWR Guidebook encourages water suppliers to include a discussion of climate change in their UWMPs. The City's Climate Action Plan (CAP) assesses City greenhouse gas emissions, establishes an emissions reduction target, and outlines strategies to meet these goals. The CAP is available online and is also included in the Appendix of this UWMP.

The California Adaptive Planning Guide (2012) projects temperature increases throughout the North Coast region. By 2100, January temperatures are projected to increase by 5 degrees Fahrenheit, and July temperatures are projected to increase by 6 degrees Fahrenheit. The number of heat waves, defined regionally as five consecutive days with temperatures as high as 93 degrees Fahrenheit, is not expected to increase within the City. Snowpack is projected to decrease significantly throughout the North Coast region, and precipitation in Ukiah is projected to decrease 10 percent by 2050. The City is not susceptible to the projected rise in sea level associated with global climate change. Public health and safety and sensitive species will likely be impacted by climate change. The CAP has seven (7) adaption planning strategies for mitigating climate change impacts on residents, businesses, agriculture, etc.

2.5 POPULATION

According to the most recent population figures from the California Department of Finance (DOF), the current 2020 resident population of the City is approximately 16,061 persons. Since the City's water service area comprises nearly 100 percent of the population residing within the City limits, the total current resident population served by the City's water system is also 16,061 persons. This is only approximately 132 persons more than the population total in 2015. Although, the City experienced a peak population of 16,151 persons in 2018, the number has fluctuated over the last five (5) years. **Table 2.5** below lists the City's recent and current (2020) populations:

Table 2.5
City of Ukiah Population

Year	Service Area Population
2015	15,929
2016	15,970
2017	15,993
2018	16,151
2019	16,029
2020	16,061

As the County seat, daytime populations fluctuate significantly. On special occasions, daytime populations can be more than twice the City's resident population listed above.

2.5.1 Population Projections

According to the DOF, population of the City of Ukiah in January 2018 was estimated at 16,226 persons. As shown in Table 2.2 of the City's Housing Element Update 2019-2027, between 2000 and 2010, the City added 545 residents, or 0.35% annual growth rate, to its population. The DoF used an annual growth rate of 0.36% for their projections, which is very close to the annual growth rate between 2000 and 2010 of 0.35%. As a result, this annual growth rate of 0.36% was used in the 2020 UWMP for the City's population projections for 2025-2045. This amounts to a growth of 58 persons per year for 25 years to 2045. Population projections for 2045, and every five-year increment from 2020 until then is shown in **Table 2.6**.

Table 2.6
Population Projections

Year	Service Area Population
2025	16,350
2030	16,639
2035	16,928
2040	17,217
2045	17,506

As the City continues to grow both in size and significance, the City may likely experience periodic spikes in the number of daytime or short-term residents (due to schools or daytime commercial jobs).

2.6 CITY WATER SYSTEM

A basic overview of the City's water system is provided herein. More information on the City's water sources, water treatment, and water demands can be found in **Sections 3 through 6** of this report. Since this UWMP is a water resource planning document, it does not provide a great degree of technical detail on water system components.

2.6.1 City Water System Overview

Overall, the City's water system consists of the following components:

- Ranney Collector (Radial Well) & Well #3
- Groundwater supply wells
- Water treatment facility
- Imported Water Connections
- Water distribution pipeline network
- Water storage facilities
- Booster stations
- Emergency interconnections
- Recycled Water

A brief description of the City's overall water system components is provided as follows:

2.6.2 Imported Water

In previous years, the City maintained an agreement with the Mendocino County Russian River Flood Control and Water Conservation Improvement District (Flood Control District). Under that agreement, the City was allowed to pump up to 800 AFY of water under the District's Permit 12947B. The agreement with the Flood Control District was discontinued in 2014, which became effective in December of 2020. The City has decided not to renew a contract with the Flood Control District, due to sufficiency of the City's water supplies.

2.6.3 Groundwater

Water produced from four (4) groundwater wells account for about 55% of the City's potable water system. These 4 wells (Wells #4, #7, #8, and #9) pull water from the Ukiah Valley Groundwater Basin, which currently is an unadjudicated basin.

In 2017, the City came together with the County of Mendocino and other Ukiah Valley agencies to form the Ukiah Valley Basin Groundwater Sustainability Agency (UVBGSA). The County of Mendocino manages the UVBGSA Board Meetings, provides information about UVBGSA, and provides communication/outreach to the public. The UVBGSA is currently preparing a Groundwater Sustainability Plan (GSP), to provide guidance for pumping activities in the basin. A 2017 report by UC Davis indicated that the basin receives an annual recharge of about 25,000 AF, with a total

storage between 400,000 AF to 500,000 AF. As a result, it is unlikely that the basin will be impacted by droughts.

Prior to 2019, Well #4 had been offline for rehabilitation. Well #8 experienced some problems during installation and has not produced as anticipated from the beginning of its operation. The total pumping capacity of Wells #4, #7, and #8 are 2,200 gpm (or 3,548 AFY). Well #9 went online in 2017 with a pumping capacity of 700 gpm (about 1,129 AFY). This brings the total pumping capacity of all four (4) groundwater wells to 4,677 AFY.

2.6.4 Surface Water

Water is produced from two (2) surface water sources, the Ranney Diversion/Collector and Well 3, which collectively account for about 45% of the City's potable water system. Both sources produce water from the Russian River. The Ranney Collector has a capacity of 4.6 million gallons per day (MGD) (5,155 AFY) and Well #3 has an estimated pumping capacity of 300 GPM (484 AFY). The Total available surface water pumping capacity is 5,638 AFY. However, the City has total water rights to 16,507 AFY of the Russian River.

2.6.5 Water Treatment Facility

The City's Water Treatment Plant (WTP) was constructed and began operation in April 1992, and treats water collected in the Ranney Collector. The WTP is located about 300 feet away from Ranney collector and uses the Microfloc contact clarification-filtration. Treatment processes include pre-chlorination, adsorption, clarification, mixed-media gravity filtration, and disinfection.

Filter backwash water generated from the water treatment plant processes is discharged to two 216,000-gallon clarification reservoirs for recycling. Treated water is pumped to a 1.5 MG clearwell / reservoir for post chlorination. From the clearwell, the water is pumped into the distribution system by vertical turbine high service pumps. Operation of the treatment plant is controlled through the use of a pressure transducer in the City's new 1.5 MG reservoir.

The most-recent improvements to the WTP included an additional Microfloc contact clarification-filtration unit for reliability and redundancy, new chlorine scrubber, new sodium hydroxide tank and dispensing system, new water distribution SCADA system, and high service pumps.

2.6.6 Distribution System

The City distributes water to residential, commercial, and other customers through approximately 5,030 service connections using a 62-mile network of distribution mains. The water system consists of four (4)

pressure zones that provide modified pressure to customers. Zone 1 is the main zone, and it serves 97 percent of the City's water system. Zone 1 is served by gravity from the two largest storage tanks. Smaller pressure zones are supplied by booster pump stations. The water service area is shown in **Figures 2.1** at end of this Section.

2.6.7 Water Storage

For storage needs, the City maintains eight (8) operating storage reservoirs with a combined storage capacity of 6.1 MG The reservoirs include a 2.5 MG concrete tank, a 100,000-gallon steel tank, a 13,000-gallon redwood tank, a 30,000-gallon steel tank (constructed in 1996), a 135,000-gallon concrete clearwell with transfer station, and three new storage tanks completed in 2005 (two 1.5 MG tanks and one 315,000-gallon tank). The City is in the process of upsizing the aforementioned steel tank from 100,000 to 160,000 gallons.

2.6.8 Booster Stations

The City of Ukiah maintains and operates three (3) booster stations throughout its service area. The booster stations are located on the westerly side of the City, near the base of foothills. The booster stations range in capacity from 40 gpm to 350 gpm. These pumps serve only a few service connections.

2.6.9 Emergency Interconnections

The City does not transfer or exchange water with its neighboring water agencies. However, the City maintains emergency agreements as follows:

- Emergency agreement with Willow County Water District
- Emergency agreement with Millview County Water District

Besides the two agencies above, the Redwood Valley County Water District (Redwood), benefits indirectly from the City's actions. For instance, the City's relinquishing of its agreement with the Flood Control District as noted in **Section 2.6.2** has allowed Redwood to obtain additional surface water from the Flood Control District.

2.6.10 Recycled Water

As of 2019, the City distributes recycled water through a 7.8-mile network of recycled water distribution mains. Per the 2015 UWMP, the City did not deliver recycled water, but had secured grant funding to expand recycled water delivery by 2020. The implementation of recycled water was broken up into a four-phase plan to deliver up to 1,400 AFY of recycled water to irrigation and industrial users. The City completed Phases 1 to 3 in September of 2019.

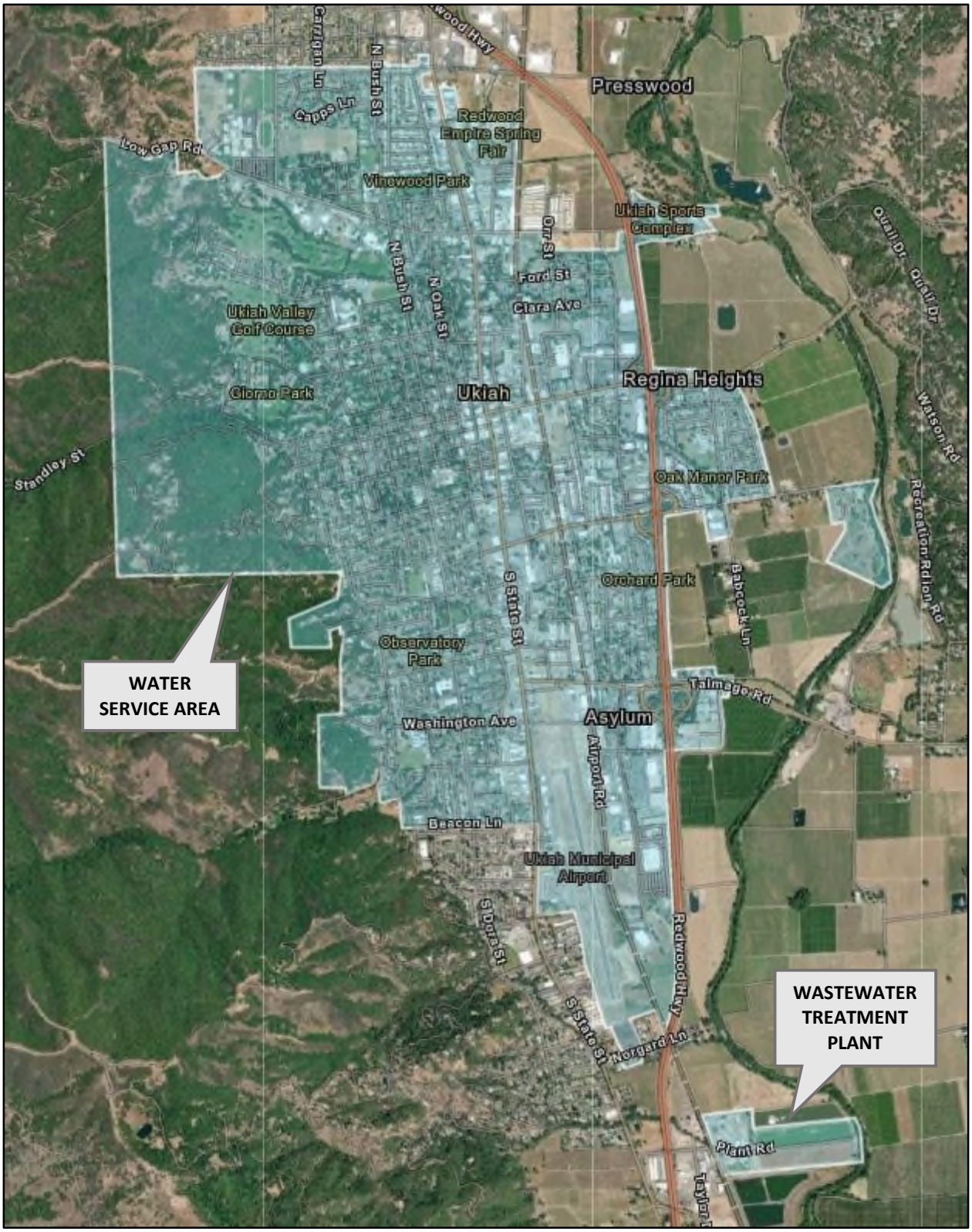


Figure 2.1: City of Ukiah Water Service Area

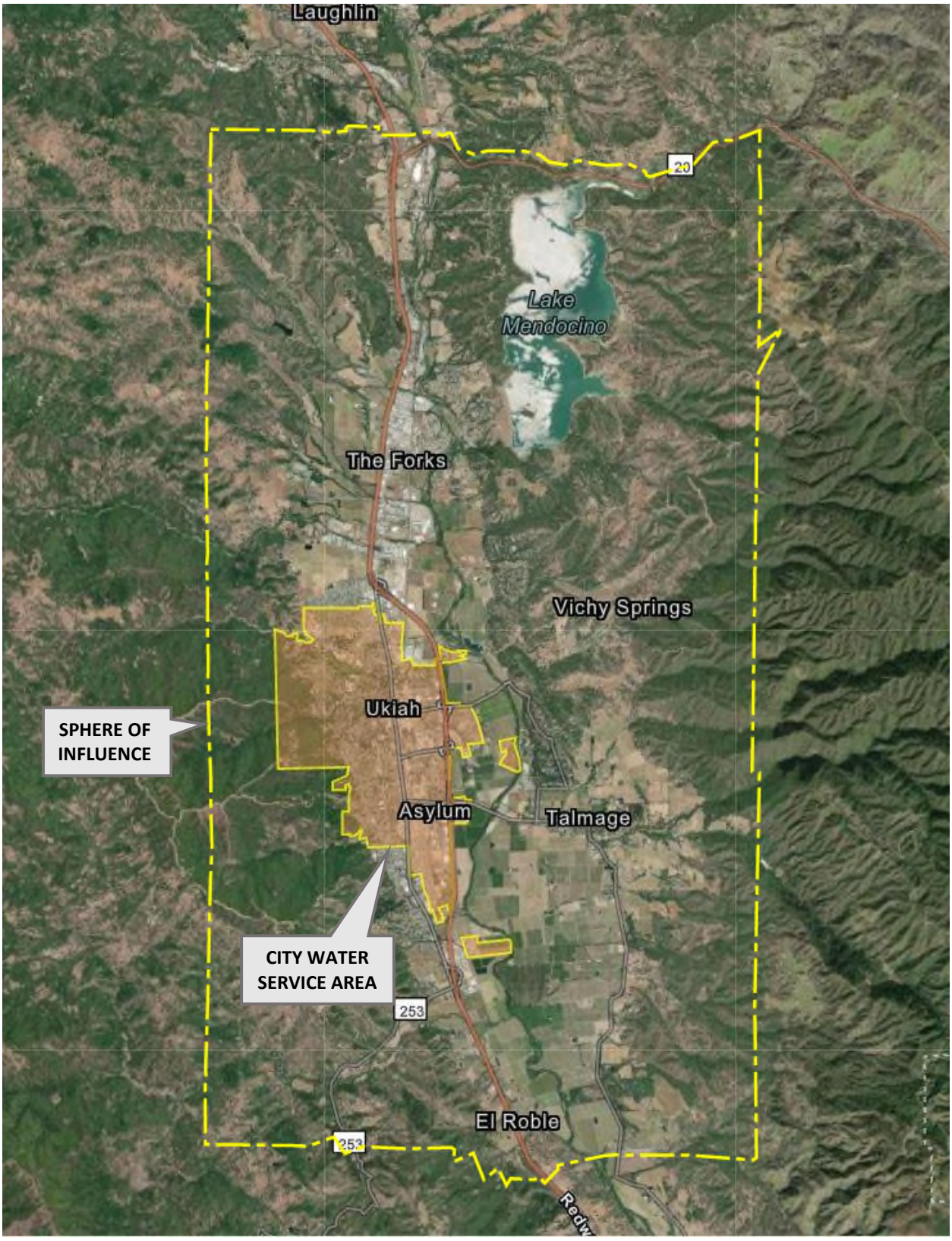


Figure 2.2: City of Ukiah Water Service Area & Sphere of Influence (SOI)

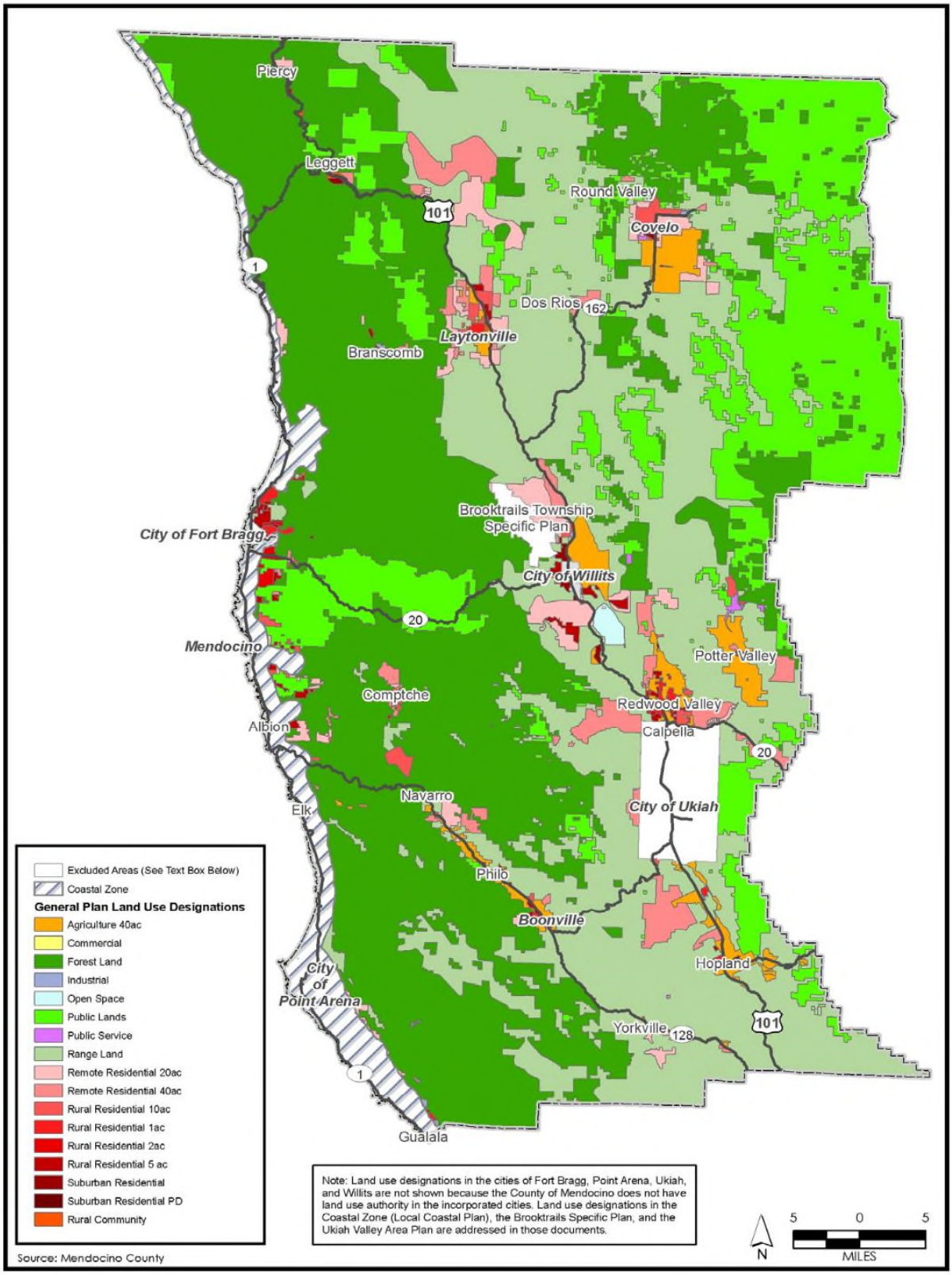


Figure 2.3: Mendocino County General Plan Land Use Map

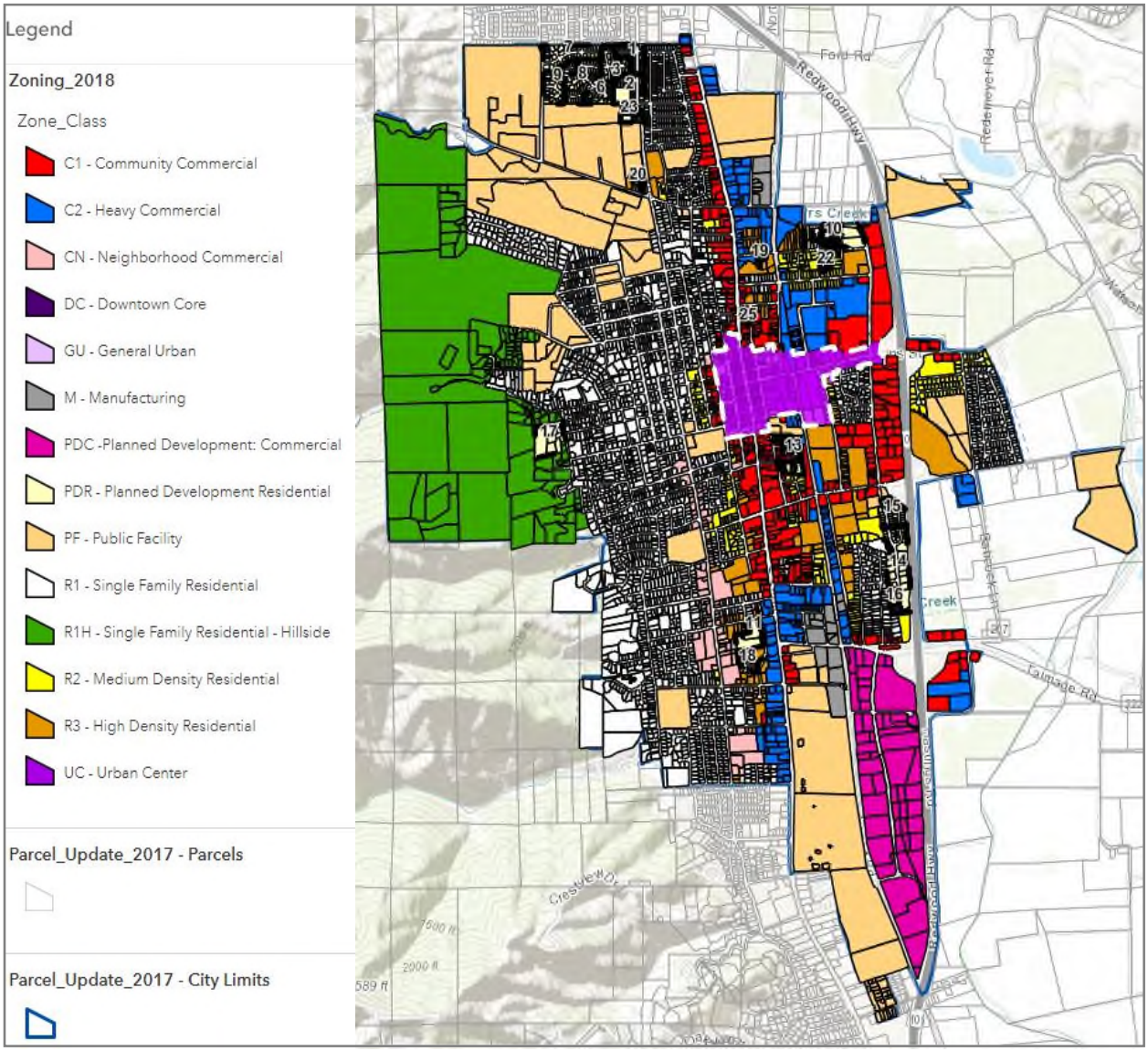


Figure 2.4: City of Ukiah Zoning Map

Section 3
Water Sources & Supplies

The City's potable water sources consist of surface water underflows extracted from the Russian River (pictured below) and groundwater from the Ukiah Valley Groundwater basin. The City uses one (1) radial well (Ranney collector) and one (1) well to collect surface water underflows. Groundwater is extracted from four (4) active groundwater wells.





Section 3

WATER SOURCES & SUPPLIES

Surface water accounts for about 55 percent of the City's water supply over the past five (5) years.

3.1 INTRODUCTION

The City currently uses both potable water and non-potable (recycled) water to meet the needs of its service area. Recycled water is covered in **Section 4**. The City's potable water comes from local water sources only, including surface water from the Russian River and groundwater from the Ukiah Valley Groundwater Basin. The groundwater basin is not currently limited with water rights agreements, whereas the City has water rights agreements with the State for use of surface water from the Russian River water. The City maintains groundwater wells, a Ranney collector, surface well, and a potable water treatment plant to produce water in the City. This Section describes the current and projected water resources available to the City over a 25-year period (through 2045).

3.2 WATER SUPPLY SOURCES

3.2.1 Surface Water (Russian River)

The City currently uses underflow from the Russian River and plans to continue doing so in the future. The Russian River hydrologic unit encompasses 1,485 square miles in Mendocino and Sonoma counties, bounded by the Coast Ranges on both the east and west (see **Figure 3.1** on Page 3-3). The head of the Russian River is located about 16 geographic miles north of the City, wherein the river picks up additional flows

from smaller tributary creeks before reaching the Ukiah Valley. The river flows southward from Redwood and Potter valleys (north of City) to its confluence with Mark West Creek, where it turns westward to cut through the coastal mountain range and empty into the Pacific Ocean at the town of Jenner. The total length of the main river is about 110 miles long.

Elevations in the watershed range from sea level (0 feet) at the estuary near the town of Jenner to as high as 4,300 feet at the summit of Mt. St. Helena in the Mayacama Mountains. The Ukiah Valley sub-region of the watershed ranges from 600 feet to 700 feet in elevation. The principal tributaries of the Russian River include the East Fork Russian River, and several, smaller creeks, including the Feliz, Pieta, Big Sulfur, Dry, Mark West (including the Laguna de Santa Rosa), Green Valley, and Austin creeks. Some of the tributary creeks within the Ukiah Valley include the Orrs Creek, Gibson Creek, Doolin Creek, Mill Creek, and Ackerman Creek. The Ukiah Valley creeks are shown in **Figure 3.2** on Page 3-4.

The volume of surface flows in the Russian River within the Ukiah Valley are significantly influenced by the operations of the Potter Valley Powerhouse (PVP) and Lake Mendocino. The PVP is managed by Pacific Gas & Electric Company (PG&E). Lake Mendocino is managed by the U.S. Army Corps of Engineers (USACE), San Francisco District. Sonoma Water and the Mendocino County Russian River Flood Control and Water Conservation District (Flood Control District) own storage space in Lake Mendocino. These agencies coordinate water releases from Lake Mendocino with the USACE and the National Marine Fisheries Service (NMFS). A recent temporary water-rights variance was requested by PG&E this year (2021), which would reduce minimum flow from the PVP into the East Fork of the Russian River from 45 cubic feet per second (cfs) to 15 cfs. The temporary variance was filed with regards to water rights decisions issued by the State Water Resources Control Board (SWRCB). The SWRCB issued Decision 1030 in 1961 which clarified water-rights to agencies along the Russian River. Decision 1610 was issued in 1986 which stipulated minimum flow requirements in the river as a condition for the water rights. The minimum flow requirements help protect marine life and to maintain the quality of water in the river's watershed.

SWRCB Decision 1610 reaffirms water rights given in Decision 1030 with minimum flow stipulations.

According to the individual permits issued under Decision 1610, dam releases from Lake Mendocino into the East Fork of the Russian River must be 25 cfs at all times. As such, Sonoma Water must release sufficient

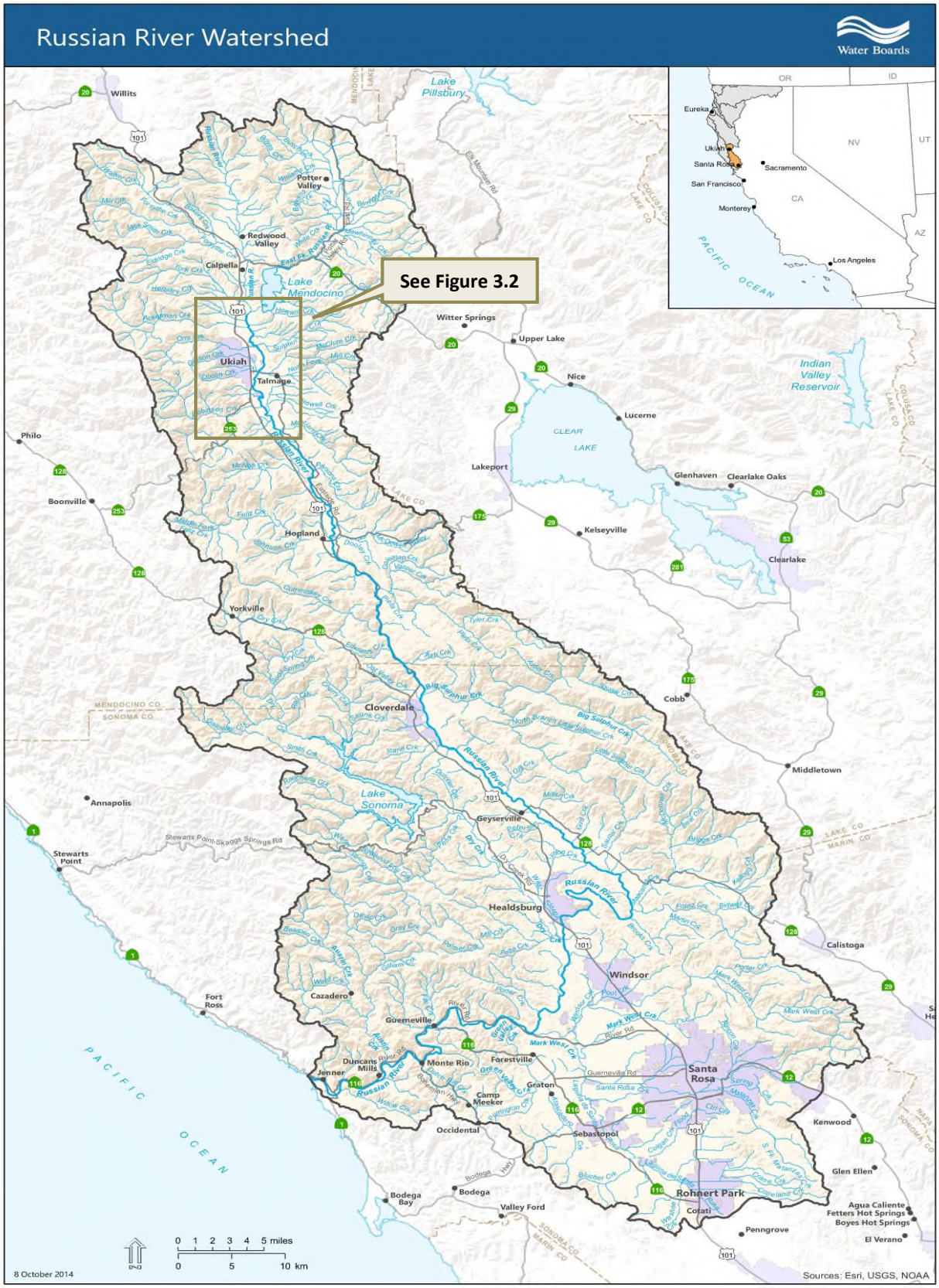


Figure 3.1: Russian River Watershed

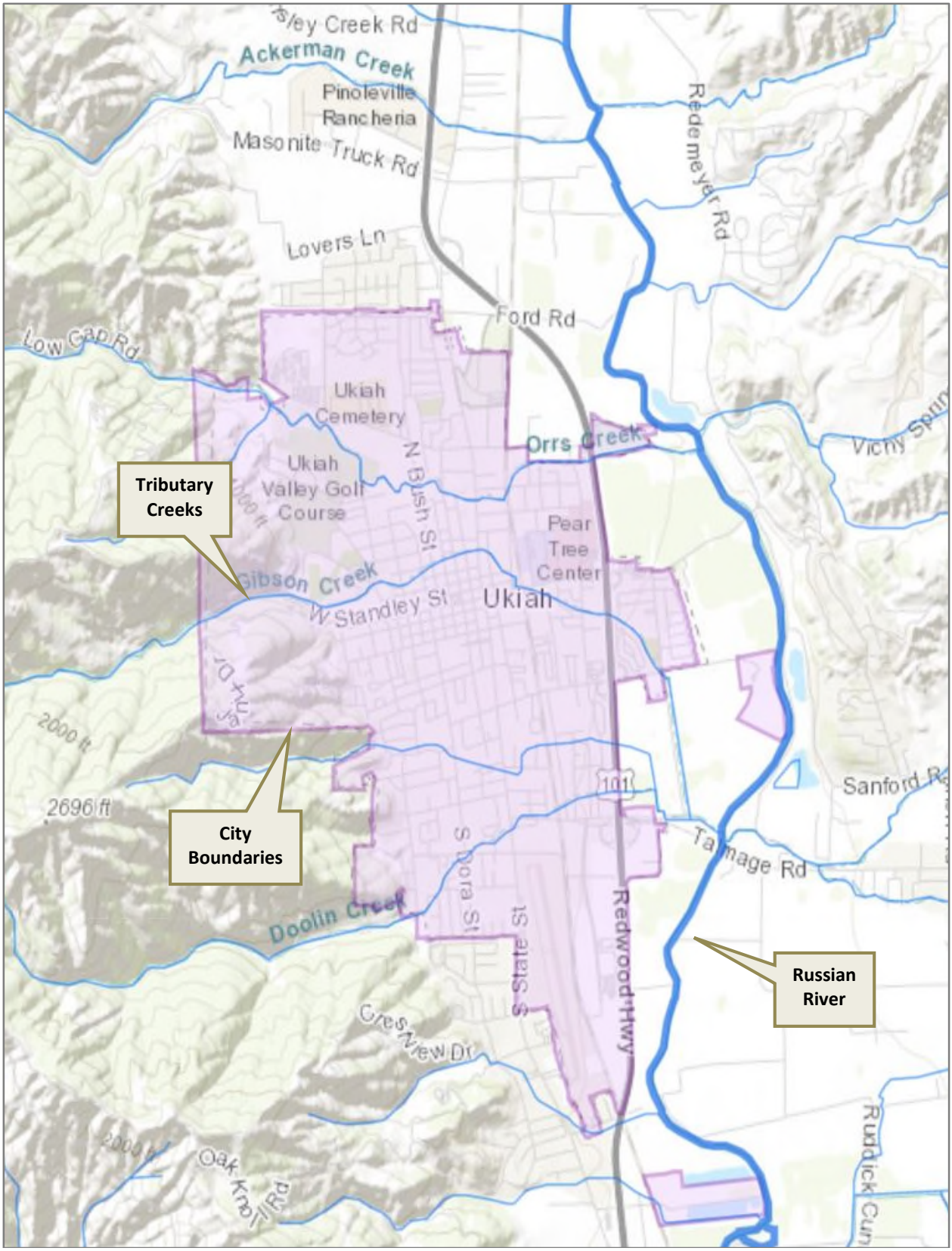


Figure 3.2: Russian River Tributaries in City Water Service Area

water from Lake Mendocino to maintain a river flow of 150 cfs to 185 cfs during normal conditions. Dry conditions are considered to be 75 cfs, and critical conditions are considered to be 25 cfs. Thus, the City can reasonably expect the following flows to be available in the Russian River adjacent to the City's water service area:

Table 3.1
Typical River Flow Volumes in Ukiah Valley

Climate Condition	Volume
Normal Water Year	150 cfs to 185 cfs
Dry Water Year	75 cfs
Critical Drought	25 cfs

Sonoma Water maintains a geographic information system (GIS) inventory of flow sensors along the entire Russian River. Flow data captured on April 30th, 2021 indicated that a flow of 53.80 cfs was measured just north of the City's water service area. This is shown in **Figure 3.4** on Page 3-7.

Two (2) reservoirs provide flood protection and water supply storage for the Russian River Watershed: 1) Lake Mendocino on the East Fork Russian River near the City of Ukiah, and 2) Lake Sonoma on Dry Creek west of Healdsburg. Lake Mendocino was formed when the Coyote Dam was constructed in 1958, and Lake Sonoma was formed in 1984 after completion of the Warm Springs Dam. Both dams were constructed by the U.S. Army Corps of Engineers as flood control projects, but also provide both water storage and hydro-electric power. The City's hydroelectric plant, located at the outlet conduit for Coyote Dam, became operational in 1986. It contains two turbine/generator units: a 1,000-kW unit and a 2,500-kW unit. The City is responsible for maintaining and operating the Hydroelectric Plant. As such, the City coordinates water releases from the dam with the USACE, Sonoma Water, the Northern California Power Agency (NCPA), and the NMFS. The releases from the dam are also reported to the Department of Water Resources (DWR).

DWR's online Data Exchange Center keeps records of all dam releases in the State. Reservoir operators in the State schedule reservoir releases and report the time/date and flow to DWR. Recent releases for Lake Mendocino are shown in **Table 3.2** below:

Table 3.2
Reservoir Releases

Date / Time	Volume
03/07/2021 - 12:00	103 cfs
03/09/2021 - 12:00	75 cfs

The releases shown in **Table 3.1** above correlate with the flow data shown on Sonoma Water's GIS database. For instance,

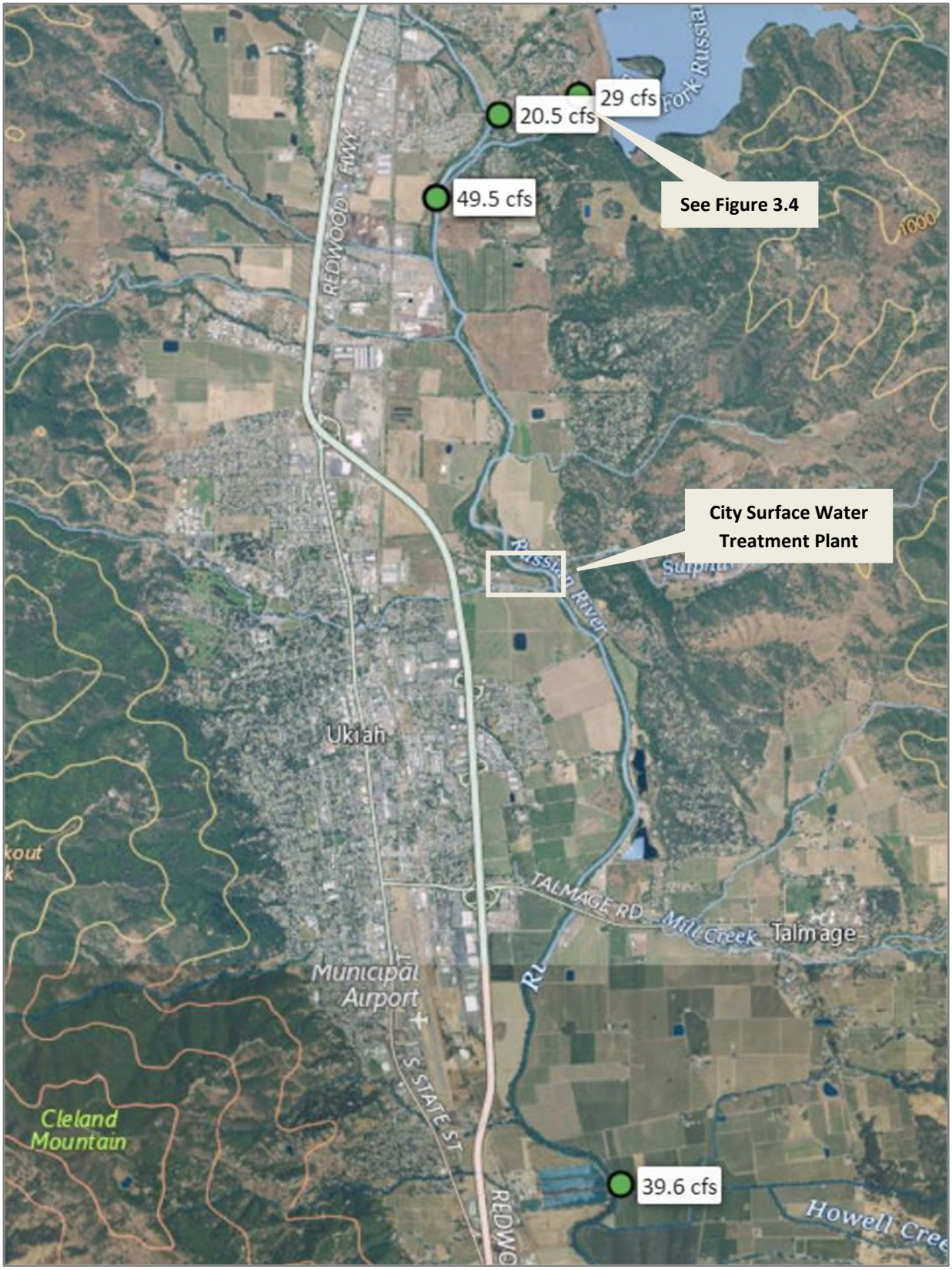


Figure 3.3: Streamflow Data from Sonoma Water (May 1, 2021)

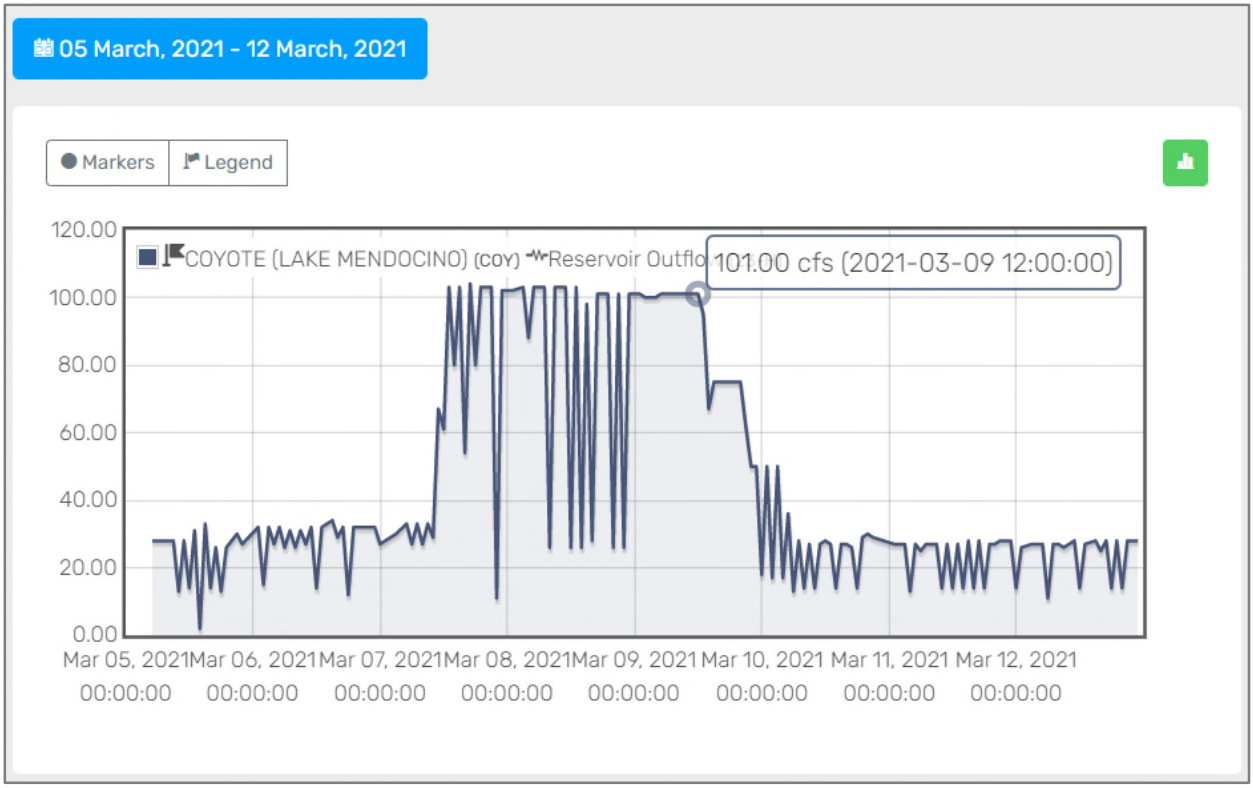


Figure 3.4: Spike in Streamflow in Russian River Following Dam Release on March 9, 2021

the flows in the East Fork of the Russian River immediately downstream of the Coyote Dam on March 9th, 12 pm were measured to be 101 cfs. This correlates with the dam release of 75 cfs at the same point in time. **Figure 3.4** above shows the flow data in the East Fork from March 1, 2021 to March 12, 2021. The graph indicates a spike in the flow during the scheduled releases shown in **Table 3.1**. The flow sensor at the confluence of the East Fork and the main branch of the Russian River (i.e. upstream of the City's surface water intake) indicated a peak flow of 324 cfs in the hours that followed the dam release on March 9th, 2021. Near the City's lower boundary, adjacent to the City's Wastewater Treatment Plant (WWTP), the peak flow was recorded at 440 cfs. The additional flows measured in the downstream sensor are likely due to the tributary creeks shown in **Figure 3.2.**

3.2.2 Surface Water Production in City

The City has Pre-1914 Right for at least 2.8 cubic feet per second (cfs) for diversion from the Russian River for a maximum of 2,027 Acre-Feet per Year (AFY). This water right is further recognized in Decision 1030 (1961).

Additionally, the City holds Water Right Permit 12952 (Application 15704) which

provides for the diversion of Russian River underflow for municipal purposes. The Permit currently covers Well #2 (no longer in use), Well #3, and the Ranney collector. Under the Permit, water can be diverted at a rate not to exceed 20.0 cfs from January 1 through December 31 with no annual limit. Therefore, the City's water right could provide a water supply of up to 14,480 AFY (20 cfs for 365 days). Combined with the City's Pre-1914 Appropriative Rights, the total surface water rights for the City stand at 16,507 AFY.

The Permit expired on December 31, 2000 and the City filed a Petition for Extension of Time with the State Water Board. The City has also filed petitions to add points of diversion and expand the place of use. The Permit is considered valid while the petitions are processed. In 2013, the City published a Draft Environmental Impact Report (DEIR) for the proposed Permit amendments. The DEIR is available on the City's website. This year (2021), the City is filing a new petition to extend Water Right Permit 12952.

The City's surface water supply is obtained from a Ranney collector (see **Figure 3.5**) and Well #3. The Ranney collector was constructed in 1966 and can draw up to 3,194 GPM (5,155 AFY operated continuously) from the alluvial zone of the Russian River at its current capacity of 4.6 million gallons per day (MGD). The Ranney collector can be used only when turbidity in the Russian River is low, a condition which occurs during dry weather conditions. During the rainy months, Russian River turbidity increases and the Microfloc contact clarification-filtration units located at The Water Treatment Plant (WTP) cannot be operated efficiently.

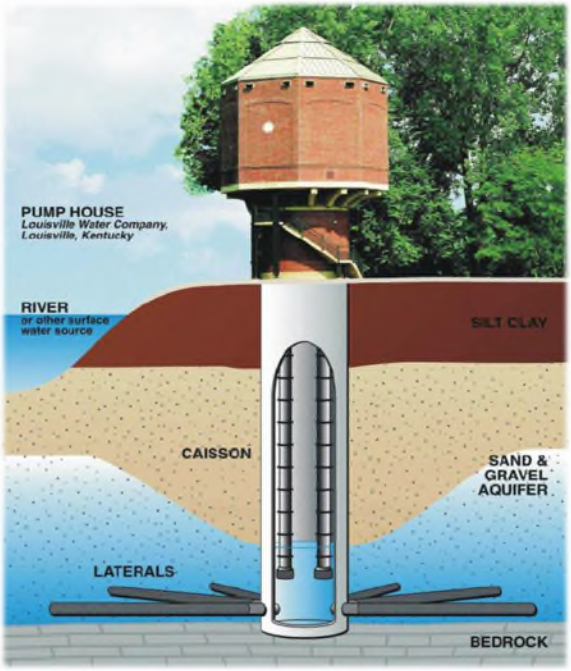


Figure 3.5: Radial Well (Ranney Collector)

Well #3 draws water from an alluvial zone along the Russian River as well. The supply source has been deemed groundwater under the direct influence of surface water by the California Department of Public Health (now the State Water Resources Control Board Division of Drinking Water) pursuant to 22 CCR §64651.10 of the California Water Works Standards. The determination is based on turbidity of the diverted water, which fluctuates with the

turbidity in the Russian River. Therefore, water diverted from Well #3 is regulated under the City's surface water right. Well #3 has an estimated pumping capacity of 300 GPM (484 AFY operated continuously). Combined with the City's Ranney collector, this results in a total surface water production capacity of 5,639 AFY.

The City's Ranney Collector and Well 3 are equipped with a flowmeter to measure water production. Water production is recorded monthly by City water staff and reported annually to DWR. Over the past six (6) years of operation, surface water extraction has averaged 1,508 AFY. **Table 3.3** displays the City's surface water supplies for years 2015 to 2020:

Table 3.3
Surface Water Production

Year	Production (AF)
2016	1,642
2017	1,537
2018	1,853
2019	1,133
2020	1,522
Average:	**1,537**

As noted by **Table 3.3** above, surface water production was substantially less than the City's surface water production capacity of 5,639 AFY. The surface water production is even further under the Critical Drought flows of 25 cfs (18,098 AFY), shown in **Table 3.1**. For these reasons, the City's surface water supplies even during severe droughts are not adversely impacted.

3.2.3 Imported (Surface) Water

As noted in **Section 2.6.2**, the City previously maintained an agreement with the Flood Control District for "imported" water. Under that agreement, the City was allowed to pump up to 800 AFY of surface water (underflows from the Russian River) under the District's Permit 12947B. The surface water was available through the same pumping equipment (Ranney collector and Well #3) that currently collects surface water underflows under the City's Pre-1914 Right and Permit 12952. The agreement with the Flood Control District was discontinued in 2014, which became effective in December of 2020. The City decided not to renew a contract with the Flood Control District, due to sufficiency of the City's current water supplies.

3.2.4 Groundwater

The City is located within the Ukiah Valley Groundwater Basin (Basin). The City pumps groundwater, and plans to do so in the future. The Basin is located in east-central Mendocino County, and underlies the entire City of Ukiah and the communities of

Talmage, The Forks, Calpella, Laughlin, and Redwood Valley. The Basin is about 22 miles long and 5 miles wide (at the widest point). The Basin is the largest of several groundwater basins along the Russian River, and covers the Ukiah Valley and the Redwood Valley. The Basin has a total surface area of about 38,000 acres, or 59 square miles. Surface elevations in the Basin range from 500 feet at the southerly end to 1,000 feet at the northerly end. The surface elevations within the City range from about 600 feet to 650 feet. Basin rainfall ranges from 35 to 45 inches.

Groundwater in basin is stored in two (2) main aquifers, which range in thickness and depth as indicated in **Table 3.4** of this Page. According to a 2017 Basin Report prepared by UC Davis, groundwater storage is stable and has been within 400,000 AF to 500,000 AF, with occasional variances. Groundwater contour maps indicate that the depth of groundwater in the City's service area can be up to 600 feet, with typical depths being less than 200 feet for municipal supply wells.

The Basin receives an average annual recharge of about 25,000 AF, of which about 23,000 AF comes from natural sources and 2,000 AF comes from the percolation pond recharge at the City's Wastewater Treatment Plant (WWTP). Natural recharge sources include, percolation from rainfall, percolation from Lake Mendocino, and lateral movement from the Russian River and its tributaries. Due to lateral movement in Basin, a portion of the recharge from streamflow exists southerly into the Sanel Valley Basin.

The key characteristics of the Basin are summarized below in **Table 3.4:**

Table 3.4
Ukiah Valley Basin
Summary of Characteristics

Item	Description
Surface Area	37,500 acres (59 sq. miles)
Max. Depth to Groundwater	600 ft.
Aquifer Thickness Range	50 - 200 ft.
Storage	450,000 AF
Natural Recharge/Safe Yield	25,300 AFY
Adjudicated Rights	N/A
Artificial Spreading Grounds	1
Injection Wells	0
Seawater Intrusion Barriers	N/A
Desalters	N/A

As noted in **Table 3.1**, there is one (1) official recharge/spreading grounds in the Basin (the City's spreading grounds at the WWTP). Unofficially, there are multiple, albeit smaller spreading grounds located throughout the Basin. These are located on

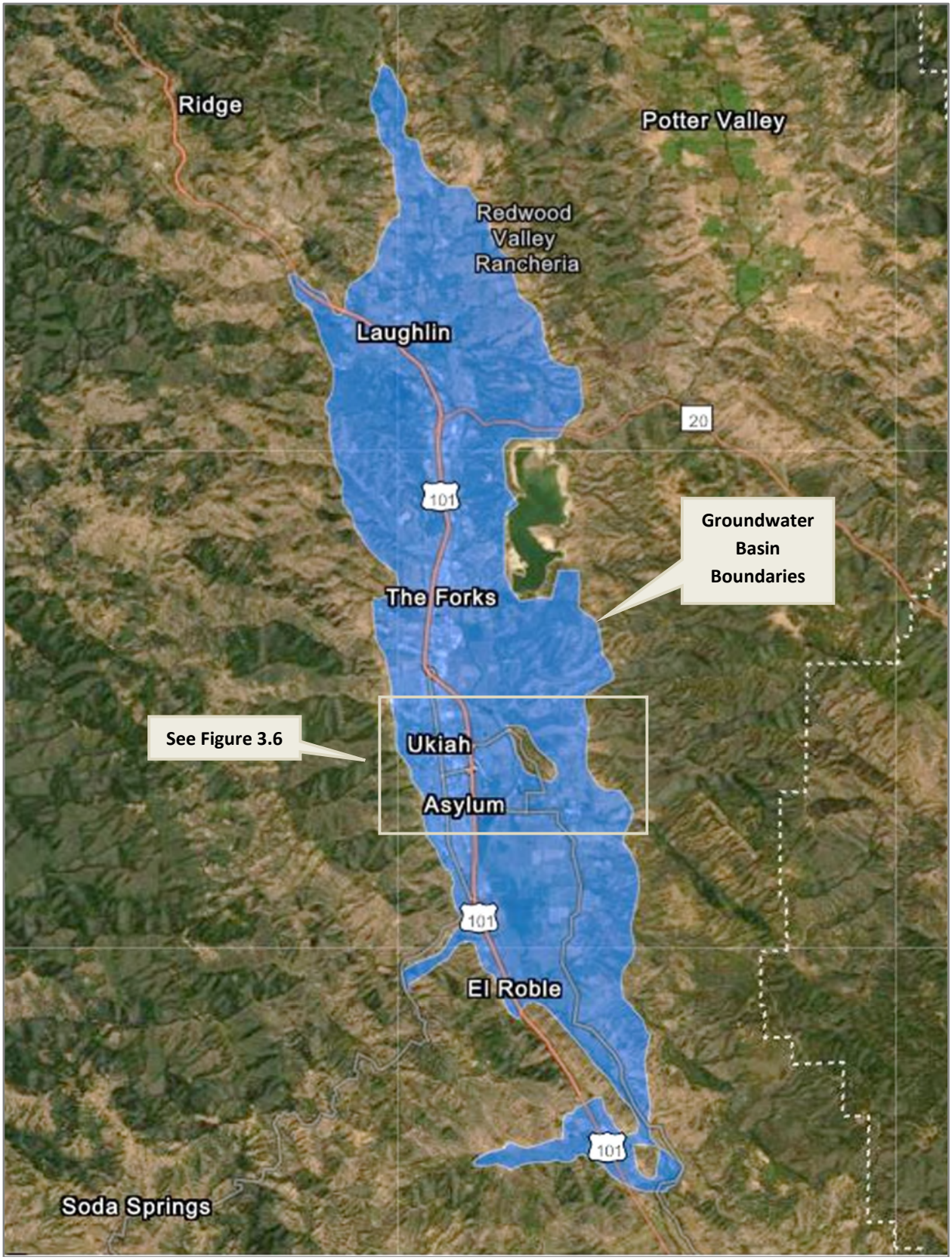


Figure 3.6: Ukiah Valley Groundwater Basin

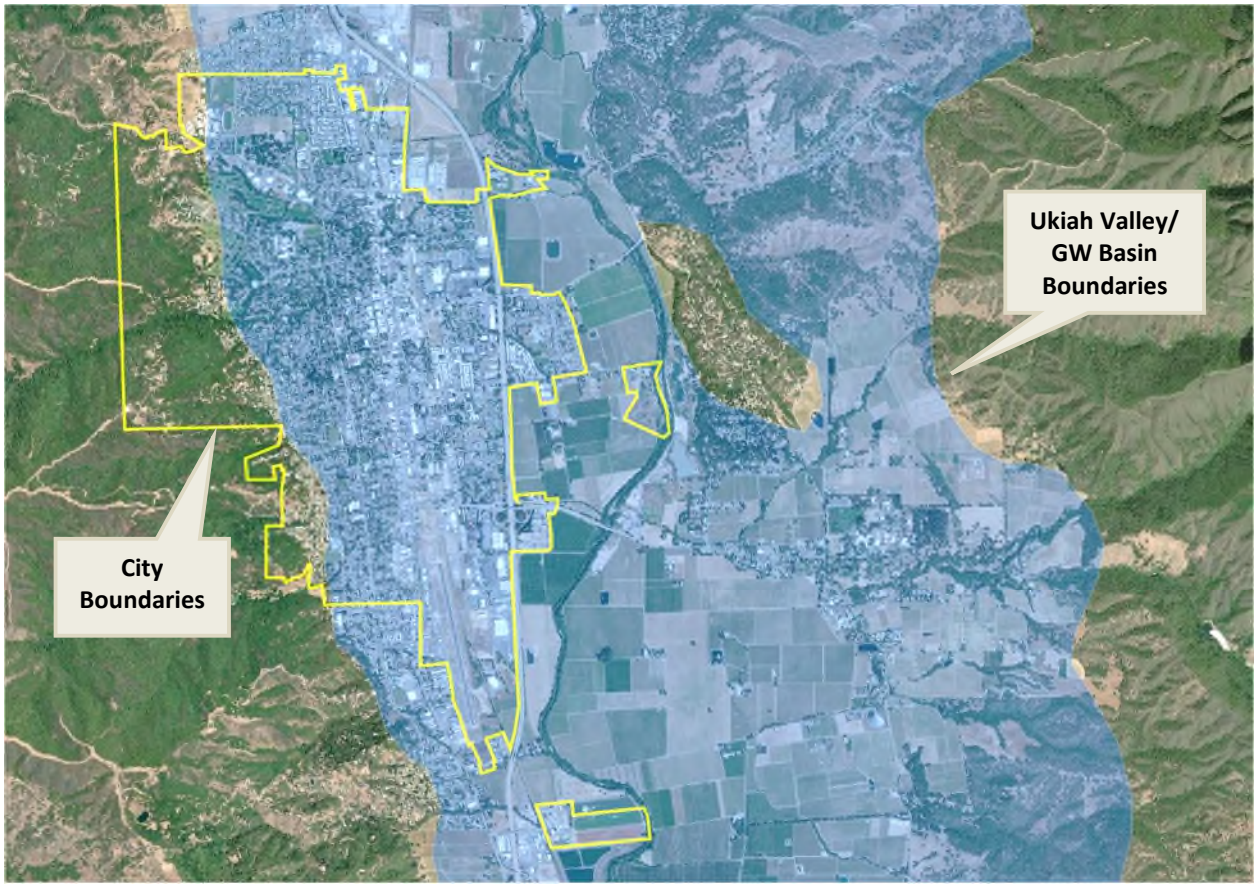


Figure 3.7: State Water Project

private agricultural properties. Although the lateral movement of groundwater is generally in the southerly direction, the recharge from the WWTP ponds provides a direct benefit to the City by maintaining inflows and reducing gradients in the Basin aquifers.

3.2.5 Groundwater Sustainability

The Sustainable Groundwater Management Act of 2014 (SGMA), a three-bill legislative package composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), was passed in September 2014. The legislation provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention when necessary, to protect the resource. The legislation lays out a process and a timeline for local authorities to achieve sustainable management of groundwater basins. It also provides tools, authorities and deadlines to take the necessary steps to achieve the goal. For local agencies involved in implementation, the requirements are significant and can be expected to take years to accomplish. The SWRCB may intervene if local agencies do not form a

Groundwater Sustainability Agency (GSA) and/or fail to adopt and implement a Groundwater Sustainability Plan (GSP).

The SGMA applies to basins designated by DWR as high or medium priority basins, based on a statewide ranking that uses criteria including population and extent of irrigated agriculture dependent on groundwater. According to May 2021 updates on DWR's SGMA Basin Prioritization Dashboard, ninety-four (94) basins were identified as medium or high priority and will be required to form GSAs and develop GSPs. These 94 basins, in combination with basins that already have existing governance and oversight in place, account for 98 percent of the pumping (20 million acre-feet), 83 percent of the population (25 million Californians), and 88 percent of all irrigated acres (6.7 million acres) within the state's groundwater basins. According to the May, 2021 dashboard by DWR, the Ukiah Valley Basin has been ranked as a medium priority basin, with a score of 19.5 (up from 18.5 in the 2015 UWMP).

In 2017, the City came together with the County of Mendocino and other Ukiah Valley agencies to form the Ukiah Valley Basin Groundwater Sustainability Agency (UVBGSA), which now serves as the GSA or watermaster for the Basin. The County of Mendocino manages the UVBGSA Board Meetings, information about the board, and communication/outreach to the public. The UVBGSA is currently preparing a Groundwater Sustainability Plan (GSP), to provide guidance for the basin. As of January 2019, portions of the GSP have been prepared, including a description of the Basin, maps, and a communication plan.

3.2.6 City Wells

The City maintains four (4) active wells, including one (1) new well since the 2015 UWMP (Well #9), which went online in 2017. The City's wells are summarized as follows:

- **Well #4 – 1,000 gpm**
  Lorraine St. & Betty St.
- **Well #7 – 700 gpm**
  E. Gobbi St.
- **Well #8 – 500 gpm**
  Oak Manor Dr.
- **Well #9 (New) – 700 gpm**
  Orchard Ave.

Prior to 2019, Well #4 had been offline for rehabilitation. Well #8 experienced some problems during installation and has not produced as anticipated from the beginning of its operation. The total pumping capacity of Wells #4, #7, and #8 are 2,200 gpm (or 3,548 AFY). Well #9 went online in 2017

with a pumping capacity of 700 gpm (about 1,129 AFY). This brings the total pumping capacity of all four (4) groundwater wells to 4,677 AFY.

3.2.7 Groundwater Production

All of the City's groundwater wells are equipped with a flowmeter to measure water production. Water production is recorded monthly by City water staff and reported annually to DWR. Over the past five (5) years of operation, groundwater extraction has averaged 1,294 AFY. **Table 3.5** displays the City's groundwater supplies for years 2015 to 2020.

Table 3.5
Groundwater Production

Year	Production (AF)
2016	915
2017	1,265
2018	1,036
2019	1,748
2020	1,507
Average:	**1,294**
2011-2015 Avg. (2015 UWMP)	**1,389**

As noted in the table above, average groundwater production decreased slightly since the 2015 UWMP. Comparing the groundwater production above to **Table 3.3** on Page 3-8, it is clear that the City typically produces more surface water than groundwater. In 2019, however, the City pumped about 600 AF more groundwater than surface water (about 50% greater).

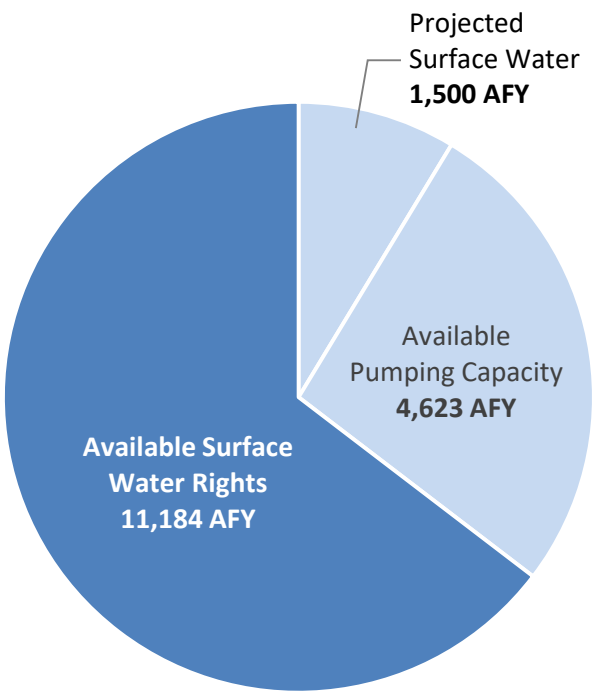
3.3 PROJECTED WATER SUPPLY

Table 3.6 displays the City's projected water supply outlook through 2045. In the near future, the City's overall water supply reliability is expected to increase due to increases in water use efficiency, and through the use of the City's new recycled water system.

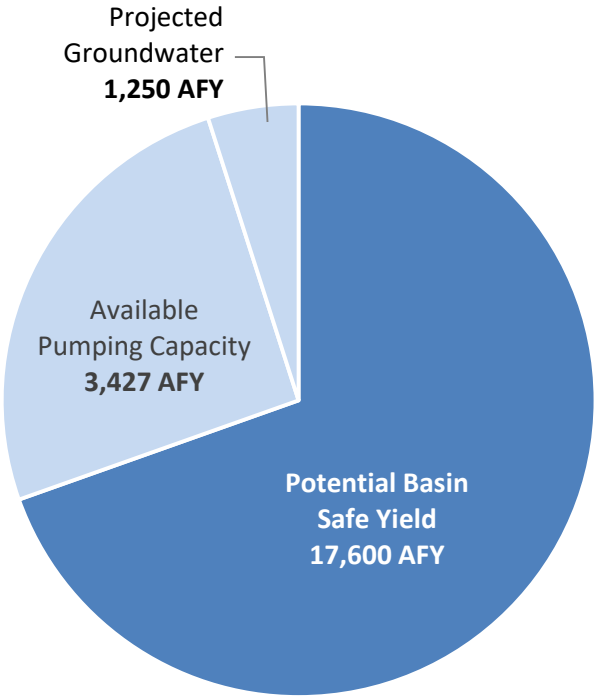
Table 3.6
Projected Water Supply Availability
(2020 – 2045)

Supply Source	Supply Available (AF)	Projected Supply Use (AF)
Surface Water	16,507	1,500
Groundwater	4,677	1,250
Recycled Water (See Section 4)	1,400	1,400
Total	**23,584**	**4,150**

As noted by **Table 3.6** above, the City's available supply through permitted rights is more than sufficient to meet the City's needs. By maintaining the City's wells and WTP in excellent condition, the City's water



Projected Surface Water Supplies (2021-2045)



Projected Groundwater Supplies (2021-2045)

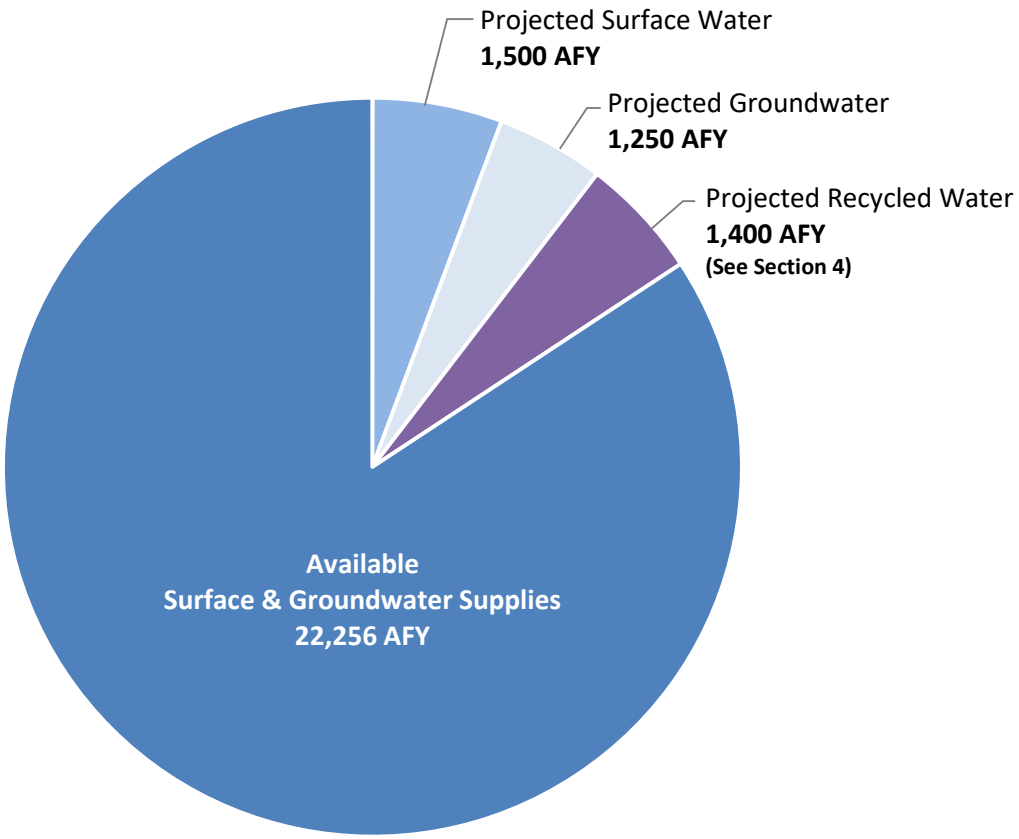


Figure 3.8: Projected Use of Water Supplies (2021 – 2045)

supply capacity should be able to meet demands for all climate scenarios through 2045. **Section 7** discusses the City's projected supply reliability for normal, dry, and multiple dry years through 2045.

3.4 ALTERNATE WATER SOURCES

This section provides an overview of alternative water sources (non-potable supplemental supplies) and their potential uses. Alternative water sources include recycled water, recycled stormwater, and greywater.

3.4.1 Recycled Water (Wastewater)

As mentioned in Section 2.6.10, the City now distributes recycled water through a 7.8-mile network of recycled water distribution mains. The City has completed Phases 1 to 3 of a 4-Phase Recycled Water Plan, with Phase 4 scheduled to be completed by 2022. **Section 4** covers recycled water.

3.4.2 Recycled Stormwater

The City currently uses recycled water in its service area, which comes from the City's sewer piping network. Currently, only one-third of the wastewater entering the City's WWTP is recycled. This is an issue of timing and investment in additional, tertiary-level recycling infrastructure. If recycled water needs increase in the future, the City can expand its recycling capacity and recycle additional wastewater entering the WWTP from the City's sewer piping network. Thus, the City does not need additional sources of water for recycling purposes. Finally, the costs associated with expansion of the WWTP to include stormwater recycling would be prohibitive unless sufficient recycled water customers are identified in the future, or State regulations are enacted requiring treatment of stormwater runoff.

Nonetheless, stormwater can provide groundwater recharge benefits for the City, provided that the stormwater entering Basin aquifers does not compromise groundwater quality. Development of land typically increases impervious surfaces which can compromise stormwater quality. In 2014, the County of Mendocino published a Low Impact Development Technical Design Manual (LID Manual). This manual provides technical guidance for redevelopment projects that significantly impact the impervious surface on a redevelopment site, and therefore require permanent stormwater best management practices (BMPs) to offset the impact. In 2011, the City of Santa Rosa and County of Sonoma prepared a similar LID manual. The City of Ukiah adopted the latter LID Manual by Resolution No. 2014-27. The LID Manual is available on the City's website.

3.4.3 Greywater

Greywater consists of water discharged from sinks, bathtubs, dishwashers, and washing machines. Greywater systems consist of an underground tank and pumping system. At this time, the promotion of greywater systems in the City is not recommended since the use of greywater is currently limited to subsurface irrigation and therefore the overall service area-wide reduction in potable water use would be minimal at best. With the passage of SB 1258, however, greywater use could expand to include use for toilet flushing, and may have its place as a potential water supply for the City in the future.

3.5 TRANSFERS OR EXCHANGES

The City does not transfer or exchange water with its neighboring water suppliers. However, as discussed in **Section 2.6.9**, the City has two (2) agreements with neighboring agencies, including the Willow County Water District and the Millview County Water District. As part of the City's agreements with these agencies, the City can choose to make emergency transfers to these agencies.

3.6 PLANNED SUPPLY PROJECTS

The City continually reviews practices that will provide its customers with adequate and reliable supplies in an environmentally and economically responsible manner. The City's water demand within its service area should remain relatively constant over the next 25 years due to minimal population growth combined with water use efficiency measures and the potential use of recycled water. Although the current water supply sources are considered adequate for existing and projected water demands, the City may add additional groundwater wells in the future to improve the reliability of the City's overall water supply. The City will also be focusing on replacement of pipelines, water meters, valves, and fire hydrants to improve water supply reliability and enhance the operations of the City's water system.

Currently, there are no plans in place for new groundwater wells within the next five (5) years, or until the 2025 UWMP. With the formation of the new UVBGSA, the City will be coordinating its long-term groundwater planning with other local Ukiah Valley Basin agencies.

3.7 ENERGY INTENSITY OF SUPPLY

According to the City's groundwater production figures shown in **Table 3.5** on Page 3-13, the City utilized about 32% of the City total well capacity (1,500 AF out of 4,677 AF) in 2020. This means that the each well motor runs roughly 7.7 hours each day. With total (combined) horsepower of about 325 HP for all wells, the City uses about 250

kilowatts every hour, or about 1,925 kilowatt hours (kWh) per day, and about 702,000 kWh each year. The PG&E emergency cost is about $0.17 per kWh (total energy cost). Thus, the typical costs to operate the City's groundwater system are as shown in **Table 3.7** below:

Table 3.7
Annual Energy Costs to Run All Well Motors

Kilowatt-Hours (kWh)	Cost ($) per kWh	Total Cost ($)
702,000	$0.17	$119,000

The costs shown in **Table 3.7** above only include energy costs to run the motors of the wells. The costs do not include smaller miscellaneous costs such as lighting, control valves, and instrumentation. However, since the motor is the most significant component of the total energy costs, these costs shown in **Table 3.7** provide a rough idea of what is required do operate the City's groundwater wells each year.

The energy costs to produce surface water at the City's WTP are greater than the typical well costs, due to additional infrastructure at the City's WTP to treat surface water. Combined with the WTP, total energy costs to produce potable water are approximately $275,000 each year.

Since the City does not have access to any potable water sources other than surface water and groundwater, the City cannot offset the energy costs required to run the City's water system. Even if the City had access to water from a wholesaler, the costs for imported water from a wholesaler are significantly greater than the total production costs of groundwater, which include not only the energy costs shown above, but also additional costs of treatment and distribution. For any water agency that can produce water locally, it is more economically feasible to produce local water than to purchase imported water. Thus, the City plans to continue to using groundwater and surface water.

Section 4
Recycled Water Opportunities

The Ukiah Wastewater Treatment Plant (UWWTP) provides wastewater treatment for the City and surrounding areas via the Ukiah Valley Sanitation District (UVSD). As of November, 2019, the UWWTP now produces about 1,000 acre-feet per year (AFY) of recycled water for the City.





Section 4

RECYCLED WATER OPPORTUNITIES

Since 2019, the City has used recycled water for agriculture, schools, and parks.

4.1 OVERVIEW

"Recycled" or "reclaimed" water is defined as wastewater purified through primary, secondary, tertiary (Title 22), or advanced treatment. Recycled water is acceptable for most non-potable water purposes such as agriculture, golf course and park irrigation, and industrial processes. The City of Ukiah treats roughly 2.7 million gallons (MG) of wastewater each day. Since 2019, a portion of this wastewater is recycled within the City's service area. The remainder of the wastewater is treated and discharged to adjacent percolation ponds for groundwater replenishment. Recycled water is considered a reliable and drought-proof water source that reduces the City's reliance on potable water. Recycled water will continue to be a critical part of the City's water supply portfolio, with planned expansions under design as of this UWMP.

This Section describes the existing and future recycled water opportunities available to the City. The section also includes estimates of potential recycled water supply and recycled water demand through 2045 in five-year increments.

4.2 WASTEWATER COLLECTION SYSTEM

The City provides wastewater collection services within its service area. The City's wastewater service area covers the entirety of the City's boundaries and also

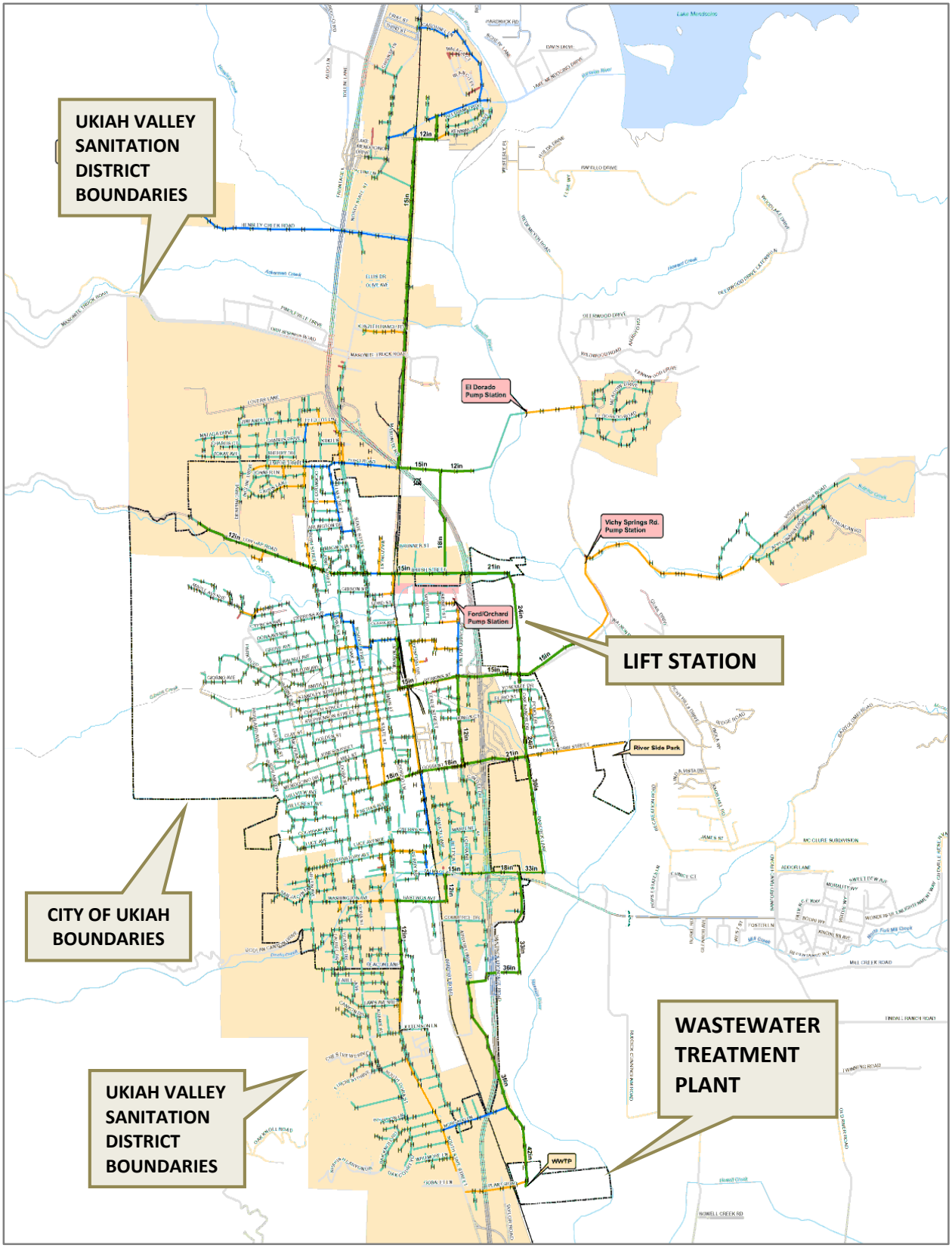


Figure 4.1: City Wastewater Network

collects some wastewater from the Ukiah Valley Sanitation District (UVSD) service area, located just outside of the City, as shown in **Figure 4.1**. Municipal wastewater in the City is generated from a combination of residential, commercial, and institutional sewer discharges. The City does not have any industrial properties that discharge high amounts of industrial wastes, such as brine.

The sewage from the City is collected from roughly 490,000 feet (93 miles) of local sewer mains that range in size from 4 inches to 12 inches. The wastewater proceeds in a southerly direction, and consists of three (3) lift stations. The wastewater is discharged into larger trunk sewer that range in size from 15 inches to 42 inches that proceed southerly to the Wastewater Treatment Plant (WWTP) (see **Figure 4.1** on the previous page). The trunk sewers travel about five (5) miles from the northern portion of the City to the WWTP in the southerly part of the City. The WWTP is operated by the City of Ukiah, and treats wastewater collected from the City and the UVSD. The WWTP has a dry-weather capacity of 3.01 million gallons per day (MGD), and a peak wet-weather capacity of 24.5 MGD. The WWTP includes primary, secondary, and tertiary treatment. As of this UWMP (2021), about one-third of the wastewater at the WWTP is recycled, and about two-thirds of the wastewater is discharged to percolation ponds at the WWTP.

The City's wastewater collection system consists of 93 miles of sewer mains and three (3) lift stations.

4.2.1 Wastewater Flows

The quantities of wastewater generated are proportional to the population and the water used in the City's service area. Estimates of the wastewater flows in the City's service area are included in **Table 4.1** below. The wastewater flows were calculated assuming wastewater flow is equivalent to about 75 percent of the water demand, which is in accordance with typical municipal wastewater master plans.

Table 4.1
Wastewater Flows Collected at WWTP

Year	Wastewater (AF)	Wastewater (MG)
2020	2,671	870
2019	2,568	837
2018	2,572	838
2017	2,546	830
2016	2,326	758
Avg:	**2,537**	**827**

Since housing development and population growth are not expected to drastically change over the course of this UWMP planning period (2045), the City anticipates

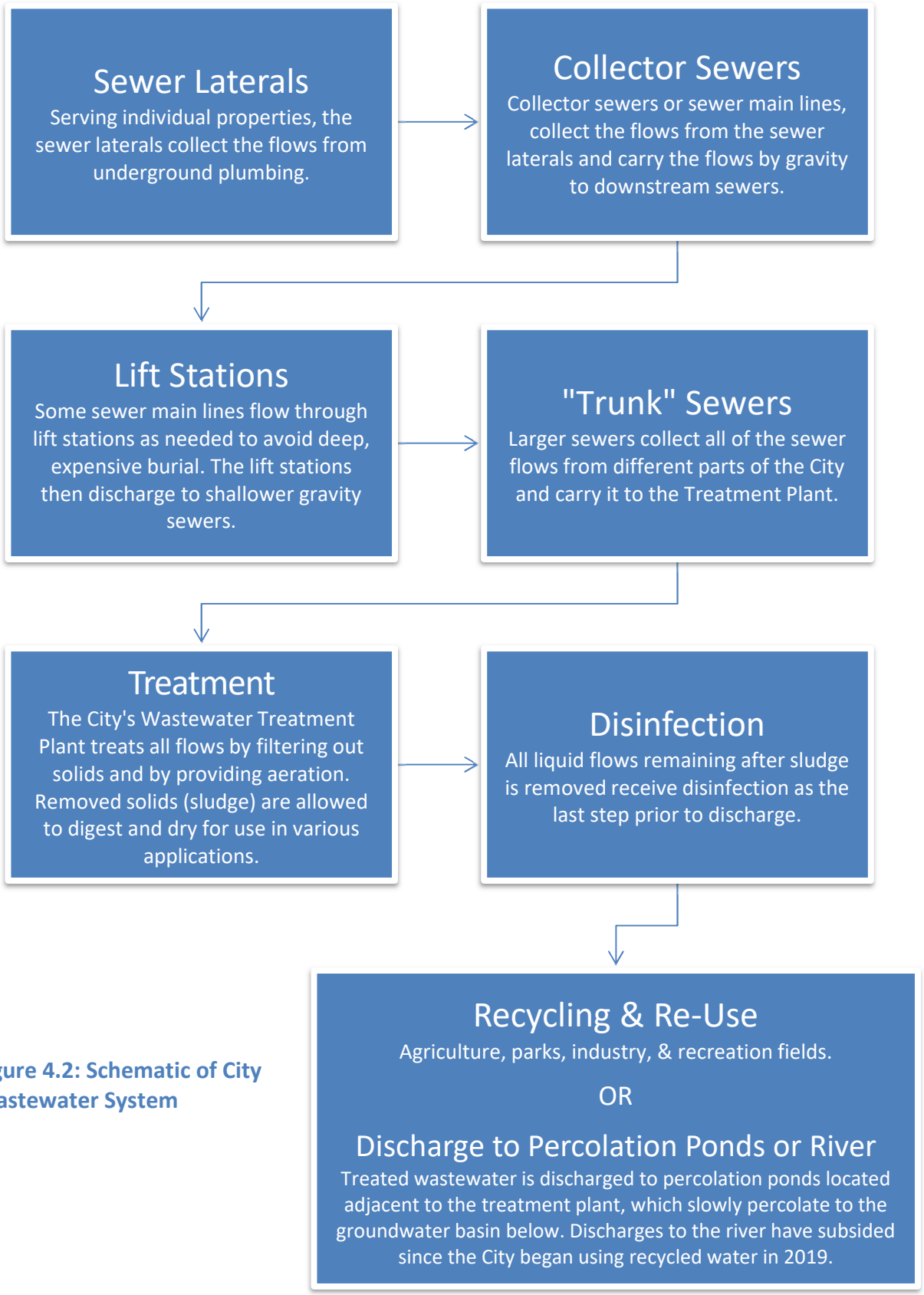


Figure 4.2: Schematic of City Wastewater System



Figure 4.3: Wastewater Treatment Plant (WWTP)

that future wastewater flows can be estimated using the projected demands shown in **Sections 6 & 7**, multiplied by a return rate of 75 percent (0.75). **Table 4.2** below shows the projected wastewater flows:

Table 4.2
Projected Wastewater Flows Collected at WWTP

Year	Flows (AF)	Flows (MG)
2025	2,875	937
2030	2,852	929
2035	2,825	921
2040	2,796	911
2045	2,785	907
Avg:	**2,827**	**921**

As indicated by **Table 4.2**, wastewater flows will only be slightly greater in 2045 than in 2020, in spite of a projected 10% growth in population by 2045 as indicated in **Section 2**. This is due to increases in water use efficiency as described in **Section 6**.

4.3 RECYCLED WATER

As indicated by **Figure 4.1**, the City's WWTP is the only wastewater treatment plant in vicinity of the City's service area. The WWTP underwent a $56.5 million upgrade in 2009 for expansion and regulation compliance purposes. This expansion also enabled the City to construct a recycled water pumping and distribution system.

The City was previously awarded $25,564,000 from the Clean Water State Revolving Loan Fund (CWSRF) and $9,996,000 in grants from the Water Recycling Funding Program (WRFP) to construct Phases 1 to 3 of the Recycled Water Project. In 2019, the City completed the first three phases of the City's recycled water system, which provides up to 1,000 acre-feet per year (AFY) of recycled water to the City and surrounding Ukiah Valley. The project also addresses regulatory requirements that limit the City's wastewater discharges to the Russian River. Ultimately, it also creates a more diversified and drought-resilient water supply for agricultural and irrigation uses.

The new recycled water system includes nearly eight (8) miles of pipeline, a 66-million-gallon (MG) water storage reservoir, upgraded treatment (tertiary) facilities. The system also included recycled water pipelines along Highway 101 and Oak Manor Drive. This recycled water system allows the City to serve approximately 325 MG of water to farmers, parks, and schools each year. The fourth phase is currently under design, which will expand the recycled water system by 400 AFY to serve the Ukiah Valley Golf Course, Ukiah High School, an agricultural field, adjacent parks, and softball fields.

The City meters the recycled water flow in their system. As of 2019, the City's recycled

water distribution system provides irrigation to agricultural lots and softball fields as shown in **Figure 4.4** on the following page. **Table 4.3** indicates the recent recycled water used by the City:

Table 4.3
Recycled Water Use in City

Year	Recycled Water Produced or Used (AF)	Recycled Water Produced or Used (MG)
2016	0	0
2017	0	0
2018	0	0
2019	120	39
2020	742	242

As indicated by **Table 4.3** above, the amount of recycled water used by the City in 2020 exceeded the projections for recycled water use in the 2015 UWMP. This shows the success of Phases 1 to 3 of the City's recycled water system.

4.3.1 Projected Recycled Water Use

The current annual capacity of the City's recycled water system is approximately 1,000 AFY. The City anticipates that about 1,000 AF of recycled water will be used in the current year (2021). As noted in the previous sub-section, the fourth phase of the recycled water project will supply an additional 400 AFY of recycled water City for agriculture and recreational purposes. Once Phase 4 of the recycled water project is complete, the City projects the following amounts of recycled water through 2045:

Table 4.4
Projected Recycled Water Use

Year	Recycled Water Production/Use (AF)	Recycled Water Production/Use (MG)
2025	1,400	456
2030	1,400	456
2035	1,400	456
2040	1,400	456

Among the amounts projected above, about 220 AF will be used at the Ukiah Valley Golf Course once Phase 4 is complete. The volume of projected recycled water listed in **Table 4.4** above (1,400 AFY) is less than the projections listed in the 2015 UWMP (1,927 AFY).

4.3.2 Planned Recycled Water Infrastructure

The expansion of the recycled water system beyond the pending capacity of 1,400 AFY would be possible if the funding for recycled water pipeline infrastructure was covered by potential recycled water users, and an agreement was in place for the use of recycled water. The City would then be able to expand the use of recycled water beyond 1,400 AFY.

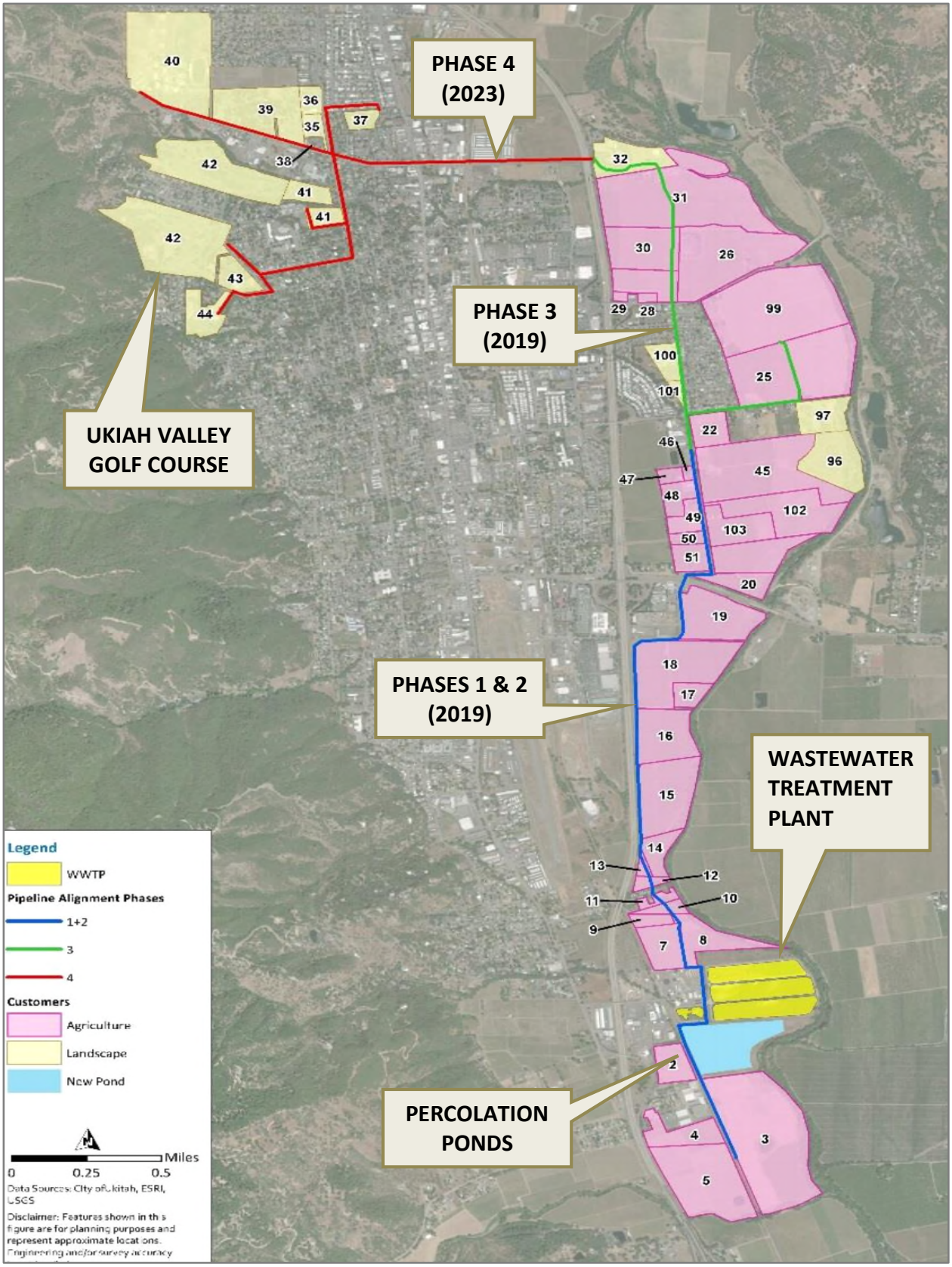


Figure 4.4: Recycled Water Phasing Plan for City of Ukiah

4.3.3 Potential Recycled Water Use

A recycled water master plan has not been prepared for the City to date, and the City has not made a formal identification of potential recycled water users other than those mentioned in Phases 1 to 4 of its current recycled water project (see **Figure 4.5** on the previous page). However, typical recycled water users include the following:

- Landscape Users (parks, sports fields)
- Commercial/Manufacturing Users
- Energy/Power Production

The City has large landscape municipal customers such as parks and schools located in the center of the City. Theoretically, there would be existing customers available to purchase recycled water if and/or when additional recycled water infrastructure is in place. More specifically, the City will be able to identify existing or future potential recycled water users through the following means:

- Existing water consumption records *(determine high volume users of water)*
- Existing commercial website data *(to determine potential use of recycled water)*

The additional recycled water pipelines could be extended from the Phase 4 distribution pipeline located in the north of the City, or the Phase 2 distribution pipeline located west of the City. If the recycled water pipeline were to be extended from the Phase 2 pipeline west of the City, this would require a bridge crossing over Highway 101, which is not feasible.

4.4 ENCOURAGING AND OPTIMIZING RECYCLED WATER USE

By using recycled water, the City has offset diversions from the Russian River and has improved water supply reliability in Lake Mendocino. The City can encourage recycled water use by restructuring its water rates and service charges for customers who use recycled water for a period of time. For example, the City is currently providing recycled water to its initial recycled water customers at no cost. The exact incentive methods for recycled water are currently in development. This may include (1) monitoring, enforcement and training for recycled water use, and (2) delivery of recycled water at a reduced rate or a rate less than that of potable water for an initial period of time.

Recycled water use has reduced diversions from the Russian River and improved water supply reliability in Lake Mendocino.

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Section 5
Water Quality

The quality of the City's water is directly related to the quality of its sources, including the Russian River and the Ukiah Valley Groundwater Basin. The water from river underflows and local groundwater aquifers is of high quality, and routinely exceeds State water standards.





Section 5

WATER QUALITY

The City's water sources require minimal to no treatment before entering the distribution system.

5.1 OVERVIEW

The quality of a natural body of water varies over time. During periods of intense rainfall or snowmelt, tributaries for surface water can change, resulting in new constituents or diluting existing constituents in the receiving waters. Conversely, during times of drought, contaminants may increase in concentration without additional flows available to dilute the concentrated contaminants. As groundwater levels rise and fall, groundwater will pass through different layers of rock and sediment and will absorb different constituents from those strata. Likewise, groundwater wells that have not been utilized over long periods of time can see water quality issues resulting from stagnant water. In summary, the quality of water changes over the course of a time and location, and these variables must be recognized by water agencies. For these reasons, City of Ukiah monitors its wells for water quality as required by State and Federal regulations.

This Section provides a general description of the City's water sources, water quality monitoring and reporting, and water treatment. Local surface water and groundwater are discussed in this Section. A discussion of potential water quality impacts on the reliability of supplies is also provided.

5.2 WATER QUALITY STANDARDS

5.2.1 Federal Regulations

In 1974, Congress passed the Safe Drinking Water Act (SDWA) in order to protect public health by regulating the nation's municipal drinking water supply. As part of the SDWA, powers were given to the Environmental Protection Agency (EPA) to regulate drinking water. The 1996 amendment to the SDWA required monitoring of new types of contaminants. Since the 1996 amendment to the SDWA, the EPA has identified over 90 contaminants in its National Primary Drinking Water Regulations (NPDWR) or "primary standards"). The main categories that the EPA has identified include: biological microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, and radionuclides. As required by the SDWA, water agencies must provide annual Water Quality Reports to its customers.

As part of Federal EPA standards, water agencies are required to prepare annual water quality reports.

5.2.2 State Regulations

Water quality regulations have changed since the Safe Drinking Water Act in 1974. Several state, regional and county agencies have jurisdiction and responsibility for monitoring water quality. The actual regulations on water quality have also changed over the years. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the State Water Resources Control Board (SWRCB). The California Department of Public Health (CDPH) previously oversaw the water quality of the State's drinking water program and the environmental lab accreditation program. As of July 2014, those programs were transferred to the SWRCB. Under the SWRCB, the Division of Drinking Water (DDW) regulates public drinking water systems, including setting the maximum contaminant levels (MCLs) and regulating the operation of water systems. In addition to the SWRCB, several regional and county agencies have jurisdiction and responsibility for monitoring water quality and contaminant sites.

In 2014, the State's drinking water program was transferred from the Health Department to the State Water Resources Control Board.

5.2.3 State Drinking Water Standards

The State of California has established two (2) main types of drinking water standards:

1. Maximum Contaminant Level (MCL)
2. Public Health Goal (PHG)

MCLs are the regulations aimed to be health-protective drinking water standards to be met by public water systems. The levels set by the State take into account a contaminant's health risk, detectability, treatability, and costs of treatment. MCLs are further broken down into the following two (2) types:

1. Primary MCL – Health Related
2. Secondary MCL – Aesthetics

Secondary MCLs are not federally enforceable according to the most recent SDWA amendments. However, they are regulated by the State of California. DDW publishes a list of Secondary MCLs, which include Copper, Iron, and Zinc.

PHGs are established by the Office of Environmental Health Hazard Assessment (OEHHA). They are concentrations of drinking water contaminants that pose no significant health risk if consumed for a lifetime. Public water systems use PHGs to provide information about drinking water contaminants in their annual water quality reports. Certain public water systems must provide a report to their customers about health risks from a contaminant that exceeds its PHG and about the cost of treatment to meet the PHG, and hold a public hearing on the report.

5.2.4 City Standards

The two (2) sources of the City's water supply, as mentioned in **Section 3**, are surface water pumped from the Russian River and groundwater pumped from the Ukiah Valley Groundwater Basin. The City provides on-site "wellhead" treatment for groundwater, and for surface Well #3. The City treats surface water produced from its Ranney collector at the City's Water Treatment Plant, located about 300 feet away from the collector.

To ensure quality of its water, the City conducts sampling and testing of water on a weekly, monthly, and annual basis. Testing is performed at several locations of the City's distribution system, as well as at the source. Results of the water quality testing are posted annually to the City's website at the following link:

http://www.cityofukiah.com/water-utility/

The testing is conducted on several parameters, including organic & inorganic chemicals, bacteriological contaminants, pesticides & herbicides, and radiological

contaminants. The City contracts with certified laboratories to perform water quality testing. The City's Annual Water Quality Reports (also known as "Consumer Confidence Reports") are filed with DDW and released to customers. The annual reports identify regulated substances (Primary MCLs), secondary substances (Secondary MCLs), unregulated substances (PHGs), and other constituents of interest (such as calcium and magnesium). The City identifies all detected substances in the annual reports. In addition, every three (3) years, at least 30 residences are tested for lead and copper at-the-tap. According to the City's 2019 Annual Report, the most recent results for this type of testing (performed in 2019) indicate that lead was not detected above the Action Level (AL) in the thirty-two (32) homes tested. Likewise, copper was not detected above the AL in the thirty-two (32) homes tested.

In addition to regular testing, the City tests for lead and copper every three (3) years at the tap.

Per the City's 2019 Annual Water Quality Report, the City tested for six (6) regulated substances, six (6) secondary substances, and nineteen (19) unregulated substances. These substances were tested at the source and in the distribution system. The testing indicated that none of the contaminants were detected above the MCL.

5.3 QUALITY OF WATER SOURCES

The quality of water delivered to the City's customers is related to the quality of the City's water sources. The amount of water derived from each source depends on the demands in the distribution system and the time of year. This section provides a brief overview of the water quality of the Russian River and the Ukiah Valley Groundwater Basin.

5.3.1 Surface Water

The Russian River watershed is about 1,500 square miles within Mendocino and Sonoma Counties. The two major dams in the watershed, create Lake Mendocino and Lake Sonoma. Major tributaries to the Russian River include Forsythe Creek, Big Sulphur Creek, Dry Creek, Austin Creek, and Laguna de Santa Rosa. The Russian River Watershed and Ukiah Valley Groundwater Basin are shown in **Figure 5.1** on the following page.

According to the SWRCB, some waterbodies in the Russian River watershed are listed under Clean Water Act Section 303(d) (also known as the list of Impaired water bodies), due to water quality impairments caused by several different pollutants. The list identified the entire Russian River watershed for such impairments as sediment and temperature. The list also

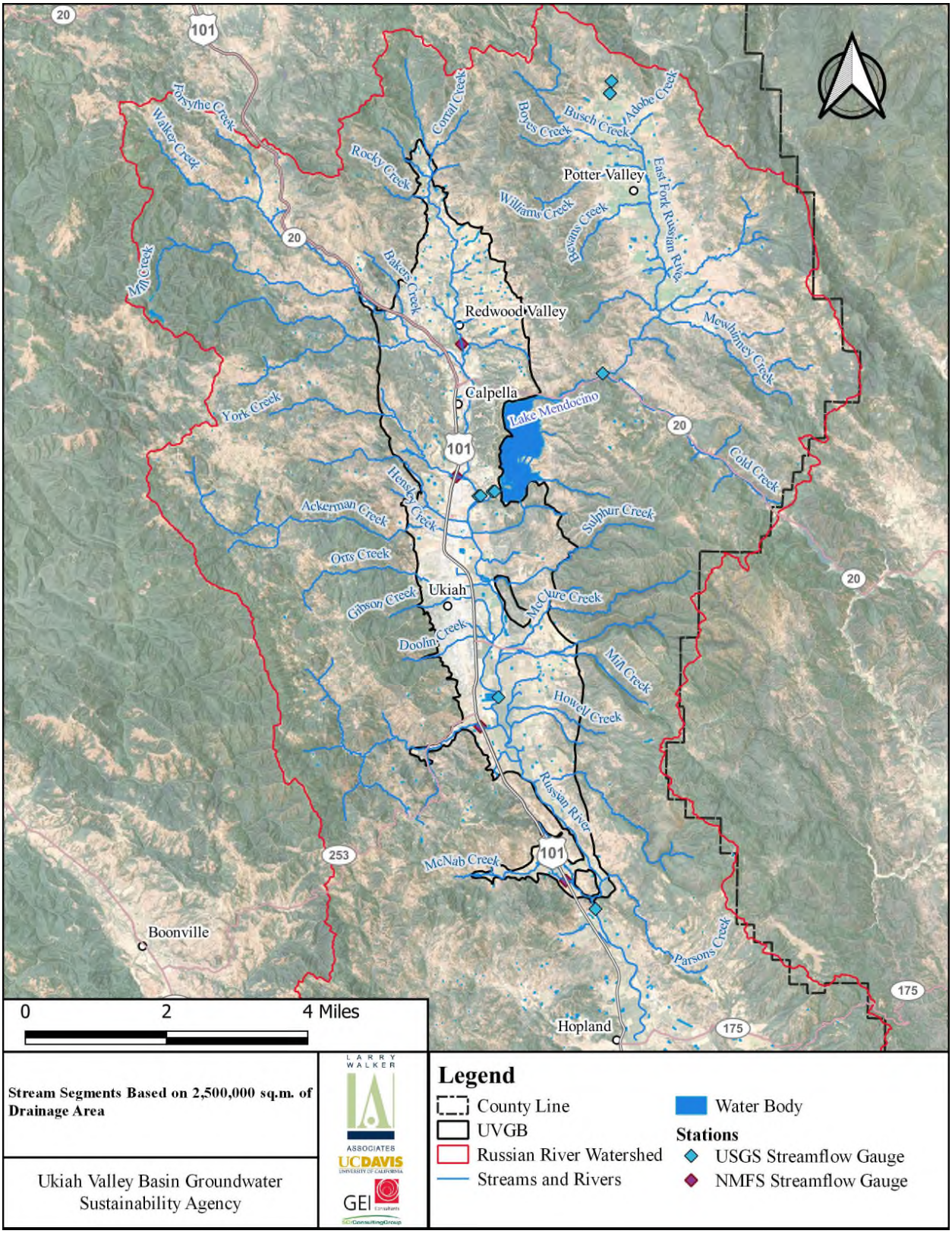


Figure 5.1: Ukiah Valley Groundwater Basin and Russian River Watershed

identified other impairments such as pathogens, mercury, phosphorus, and dissolved oxygen in waterbodies throughout the watershed. Placement on this list generally triggers development of a pollution control plan called a Total Maximum Daily Load (TMDL) for each water body and associated pollutant/stressor on the list

The Regional Water Board of the SWRCB adopted the Action Plan to establish a Total Maximum Daily Load (TMDL) for the Russian River Watershed in August 2019. The Action Plan revealed that these contaminants exist in higher concentrations in the lower part of the Russian River Watershed. Since the City is located in the upper part of the watershed, the surface water quality is generally of higher quality.

5.3.2 Groundwater

Groundwater underlying the City's water service area is generally of high quality. According to DWR's Groundwater Bulletin 118 (California's Groundwater), water quality in the Ukiah Valley basin is characterized as hard to hard bicarbonate. Total dissolved solids (TDS) content for selected samples from municipal wells ranged from 87 to 301 mg/L. In the City's most recent Annual Water Quality Report (2019), the TDS concentrations ranged from detected in the City's drinking water 200 to 220 mg/L. The secondary maximum contaminant level (MCL) range for TDS concentrations in drinking water is 500 (recommended) to 1,000 mg/L. According to a report for the Ukiah Valley Basin in DWR's Bulletin 118, none of the sampled wells in the basin were reported to have any of the major contaminants (i.e. biological, chemical, radiological), above the MCL. As also noted on Page 5-4, the City did not detect any contaminants above the MCL in its wells or distribution system. In summary, the City's groundwater is generally of excellent quality.

5.4 IMPACTS OF WATER QUALITY

The City's water is innately of high-quality, requiring minimal to no treatment before entering the distribution system. Nevertheless, the quality of water dictates the management strategies a water supplier will implement, including, but not limited to, the selection of water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. A direct result of the degradation of a water source is treatment costs.

5.4.1 Impacts of Abandoned Wells

The presence of abandoned groundwater wells represents a potential hazard to the quality of the groundwater basin. Abandoned and improperly destroyed wells

can act as conduits for contaminants to reach drinking water supplies. It is vital for the long-term protection of the basin that abandoned wells be located and destroyed.

While it is the landowner's responsibility to destroy an abandoned well, local water agencies should be proactive about making sure that abandoned wells are in fact destroyed. The destruction of abandoned groundwater wells should be performed in accordance with state standards. California Water Code Section 13750.5 requires that those responsible for the destruction of water wells possess a C-57 Water Well Contractor's License. Whenever a water well is destroyed, a report of completion must be filed with the California DWR within 60 days of the completion of the work. DDW and Mendocino County (County) are responsible for permitting and inspecting construction and destruction of wells.

Well construction and destruction standards are necessary for the protection of aquifers. Recommended statewide well standards for the protection of groundwater quality are contained in the Department of Water Resources Bulletin 74-81 and Bulletin 74-90. In Mendocino County, water well and monitoring well permits are issued by the MCDEH, which requires that construction, repair, alteration, and destruction of wells follow the State of California (California Well Standards Bulletin 74-81 and 74-90), and the Mendocino County Well Ordinance (County Code Chapter 16.04). Under the Mendocino Monitoring Well Application, known contaminated sites must also comply with standards of the North Coast Regional Water Quality Control Board (NCRWQCB), which require an approved workplan before any field work is initiated.

SWRCB-DDW regulations recommend a minimum radius of 50 feet for well site control zones for all public water systems in the state. The requirement applies to abandoned wells as well as functional activities that could potentially lead to "source water contamination" according to EPA regulations. (IWRP, 2007).

5.4.2 Groundwater Contamination Response

Currently, the City has a Water Shortage Contingency Plan (WSCP), Hazard Mitigation Plan (HMP), and an Emergency Operations Plan (EOP) in place to deal with the effects of potential groundwater contamination that reduces supplies. This information is provided in **Section 8**.

5.4.3 DDW Sanitary Surveys

A Watershed Sanitary Survey is a document that examines the potential sources of contaminants in a watershed and includes recommendations for managing these

effects. Per DDW guidelines, the Watershed Sanitary Surveys are supposed to be updated every five (5) years. The City is also subject to periodic inspections by DDW staff every three (3) years. The Sanitary Survey Inspection conducted by DDW includes inspection and evaluation of the following:

1. Water Sources
2. Treatment
3. Distribution System
4. Finished Water Storage
5. Pumping Facilities
6. Monitoring & Reporting
7. System Management/Operation
8. Operator Compliance

5.4.4 Source Water Assessment

In June of 2016, the City completed a Source Water Assessment. This study considered the topography, type of vegetative cover, soil type, type of animal life, and climate conditions of our watershed. The intent of the Assessment was to identify sources of contaminants or potential sources of contaminants. Several types of land uses were considered to have influence on raw waters, including:

- Existing and Historic Gas stations
- Plastic Manufacturers
- Existing and/or Historic Landfills
- Historic Mining Operations
- Leaking Tanks & Septic Systems
- Wastewater Treatment and Disposal
- Managed Forests

The influence of the above items was considered to be minimal, and several areas of concern have been mitigated. These include the closing of the landfill, the replacement of leaking underground storage tanks, and bulk fuel containment. The City is continually upgrading its system to prepare for a variety of possible hazards. The City's water is still considered safe and reliable.

5.4.5 Impacts on Management & Reliability

As a result of the City's water quality policies, the City has not experienced any water quality issues that would affect water supplies. Groundwater in the basin has been of high quality. The City's 2019 Annual Water Quality Report is provided in the Appendix. The City does not anticipate any significant impacts to water supply reliability due to water quality issues.

Section 6
Water Use

The residential sector accounts for about half (50 percent) of the potable water use in the City. The commercial sector accounts for about 25 percent of the potable water use in the City. Total potable water consumption has declined in recent years due to increased water conservation awareness.





Section 6

WATER USE

Water use within the City's service area includes residential indoor use, commercial use, and landscape irrigation use.

6.1 OVERVIEW

As mentioned in **Section 2**, the City's water service area is almost fully-developed and water use needs have been well-established for nearly three (3) decades. As such, total water demand on the City's water supply system is not subject to significant change each year. However, water use within the City's service area varies each month based on climate conditions.

This section explores the potable water usage trends in the City and projects total usage per customer type. As mentioned in **Section 2.2**, the City's "Sphere of Influence" (SOI), will be considered in water use projections. For practicality, a set number of service connections will be assessed.

6.2 RECENT WATER USE CHANGES

Since the 2015 UWMP, there have been local and statewide influences on water use in the City. These include the current drought, which has seen the second-lowest rainfall on record for the Ukiah Valley. The Coronavirus Disease of 2019 (COVID-19) has also impacted residential, commercial and institutional water. On March 19, 2020, State residents were directed to stay home, except to go to an essential job or to shop for essential needs. It was then modified on May 4, 2020. The Regional Stay Home

Order, announced December 3, 2020, triggered additional restrictions after a region was announced to have less than 15% ICU availability. It prohibited private gatherings of any size, closed sector operations except for critical infrastructure and retail, and required masking and physical distancing. The Regional Stay Home Order was lifted January 25, 2021.

The State Water Resources Control Board, Division of Drinking Water (DDW) has stated that the public water systems (PWS) operations are designated as essential functions and staff and suppliers are not restricted by any current orders. This has allowed for water system operators and maintenance workers to successfully keep the PWS providing safe and clean drinking water to customers. The full impacts of the coronavirus pandemic on the water industry are still emerging, including the effect on residential and commercial water demands. Available data for most agencies indicate that residential water demand has increased while non-residential demand has decreased. In San Francisco, California, residential demand increased by ten (10) percent, while non-residential demand declined by 32 percent. Residential communities have experienced either moderate increases or mild decreases. Agencies where total water use has declined during the coronavirus pandemic have seen a drop in revenue for 2020-2021. Moreover, as businesses begin to reopen and implement hygiene and disinfection practices, water use may rise dramatically. Such rapid and dramatic changes in water use can exacerbate existing and reveal new system weaknesses.

During the covid-19 pandemic, public water systems, including operations and maintenance personnel, were designated as essential.

6.3 CURRENT CITY WATER NEEDS

Since the City's early stages, as previously mentioned in **Section 2.1.1**, agriculture has been the largest industry in the Ukiah Valley. Since the City has recycled-water agricultural customers, the agricultural industry has an indirect impact on the City's total demand. That is, the Ukiah Valley is home to wineries, grape vineyards, pear orchards, wood production plants, and non-agricultural manufacturers. These businesses have influenced the City's resident population and visiting population over the past few decades.

The City's population has increased only slightly since 2015, and is currently growing at roughly 0.36 percent annually. This is slightly above the growth rate for Mendocino County, which is approximately 0.13 percent). The City is approaching ultimate "built-out" with remaining

expected future water demands primarily attributable to possible land use changes in residential densities and in-fill land development projects. Future water demand increases will be attributable to these minor redevelopments as well as increases in household densities in existing developments.

6.3.1 Current Water Needs

The City supports the water needs of its residents and businesses while maintaining the beauty of its community parks, schools, and recreational facilities both in the private and in the public sector. The residential zone comprises the majority of the City's water service area. The residential sector consists of personal-use water needs (i.e. showers, toilets, and clothes washers) and non-personal water-use needs (i.e., irrigation, car washing, etc.). The City has a significant number of residential lots which require consistent landscape irrigation.

In the commercial and institutional sector, water needs vary as customers range from restaurants to offices and from retail stores to schools. Office buildings and retail stores require significantly less water than restaurants and schools and are not usually the key focus of water conservation efforts. The key focus for the City in the commercial sector will be to provide and maintain a consistent water supply to the businesses, including the planned commercial developments near State Street and Perkins Street, as shown in **Figure 2.4** of **Section 2**.

To maintain civic pride and a sense of community, City parks and other City right of ways (medians, etc.) require consistent irrigation. To prevent water waste the City follows an irrigation schedule that limits the length of irrigation to avoid overspray runoff and also evapotranspiration from daytime watering.



Figure 6.1: Oak Manor Park

Overall water use characteristics within the City's service area reflect slightly higher than average regional water use characteristics within the North Cost Hydrologic Region and Mendocino County. Nevertheless, the City has reduced water consumption by about 22% in the past two decades. Additionally, the City is updating its Water Shortage Contingency Plan (**Section 8**) to prohibit water waste.

6.4 CLIMATE IMPACTS ON WATER USE

California faces changes in water use habits due to a variety of issues including population growth, regulatory restrictions and climate change (including the previous severe drought of 2011-2016). More specifically, weather unpredictability (more extreme drought and flood events) poses additional challenges to water agencies, not only due to impacts on water supplies but also due to impacts on water demands. In the City's upcoming General Plan, a Climate Action Plan (CAP) will be included which assesses City greenhouse gas emissions, establishes an emissions reduction target, and outlines strategies to meet these goals.

During and since the preparation of the 2015 UWMP, there have been local and statewide influences on water use in the City. In January of 2014, former Governor Brown declared a state of emergency and directed state officials to take all necessary actions to prepare for water shortages. As the drought prolonged into 2015, to help cope with the drought, former Governor Brown gave an executive order in April 2015 which mandated a statewide 25% reduction in water use, with each agency assigned specific target reductions.

Changes in water usage habits have a special concern for the State due to the inter-dependence of many agencies for the transfer and use of water. For instance, some agencies are unable to produce water locally and thus entirely dependent on imported water sources, while others are able to produce all water locally (groundwater). Further, some agencies are able to reduce water demands with only minimal impacts (i.e. sales revenue), while other agencies will incur more significant impacts if water consumption is reduced. This would include agencies with agricultural and heavy industrial customers. Thus, the State will likely face challenges in the near future to implement fair and equitable water conservation policies.

6.4.1 California Water Plan Update 2018

DWR's California Water Plan Update 2018 is a resource guide for local agencies on water management planning. It sets goals for developing new water resources and maximizing existing water resources. It also provides information on funding available to local agencies in meeting sustainability goals. Since the Water Plans are updated every five (5) years during non-UWMP years, the information contained in these plans is helpful for water agencies in water resource planning in the UWMPs.

6.5 WATER USE

6.5.1 Past Water Use

Although the population of the City has mildly increased over the past two decades,

overall water use within the City's service area has declined steadily. This is a result of water conservation, as water-use efficiency has outweighed the additional water users. As reported in the City's 2015 UWMP, the City's baseline water use until the mid-2000s was about 4,000 acre-feet (AF). By 2015, water consumption in the City was about 2,500 AF.

6.5.2 Recent Water Use

Table 6.1 below shows the City's water consumption over the past five (5) years. Water consumption has been consistent, with a fluctuation of about 7% from the average.

Table 6.1
City Recent Water Use

Year	Total Potable Consumption (AF)	Per Capita (GPCD)
2016	2,557	143
2017	2,802	156
2018	2,889	160
2019	2,881	160
2020	3,030	168
Average (GPCD):		**158**
2020 Water Use Target (GPCD):		**186**

As indicated by **Table 6.1** above, the City has already reached their 2020 water use reduction target.

6.6 WATER USE BY SECTOR

6.6.1 Service Connections/Accounts

The City maintains records of water consumption and bills its customers on a bi-monthly basis for its water service. The City maintains approximately 5,030 service connections with a mixture of residential, commercial, institutional, and industrial customers. The City maintains single-family and multi-family accounts as separate sectors. Institutional and commercial accounts are combined as one sector. The current (2021) breakdown of accounts is shown in **Table 6.2**:

Table 6.2
Number of Service Connections (2020)

Sector	Service Connections
Single Family Residential	3,418
Multi-family Residential	603
Commercial/Institutional	856
Industrial	2
Landscape Irrigation	150
Other	0
Total Connections:	**5,030**

As shown in **Table 6.2** above, about 80 percent of the City's service connections are residential accounts (single or multi-family), since the City consists primarily of

residential properties. Commercial and institutional accounts comprise 17 percent of the total accounts. Landscape Irrigation accounts comprise only 3 percent of the City's metered connections.

In general, the total number of active accounts does not necessarily represent the total number of actual service connections tapped into the City's distribution mains. The total number of active accounts varies based on occupancy of a dwelling unit or commercial property.

6.6.2 Water Use by Sector

The City records water use per service connection only and bills customers based on a single water rate structure. The City's single rate is listed in **Section 9.4** of this UWMP. Water sales data is compiled by City water staff and submitted to DWR in the Electronic Annual Report.

The total water consumption by customer type since 2015 is shown on **Table 6.3** on the following page. As noted by the table, Single-Family and Multi-Family Residential accounts are equivalent, and are the highest consuming sectors in the City since most of the City is zoned mostly for residential accounts.

Table 6.3
Current and Historic Water Demand by Sector (AF)

Sector	2016	2017	2018	2019	2020
Single Family Residential	710	777	783	786	817
Multi-family Residential	710	777	783	786	817
Commercial/Institutional	652	714	723	719	748
Industrial	48	53	54	53	55
Landscape Irrigation	185	202	205	200	209
Other	25	27	26	26	27
Total Water Sales:	**2,326**	**2,547**	**2,573**	**2,569**	**2,672**
Unaccounted for Water	**232**	**257**	**317**	**313**	**359**
Total Water Consumption (Total Supply into System):	**2,557**	**2,803**	**2,890**	**2,881**	**3,030**

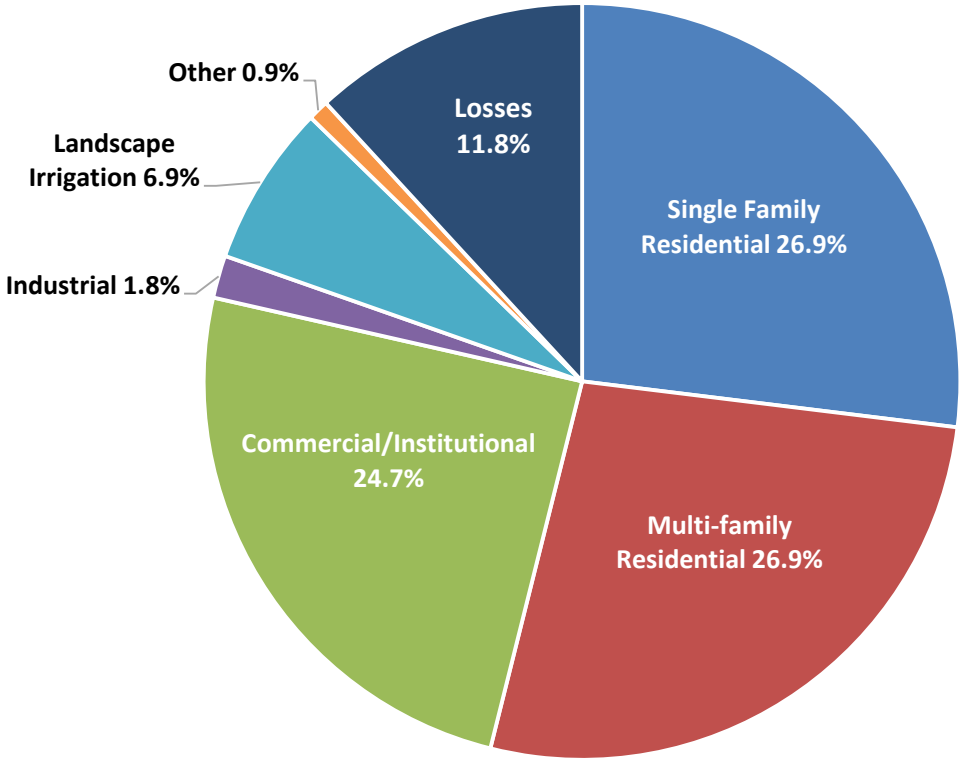


Figure 6.3: Current Water Demand by Sector (in 2020)

As indicated by **Table 6.3**, the City's unaccounted for water ranged from 232 to 359 AF, which is about 10.4 percent of the total water supply into the City's distribution system. Unaccounted for water consists of routine flushing, unmetered use, and water losses. Although water losses have cost impacts on water agencies, they cannot be prevented entirely. Instead, effort is given to controlling the quantity of water losses (to a cost-effective extent) in order to reduce the cost impact of water losses on water operations. For this reason, the City has prepared water loss audits using AWWA software. The water audits for 2016 to 2019 are provided in the Appendix of this UWMP. The 2019 Audit shows that the City's Leakage Index (the ratio of real loss to unavoidable loss) was 2.39, which is a good score for water agencies.

6.7 WATER CONSERVATION ACT

6.7.1 Act Background (SBx7-7)

Due to reductions of water in the San Joaquin Delta, the Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to protect statewide water sources. The legislation called for a 20 percent reduction in water use in California by the year 2020. The legislation amended the water code to call for 2020 and 2015 water use targets in the 2010 UWMPs, updates or revisions to these targets in the 2015 UWMPs and allows the Department of Water Resources (DWR) to enforce compliance to the new water use standards. Beginning in 2016, failure to comply with interim and final targets will make the City ineligible for grants and loans from the State needed to attain water self-sufficiency by 2020.

In addition to an overall statewide 20 percent water use reduction, the objective of SBx7-7 is to reduce water use within each hydrologic region in accordance with the agricultural and urban water needs of each region. Currently, the Department of Water Resources (DWR) recognizes 10 separate hydrologic regions in California as shown in **Figure 6.4**. Each hydrologic region has been established for planning purposes and corresponds to the State's major drainage areas. The City of Ukiah is located in the North Coast Hydrologic Region (HR), which includes all of Mendocino, Humboldt, Trinity, and Del Norte counties, roughly half of Sonoma, Siskiyou, and Modoc counties, and a small portion of Lake and Glenn Counties. The North Coast HR is shown in **Figure 6.5.**

Per capita water use, measured in gallons per capita per day (GPCD), in the North Coast HR varies between different water



Figure 6.4: California's 2020 Water Conservation Goals



Figure 6.5: North Coast Hydrologic Region

agencies depending on the geographic and economic conditions of the agency's service area. The North Coast HR has an overall baseline per capita water use of 165 GPCD and DWR has established a regional target of 137 GPCD for the region as a compliance target to satisfy SBx7-7 legislation.

The *Methodologies* guidebook made provisions that allowed a water supplier to meet the target requirements by achieving one of four (4) different targets, provided that the water supplier's baseline water use was low enough relative to the region within which it supplies water. For most agencies, the two most common options are 1) 20% reduction or 2) 5% reduction from the Hydrologic Region.

Exempt Agencies

If an agency has a baseline per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already considered water efficient. In such a case, that agency must document in subsequent UWMPs that its water usage is still under 100 GPCD.

6.7.2 SBx7-7 Baseline & Target

The basic procedure for determining the applicable water reduction target is illustrated by **Figures 6.6 and 6.7** on the following page. The City previously established water use targets for 2015 and 2020. DWR provided guidelines for determining these targets in its *Methodologies* guidebook for the 2010 and 2015 UWMPs. In the 2010 and 2015 UWMPs, the City's baseline water use and targets were determined based on the procedures shown in **Figures 6.6 and 6.7**.

If an agency's 10-year baseline is slightly higher than the Hydrologic Region's target, that agency still must achieve a five percent reduction from its 5-year baseline. If an agency has a per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already considered water efficient.

Since the City did not use recycled water during the baseline period, a 10-year rolling average was previously calculated instead of a 15-year rolling average. The City's baseline water use is 233 GPCD, which was obtained from the 10-year period January 1, 1995 to December 31, 2004.

Table 6.4 shows historic (1995 to 2009) water use and provides the base period ranges used to calculate the baseline water use for the City. The data was used to calculate the continuous 10-year and 5-year average baseline. Moreover, regardless of the compliance method adopted by the City it will need to meet the minimum water use

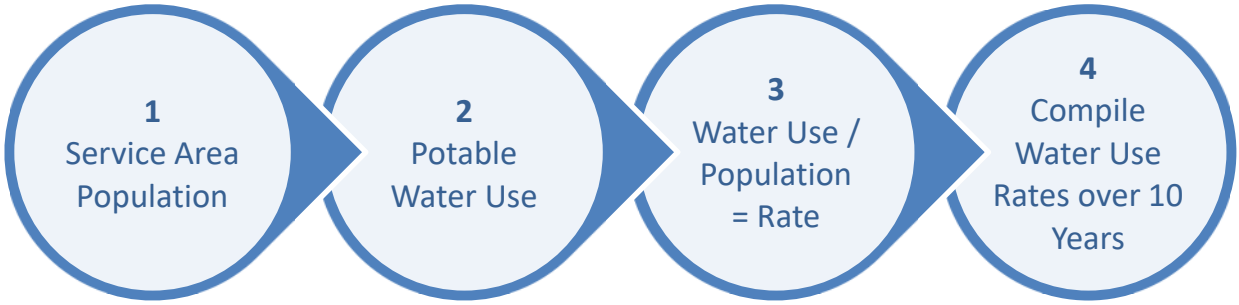


Figure 6.6: Procedure for Determining Baseline Per Capita Water Use

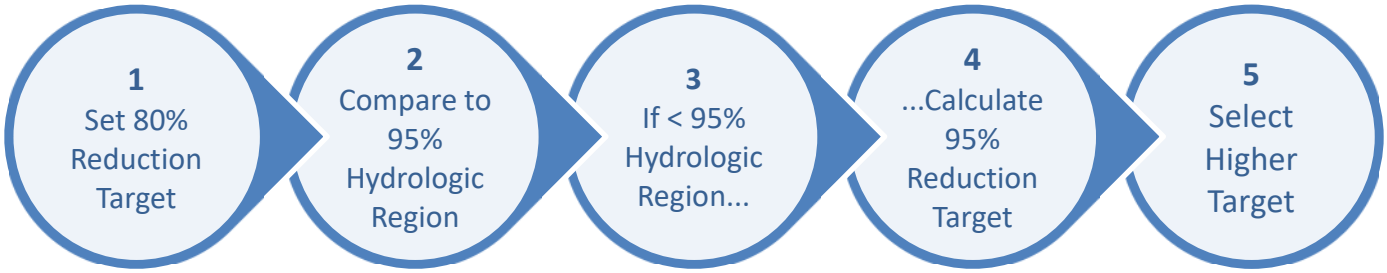


Figure 6.7: Procedure for Determining Target Per Capita Water Use

target of 5 percent reduction from a 5-year baseline as calculated.

Table 6.4
City of Ukiah Water Use (GPCPD)

Year	Total Potable Consumption (AF)	Per Capita (GPCD)
1995	3,879	231
1996	4,036	239
1997	3,910	229
1998	3,762	219
1999	4,223	245
2000	4,097	236
2001	4,088	234
2002	4,164	252
2003	3,870	216
2004	4,131	230
2005	3,753	209
2006	3,833	214
2007	3,744	209
10-yr. Baseline (1995-2004) (SB7: 10608.20)		**233**
5-yr. Baseline (2003-2007) (SB7: 10608.22)		**216**
North Coast HR Baseline:		**165**

As shown in **Table 6.4** above, the City's 10-yr and 5-yr baselines were determined to be 233 GPCD and 216 GPCD, respectively.

The City's baseline water use was then compared to the regional compliance target to determine the applicable reduction amounts per the SBx7-7 additions to the water code. The legal stipulations applicable to the City and the required target to be enforced by DWR are shown in **Table 6.5** below:

Table 6.5
City of Ukiah
SBx7-7 2020 Water Use Targets (GPCD)

Min. Reduction Requirement (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
205	186	130
	Interim (2015) Target:	**209**
	2020 Per Capita Target:	**186**
	Last Five Year Avg GPCD:	**158**
	2020 Actual GPCD:	**168**

Since the City's minimum reduction requirement of 205 GPCD is greater than the regional target of 137 GPCD, the City must select **Method 1**, or 80% of 10-year baseline, as its 2020 water use target. Therefore, the City's compliance target for 2020 is **186 GPCD** in accordance with Section 10608.22 of the Water Code. As noted in **Table 6.5** above, the City has been under their target for the past five (5) years.

6.7.3 SBx7-7 Target Compliance

With an average water consumption rate of 142 GPCD over the past five (5) years, the City has seen a 35 percent increase in water-use efficiency in the past 20 years. As indicated by **Table 6.5**, the City has already achieved not only its interim (2015) target of 209 GPCD, but also its 2020 target of 186 GPCD. This is due to greater water conservation awareness amongst the general public and the implementation of water conservation measures mentioned in **Section 9**. The City can maintain its water consumption rates below its SBx7-7 target by focusing on water conservation measures.

6.8 PROJECTED WATER DEMAND

Although the City is in a "built-out" condition, this Section will analyze three (3) scenarios, the first of which is a “normal” scenario (no expansion of the water service area). The other two (2) are possible, albeit unlikely growth scenarios by the year 2045:

1. 2,500 Additional Service Connections
2. 5,000 Additional Service Connections

It is assumed in each five (5) year increment, a total of 500 or 1,000 additional service connections could be served by the City, until the year 2045. The additional service connections listed above would come from outside the City’s current water service area, but within the City’s “Sphere of Influence” as described in **Section 2**. **Table 6.6** projects “normal” water demands through 2045, while **Tables 6.7 and 6.8** show the two scenarios. This analysis does not imply any intent by the City to expand their water service area. These scenarios are analyzed only for the purpose of demonstrating resiliency of the City’s water system to meet demands.

6.8.1 Passive Savings

The City should experience only mild increases in its water consumption over the long term in spite of overall population increases. This is due to “passive savings”. That is, over time, homes will be equipped with water-saving fixtures and landscapes. Also, over time, residents will become more aware of water conservation and City water code policies such as limitations on landscape irrigation and car washing. This “passive savings” will offset new water demands stemming from population growth.

For the sake of future water demand projections in this UWMP, “passive savings” is taken into consideration by analyzing the declines in water consumption rates. The estimated rate of decline in the water consumption rate (GPCD) is 0.5% annually. It is practical to assume that water use efficiency will continue to increase on its own over the next couple of decades.

6.8.2 Low-Income Water Demands

Senate Bill 1087 and California Water Code Section 10631.1 require that water use projections of a UWMP include the projected water use for lower income households as identified in an agency's Housing Element. The City has a civic and legal responsibility to provide for the water-related health and safety of the community. One of the City's objectives is to provide its customers with an adequate and reliable supply of high-quality water to meet present and future needs in an environmentally and fiscally responsible manner. As such, water use priority does not differ based on income level.

Current Low-Income Housing Needs

According to the 2019-2027 Housing Element Update of the City's General Plan, there are about 6,500 total housing units in the City. The low-income units in the City are listed as follows:

- **Extreme/Very-Low Income**
  About 1,945 Homes

- **Low-Income**
  About 950 Homes

Thus, there are a total of 2,895 low-income housing units currently in the City. This represents about 45 percent of the total housing needs in the City. With an estimated 3 persons per household and a consumption rate of 160 GPCD, the City requires about 1,500 AFY of water to meet the needs of these residents.

Projected Low-Income Housing Needs

Regarding projected low-income water needs, the population projections shown in **Section 2** of this UWMP indicate that population will increase by about 1,500 people by 2045. This means that about 680 additional low-income persons will require water in the City. This amounts to 120 AFY of additional water to meet low-income housing needs. This quantity represents the natural growth of lower-income households, and does not include planned low-income housing developments. The City's 2019-2027 Housing Element projects 160 new affordable housing units by 2027. This would add about 480 people to the City within the next decade. If constructed, the City would need about 86 AFY of additional water to meet the needs of these residents. This would bring the total projected water needs of lower-income residents to 1,706 AFY. These low-income water demands are included in future projections for single family and multi-family homes listed in **Tables 6.6-6.8** on the following pages.

Table 6.6
Projected Water Demand by Sector (No Expansion of Water Service Area)

Sector	2025	2030	2035	2040	2045
Water Service Area Population	16,350	16,639	16,928	17,217	17,506
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	155	151	147	144	140
Demands (AF)					
Single Family Residential	769	763	757	751	744
Multi-family Residential	769	763	757	751	744
Commercial/Institutional	706	701	695	689	683
Industrial	52	52	51	51	50
Landscape Irrigation	199	197	195	194	192
Other	26	25	25	25	25
Total Water Sales:	**2,521**	**2,501**	**2,481**	**2,460**	**2,439**
Unaccounted for Water	293	291	289	286	284
Total Water Consumption (Total Supply into System):	**2,814**	**2,792**	**2,770**	**2,746**	**2,723**

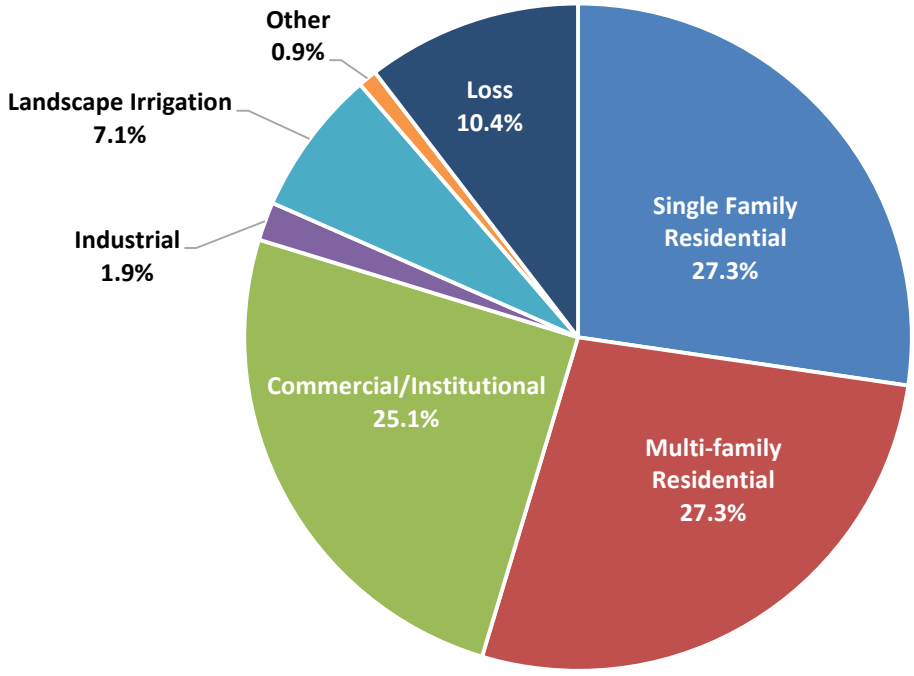


Figure 6.8: Projected Water Demand by Sector (in 2045)

Table 6.7
Projected Water Demand by Sector (Scenario 1: 2,500 Additional Service Connections)

Sector	2025	2030	2035	2040	2045
Base Water Service Area Population (**Table 6.6**)	16,350	16,639	16,928	17,217	17,506
Additional (Cumulative) Service Connections	500	1,000	1,500	2,000	2,500
Additional Population Growth (3 Persons-per-Connection)	1,500	3,000	4,500	6,000	7,500
Total Population	**17,850**	**19,639**	**21,428**	**23,217**	**25,006**
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	155	151	147	144	140
Demands (AF)					
Single Family Residential	840	901	958	1012	1063
Multi-family Residential	840	901	958	1012	1063
Commercial/Institutional	771	827	880	929	976
Industrial	57	61	65	68	72
Landscape Irrigation	217	232	247	261	274
Other	28	30	32	34	35
Total Water Sales:	**2,752**	**2,952**	**3,140**	**3,318**	**3,484**
Unaccounted for Water	320	343	365	386	405
Total Water Consumption (Total Supply into System):	**3,072**	**3,295**	**3,506**	**3,704**	**3,889**

Note: This analysis does not imply any intent by the City to expand their water service area. This scenario is analyzed only for the purpose of demonstrating resiliency of the City's water system to meet demands.

Table 6.8
Projected Water Demand by Sector (Scenario 2: 5,000 Additional Service Connections)

Sector	2025	2030	2035	2040	2045
Base Water Service Area Population (**Table 6.6**)	16,350	16,639	16,928	17,217	17,506
Additional (Cumulative) Service Connections	1,000	2,000	3,000	4,000	5,000
Additional Population Growth (3 Persons-per-Connection)	3,000	6,000	9,000	12,000	15,000
Total Population	**19,350**	**22,639**	**25,928**	**29,217**	**32,506**
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	155	151	147	144	140
Demands (AF)					
Single Family Residential	910	1038	1160	1274	1382
Multi-family Residential	910	1038	1160	1274	1382
Commercial/Institutional	836	953	1064	1170	1269
Industrial	61	70	78	86	93
Landscape Irrigation	235	268	299	329	357
Other	30	35	39	43	46
Total Water Sales:	**2,983**	**3,403**	**3,800**	**4,175**	**4,529**
Unaccounted for Water	347	396	442	486	527
Total Water Consumption (Total Supply into System):	**3,330**	**3,799**	**4,242**	**4,661**	**5,056**

Note: This analysis does not imply any intent by the City to expand their water service area. This scenario is analyzed only for the purpose of demonstrating resiliency of the City's water system to meet demands.

Section 7
Reliability Planning

The current drought of 2020-2021 has resulted in reduced flows in the Russian River (as pictured below). The current drought highlights the need for strong water supply management and forecasting.



Section 7

RELIABILITY PLANNING



Flows in the Russian River adjacent to the City can decrease by over 50% during drought conditions.

7.1 OVERVIEW

The current drought of 2020-2021 is impacting agencies within the Russian River watershed. Recent data from local flow monitoring stations indicate that water levels in the Russian River are close to a "Critical Drought" classification under the water rights permits given to local agencies in 1961 and 1986. Due to the drought, Sonoma Water has requested temporary allowances to the conditions of its water right permits, which affects dam releases from Lake Mendocino into the Russian River upstream of the City's surface water intake. These conditions indicate that local agencies that rely on surface water should maintain and enhance groundwater and recycled water supplies, to prepare for up to five (5) years of drought. As indicated in **Sections 3** and **4**, the City has a strong groundwater and recycled water network.

This Section discusses historic and recent droughts in the State and in the region. This Section also compares projected supply to projected demand over a 25-year planning period (through 2045) for various climate scenarios. Demand and supply projections are provided in **Tables 7.1** - **7.7**.

7.2 HISTORIC STATEWIDE DROUGHTS

Climate data has been recorded in California since 1858. Since then, California has experienced several periods of severe

drought, including: 1928-34, 1976-77 and 1987-91, 2007-2009, and most recently in 2011-2017. In addition to these, California has also experienced several periods of less severe drought. Among the aforementioned droughts, the year 1977 is still considered to be the driest year of record in the Four Rivers Basin by DWR (these rivers flow into the Delta and are the source of water for the State Water Project).

In 1983, as a result of previous droughts, the State legislature enacted the UWMP Act, which requires the preparation of this UWMP. Several subsequent amendments have been made to the Act to ensure such items as public coordination, recycled water, and contingency response plans are included in UWMPs, among other items.

In 1991, as a result of the 1987-1991 drought, over 100 water agencies and environmental groups came together to form the California Urban Water Conservation Council (CUWCC) to manage the impacts of drought and promote water conservation. In January 2018, the CUWCC became the California Water Efficiency Partnership (CalWEP), and consists of over 200 water agencies and private companies. CalWEP assists its member agencies with public policy, research, and education tools.

As a result of the drought of 2007-2009, former Governor Schwarzenegger signed the Water Conservation Act of 2009 (SBx7-7), which is perhaps the strongest piece of legislation to date on water conservation, requiring mandatory water conservation up to 20 percent by 2020.

The most-recent drought hit the state of California in 2011-2017. In response to this drought, DWR and the U.S. Bureau of Reclamation finalized the 2016 Drought Contingency Plan that outlined State Water Project and Central Valley Project operations for February 2016 to November 2016. The plan was developed in coordination with staff from State and federal agencies. One of the key purposes of the plan was to communicate goals for water management and the potential operations needed to achieve those goals for water resources stakeholders and the public. The plan was updated in March 2021 to reflect the recently dry conditions of 2019-2021.

7.3 CURRENT DROUGHT

The current drought in Mendocino and Sonoma Counties began in 2020. As measured in the City of Ukiah, recorded rainfall for 2020 was 11.32 inches, which amounts to 31% of the average rainfall (37.01 inches). This was the second lowest rainfall recorded since 1893. According to the individual permits issued under Decision 1610, dam releases from Lake Mendocino



Figure 7.1: Lake Mendocino: Before Drought (2020)

into the East Fork of the Russian River must be a minimum of 25 cubic feet per second (cfs) at all times, which totals to 16 million gallons per day (MGD). Under Decision 1610, Sonoma Water must release sufficient water from Lake Mendocino to maintain a river flow of 150 cfs to 185 cfs during normal (rainfall) conditions, 75 cfs under dry conditions, and 25 cfs under critically dry conditions (the minimum required amount under Decision 1610).

In January, 2021, Sonoma Water filed a Temporary Urgency Change Petition (TUCP) with the State Water Resources Control Board (SWRCB) regarding the the requirements of Decision 1610. TCUPs are prepared when drought conditions affect a water rights holder's ability to meet the needs of its service area. The TCUPs can provide relief to water rights holders by deviating from the terms of their water rights agreements. The TCUPs are valid for a period of six (6) months, and are renewable if drought conditions persist. The TCUP filed by Sonoma Water in January was in regard to the management of water levels in Lake Mendocino. In particular, Sonoma Water requested changes to the conditions of Decision 1610, to stipulate that instream flow requirements for the Upper Russian River be established based on water storage in Lake Mendocino, rather than Lake Pillsbury. The requested changes by Sonoma Water intend to improve water levels in Lake Mendocino, which currently



Figure 7.2: Lake Mendocino: Current Drought (April 2021)

are at critically dry levels. The TCUP was filed in response to a variance filed by Pacific Gas & Electric over the inflows to the Potter Valley Powerhouse. PG&E had concerns over whether minimum inflow flow requirements would allow them to maintain safe operation of the Potter Valley Powerhouse. This would reduce water diverted from the Eel River into the Russian River from 45 cfs to 15 cfs.

On April 21, 2021, a drought emergency was declared for Sonoma and Mendocino Counties. An Executive Order was signed, which officially declared a drought emergency for these two counties. The executive order did not enact any mandates, but allows for mandates to follow should the conditions persist. Further, the Executive Order opens the door for variances in water rights agreements should agencies file for TCUPs.

7.3.1 Drought Impacts on City Water Supply

The TCUP filed by Sonoma Water will allow remaining storage in Lake Mendocino to be conserved, but will result in reduced releases from the Coyote Dam into the East Fork of the Russian River, which confluences with the main Russian River which flows alongside the City. It is expected that the minimum requirement of 25 cfs will be met, but dam releases above this amount may be intermittent in order to allow Lake Mendocino to refill. When released, these

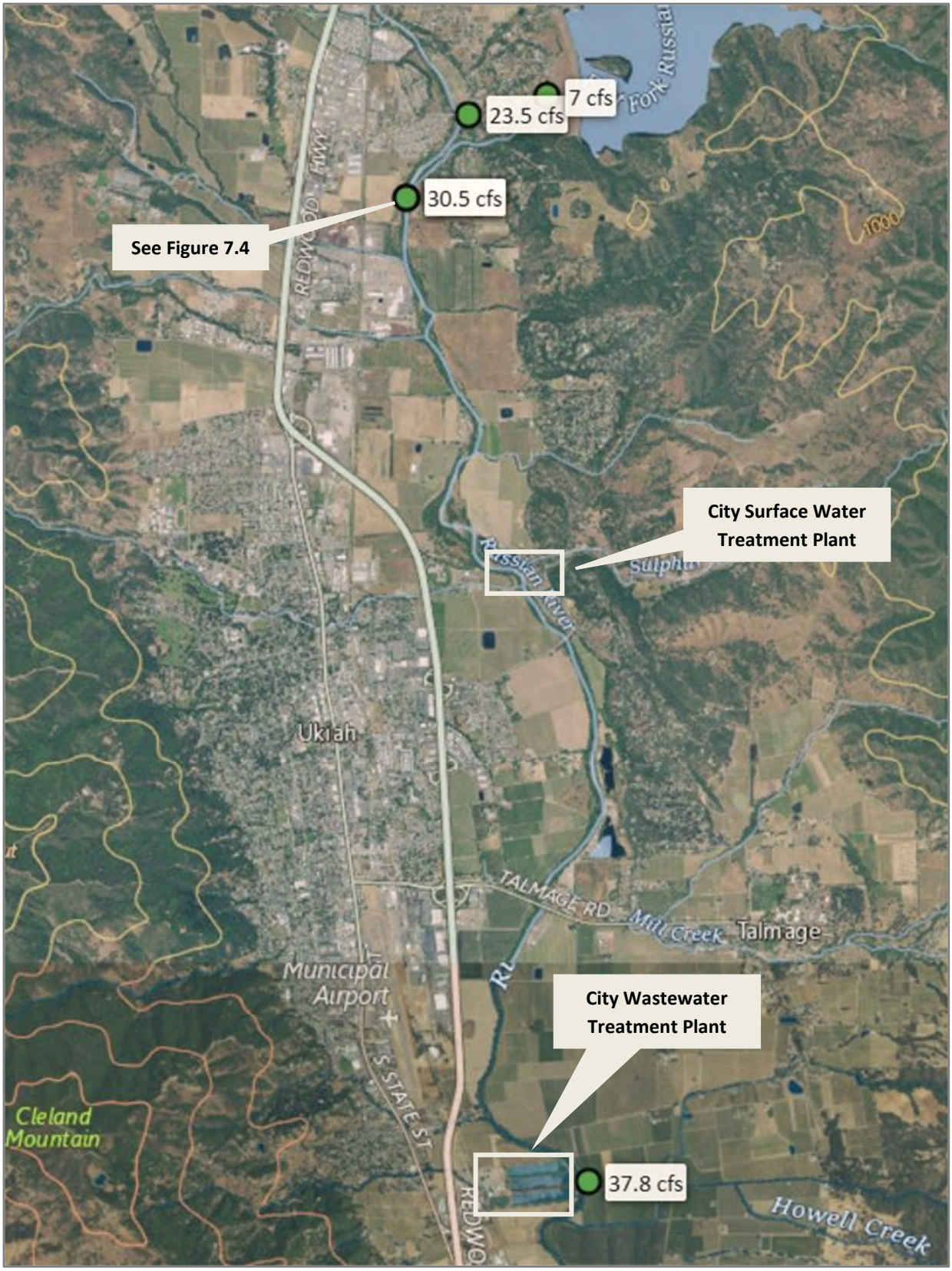


Figure 7.3: Streamflow Data from Sonoma Water (May 1, 2021)

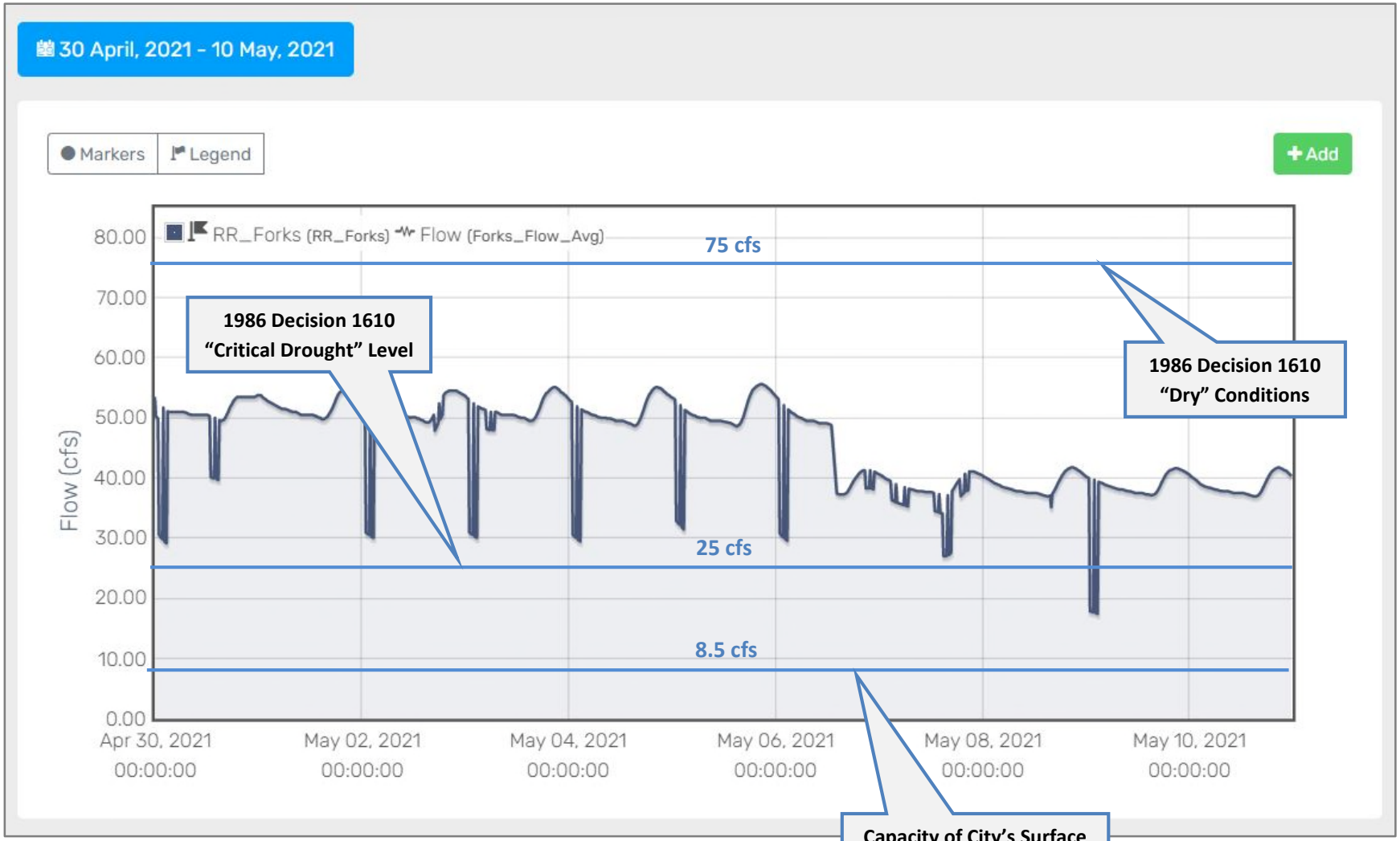


Figure 7.4: Recent Streamflow Graph (April 30th, 2021 to May 10, 2021)

flows will confluence with the western branch of the Russian River, and thus the flows adjacent to the City will be greater than 25 cfs. Notwithstanding, the City recognizes that these surface water flows still exceed the City's surface water rights, which stand at 16,507 AFY (combined total). Further, the City's capacity to extract its total available surface water rights is limited by its current pumping infrastructure, which currently consists of its Ranney Collector and Well #3. The City's Ranney Collector has a capacity of 5,155 AFY and Well #3 has a capacity of 483 AFY, which results in a combined total of 5,638 AFY. This pumping capacity is well below the minimum flow requirements in the Russian River of 25 cfs (18,100 AFY). For these reasons, the City's surface water supplies even during severe droughts are not adversely impacted. The City will however bias operations towards groundwater to minimize its impact on Lake Mendocino and the Russian River.

Surface flows during severe droughts still exceed the City's surface water rights.

7.4 CITY SUPPLY RELIABILITY

The City obtains its water sources from surface water, groundwater, and recycled water, with surface water sources accounting for the slight-majority of the City's total water supply. These surface water sources are fed from tributaries miles upstream of the City's intake point. For this reason, there are several factors outside of the City's control that can impact water supply reliability, including:

- **Physical**
  Water Storage & Pumping Facilities
- **Legal**
  Water Rights
- **Environmental**
  Plant & Aquatic Life Obligations
- **Water Quality**
  Concentrations of Contaminants
- **Climate**
  Renewal of Source Water

The previous section (**Section 7.3**) discussed the impacts of droughts on the City's surface water supplies. Depending on drought severity, all of the above factors can exist concurrently or can overlap during the course of a drought. For instance, low water volumes in rivers and reservoirs could result in a higher concentration of contaminants, decay of plant and aquatic life, and changes in legal contracts for water rights. It could also result in indirect restrictions on surface water availability from local agencies, such as Sonoma Water's TCUP mentioned in **Section 7.3** which could impact the dam releases into the east fork of the Russian River. Conversely, during periods of excessive rainfall, flooding can potentially damage



Figure 7.5: Coyote Dam Spillway and City of Ukiah Hydroelectric Plant

Coyote Dam structures, similar to the damage at Lake Oroville in 2017. Earthquakes can also cause damage to the Coyote structures, including the City's Hydroelectric Plant.

7.4.1 Physical Constraints

The fundamental factor that affects water supply reliability is the hydraulic capacity of supply and distribution system facilities. As indicated in the previous section, although the City's water supply infrastructure under-utilizes the City's water rights, the current supply and distribution system is considered sufficient for the current and projected demands within the planning horizon of this UWMP.

7.4.2 Legal Constraints

As mentioned in **Section 3**, the City maintains two (2) water-rights permits with SWRCB for diversions from the Russian River and one (1) agreement with the Flood Control District for additional diversions from the Russian River (if necessary). Of the two (2) agreements with SWRCB, the City's Pre-1914 Appropriative Right to divert from the Russian River provides a reliable supply source, which is unlikely to be interrupted due to the seniority of this right. On the other hand, the City's Water Rights Permit 12952 expired in 2000 and the City had previously filed an Extension of Time petition with the SWRCB. The City had requested that this permit be extended to

the year 2080. As of this UWMP, the City is currently re-filing with the SWRCB, for continued extension of this permit.

7.4.3 Environmental Constraints

The two key environmental agencies that are involved on water supplies issues related to the Russian River and Lake Mendocino include:

- California Dept. of Fish & Wildlife
- National Marine Fisheries Service

The City is not involved directly with these agencies. Sonoma Water is the primary liaison for the City and the Flood Control District. Sonoma Water's operations are subject to the Russian River Biological Opinion. To date, the City's surface water supplies have not been impacted by environmental factors, and the City does not anticipate future disruption of supplies as a result of environmental factors.

7.4.4 Water Quality Constraints

The quality of existing surface water and groundwater supply sources over the course of this UWMP planning period is expected to be excellent. If water quality becomes an issue for water supply reliability in the future, the City will evaluate the need for upgrades to its current treatment system or construction of a new water treatment facility. The quality of the City's water supplies is further discussed in **Section 5** of this UWMP.

7.4.5 Climate Impacts on Water Supply

As a member of the UVBGSA, the City will have access to groundwater models that will be prepared according to DWR's 2016 technical guide on groundwater modeling. These models can help the City better understand drought impacts on groundwater levels in the Basin. In general, the Ukiah Valley area receives an average of 37 inches of precipitation per a year. The relatively abundant precipitation contributes runoff to the Russian River system and recharges the groundwater basin. During drought conditions, when surface water supplies are limited or unavailable, water supply is available to the City from groundwater storage in the basin. According to a recent study prepared by UC Davis in 2017 on the Ukiah Valley Groundwater Basin, the basin receives an annual recharge of about 25,000 AF, and has a total storage between 400,000 AF to 500,000 AF. Thus, the City's groundwater volumes are not subject to short-term water shortages from dry weather conditions.

A groundwater basin study by UC Davis was conducted in 2017 for the City of Ukiah.

7.5 DROUGHT RISK ASSESSMENT

The drought risk assessment is an assessment of the reliability of the City's water supplies by comparing projected future water demands with expected available water supplies under three different hydrologic conditions: (1) normal water year, (2) single dry year, and (3) multiple dry years. For the sake of this UWMP, the multiple dry-year period is taken to be five (5) years. Future supply and demand conditions can be determined from the following data:

- Population forecasts
- Water supply capacity
- Recent water use trends

The data described above has been provided in the previous sections of this UWMP, including **Section 3** (Water Sources & Supplies) and **Section 6** (Water Use). The projected comparisons in this Section are based on data from those previous sections.

7.5.1 Basis for Projected Demands

To project future demands, it will be assumed that total demand will change annually based on changes in population multiplied by the individual demand per-person (also known as the "per-capita" consumption rate -see **Section 6**). The per-capita rates used in the future projections will be based on actual water use data from the recent past. In particular, the City's averages for the last five (5) years will be used as the basis to project demands through the year 2045. To project demands and supplies, the following is assumed:

- Consumption rate of 158 gallons per capita per day (GPCD) starting in 2021. This is the average consumption rate for the City in the last 5 years.

- Starting in 2022, consumption rate will decrease by 0.5% annually.

A decreasing consumption rate scenario provides a realistic basis for planning purposes since it considers gradual increases in water-use efficiency. In the past 20 years, the City has seen a 22% decrease in water use efficiency. The City's consumption rate (GPCD) in 2000 was 215 GPCD, and the City's consumption rate in 2020 was about 168 GPCD. This amounts to an average decrease of about 1.5% annually.

For drought-time demands, is expected that there will be a small degree of increase due to the lack of rainfall on landscapes. To project demands during single and multiple (five) year drought periods, the following increase factors will be assumed:

- Dry Year: 8%
- Multiple Dry Years: 8%, 10%, and 5%

During the recent drought of 2011 to 2017, water agencies in the State experienced an

increase in water demands, until former Gov. Brown's Emergency Declaration in 2015. Nevertheless, the increase factors listed above are reasonable for the purposes of demand projections since they provide reasonable estimates of increases in water use for irrigation during dry-years.

7.5.2 Basis for Projected Supplies

For projected supplies, the City expects its surface water supplies to be based off of the City's two (2) surface water agreements with the State Water Resources Control Board. As mentioned in **Section 7.3**, this amounts to a total of 16,507 AFY. Finally, the City's groundwater supply will be based on the City's groundwater pumping capacity, which is currently at 4,677 AFY. Thus, the City is forecasted to have 21,184 AF of water available during normal years.

As seen by the current drought of 2020-2021, during dry years, surface water flows in the Russian River could decrease by up to two-thirds of normal water year river flows. These reduced surface flows in the river still exceed the City's water rights. Nonetheless, for conservative planning purposes, it will be assumed that the City's surface water supplies during dry years will be one-third (33%) of normal water year surface supplies. This would impact only the City's Water Right Permit 12952 (Application 15704), since the City's Pre-1914 Right is not curtailable by the SWRCB. This would result in the following surface supplies during dry years:

- Surface Water (Pre-1914): 2,027 AFY
- Surface Water (Permit 12952): 4,830 AFY

This results in a total surface supply of 6,857 AFY. Since annual groundwater recharge exceeds the City's pumping capacity, groundwater is expected to be a "drought proof" source of supply. Thus, the City's total supply (surface + groundwater) during dry years is 11,534 AFY.

7.5.3 Tabular Comparisons

As mentioned in Section 6, three (3) projected scenarios will be analyzed to assess the resiliency of the City's water system. These scenarios include

1. No Expansion of Water Service
2. Addition of 2,500 Service Connections
3. Addition of 5,000 Service Connections

Tables **7.1** to **7.7** on the following pages provide the City's supply and demand projections to the year 2045. **Figures 7.6 to 7.11** show a visual pie-chart for different water year scenarios. Based on the data presented in these tables and figures, the City can expect to meet future demands for all three scenarios under all climate conditions through 2045.

Table 7.1
City of Ukiah Water Supply Availability & Demand Projections
Normal Water Year

Water Sources	2025	2030	2035	2040	2045
Population					
Water Service Area Population (Base Service Area)	16,350	16,639	16,928	17,217	17,506
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	17,851	19,640	21,429	23,218	25,007
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	19,351	22,640	25,929	29,218	32,507
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	155	151	147	144	140
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	14,480	14,480	14,480	14,480	14,480
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**21,184**	**21,184**	**21,184**	**21,184**	**21,184**
Demand (AF)					
Total Demand (City Water Service Area)	**2,836**	**2,815**	**2,793**	**2,770**	**2,747**
Total Demand (Scenario 1)	3,097	3,323	3,536	3,736	3,924
Total Demand (Scenario 2)	3,357	3,830	4,278	4,701	5,101
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	**18,348**	**18,369**	**18,391**	**18,414**	**18,437**
Difference (Scenario 1)	18,087	17,861	17,648	17,448	17,260
Difference (Scenario 2)	17,827	17,354	16,906	16,483	16,083

Notes:

1. Total Demand = Consumption Rate x Projected Population
   a. Average consumption rate of last 5 years = 158 gallons per capita per day (GPCD)
   b. Estimated starting consumption rate in 2021 = 158 GPCD
   c. SBx7-7 Target for 2020: 186 GPCD
   d. Approximate "passive" savings: 0.5% per year
   e. Projected "passive" savings: 0.5% per year = 140 gpcd by 2045
2. Groundwater supplies based on the City's well pumping capacity: **4,677 AFY.**
3. Surface water supply represents supply available to City, if needed, based on the City's surface water rights through Pre-1914 Appropriative Right of 2,027 AFY and through Water Rights Permit 12952 (14,480 AFY).
4. Total available supply in all years: 4,677 AFY + 2,027 AFY + 14,480 AFY = **21,184 AFY**.

Table 7.2
City of Ukiah Water Supply Availability & Demand Projections
Single Dry Year

Water Sources	2025	2030	2035	2040	2045
Population					
Water Service Area Population (Base Service Area)	16,350	16,639	16,928	17,217	17,506
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	17,851	19,640	21,429	23,218	25,007
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	19,351	22,640	25,929	29,218	32,507
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	155	151	147	144	140
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	4,830	4,830	4,830	4,830	4,830
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**11,534**	**11,534**	**11,534**	**11,534**	**11,534**
Demand (AF)					
Total Demand (City Water Service Area)	**3,063**	**3,040**	**3,016**	**2,992**	**2,967**
Total Demand (Scenario 1)	3,344	3,588	3,818	4,035	4,238
Total Demand (Scenario 2)	3,625	4,137	4,620	5,077	5,509
% Increase from Normal Year	108%	108%	108%	108%	108%
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	8,471	8,494	8,518	8,542	8,567
Difference (Scenario 1)	8,190	7,946	7,716	7,499	7,296
Difference (Scenario 2)	7,909	7,397	6,914	6,457	6,025

Notes:

1. Total Demand = Consumption Rate x Population x Single Dry Year Increase of 108%.
2. Reduced surface water supplies during dry years: 2,027 AFY + 4,830 AFY = 6,857 AFY
3. All other items derived in similitude to Table 7.1.

Table 7.3
City of Ukiah Water Supply Availability & Demand Projections
Multiple Dry Years (2021-2025)

Water Sources	2021	2022	2023	2024	2025
Population					
Water Service Area Population (Base Service Area)	16,119	16,177	16,235	16,294	16,350
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	16,419	16,777	17,135	17,493	17,851
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	16,719	17,377	18,035	18,693	19,351
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	158	157	156	156	155
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	4,830	4,830	4,830	4,830	4,830
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**11,534**	**11,534**	**11,534**	**11,534**	**11,534**
Demand (AF)					
Total Demand (City Water Service Area)	**3,081**	**3,134**	**2,987**	**2,983**	**2,978**
Total Demand (Scenario 1)	3,138	3,250	3,152	3,202	3,251
Total Demand (Scenario 2)	3,196	3,366	3,318	3,422	3,525
% Increase from Normal Year	108%	110%	105%	105%	105%
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	8,453	8,400	8,547	8,551	8,556
Difference (Scenario 1)	8,396	8,284	8,382	8,332	8,283
Difference (Scenario 2)	8,338	8,168	8,216	8,112	8,009

Notes:

1. Total Demand = Consumption Rate x Population x Single Dry Year Increase of 108%.
2. Reduced surface water supplies during dry years: 2,027 AFY + 4,830 AFY = 6,857 AFY
3. All other items derived in similitude to Table 7.1.

Table 7.4
City of Ukiah Water Supply Availability & Demand Projections
Multiple Dry Years (2026-2030)

Water Sources	2026	2027	2028	2029	2030
Population					
Water Service Area Population (Base Service Area)	16,409	16,468	16,527	16,587	16,639
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	18,209	18,568	18,927	19,287	19,640
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	20,009	20,668	21,327	21,987	22,640
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	154	153	153	152	151
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	4,830	4,830	4,830	4,830	4,830
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**11,534**	**11,534**	**11,534**	**11,534**	**11,534**
Demand (AF)					
Total Demand (City Water Service Area)	**3,059**	**3,111**	**2,965**	**2,961**	**2,956**
Total Demand (Scenario 1)	3,394	3,508	3,396	3,443	3,489
Total Demand (Scenario 2)	3,730	3,904	3,827	3,925	4,022
% Increase from Normal Year	108%	110%	105%	105%	105%
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	8,475	8,423	8,569	8,573	8,578
Difference (Scenario 1)	8,140	8,026	8,138	8,091	8,045
Difference (Scenario 2)	7,804	7,630	7,707	7,609	7,512

Notes:

1. Total Demand = Consumption Rate x Population x Single Dry Year Increase of 108%.
2. Reduced surface water supplies during dry years: 2,027 AFY + 4,830 AFY = 6,857 AFY
3. All other items derived in similitude to Table 7.1.

Table 7.5
City of Ukiah Water Supply Availability & Demand Projections
Multiple Dry Years (2031-2035)

Water Sources	2031	2032	2033	2034	2035
Population					
Water Service Area Population (Base Service Area)	16,699	16,759	16,819	16,880	16,928
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	19,999	20,359	20,719	21,080	21,429
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	23,299	23,959	24,619	25,280	25,929
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	150	150	149	148	147
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	4,830	4,830	4,830	4,830	4,830
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**11,534**	**11,534**	**11,534**	**11,534**	**11,534**
Demand (AF)					
Total Demand (City Water Service Area)	**3,036**	**3,088**	**2,943**	**2,939**	**2,933**
Total Demand (Scenario 1)	3,636	3,751	3,626	3,670	3,712
Total Demand (Scenario 2)	4,236	4,414	4,308	4,401	4,492
% Increase from Normal Year	108%	110%	105%	105%	105%
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	8,498	8,446	8,591	8,595	8,601
Difference (Scenario 1)	7,898	7,783	7,908	7,864	7,822
Difference (Scenario 2)	7,298	7,120	7,226	7,133	7,042

Notes:

1. Total Demand = Consumption Rate x Population x Single Dry Year Increase of 108%.
2. Reduced surface water supplies during dry years: 2,027 AFY + 4,830 AFY = 6,857 AFY
3. All other items derived in similitude to Table 7.1.

Table 7.6
City of Ukiah Water Supply Availability & Demand Projections
Multiple Dry Years (2036-2040)

Water Sources	2036	2037	2038	2039	2040
Population					
Water Service Area Population (Base Service Area)	16,989	17,050	17,111	17,173	17,217
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	21,789	22,150	22,511	22,873	23,218
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	26,589	27,250	27,911	28,573	29,218
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	147	146	145	144	144
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	4,830	4,830	4,830	4,830	4,830
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**11,534**	**11,534**	**11,534**	**11,534**	**11,534**
Demand (AF)					
Total Demand (City Water Service Area)	**3,012**	**3,064**	**2,920**	**2,916**	**2,909**
Total Demand (Scenario 1)	3,863	3,980	3,842	3,884	3,923
Total Demand (Scenario 2)	4,714	4,896	4,763	4,852	4,936
% Increase from Normal Year	108%	110%	105%	105%	105%
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	8,522	8,470	8,614	8,618	8,625
Difference (Scenario 1)	7,671	7,554	7,692	7,650	7,611
Difference (Scenario 2)	6,820	6,638	6,771	6,682	6,598

Notes:

1. Total Demand = Consumption Rate x Population x Single Dry Year Increase of 108%.
2. Reduced surface water supplies during dry years: 2,027 AFY + 4,830 AFY = 6,857 AFY
3. All other items derived in similitude to Table 7.1.

Table 7.7
City of Ukiah Water Supply Availability & Demand Projections
Multiple Dry Years (2041-2045)

Water Sources	2041	2042	2043	2044	2045
Population					
Water Service Area Population (Base Service Area)	17,279	17,341	17,404	17,466	17,506
Water Service Area Population (Scenario 1: 2,500 Additional Connections by 2045)	23,579	23,941	24,304	24,666	25,007
Water Service Area Population (Scenario 2: 5,000 Additional Connections by 2045)	29,879	30,541	31,204	31,866	32,507
Consumption Rate (GPCD) *Including 0.5% Annual Passive Savings*	143	142	142	141	140
Supply (AF)					
Surface Water (Pre-1914 Rights)	2,027	2,027	2,027	2,027	2,027
Surface Water (Permit 12952)	4,830	4,830	4,830	4,830	4,830
Groundwater (Wells #4, #7, #8, & #9)	4,677	4,677	4,677	4,677	4,677
Total Supply	**11,534**	**11,534**	**11,534**	**11,534**	**11,534**
Demand (AF)					
Total Demand (City Water Service Area)	**2,988**	**3,039**	**2,896**	**2,892**	**2,884**
Total Demand (Scenario 1)	4,077	4,195	4,045	4,085	4,120
Total Demand (Scenario 2)	5,166	5,352	5,193	5,277	5,356
% Increase from Normal Year	108%	110%	105%	105%	105%
Supply/Demand Comparison (AF)					
Difference (City Water Service Area)	8,546	8,495	8,638	8,642	8,650
Difference (Scenario 1)	7,457	7,339	7,489	7,449	7,414
Difference (Scenario 2)	6,368	6,182	6,341	6,257	6,178

Notes:

1. Total Demand = Consumption Rate x Population x Single Dry Year Increase of 108%.
2. Reduced surface water supplies during dry years: 2,027 AFY + 4,830 AFY = 6,857 AFY
3. All other items derived in similitude to Table 7.1.

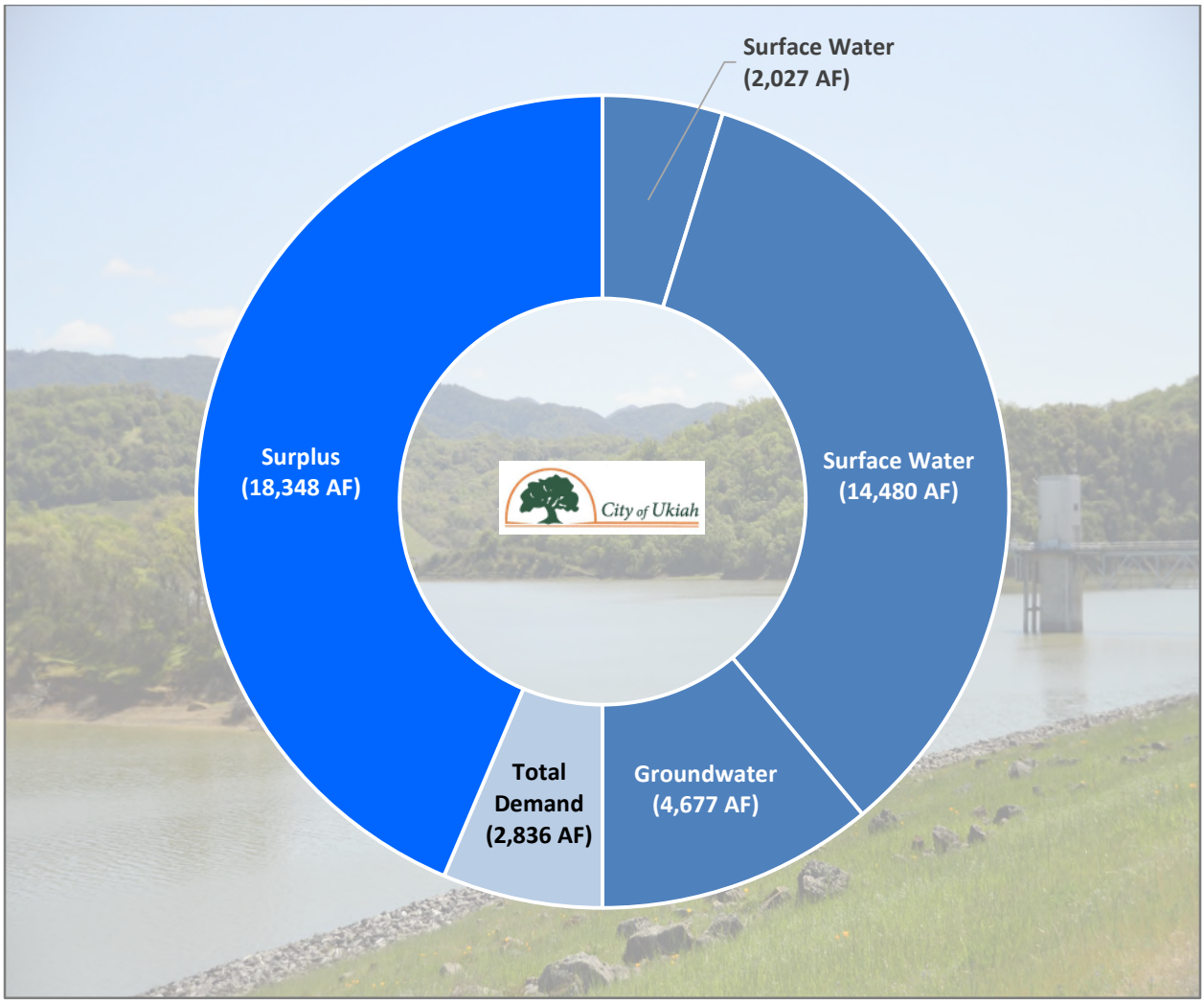


Figure 7.6: Projected Normal Water Supply: Year 2025

Notes:

1. See Notes Under Table 7.1.
2. Surplus = Total Available Supply – Total Demand = 21,184 AF – 2,836 AF = 18,348 AF

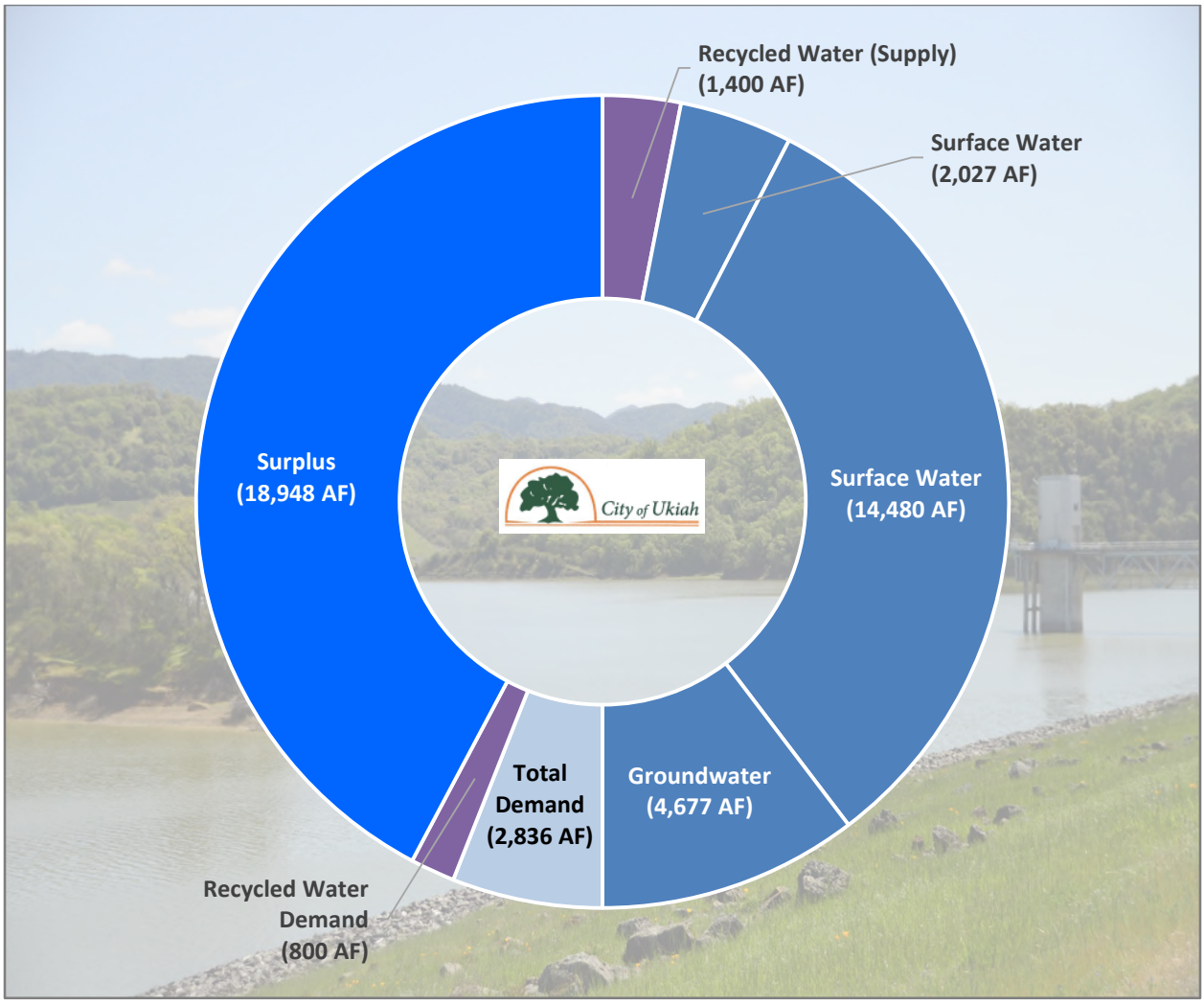


Figure 7.7: Projected Normal Water Supply: Year 2025 (Including Recycled Water)

Notes:

1. See Notes Under Table 7.1.
2. Surplus = Total Available Supply – Total Demand = 22,584 AF – 2,836 AF – 800 AF = 18,948 AF
3. See Section 4 for Details on Recycled Water

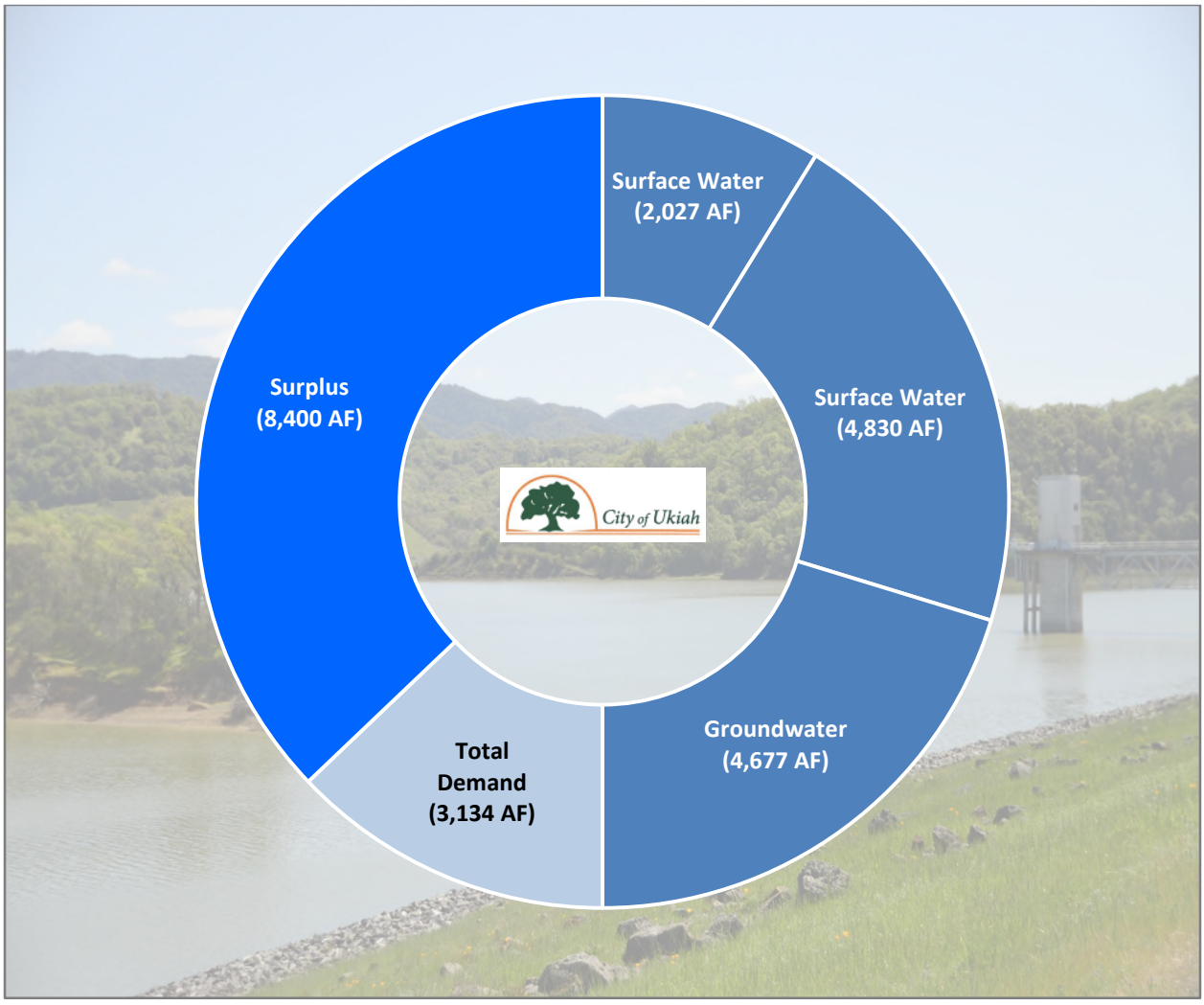


Figure 7.8: Projected 3-Year Minimum Water Supply: Dy Years 2022 – 2024

Notes:

1. See Notes Under Table 7.1.
2. Surplus = Total Available Supply – Total Demand = 11,534 AF – 3,134AF = 8,400AF

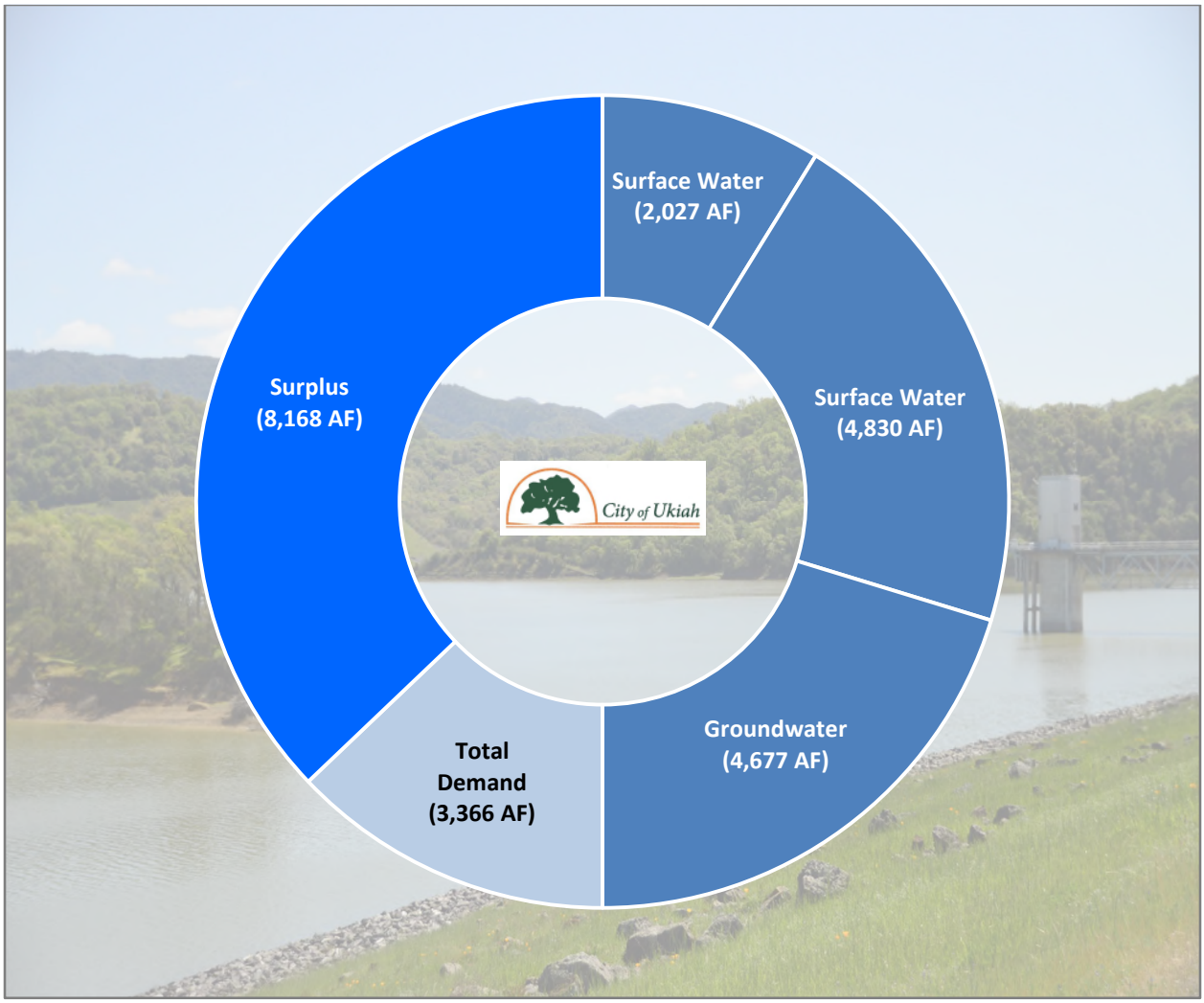


Figure 7.9: Projected 3-Year Minimum Water Supply (Scenario 2: Additional Service Connections) Dry Years 2022 – 2024

Notes:

1. See Notes Under Table 7.1.
2. Surplus = Total Available Supply – Total Demand = 11,534 AF – 3,366 AF = 8,168 AF

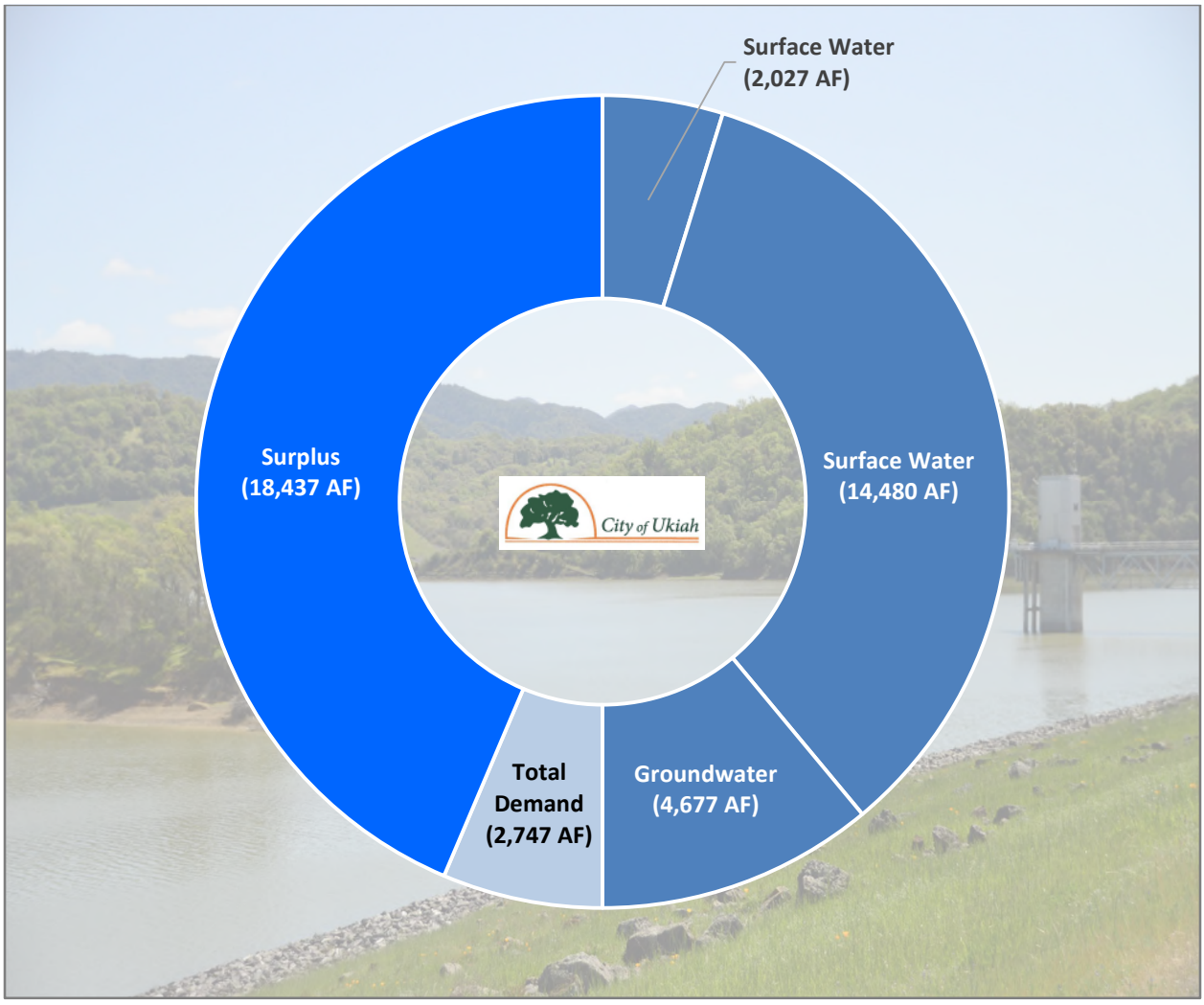


Figure 7.10: Projected Normal Water Supply: Year 2045

Notes:

1. See Notes Under Table 7.1.
2. Surplus = Total Available Supply – Total Demand = 21,184 AF – 2,747 AF = 18,437 AF

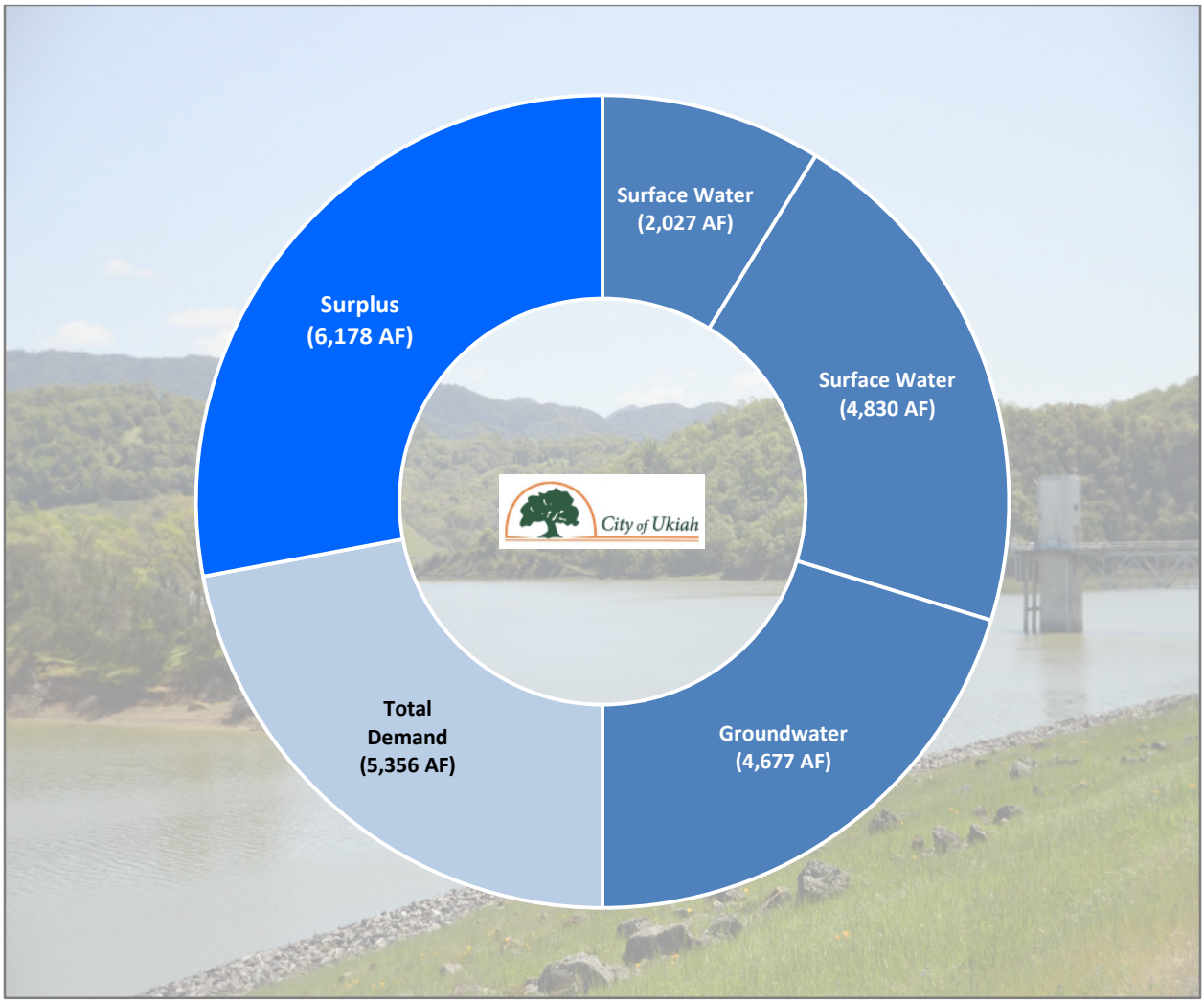


Figure 7.11: Projected Minimum Water Supply (Scenario 2: 5,000 Additional Service Connections) Dry Year 2045

Notes:

1. See Notes Under Table 7.1.
2. Surplus = Total Available Supply – Total Demand = 11,534 AF – 5,356 AF = 6,178 AF

7.6 ENSURING ADEQUATE SUPPLY

As indicated by the tables on the previous pages, the City does not expect to have a water supply shortage through 2045. The City's surface water supplies exceed the City's surface water pumping capacity. Further, groundwater supplies are not expected to be affected during droughts lasting up to five years. Finally, extreme droughts or sudden supply interruptions can be addressed by following the criteria of the City's Water Shortage Contingency Plan (WSCP) along with any regional contingency plans. These programs are discussed in **Section 8**. For these reasons, the City is confident that water supplies are adequate to meet demands for all weather conditions through 2045.

7.7 WSCP SUPPLY AUGMENTATION

Although the City does not expect to have a water supply shortage through 2045, as indicated by **Tables 7.1** to **7.7**, severe and extent droughts may cause the WSCP to be enacted. The City will rely on the implementation of the WSCP to augment the City's reduced supply during consecutively dry years. The WSCP supply augmentation benefits during a five-year drought are shown in **Standard DWR Table 7-5** in **Appendix E.**

7.8 WATER SUPPLY OPPORTUNITIES

Other than upgrades to its existing infrastructure, the City does not have any formal plans for water supply projects at the current time. However, the City continually reviews practices that will provide its customers with adequate and reliable supplies. The most recent example is the City's Well #9, which went online in 2017 with a capacity of 700 gpm.

In the coming years, the City will focus efforts on upgrading or establishing new wells. The City will also continue its regular maintenance of its existing infrastructure, including its Ranney Collector.

7.9 RELIABILILTY MANAGEMENT

As noted in **Tables 7.1** to **7.7**, surface water supplies can be impacted during severe droughts, including the current drought which has seen the second lowest rainfall on record for the Ukiah Valley. This highlights the need to monitor and coordinate pumping activities in the Basin. In 2017, the Ukiah Valley Basin Groundwater Sustainability Agency (UVBGSA) was formed through a Joint Powers Agreement (JPA). The JPA was signed in April of 2017, with the County serving as the lead agency of the UVBGSA. The UVBGSA serves as the official Groundwater Sustainability Agency (GSA) for the Ukiah Valley Basin under the

Sustainable Groundwater Management (SGMA) Act of 2014. The purpose of the UVBGSA is to coordinate the sustainable management of the Basin, including the preparation of a Groundwater Sustainability Plan (GSP) for the Basin. The GSP is currently being prepared as of this UWMP (April 2021).

Section 8
Contingency Planning

Diesel-powered generators, such as the one pictured below, can provide a backup supply of water in case of power outages to water wells or booster station pumps.



Section 8

CONTINGENCY PLANNING



Diesel-powered pumps can provide emergency water supplies during sudden catastrophes.

8.1 INTRODUCTION

In addition to prolonged droughts that can gradually decrease water supplies, water supplies may be interrupted in a number of sudden, catastrophic ways. Sudden catastrophes may include earthquakes, power outages, pumping equipment failures, or spikes in groundwater contaminants that cannot be remedied expeditiously. Water shortages can also be a result of intentional or accidental manmade catastrophes, such as acts of terrorism or chemical spills into nearby canals or groundwater spreading grounds. It is important that the City has a plan in place to manage its water system during short or long-term water shortages. Long term, water shortages can be addressed through conservation and supply augmentation. Short term, water shortages are best handled though a "Contingency Plan". A Water Shortage Contingency Plan (WSCP) is a required component of the City's UWMP, which provides guidance on stages of action to be undertaken by the City in response to water supply shortages. A WSCP is an independent document that is incorporated into the City's UWMP.

This Section serves as the City's WSCP. The City's response to water shortages will be a coordinated effort between its own staff and other local and regional water agencies



Figure 8.1: Lake Oroville Failure (February 2017)

During a water shortage emergency, the City will activate this WSCP, which coincides with **Article 11, Section 3600 to 3616 of the City's Municipal Code**. The intent of the plan is to reduce the effect of shortages on the City's customers. This WSCP is in compliance with Water Code requirements CWC § 10632 to 10632.5.

8.2 NEED FOR CONTINGENCY PLANS

The recent drought of 2011-2017 significantly depleted the State's supply of water and posed a challenge to many agencies throughout the State. Following the drought, the State experienced a wet winter in 2017. This resulted in flooding in parts of the State. Several dams overflowed and caused the evacuation of thousands of residents. The most visible example of dam failures was the failure of the Oroville Dam in February of 2017. Structural failure of the Oroville Dam spillway resulted in heavy flooding, damage to farmland, and the evacuation of nearly 200,000 residents. As a result of the crisis, DWR prepared a Lake Oroville Flood Season Operations Plan in order to operate the reservoir during construction of the repairs. The failure of the reservoir highlighted the need for improvements to regional and local contingency plans.

8.2.1 Recent State Water Code Amendments

As a result of the recent drought and flooding in the State, the following changes were made to the Water Code in 2018 which affect WSCPs:

- *CWC § 10632 (a)(1):* WSCPs must include attributes of its Water Supply Reliability Analysis, or reliability of water supplies under five consecutive drought years.
- *CWC § 10632 (a)(3)(A):* WSCPs must include six (6) Standard Stages, including a shortage of greater than 50 percent of "normal" water supply.
- *CWC § 10632 (a)(4):* WSCPs must include shortage response actions, and the extent of which the action will address the shortage, based on the severity level of the shortage.
- *CWC § 10632 (a)(2):* WSCPs must include a plan for preparing annual water supply and demand assessments.
- *CWC § 10632.5 (a)(5):* WSCPs must include communication protocols to inform customers and the general public of current or predicted water shortages stages.
- *CWC § 10632.5 (a)(9):* WSCPs must include monitoring and reporting procedures to assure the agencies' ability to monitor customer compliance and report data to the State/DWR.
- *CWC § 10632.5 (a)(10):* WSCPs must include a procedure for evaluation of the WSCP and an outline or procedure to adjust the UWMP in subsequent cycles (i.e. 2025).

The water code changes listed above were added to the Water Code in 2018. In addition, the following measures were taken in recent years that affect WSCPs:

- In 2014, the State Water Resources Control Board (SWRCB) issued Resolution 2014-0038, which aims to enhance customer awareness of their personal water use and establish incentives to reduce demand, such as tiered or drought rate structures.
- In 2015, Gov. Brown issued Executive Order B-29-15, which calls for a temporary reduction in statewide water use by up to 25 percent.

The SWRCB extended Executive Order B-29-15 in February of 2017. In April 2017, the SWRCB rescinded the mandatory conservation requirements of the Oder. The action was in response to the ending the drought state of emergency and transitioning to a permanent framework for making water conservation a California way of life.

8.3 LEGAL AUTHORITY

As indicated by **Sections 8.1** and **8.2**, the City has the legal obligation to prepare and implement a WSCP during times of drought or sudden supply interruptions. Response to water shortages is also codified into City Municipal Code (**Article 11, Section 3600 to 3616**, "Water Conservation"). **Section 8.6.3** and **Table 8.3** of this WSCP include a listing of shortage response actions per CWC § 10632 (a)(3)(A), including the means by which the City will declare a water shortage and authorize response actions. The remaining Sections of this WSCP describe the City's response actions in greater detail.

8.4 WATER SUPPLY RELIABILITY ANALYSIS

The City's UWMP does not anticipate a water supply shortage due to drought conditions through 2045. Groundwater supplies are not expected to be affected during droughts lasting up to five (5) years. Likewise, the City's Pre-1914 surface water rights are expected to be available during drought periods. Furthermore, droughts will be mitigated by implementing this WSCP. The results of the City's Drought Risk Assessment (DRA) are shown in **Figure 8.2** and **Table 8.1** on the following page (also **Appendix E**, Table 7-5).

Due to the number of groundwater wells in the City's water system, the City has redundancy in the event of water quality impairments with a particular well. **Figure 8.3** shows a general procedure that the City may take if any wells are detected to have water quality concerns. If necessary, the City has the ability to increase pumping from other wells to account for loss of production. The City may also construct additional wells over the course of this UWMP planning period (2045), to improve operational flexibility and redundancy. Therefore, the City does not anticipate any significant impacts to water supply reliability as a result of water quality.

Other events which may create a water shortage condition are discussed in **Section 8.7** of this WSCP. These events may include, but not be limited to:

- Regional Power Outage
- Earthquake
- Terrorism Incident

If any of the above events occur, the City will work in conjunction with the County of Mendocino and the neighboring agencies listed in **Section 8.7** (Page 8-15) to address the effects of potential water shortages. **Section 8.7** of this WSCP provides a brief overview of the City's response actions to these types of emergencies. Regional response actions are also outlined in Regional Planning documents on the County of Mendocino's website, and as referenced in this WSCP.

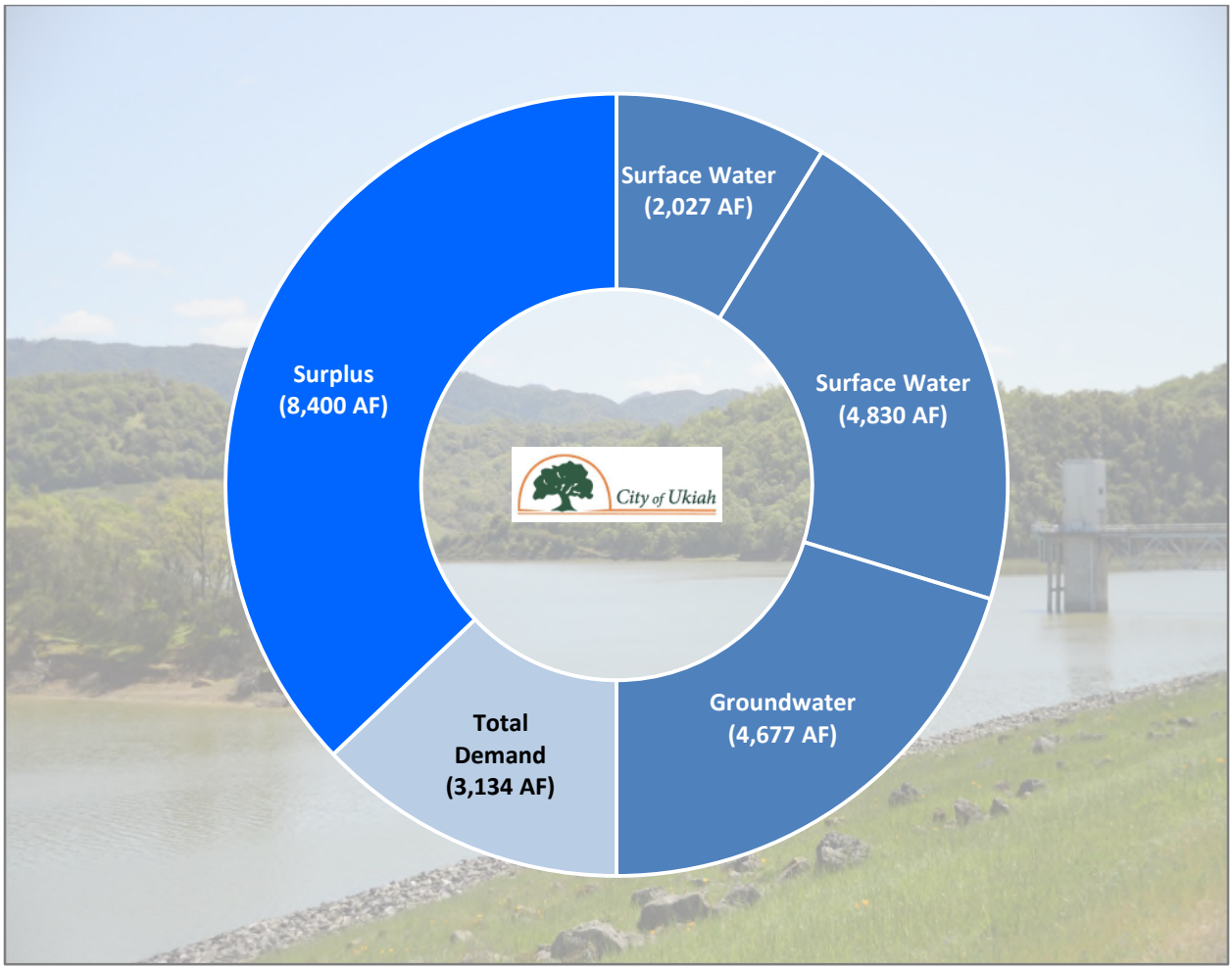


Figure 8.2: Drought Risk Assessment (Next Five Years). Graph Shown for Next Year (2022)*

Table 8.1
Drought Risk Assessment (Next Five Years)*

Year	Total Dry-Year Water Use (AF)	Total Dry-Year Supply (AF)	Difference (AF)	WSCP Net Benefit (AF)	Potential Difference (AF)
2021	3,081	11,534	8,453	308	8,761
2022	3,134	11,534	8,400	313	8,713
2023	2,987	11,534	8,547	299	8,846
2024	2,983	11,534	8,551	298	8,849
2025	2,978	11,534	8,556	298	8,854

Note: The results shown in **Figure 8.2 and **Table 8.1** above provide a conservative result since the City also has groundwater storage capacity to which it may dip into to "close the gap" if necessary.*

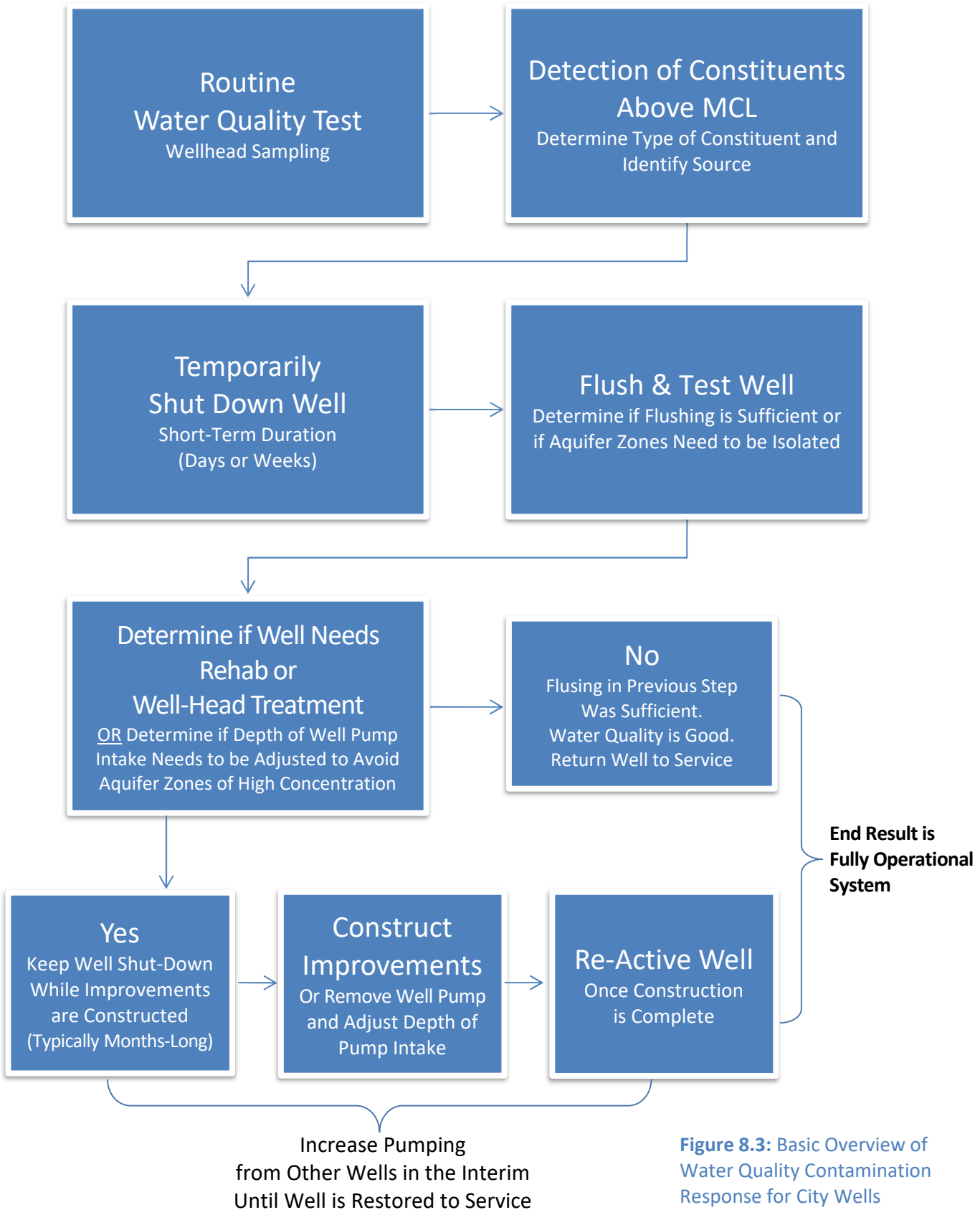


Figure 8.3: Basic Overview of Water Quality Contamination Response for City Wells

8.5 ANNUAL ASSESSMENTS

Agencies typically prepare Water Supply Assessments (WSAs) when housing developments are proposed by developers. WSAs provide an estimated of available supplies for a proposed development in order to confirm the possibility of serving water to a particular development. Over the next few decades, the City will experience only mild growth in its water service area. Most of this will be re-development. The City will need to refine its procedure for developing WSAs and for assessing water demands in its service area.

Similar to a development-driven WSA, a system-wide assessment of supplies and demands will be required of all water agencies in the State. According to CWC § 10632 (a)(2), the City will be required to prepare an "Annual Assessment" of supplies and demands, including an Annual Water Shortage Assessment Report, by July 1st of each year. At this time, DWR requires that the City include a guideline for preparation of an Annual Assessment in this WSCP.

8.5.1 Decision Making Process

The City's Annual Assessment will be based on metered data from active wells and from customer meters. These figures are available to the City on a monthly basis, or more frequently if the City desires. The City can also rely on quarterly or annual reports. With newer software, the City can adjust to changing conditions (such as rainfall) and can adjust its reporting leading up to the submittal of the Annual Assessments. As of next year (2022), City staff will review water production data and water consumption data starting in January, with the intent to prepare an Annual Water Shortage Assessment Report to the City Council by May each year. The Final Report can then be submitted to DWR by July 1 of each year.

8.5.2 Key Data Inputs

The Annual Assessment will be based on the forecasted demands and estimated water supply availability, including any known infrastructure constraints. The Annual Assessment will also consider weather, population growth, and other influencing factors, such as state or local policies that will impact water demands, or regulations affecting water supplies.

The following data are typically available to City staff and can be relied on when preparing the Annual Assessments:

1. Estimated dry-year demand without any conservation measures. Dry-year demands will be determined by adding an increase factor of 5% to normal demands.

2. Estimated total water supply availability under dry-year scenarios. The water supply available will be based on what is available to the City, regardless of pumping capacity. Groundwater supplies can be estimated from annual Basin Reports prepared under the 2014 Sustainable Groundwater Management Act (SGMA) and from local groundwater level monitoring.

3. Estimated capacity of water production infrastructure. Any known or forecasted issues affecting the City's water production infrastructure can be considered, such as:

    - Mechanical or electrical issues with groundwater well pumps.
    - Possible power outages for operation and maintenance
    - New construction and repairs

The potential constraints on water supply capacity listed under Item 3 above are subject to change from year to year. The City should inspect its water system for the condition of its groundwater wells and surface water treatment plant before making a determination on possible restrictions in water supplies (due to mechanical or electrical conditions). In addition, the City should contact SWRCB and Sonoma Water concerning water levels in Lake Mendocino. This will help the City to forecast dam releases and stream flows in the Russian River. Dam releases also have a minor, indirect impact on subsurface inflows to the Ukiah Valley Groundwater Basin.

8.5.3 Current Forecast

In general, the total available water supply will be based on the capacity of the City's water supply infrastructure or rights, whichever is more restrictive. At this time, the City's combined water supply availability is 21,184 AFY. This is based on surface water rights and the capacity of the City's groundwater wells. Regardless of the available supply, the actual supply into the City's water system will be based on the projected demands. **Table 8.1** provides the projected supply capacity volumes along with the projected water demand (about 3,134 AF in 2022).

Based on **Table 8.1**, the City will have a projected demand of 2,978 AF in 2025, which is about twenty percent (20%) of the City's projected dry-year water supply. Although this indicates the City's water supplies will be more than sufficient to meet demands, the City can construct additional groundwater well(s) to provide greater operational flexibility.

8.6 CONTINGENCY PLANS

Unlike many agencies in California, the City does not rely on imported water directly from a wholesale agency. The City's water sources come from local water sources only, and the City obtains water from these sources with its own pumping infrastructure. However, the City coordinates with three (3) water agencies that manage or oversee water supplies in Lake Mendocino, the Russian River, and the Ukiah Valley Groundwater Basin. These agencies include Sonoma Water, the Russian River Flood Control and Water Conservation Improvement District, and the Mendocino County Water Agency. Thus, the City's water shortage response efforts can be coordinated with the help of these agencies.

8.6.1 City Contingency Plan

The City's "Water Shortage Emergency" Plan was originally adopted as Article 11 Sections 3600 to 3616 of the City's Municipal Code. The provisions of the Plan are currently being updated as described in this WSCP to provide the City with the authority and guidance to implement a phased response plan to water shortages. In the event of a water shortage, the City Council will implement the appropriate water conservation phase by resolution.

The objectives of the response plan are to:

1. Prioritize essential uses of water
2. Maximize local municipal water supplies
3. Eliminate water waste city-wide
4. Minimize adverse financial effects

Regarding Objective No. 1, priorities for use of available potable water during shortages are based partly on California Water Code, Sections 350-358. Water allocations are established for all customers according to the following ranking system:

1. **First Priority**: Minimum health and safety allocations for interior residential needs
2. **Second Priority**: Commercial, industrial, institutional/governmental operations
3. **Third Priority**: Existing landscaping
4. **Fourth Priority**: New customers, proposed projects, etc.

Regarding the 1st Priority specified above, about 80% of the City's water service connections consist of residential accounts. As a result, the City can use its population estimates to assess water use needs during a shortage.

8.6.2 Health & Safety (1st Priority)

In 2018, the State adopted Assembly Bill 1668, which amends Section 10608.20 of the Water Code to stipulate an indoor water use standard of 55 gallons per capita per day. The City is obligated to determine the minimum health and safety water needs for its residents. To assess the minimum amount of water that should be available (1st Priority Level), the amount of personal hygiene household water use must be quantified. Based on common indoor residential water use in the United States, health and safety water use is estimated to be as shown in **Table 8.2** below:

Table 8.2
Water Fixtures: Health & Safety
Personal Use (gal/day)

Item	Regular	Voluntary Conservation
Toilet	14	10.5
Shower	15	12
Washer	12	11
Kitchen	4	3
Other	4	4
Total	**49 gal**	**40.5 gal**

Since the City has a population of about 17,000 residents, at a rate of 40.5 GPCD, the City will need up to **2.1 AF (0.7 MG) per day** to provide for the health and safety of its residents (if conservation is voluntary). With a total above-ground storage under 4 MG, the City can only provide for **just two (2) days** of water supply to its residents in the event of a shutdown of the City's water production infrastructure. However, the ability to meet the most basic water needs of its residents during a severe shortage may be difficult unless the City's citizens are aware of the water supply shortage.

8.6.3 Stages of Action

The City's Annual Assessments prepared under **Section 8.5** can be used to predict shortages. The City's WSCP imposes six (6) stages of response actions based on the severity of the City's water supply shortage. The stages are based on DWR's established criteria as shown in **Table 8.3** below:

Table 8.3
Water Shortage Stages & Reduction Targets

Shortage Stage	Restriction Type	Water Supply Reduction Target
1	Voluntary	10%
2	Mandatory	20%
3	Mandatory	30%
4	Mandatory	40%
5	Mandatory	50%
6	Mandatory	>50%

To lessen confusion on City customers, the first four stages (Stages 1 to 4) regulate customer responses to shortages, while the latter two stages (Stages 5 & 6) regulate City water staff response efforts.

The Ukiah City Council will formally declare the stage of the water shortage, following a public hearing, upon determination from City water staff that a water shortage exists and the WSCP should be implemented. Following Council declaration of a shortage stage, the WSCP will become effective no sooner than the first billing period on or after the date of publication of the Council Resolution.



Figure 8.4: City Council Can Declare Shortage Stages

The WSCP will remain in effect until Council declares the water shortage emergency has ended. Alternatively, Council may also change the water shortage stage as appropriate. However, Council will not impose mandatory measures without first conducting a duly-noticed public hearing pursuant to CWC § 350 or § 375.

8.6.4 Communication Protocols

A common understanding on the water supply situation is essential for the WSCP to be effective. During a water shortage, the City will be able to allocate staffing and resources to inform its customers of the Council-declared water shortage. In particular, the City will inform its water service customers of the following:

- Water Shortage Stage
- Water Use Prohibitions
- City Water Staff Response Actions

The communication protocol will be in place prior to formal declaration of a water supply shortage. The frequency and extent of coordination will be based on the shortage severity. The City will use the following resources to communicate with its customers:

- City Website
- Social Media (i.e. Twitter/Facebook)
- Bill Inserts/Postcard Notices
- Billboard or Digital Message Boards
- Advertisements (Radio & Print)

The goal of the communication efforts will be to raise awareness of the drought and to motivate customers to conserve water. The City should also prepare customers for possible increases in water shortage severity. Finally, as mentioned under Priority 1 in **Section 8.6.1**, the key goal of communication is to promote available water resources, provide specialized outreach for impacted industries, including instructions on how to receive bottled water, and how to participate in public hearings with City staff.

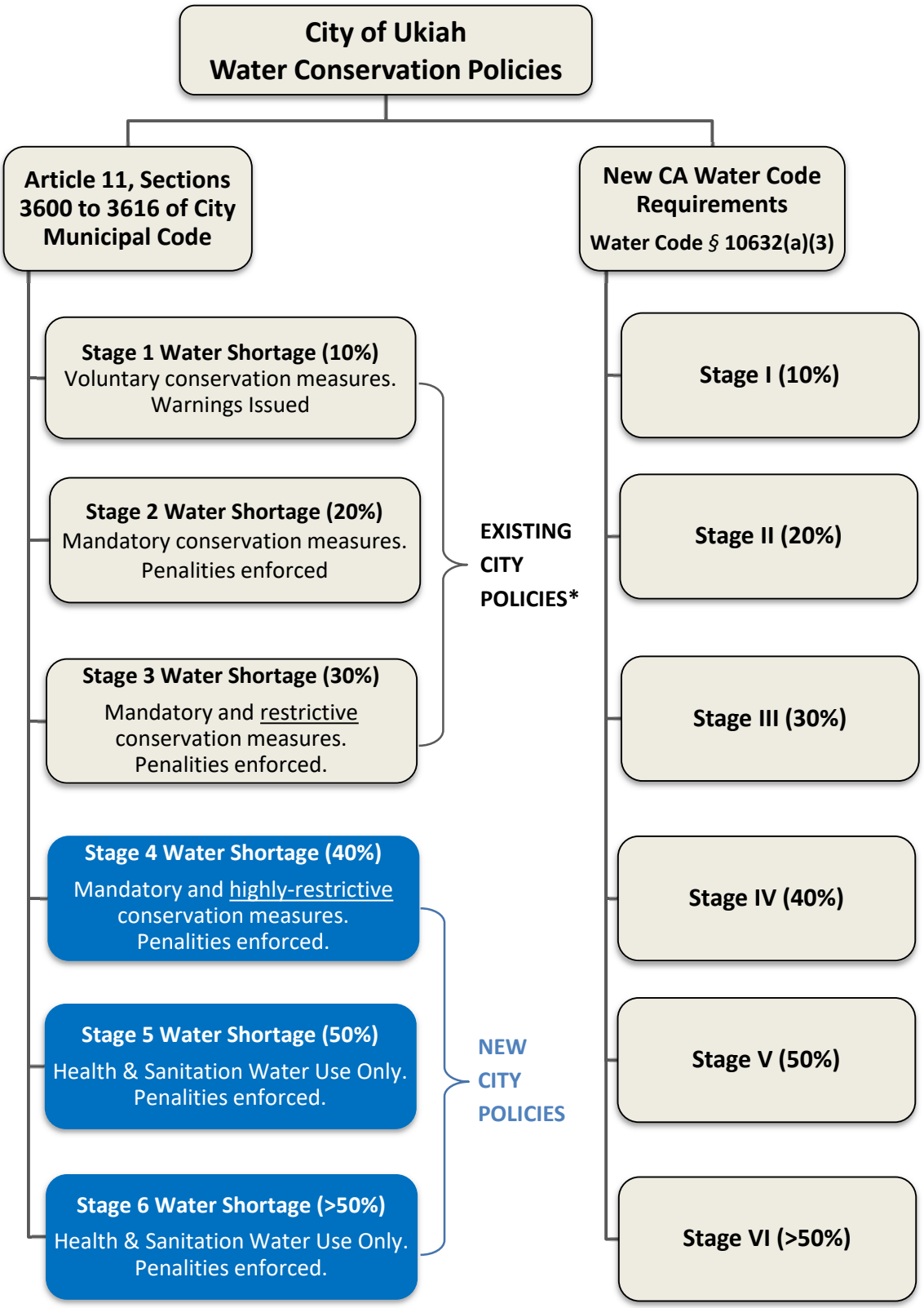


Figure 8.5: City Water Shortage Contingency Plan

**City's Existing Water Shortages Stages are as follows: I (10% - 20%), II (20% - 35%), and III (35 – 50%)*

8.6.5 Limitations/Prohibitions

During a shortage, prohibitions on water use may include some or all of the following:

1. Irrigation runoff
2. Landscape irrigation for more than 15 minutes (except drip irrigation)
3. Irrigation on rainy days or within specified hours of a rain event
4. Failure to repair leaks in a timely manner
5. Washing of automobiles without a bucket or positive shutoff nozzle
6. Restaurants serving water to their customers, except when specifically requested by their customers
7. Operating a decorative water fountain without re-circulated water
8. Operating a commercial car wash without re-circulated water
9. Operating a single-pass cooling system
10. Hotels and motels shall not launder towels and linens daily, except when specifically requested by their customer

Additional prohibitions may also be enforced, depending on the declared stage shown in **Table 8.3**. As mentioned on Page 8-10, it is the City's intent to maintain only four (4) levels of water-use prohibitions for customers. The additional Stages of shortages will be used for communication purposes with customers. The City's Water Division will use Stages 5 and 6 to implement response actions by Water Division staff. The City response actions to water shortages are listed in **Table 8.6**.

8.6.6 Penalties for Non-Compliance

Although Article 11, Sections 3610 does not explicitly describe penalties for violations of this WSCP, the following penalties are recommended:

1. **First violation**. For a first violation, the City shall issue a written notice of violation to the water user violating the provisions of this chapter
2. **Second violation**: $50 fee in addition to water bill for usage
3. **Third violation**: $100 fee in addition to water bill for usage
4. **Subsequent violations**: Shut-off/ temporary discontinuance of service

The penalties listed above may be waived if a customer completes an application for exception permit. Hardship, safety, or health conditions are among the reasons granted for the exception.

8.7 DISASTER MANAGEMENT

During a water shortage, the City has the following tools available to restrict water use to health and safety uses only:

- Expanding public outreach
- More frequent meter readings
- Fines and penalties
- Flow-restriction devices
- Moratorium on service connections

The City participates in the Mendocino County Multi-Jurisdictional Hazard Mitigation Plan (MHMP), which provides guidance for hazard identification, planning, preparation, and response. The MHMP was recently updated in 2020. The MHMP includes an assessment of seismic risk. Other planning tools, such as the 2016 Mendocino County Emergency Operations Plan (EOP), provides for the most effective allocation of resources during an emergency. The County EOP works in conjunction with the County's Office of Emergency Services and the City's Office of Emergency Management, which is managed by the City Manager's office. The City's Office of Emergency Management coordinates with the City's Fire and Police Departments, City staff, local businesses, and the general public to prepare, respond, and recover from natural or man-made hazards. During a disaster, the City's water department staff will maintain water operations as follows:

The County's MHMP provides guidance for the City in dealing with disasters.

- All on-duty personnel will remain on duty until relieved of duty
- Off-duty personnel will be expected to return to work or be "on-call"
- During a disaster, operational shifts may be extended for the duration of the event

In the event that any portions of the City's water system are without water, the City's water department staff will carry out the following operations:

- Assess impact of incident
- Communication with adjacent water agencies
- Identify need for and prioritize locations for water distribution
- Provide for water quality assurance or prepare notices for water quality
- Evaluate, plan, and implement actions to acquire and distribute water

- Determine the need to staff a water task group and secure resources through the Logistics Section

- Provide informational status to nearby water agencies, including:

  - Mendocino County Water Agency
  - Sonoma Water
  - Flood Control District
  - Millview County Water
  - Willow County Water
  - Redwood Valley County Water
  - Calpella County Water

- Provide information to media as appropriate

This WSCP provides a general guide of City response actions to catastrophes. Other planning documents referenced herein or provided in the Appendix provide additional details which supplement this WSCP.

8.7.1 Seismic Risk and Emergency Backup

According to the US Geological Survey (USGS) GIS Fault Maps, the Maacama Fault Zone runs alongside the City of Ukiah, and underlies the path of the Russian River from Lake Mendocino. **Figure 8.6** provides a screenshot of the Maacama Fault in relation to the Ukiah Valley. The County's MHMP has evaluated the City's exposure to damages resulting from an earthquake caused by this fault (see **Figure 8.7**). An earthquake can damage potable water, recycled water, and wastewater utilities. Impacts to the City's water system may include, but not be limited to:

- Damage to wells/well houses
- Water tank damage or collapse
- Damage to water distribution system

Damage to distribution lines due to shifting ground and soil liquefaction can result in potential water loss, water service interruptions, low pressure, contamination and sinkholes and/or large pools of water throughout the service area. For these reasons, earthquakes can potentially restrict water supplies for a longer period of time than a power outage or man-made catastrophe. In the event that an earthquake damages portions of the City's pumping or distribution system, the City can provide temporary drinking water to customers through potable water trucks as noted in **Section 8.7.3.**

8.7.2 Emergency Backup for City Wells

Even if an earthquake does not result in damage to water production or distribution facilities, an earthquake could result in a power outage. The City's water operations staff will be on standby alert during an emergency to respond promptly to water supply interruptions. The City's water operations staff will work with the City's

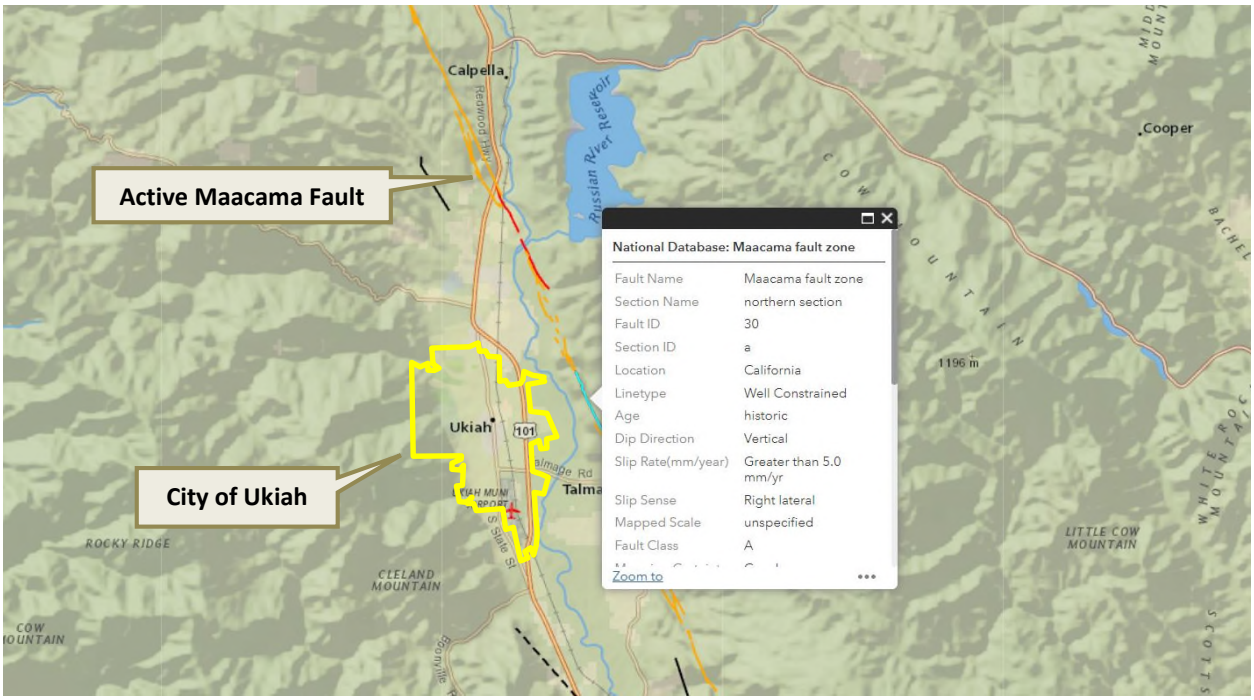


Figure 8.6: USGS Fault Zone GIS Map

Electric Utility Department to restore power to water supply facilities. In the interim, the City's water supply facilities are equipped with quick connections that allow for quick and easy hook-up to generators brought to the facility. This ensures little down time of pumping facilities during power failures. The total water available from the City's wells with backup power is 2,900 gpm (4.2 MGD). These quantities would be sufficient to meet not only reduced demands, but normal demands. If additional water supply capacity is needed, or if the primary backup power is not functioning, portable diesel-powered pumps can be procured and set up at the well sites. Due to sufficient well capacity, this task is to be used in the most severe shortage (Stage 6), as noted in **Table 8.6** on Page 8-25.

8.7.3 Emergency Water Supply

The City's distribution system does not have any physical interconnections with other agencies' pipelines. In the event that the City is in need of an emergency supply of water for health and safety needs, the City can obtain emergency water through portable means. This would involve vehicles equipped with potable water tanks. The City would have to obtain potable water trucks from nearby suppliers.

The California Department of Public Health maintains a list of Licensed Water Haulers that includes Mendocino County. According to the most recent data provided by the State, the closest hauler/provider of potable water tanks and/or trucks is

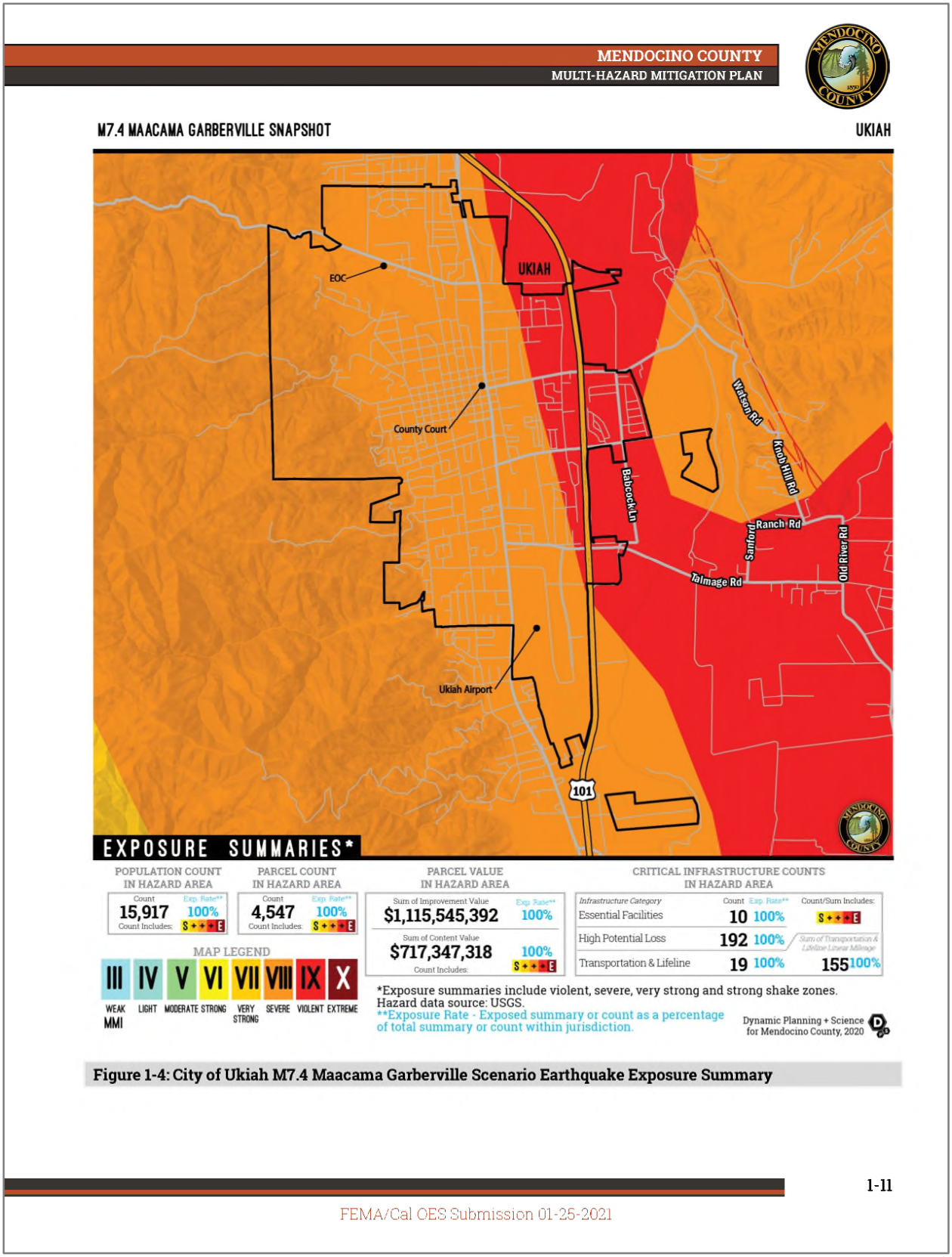


Figure 1-4: City of Ukiah M7.4 Maacama Garberville Scenario Earthquake Exposure Summary

Figure 8.7: Fault Exposure Map (Mendocino County 2020 MHMP)

Lucchetti Excavating®, located within the City limits. The next-closest hauler/provider is the Mendocino Water Company®, located about 60 miles from the City.



Figure 8.8: Potable Water Tank Trailer

The City can also consider purchasing large tanks (500 gallons or more), and securing them to the back of City trucks. This will allow the City to distribute water to customers during an emergency.

8.7.4 Additional Aid

Additional available emergency services include the Master Mutual Aid Agreement and the California Water Agency Response Network (CalWARN). These services are available to all public agencies that have signed the agreement and is planned out of the California Office of Emergency Services. This aid is available to the City, if necessary.

8.7.5 Summary of Emergency Response

The City's response to natural or man-made disasters will be a coordinated effort amongst its own its own staff with backup assistance from the County and neighboring agencies. The most critical task in the City's response to a catastrophe is the distribution of water to customers. In so doing, the City can follow the provisions of the County MHMP, the County EOP, and the City's Water System Emergency Response Plan (ERP). The County Emergency Operations Center (EOC) can also be used, if necessary.

8.8 WSCP ENFORCEMENT & EVALUATION

To properly assess the effectiveness of this WSCP, the City will need to monitor metered consumption and production. The City will also need to track its billing system to see if fines for violations of water-use prohibitions have been issued.

8.8.1 Monitoring

Using the City's water billing records, the City will be able to identify not only the conserved volumes, but also the customers which are in violation of the provisions of this chapter. In particular, the City can review data from the following sources:

- **Production Meters**: Provides an account of daily water production
- **Customer Meters**: Provides an account of monthly consumption

The City reads meters on a monthly basis. During a shortage, the City can determine

violations by monitoring meters on a bi-weekly or weekly basis which will allow the City to enforce the conservation requirements of this WSCP.

In addition to monitoring customer use, the City also has the ability to monitor production volumes to determine if the well supplies have been reduced. Under normal conditions, potable water production figures are recorded daily. Weekly and monthly reports are prepared and monitored. This data will be used as a baseline to measure the effectiveness of any water shortage contingency stage that may be implemented.



Figure 8.9: Well Production Meter

During rationing conditions, the City's water budget will also be monitored more frequently. This may be done on a weekly, daily, or hourly basis depending on the severity of the drought.

8.8.2 Enforcement

During shortage conditions, the City can implement water-waste patrols, or increase the frequency of existing water waste patrols. If City staff are unable to conduct additional water waste patrols, the City can contract with outside support to conduct water waste patrols. However, contracting with an outside firm would incur additional costs at a time when revenue is impacted. If violations are observed, fines/penalties per **Section 8.6.6** can be applied.

8.8.3 Reporting

During a declared water shortage, City water staff will report water production and consumption figures to City Council on a monthly basis. Pending regulations from the SWRCB will also require the City to report data to SWRCB on a monthly basis. Thus, during a declared shortage of the WSCP, City staff will report water production and consumption figures to both City Council and the SWRCB on a monthly basis.

8.9 FISCAL IMPACTS

8.9.1 Impacts to Revenue

During a water shortage, the City's total water revenue and operating expenses, demand reductions will likely result in negative net cash provided by operating activities. The City recently completed a Water Rate Study in June, 2020, which will set forth water rate increases in July of this year (2021). The City uses only one rate for

all customer types. The current and pending rates are as follows:

- October 2020: **$3.26** per CCF
- July 2021: **$3.48** per CCF

Based on the rates above, a 50% decrease in residential use (currently 160 GPCD), would result in 80 GPCD Reduction in Water Use (1,523 AFY annually). This would result in the following revenue losses:

- **$180,000** in lost revenue per month
- **$2.2 million** annual lost revenue

To mitigate the impacts of revenue loss, the City currently has a fixed monthly readiness-to-serve charge that applies to all accounts regardless of consumption. These charges range from about $38 per month for a 3/4-inch meter to $1,144 per month for an 6-inch meter. These rates helps generate some revenue even if no water is used.

Fiscal impacts can also be mitigated by implementing the City' drought rate surcharges. In 2016, the City adopted drought rate surcharges, which allow for increases of nearly 33% above the normal rates listed above. The surcharges would mitigate the impact of revenue losses during water shortages.

In addition, the following actions could take place under such circumstances:

- Implement a tiered structure during water shortages that penalizes higher usage
- Delay capital improvement projects
- Consider temporary increase of water rates to meet operation and maintenance costs

The City also contributes (transfers) water rate revenue from the Operating Fund to the Capital Replacement Fund to support the capital improvement program. In the most severe water shortages, the City may reduce the annual contribution to the Capital Replacement Fund.

A combination of the measures outlined above may be used to offset or diminish the effects of lost revenues. The measures would be temporarily employed and then returned to pre-shortage rates when conditions improve.

8.9.2 Impacts to Reserve Funds

The City carries reserves in the water system accounts, to fund for needed improvements to its water system. The balance of reserves the City is maintained primarily for facility repair and replacement. Under a shortage crisis, some flexibility would exist to dip into these reserves to help offset loss of revenue.

8.10 THREE-YEAR MINIMUM SUPPLY

During a potential drought over the next 3-years, the City could see some challenges to its Permit 12952 surface water rights from the SWRCB. Although this could reduce the City's water supply by up to 10,000 AF, the City anticipates the ability to meet water demand for all climatic conditions for the near future. This is also confirmed in **Section 7** of the UWMP. **Table 8.4** below displays the minimum water supply available to the City based on a 3-year dry period over the next three years:

Table 8.4
Three-Year Minimum Supply (AF)

Category	2021	2022	2023
Dry Supply	11,534	11,534	11,534
Dry Demand	2,925	2,975	2,836
Surplus	**8,609**	**8,559**	**8,698**

Based on the table above, the City should expect 100 percent supply reliability during a drought lasting over the next three years. The 3-year minimum supplies shown above are worst-case drought scenarios. The figures in **Table 8.4** do not account catastrophic supply interruptions, or emergency power outages. Such catastrophic scenarios would limit water supplies to a greater degree and would require the response actions described in this WSCP.

8.11 WSCP ADOPTION AND REFINEMENT

8.11.1 Council Resolution

On June 2, 2021, the City Council adopted a Resolution No. 2021-24 (included in **Appendix B**) approving this WSCP. The City will be updating Article 11, Sections 3600 to 3616 of the City's municipal code in the following weeks to coincide with this WSCP. **Tables 8.5 & 8.6** on the following pages provide a summary of the customer water use prohibitions and City response actions to the water shortages.

8.11.2 WSCP Refinement Procedures

The City intends to update and refine this WSCP as necessary. The WSCP can be updated in one of the following ways:

- Cyclical Updates
- Data-Driven Updates
- Externally-Driven Updates

The following is a guideline for how the City will update this WSCP:

Cyclical Updates

The cyclical updates will be handled by City staff internally with the assistance of an outside engineering consultant. Once the WSCP is implemented, the City will document the effectiveness of the

customer water use prohibitions listed in **Tables 8.5** and the City water staff response actions listed in **Table 8.6**. The effectiveness will be evaluated using the methodologies described in **Section 8.8**. The WSCP effectiveness will be documented over the course of five (5) years, until the next UWMP update. It is the City's intent to update the WSCP every 5 years, alongside the City's UWMP. The City will conduct an internal review of the WSCP prior to releasing a Request for Proposals (RFP) for the UWMP and WSCP. The RFP process will provide the City with an opportunity to revise the WSCP as-needed.

Data-Driven Updates

Data-driven updates to the WSCP will likely occur mid-cycle or at some point between the 5-year cycle. The data-driven updates can be prepared entirely by City staff (internally) due to the urgency of such updates. For example, if the City finds that the fines/penalties covered under **Section 8.6.6** are not effective at reducing overall demand, the City may increase the fines through an amendment to the City Municipal Code, and revise **Section 8.6.6** (and City Municipal Code) to reflect the new fines. Other items of this WSCP can be updated in a similar manner.

Externally-Driven Updates

Conversely, if the fines are found by the City's customers to be too punitive, and Council is petitioned to reduce the fines, the City can adjust a portion of the City Municipal Code, and revise **Section 8.6.6** herein to reflect the new fines. Other items of this WSCP can be updated in like manner.

8.11.3 WSCP Re-Adoption

Once the WSCP is revised, the City Council will be required to re-adopt the revised WSCP. This will require a public hearing to receive public comments on the WSCP. The revised WSCP will replace the former WSCP, and will then remain effective until the City elects to update the WSCP

Perhaps the most critical task in the City's response to shutdowns in water is the distribution of water to customers. As noted in the caption to the cover of this Section, portable pumps and water trucks can be used to distribute water to customers. Due to the time and planning involved in procuring these types of vehicles, this task is identified only in the most severe type of shortage (Stage VI).

Table 8.5
Prohibitions on Water Use During Water Shortages

Stage	Prohibition/Restriction	Penalty
Stage 1 (<10%)	• No Irrigation between 10 am to 8 pm • No Person Shall Operate a Decorative Water Feature (Fountains, Ponds, etc.) that Does Not have a Recirculating System • All Landscape Irrigation Limited to No More than Three (3) Days per Week • All Landscape Irrigation Limited to No More than 15 minutes per Station per Watering Day • Repair or Isolate Leaks within 72 Hours of Notification by the City • No Washing Sidewalks and Driveways with Water • Car Washing Only with Bucket or a Hose with Shutoff Valve or Nozzle • Excess Irrigation Runoff is Prohibited • No Landscape Irrigation During or Within 48 hours of a Rain Event • Restaurants to Serve Water Only Upon Request • Restaurants to Wash Kitchen and Dining Room with Bucket or Specialized Water Broom Only • Hotels/Motels to Provide Customer Option of Daily Laundry • Automobile Wash Business Must Use Water Recycling Systems	No
Stage 2 (10% to 20%)	• All Landscape Irrigation Limited to No More than Two (2) Days per Week from June 1 to Oct 31 and No More than Once per Week from Nov 1 to May 31 • All Landscape Irrigation Limited to No More than 10 minutes per Station per Watering Day • No Refilling of Ornamental Lakes or Ponds, Except to Sustain Aquatic Life • Repair or Isolate Leaks within 48 Hours of Notification by the City • Pools or Spas to have a Cover to Prevent Evaporation • Cease All Operation of a Decorative Water Features (Fountains, Ponds, etc.) • No Landscape Irrigation During or Within 72 hours of a Rain Event • Commercial Nurseries shall Use Water Only During the Hours from Midnight to 6 am • Commercial Landowners to Allow Tenants the Option of Replacing Lawns & Landscapes	Yes
Stage 3 (20% to 30%)	• All Landscape Irrigation Limited to No More than Once per Week from June 1 to Oct 31 and No Irrigation from Nov 1 to May 31 • All Landscape Irrigation Limited to No More than 8 minutes per Station per Week • Repair or Isolate Leaks within 24 Hours of notification by the City • Car Washing Limited to Only Automobile Washes that Use Water Recycling Systems • No Landscape Irrigation During or Within 1 Week of a Rain Event • Restaurants to Wash Dining Room Once Daily (after Close of Business) and Only with Bucket or Specialized Water Broom • Restaurants to Pre-Soak Dishes • Restaurants to Install Solenoid Valve for Sinks with Garbage Disposals • No Commercial Window-Washing • Apartment Buildings to Certify Low-Flow Fixtures (Showerheads and Faucets) are	Yes

Table 8.5 Prohibitions on Water Use During Water Shortages		
Stage	**Prohibition/Restriction**	**Penalty**
Stage 3 (20% to 30%)	Installed prior to Leasing Apartments • Commercial Buildings and Restaurants to Replace/Install Waterless Urinals • Commercial Buildings and Restaurants to Replace/Install Low-Flow Toilets • Hotels/Motels to Wash Laundry Only After Change of Customer	Yes
Stage 4 (30% to 40%)	• Cease All Irrigation Except by Reclaimed Water or Except for Crops or Horticulture (Nurseries) or for Fire or Erosion Maintenance • No Refilling of Pools or Spas • Commercial Landscape to be Replaced with CA-Friendly Landscape	Yes
Stages 5 & 6 (50% or more)	• N/A (Same Requirements as Stages 1 to 4 Above) • This Stage Involves Only Operational/Management Response Actions	Yes

Table 8.6
City Water Department Response Actions During Water Shortages

Stage	City Water Department Response Action	Financial Impacts
Stage 1 (<10%)	• Begin an Enhanced Public Awareness Campaign	Increased Expense for City Use Financial Reserve Funds
Stage 2 (10% to 20%)	• No Refilling of Municipal Ornamental Lakes or Ponds, Except as Necessary to Sustain Aquatic Life • Reduced Flushing Frequency • No New Potable Water Service • No New Temporary Meters or Permanent Meters • No Statements of Immediate Ability to Serve or Provide Potable Water Service • (Will Serve Letters, Certificates, Or Letters of Availability) • Suspend Consideration of Annexations to the City's Water Service Area • Establish a Water Allocation for Certain Properties Within the City's Jurisdiction	Increased Expense for City Use Financial Reserve Funds Possible Implementation of Drought Rate Surcharge
Stage 3 (20% to 30%)	• Increase Groundwater Pumping • Issue Water Quality Notices (if Necessary) in Case Additional Pumping Creates Water Quality Issues • Coordinate with Adjacent Agencies to Prepare for Possible Need of Emergency Water when/if Conditions Worsen • Notify customers immediately of suspected leaks in their plumbing • Repair or Isolate Water Main Leaks within 24 Hours • Provide Letters to Certain Properties for Allocations Established in Stage 2 Informing Reduction of 10% in Allocation of Tiered Rate • Elimination of Specific Municipal Uses such as Hydrant Flushing, Street Cleaning, and Water-Based Recreation	Increased Expense for City Use Financial Reserve Funds Possible Implementation of Drought Rate Surcharge
Stage 4 (30% to 40%)	• Rate Increase Study to Mitigate Loss of Revenue • Further Increase in Rates for Certain Over-Allocation Properties Issued Warnings/Notices in Stage 3 • Increase Frequency of Meter Readings to Once Monthly in Order to Allow Staff and Customers to Track Progress • Implement Water Waste Patrols (Once Monthly) • Coordinate with Adjacent Agencies to Receive Emergency Water via Emergency Interconnections • Deter Flushing of Mains Until Maximum Allowable Time for Quality/Safety • Coordinate with Manufacturers and/or Governing Agencies to Receive Fleet of Potable Water Trucks	Increased Expense for City Use Financial Reserve Funds Possible Implementation of Drought Rate Surcharge Defer Capital Projects

Table 8.6
City Water Department Response Actions During Water Shortages

Stage	City Water Department Response Action	Financial Impacts
Stage 5 (40% to 50%))	• Systemwide Rate Increase to Achieve Necessary Reduction and to Mitigate Loss of Revenue • Notices on Government Access Channel (TV) • Hand-Post Drought Notices on all Customer Properties (Residential Homes & Commercial Buildings)	Increased Expense for City Use Financial Reserve Funds Possible Implementation of Drought Rate Surcharge Defer Capital Projects
Stage 6 (>50%)	• Mobilize Potable Water Trucks • Decrease Pressure in Water Mains	Increased Expense for City Use Financial Reserve Funds Possible Implementation of Drought Rate Surcharge Defer Capital Projects

Section 9
Conservation Measures

The City's ordinances, adopted by Council, have strict provisions which encourage the efficient use of water while penalizing wasteful use. The City's water staff are also committed to water use efficiency through the use of management practices and customer assistance programs.





Section 9

CONSERVATION MEASURES

Conservation measures, including those aimed at water waste prevention, are an essential part of the City's policies.

9.1 OVERVIEW

As a result of seasonal droughts and continued urban development, water conservation is important to California's sustainability. To help conserve California's water resources, several public water agencies came together to form the California Urban Water Conservation Council (CUWCC). The CUWCC was officially formed in 1991 when the agencies signed a Memorandum of Understanding (MOU) on urban water conservation. In January 2018, the CUWCC became the California Water Efficiency Partnership (CalWEP). Currently, over 200 water agencies are members of CalWEP. The main focus of CalWEP is to assist its member agencies with public policy, research, and education tools. Regarding the UWMPs, CalWEP works with DWR in order to help form BMP/DMM policies contained in the UWMPs.

The CUWCC/CalWEP MOU established 14 Best Management Practices (BMPs) which were defined roughly as policies, programs, practices, rules, regulations, or ordinances that resulted in a more efficient use or conservation of water. The BMPs were equivalent to the 14 Demand Management Measures (DMMs) defined in the UWMP Act, until 2015. As of the 2015 UWMPs, the Department of Water Resources (DWR) streamlined the 14 DMMs into six (6)

generalized categories, with an additional seventh (7th) optional category. According to the 2020 UWMP Guidebook, DWR has confirmed that the Water Code has not updated the reporting requirements for the DMMs in the 2020 UWMPs.

The City acknowledges that efficient water use is the foundation of its current and future water planning and operations policies. The City implements water conservation through a combination of programs, resources, and policies.

9.2 DWR DMMs FOR 2020 UWMPs

The DMMs are intended to reduce long-term urban demands from what they would have been without their implementation. The DMMs are in addition to programs which may be instituted during occasional water supply shortages.

i. Water Waste Prevention Ordinances

ii. Metering

iii. Conservation Pricing

iv. Public Education & Outreach

v. Programs to Assess and Manage Distribution System Real Loss

vi. Water Conservation Program Coordination and Staffing Support

vii. Other Demand Management Measures that have a significant impact on water use

As with previous UWMPs, agencies that are members of CalWEP can submit the BMP annual reports in lieu of providing a description of each DMM in the UWMP.

9.3 CalWEP BMPs

An active member of the CalWEP is one that has signed the MOU and implements the water conservation measures stipulated by the CalWEP. According to CalWEP, an agency "implements" a conservation measure by achieving *and* maintaining the level of activity called for in each BMP's definition, as described in the MOU. This requires a minimum level of staffing and funding efforts. To document the implementation of a BMP, an agency is required to submit annual BMP reports to CalWEP that document the implementation of each BMP.

Figure 9.1: CUWCC became CalWEP in January 2018

The City is not currently a member of CalWEP. However, the City is implementing the same conservation measures as described in the previous sub-section.

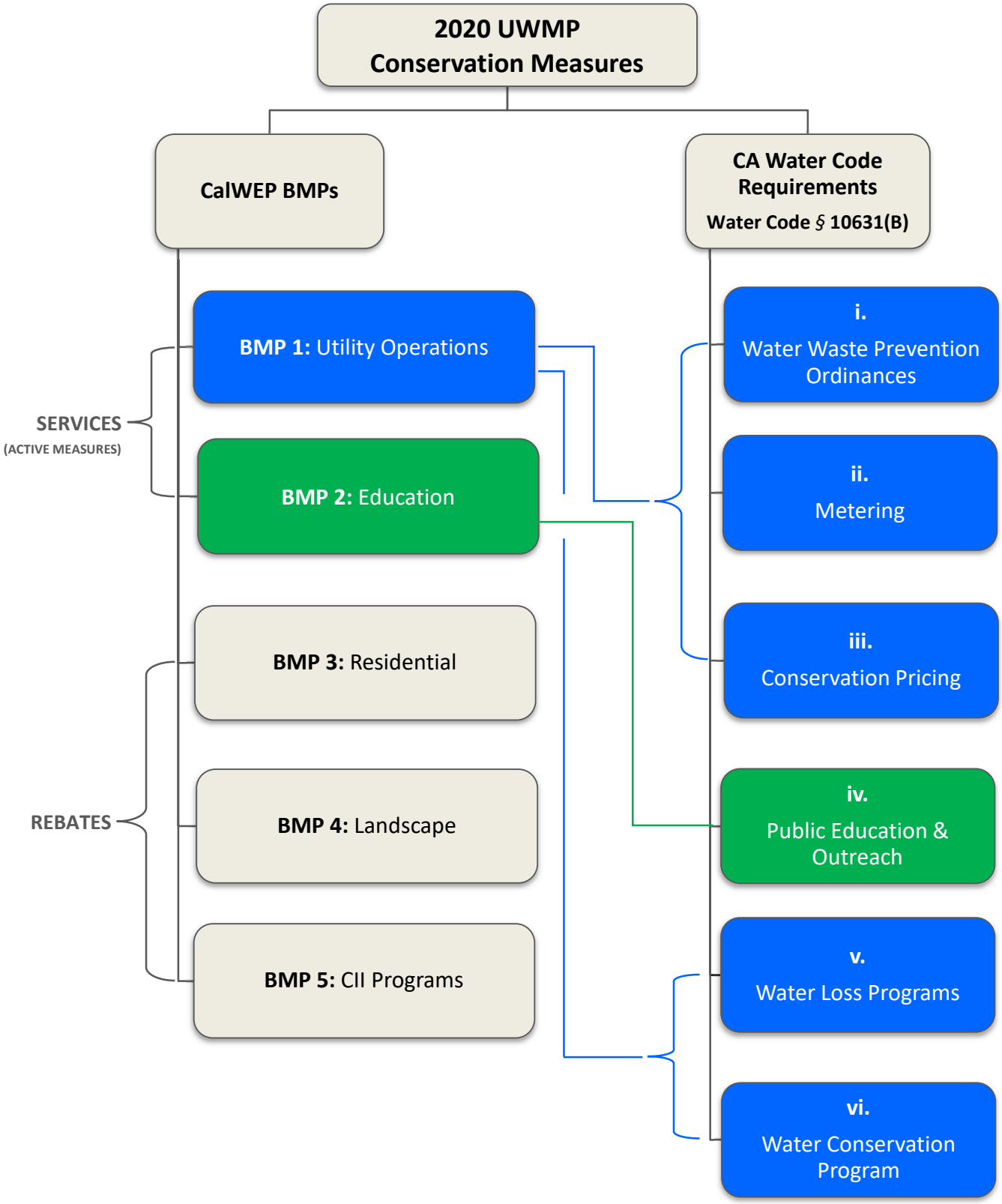


Figure 9.2: Conservation Measures for 2020 UWMPs: CalWEP and DWR Compared

9.4 CITY CONSERVATION MEASURES

The City actively promotes the reduction of water demand through various water conservation outreach programs. As noted in **Figure 9.2** on the previous page, the CalWEP BMPs are broad measures aimed at reducing water use either directly (through rebates and fixture changes), or indirectly (through service-oriented measures).

As a smaller community surrounded by miles of agriculture and open space, the City is unique compared to many of the other urban, "built-out" water agencies. As such, the City's conservation efforts are tailored to address the characteristics of the City's community. Over the past several years, the City has focused primarily on water operations-oriented efforts, including the measures highlighted in blue in **Figure 9.2**. For example, the City recently established a new rate structure, which includes a drought rate surcharge. The City has focused less on rebates and retrofits as water-efficient appliances and fixtures have saturated the market over the past few decades. Nevertheless, the City is committed to using "good faith effort" to implement all of the BMPs as described in this section.

DMM No. 1 Water Waste Prevention

City Ordinance No. 691 was adopted by the City Council in 1977, prohibiting the waste of water. Ordinance No. 691 was incorporated as Article 11, Section 3600 to 3616 of the City municipal code. This part of the City code was most recently updated in 2014 to include a description of non-essential uses of water, and prohibitions of water use under shortage conditions. The City code also describes the actions taken by the City if subsequent violations occur.



Figure 9.3: Irrigation Water Waste

Similar to water waste prohibitions, Assembly Bill No. 1881 was passed in 2006, requiring local agencies to adopt model water efficiency landscape ordinances beginning in January 2010. The City has incorporated landscape standards into its municipal code in Chapter 2 (Zoning), Articles 4 through 8. The landscape standards were last updated in 2016 via Ordinance No. 1168.

The City is currently preparing an update to Article 11, Section 3600 to 3616 of the City's code to include new prohibitions on water use, depending on drought severity.

This pertains to updates to CA Water Code § 10632(a)(3), which was amended by Sente Bill 606 in 2019.

DMM No. 2: Metering

All of the City's water service connections, for all customer sector types, are metered. The City bills its customers according to meter consumption on a monthly basis. Meter calibration and periodic replacement ensures that customers are paying for all of the water they consume, and therefore encourages conservation. The City will continue to meter all new water service connections.

All of the City's meters are standard Badger® model meters. The City has evaluated the potential for fixed-base and drive-by Automatic Meter Read (AMR) systems that would allow the City to monitor each individual customer account for compliance with water conservation measures. A fixed system involves placing antennas throughout the City that would collect data from the water meters at set intervals. The data would then be downloaded to the City's Supervisory Control and Data Acquisition (SCADA) system or transferred to a desktop computer. The data is used for individual users for billing purposes or for alerting the City if a set water use threshold has been exceeded, signaling a possible leak on the property. If this condition arises, the owner of the property would be notified by either email or a phone call. A drive-by system is similar to the fixed base system, but instead of using a network of antennas, meter readings are picked up by driving by the meters with specially equipped vehicles and then downloading the readings after returning to the office.



Figure 9.3: AMI-Style Water Meter

As of this 2020 UWMP, the City does not have any plans to upgrade to an AMR or AMI system. Effectiveness of the City's metering is evaluated by comparison of water use before meter retrofit to water use after the meter retrofit. When metered water use increases and unaccounted-for water decreases, the new water meters are assumed to be accurately recording the actual volume of water delivered to customers. Implementation of this DMM is expected to help the City achieve its water use targets by providing accurate water use information to the customer and the City.

DMM No. 3: Conservation Pricing

Due to the sufficiency of the City's water supply as described in **Section 7**, the City does not have a tiered rate that encourages water conservation (i.e. increases rates for higher-volume customers). The water usage rate was last updated in October, 2020. The current (April 2021) water usage rates for all of the City's customer types are shown in **Table 9.1** below:

Table 9.1
City of Ukiah Water Rates (April 2021)

Tier	Pricing (per HCF)
Current Rate	$3.26
Pending Rate	$3.48
Drought Surcharge	15% to 35%

The pending rate structure listed above was established as part of a Water Rate Study that was completed in June, 2020. The drought surcharge was recently approved by the City in 2016 in June 2016, to help the City recover lost revenue during a water shortage. The measure of effectiveness of the City's rate structure, and in particular the drought surcharge, will be assessed based on decreases in the total amount of metered consumption, since the usage charges are based on total consumption measured by the City's water meters on a monthly basis.

DMM No. 4: Public Education & Outreach

This conservation measure consists of distributing information to the public through a variety of methods including brochures, radio and television, school presentations and videos, and web sites, including a school education program that includes providing educational materials and instructional assistance. The City promotes public awareness of water conservation through occasional bill stuffers, distribution of its Annual Water Quality Report, radio broadcasts, and the City website. In addition, City employees are encouraged to discuss conservation measures with customers. The City offers local school tours of its water treatment plant and provides materials to schools for conservation education. In addition, four science classes on public water supply are offered once a year at the local high school.

The City has implemented this conservation measure and provides public information programs on water conservation and other water issues on an ongoing, year-round basis. The City understands that public awareness of water conservation issues is an important factor in ensuring a reliable water supply.

The City does not directly measure the effectiveness of this conservation measure. In general, however, more public awareness

and education programs give customers increased knowledge of water conservation opportunities. Implementation of this conservation measure is expected to help the City achieve its water use targets by educating water users about the importance of improving water use efficiency and avoiding water waste.

DMM No. 5: Programs to Assess and Manage Distribution System Real Loss

A water audit is a process of accounting for water use throughout a water system to quantify the unaccounted-for water. Unaccounted-for water is the difference between metered production and metered consumption on a system-wide basis. A leak detection program typically consists of both visual inspection and audible inspection. Visual inspection includes the inspection of distribution system to identify obvious signs of leakage. Audible inspection utilizes specialized electronic listening equipment to detect the sounds associated with distribution system leakage. This process allows the City to pinpoint the location of suspected leaks.

The City's surveillance of its water system to detect leaks is an on-going operation. The City recognizes the urgency of repairing leaks and responds to any leak in an expedient manner. Field employees are trained in detecting leaks and signs of unauthorized uses of water. In addition, the customer billing system flags high or unusual water bills, which are then investigated for possible leaks in customer's piping. When a leak is first noticed, the pipeline is inspected and promptly repaired.

The City has prepared water audits since the 2015 UWMP. The audits were prepared in accordance with CWC Section 10631(e)(3), using methods and a worksheet developed by the American Water Works Association (AWWA). The AWWA audit worksheets require a detailed approach to separate apparent water losses from overall water loss totals to reveal the actual "Real Losses" as well as the "Non-Revenue Water". The AWWA audit defines the following:

- **Water Losses**: Water supplied minus authorized (metered) consumption.
- **Apparent Losses**: Unauthorized or un-metered consumption and inaccuracies or errors.
- **Real Losses**: Water losses minus apparent losses. The actual volume of water lost through leaks, breaks, etc.
- **Non-Revenue Water**: Real water losses plus apparent losses plus unbilled metered and unbilled unmetered consumption

Based on the results of the 2016-2020 water audits, copies of which are included in the Appendix, the City's water system losses are shown in **Table 9.2** below.

Table 9.2
Distribution System Losses (AF)

Year	Loss (AF)	Percent of Total Water Use
2016	231	9.0%
2017	256	9.1%
2018	317	11.0%
2019	313	10.9%
2020	358	11.8%

The results of the last few audits indicate that water loss has increased slightly. This was due to increases in water use since the end of the previous drought. As the City is currently in a severe drought since late 2020, the City's anticipates a reduction in water loss for 2021.

In general, the effectiveness of the City's water audits is evaluated through the results contained in the City's annual AWWA Audit reports submitted to DWR. Implementation of this conservation measure is expected to help the City maintain its water use under its SBx7-7 targets (see **Section 6**) by identifying sources of water loss so that repairs can be made and losses minimized.

DMM No. 6: Water Conservation Program Coordination and Staffing Support

The position of Conservation Coordinator is an ongoing part of the City's water utility policies. The City's Management Analyst serves as the City's Water Conservation Coordinator. The City's Public Works staff also assists with coordinating conservation efforts and providing public information about water conservation. In particular, Water and Sewer Division Staff provide indoor and outdoor conservation tips for customers. Typical water conservation coordination duties include answering questions of the public, coordinating with State and local agencies, and providing information to customers on water conservation.

The effectiveness of this conservation measure will be evaluated in conjunction with the success of the City's water conservation efforts as a whole. Implementation of this conservation measure is expected to help the City achieve its water use targets by making water conservation a priority of all City staff, in addition to the day-to-day conservation coordinator.

DMM No. 7: Other Conservation Measures

In addition to the six (6) DMMs described above, the City implements a large

landscape irrigation conservation program and a commercial, industrial, institutional water customer conservation program. These two programs are described below.

DMM No. 7a: Large Landscape Conservation

As part of Chapter 2 (Zoning), Articles 4 through 8, the City has established landscape efficiency standards. The City's landscape efficiency standards were last updated in 2016 via Ordinance No. 1168.

The City's Planning Department reviews all proposed landscaping plans for new development, in order to ensure that proposed landscaping consists of plants "which grow well in Ukiah's climate without extensive irrigation". New developments can only be approved when the proposed landscaping plans adhere to the City's municipal code. It is through the planning review process that the City ensures that large landscapes are water efficient.

The City implements this conservation measure on an ongoing, year-round basis. The City has very few commercial, industrial, and institutional (CII) accounts and does not track the water use for large landscape consumers. Therefore, the City has not historically tracked the actual water savings associated with the implementation of this conservation measure. Implementation of this conservation measure is expected to help the City maintain its water use targets by preventing planting of landscaping that would not grow well in Ukiah's climate without extensive irrigation.

DMM No. 7b: Commercial, Industrial, & Institutional Programs

With this conservation measure, the City can develop a conservation program for CII accounts that includes water audits targeted to the top water users. This program would include surveys of past program participants to determine if audit recommendations were implemented. This program would also include incentives related to the use of efficient water-use technologies.

The City has only three (3) industrial customers, including Mendocino Brewing Company and Maverick Enterprises who make up the majority of the water use in the industrial sector. To implement this conservation measure, the City surveys the water usage of these industries. Any new commercial, industrial, or institutional developments will be reviewed by the City's Planning Department and must meet all requirements of the City's Municipal Code.

The City has not historically tracked the actual water savings associated with the implementation of this conservation

measure. Implementation of this conservation measure is expected to help the City maintain its water use targets by tracking water use of large industrial customers and alerting the customer to substantial changes in water use that could indicate the need for greater water use awareness within the industrial facility.

9.5 CONTINUED IMPLEMENTATION

Through implementation of conservation measures described in this Section and the construction of the City's recycled water system described in **Section 4**, the City has saved over 1,000 AF of potable water this past year (2020). The City has also successfully recharged about 2,200 AF of treated wastewater into the groundwater basin in 2020. The City anticipates that over 1,400 AF of potable water can be conserved each year through recycled water use and the implementation of water conservation.

As described in **Section 6** of this UWMP, the City's per capita water use in 2020 was 169 gallons per capita per day (GPCD), which demonstrates that the **City has met its 2020 urban water use target** of 186 GPCD. Although the City has met its target year water use, the City plans to continue its conservation efforts described herein for at least the next five (5) years, and re-evaluate these measures in the 2025 UWMP. The City will continue to track all program activities. Program effectiveness and per capita water use will be monitored through the billing system. For example, the City can measure impacts of infrastructure, repairs and replacements, including leaky mains, by comparing apparent water losses from the previous month.

APPENDICES A – O







Appendix A: Council Resolution Adopting 2020 UWMP

City of Ukiah 2020 Urban Water Management Plan

RESOLUTION NO. 2021-23

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF UKIAH ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN

The City Council of the City of Ukiah does hereby resolve as follows:

WHEREAS the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq.), known as the Urban Water Management Planning Act, during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS the City is an urban supplier of water providing water; and

WHEREAS the UWMP shall be periodically reviewed at least once every five years, and that the City shall make any amendments or changes to its plan which are indicated by the review; and

WHEREAS the UWMP must be adopted after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption; and

WHEREAS the City has therefore, prepared and circulated for public review a draft UWMP, and a properly noticed public hearing regarding said UWMP was held by the City Council on June 2, 2020; and

WHEREAS the City of Ukiah shall file said UWMP with the California Department of Water Resources within 30 days of adoption.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ukiah assembled in a regular Council Meeting on June 2, 2020, in City Council Chambers, to hereby agree as follows:

1. The City is in conformance with all applicable requirements of the Urban Water Management Planning Act;
2. The 2020 UWMP is hereby adopted and ordered filed with the City Clerk;
3. This resolution shall be in full force and effect immediately upon its passage and adoption thereof;
4. The Council is hereby authorized and directed to file the 2020 UWMP with the California Department of Water Resources within 30 days after this date;

The City Attorney is authorized to make minor typographical changes to this Resolution that does not change the substance of this Resolution;

I HEREBY CERTIFY that the foregoing Resolution, being Resolution No. 2021-23 as duly adopted by the City Council of the City of Ukiah, at the regular meeting of the City Council, by the following vote, to wit:

AYES: Councilmembers Crane, Rodin, Duenas, Brown, and Mayor Orozco
NOES: None
ABSTAIN: None
ABSENT: None

Juan V. Orozco, Mayor

ATTEST:

Kristine Lawler, City Clerk

Approved as to Form and Legality:

City Attorney

11a 2020 UWMP Resolution

Final Audit Report 2021-06-03

Created:	2021-06-03
By:	Kristine Lawler (klawler@cityofukiah.com)
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"11a 2020 UWMP Resolution" History

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Adobe Sign

Appendix B: Council Resolution Adopting 2020 WSCP

City of Ukiah 2020 Urban Water Management Plan

RESOLUTION NO. 2021-24

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF UKIAH ADOPTING A WATER SHORTAGE CONTINGENCY PLAN

The City Council of the City of Ukiah does hereby resolve as follows:

WHEREAS the California Water Code Section 10632 requires every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its Urban Water Management Plan (UWMP); and

WHEREAS the City is an urban supplier of water providing water; and

WHEREAS the City of Ukiah has prepared and adopted a UWMP under separate Resolution No. 2021-23; and

WHEREAS State Senate Bill 606 passed in 2018 has amended the Water Code related to the requirements of WSCPs to include six standard stages for water shortages up to and beyond 50 percent; and

WHEREAS the City has updated its WSCP in accordance with these changes in the Water Code, and said WSCP is included as part of the UWMP; and

WHEREAS the conservation of water is critically important if the City of Ukiah is to sustain itself; and the effective and equitable management of limited water supplies during a water shortage minimizes the impact on the people and the economy of the City of Ukiah; and

WHEREAS the City of is granted the authority by the State Water Code Section 350 and City municipal code 3602 to declare a water supply shortage and to adopt by resolution regulations and restrictions on the delivery and consumption of water; and

WHEREAS the City has therefore, prepared and circulated for public review a draft UWMP, and a properly noticed public hearing regarding said UWMP, held by the City Council on June 2, 2021, wherein the WSCP was also presented in the public hearing; and

WHEREAS the City of Ukiah shall file said WSCP with the California Department of Water Resources within 30 days of adoption; and

WHEREAS the City of Ukiah urban water supplier shall make available the WSCP prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the WSCP.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ukiah assembled in a regular Council Meeting on June 2, 2021, in City Council Chambers, to hereby agree as follows:

1. The City is in conformance with all applicable requirements of the Water Code
2. The WSCP is hereby adopted and ordered filed with the City Clerk;
3. This resolution shall be in full force and effect immediately upon its passage and adoption thereof;
4. The Council is hereby authorized and directed to submit the WSCP along with UWMP to the California Department of Water Resources within 30 days after this date;

The City Attorney is authorized to make minor typographical changes to this Resolution that does not change the substance of this Resolution;

I HEREBY CERTIFY that the foregoing Resolution, being Resolution No. 2021-24 as duly adopted by the City Council of the City of Ukiah, at the regular meeting of the City Council, by the following vote, to wit:

AYES: Councilmembers Crane, Rodin, Duenas, Brown, and Mayor Orozco
NOES: None
ABSTAIN: None
ABSENT: None

Juan V. Orozco, Mayor

ATTEST:

City Clerk

Approved as to Form and Legality:

City Attorney

11a 2020 WSCP Resolution

Final Audit Report 2021-06-03

Created:	2021-06-03
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Appendix C: UWMP Act

City of Ukiah 2020 Urban Water Management Plan

Appendix A. California Water Code – Urban Water Management Planning

This material is for informational purposes only and not to be used in place of official California Water Code (Water Code).

This document presents updated sections of Water Code as of January 1, 2020, as compiled by DWR staff. The selection focuses on the portions of code directly relevant to preparation of the urban water management plan and contextually relevant to urban water suppliers and the Department of Water Resources (DWR). This includes the Urban Water Management Planning Act and the Sustainable Water Use and Demand Reduction (SB X7-7), and more. Further legislative information is available on the California Legislative Information website at https://leginfo.legislature.ca.gov/.

The following Water Code sections are included in this appendix.

- **Sustainable Water Use and Demand Reduction (SB X7-7) Water Code Division 6, Part 2.55**
  - **Chapter 1. General Declarations and Policy**, Sections 10608 – 10608.8
  - **Chapter 2. Definitions**, Section 10608.12
  - **Chapter 3. Urban Retail Water Suppliers**, Sections 10608.16 – 10608.44
  - **Chapter 4. Agricultural Water Suppliers**, Section 10608.48
  - **Chapter 5. Sustainable Water Management**, Section 10608.50
  - **Chapter 6. Standardized Data Collection**, Section 10608.52
  - **Chapter 7. Funding Provisions**, Sections 10608.56 – 10608.60
  - **Chapter 8. Quantifying Agricultural Water Use Efficiency**, Section 10608.64

- **Urban Water Management Planning Act**
  Water Code Division 6, Part 2.6
    - **Chapter 1. General Declaration and Policy**, Sections 10610 – 10610.4
    - **Chapter 2. Definitions**, Sections 10611 – 10618
    - **Chapter 3. Urban Water Management Plans**
      Article 1. General Provisions, Sections 10620 – 10621
      Article 2. Contents of Plans, Sections 10630 – 10634
      Article 2.5. Water Service Reliability, Section 10635
      Article 3. Adoption and Implementation of Plans, Sections 10640 – 10645
    - **Chapter 4. Miscellaneous Provisions**, Sections 10650 – 10657

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION
CHAPTER 1. General Declaration and Policy [10608 – 10608.8]

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time,

providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population

growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

CHAPTER 2. Definitions [10608.12]

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the

calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.

(e) "Commercial water user" means a water user that provides or distributes a product or service.

(f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(g) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(i) "Industrial water user" means a water user that is primarily a

manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(j) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(k) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(l) "Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.

(m) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(n) "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.

(o) "Potable reuse" means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.

(p) "Process water" means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that

are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.

(q) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050.

(r) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(s) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(t) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.

(v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(w) "Urban wholesale water supplier" means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

CHAPTER 3. Urban Retail Water Suppliers [10608.16 – 10608.44]

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(1) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2017 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail

water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of

subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its internet website, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water

supplier and urban retail water suppliers.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial

percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under

federal Executive Order 13514.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the

department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.34. (a) (1) On or before January 1, 2017, the department shall adopt rules for all of the following:

(A) The conduct of standardized water loss audits by urban retail water suppliers in accordance with the method adopted by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0.

(B) The process for validating a water loss audit report prior to submitting the report to the department. For the purposes of this section, "validating" is a process whereby an urban retail water supplier uses a technical expert to confirm the basis of all data entries in the urban retail water supplier's water loss audit report and to appropriately characterize the quality of the reported data. The validation process shall follow the principles and terminology laid out by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0. A validated water loss audit report shall include the name and technical qualifications of the person engaged for validation.

(C) The technical qualifications required of a person to

engage in validation, as described in subparagraph (B).

(D) The certification requirements for a person selected by an urban retail water supplier to provide validation of its own water loss audit report.

(E) The method of submitting a water loss audit report to the department.

(2) The department shall update rules adopted pursuant to paragraph (1) no later than six months after the release of subsequent editions of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36. Except as provided by the department, until the department adopts updated rules pursuant to this paragraph, an urban retail water supplier may rely upon a subsequent edition of the American Water Works Association's Water Audits and Loss Control Programs, Manual M36 or the Free Water Audit Software.

(b) (1) On or before October 1 of each year until October 1, 2023, each urban retail water supplier reporting on a calendar year basis shall submit a completed and validated water loss audit report for the previous calendar year or the previous fiscal year as prescribed by the department pursuant to subdivision (a).

(2) On or before January 1 of each year until January 1, 2024, each urban retail water supplier reporting on a fiscal year basis shall submit a completed and validated water loss audit report for the previous fiscal year as prescribed by the department pursuant to subdivision (a).

(3) On or before January 1, 2024, and on or before January 1 of each year thereafter, each urban retail water supplier shall submit a completed and validated water loss audit report for the previous calendar year or previous fiscal year as part of the report submitted to the department pursuant to subdivision (a) of Section 10609.24 and as prescribed by the department pursuant to subdivision (a).

(4) Water loss audit reports submitted on or before October 1, 2017, may be completed and validated with assistance as described in subdivision (c).

(c) Using funds available for the 2016–17 fiscal year, the board shall contribute up to four hundred thousand dollars ($400,000) towards procuring water loss audit report validation assistance for urban retail water suppliers.

(d) Each water loss audit report submitted to the department shall be accompanied by information, in a form specified by the department, identifying steps taken in the preceding year to increase the validity of data entered into the final audit, reduce the volume of apparent losses, and reduce the volume of real losses.

(e) At least one of the following employees of an urban retail water supplier shall attest to each water loss audit report submitted to the department:

(1) The chief financial officer.

(2) The chief engineer.

(3) The general manager.

(f) The department shall deem incomplete and return to the urban retail water supplier any final water loss audit report found by the department to be incomplete, not validated, unattested, or incongruent with known characteristics of water system operations. A water supplier shall resubmit a completed water loss audit report within 90 days of an audit being returned by the department.

(g) The department shall post all validated water loss audit reports on its internet website in a manner that allows for comparisons across water suppliers. The department shall make the validated water loss audit reports available for public viewing in a timely manner after their receipt.

(h) Using available funds, the department shall provide technical assistance to guide urban retail water suppliers' water loss detection programs, including, but not limited to, metering techniques, pressure management techniques, condition-based assessment techniques for transmission and distribution pipelines, and utilization of portable and permanent water loss detection devices.

(i) No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In

adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements.

10608.35. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and make a recommendation to the Legislature, by January 1, 2020, on the feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers.

(b) The studies and investigations shall include an evaluation of the suitability of applying the processes and requirements of Section 10608.34 to urban wholesale water suppliers.

(c) In conducting necessary studies and investigations and developing its recommendation, the department shall solicit broad public participation from stakeholders and other interested persons.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. (a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in

Section 10608.16.

CHAPTER 4. Agricultural Water Suppliers [10608.48]

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement both of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's

pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The department shall require information about the implementation of efficient water management practices to be reported using a standardized form developed pursuant to Section 10608.52. (f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(f) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(g) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(h) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

CHAPTER 5. Sustainable Water Management [10608.50]

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

CHAPTER 6. Standardized Data Collection [10608.52]

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

CHAPTER 7. Funding Provisions [10608.56 – 10608.60]

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita

reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public

Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

CHAPTER 8. Quantifying Agricultural Water Use Efficiency [10608.64]

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION [10608 – 10609.42]

CHAPTER 9. Urban Water Use Objectives and Water Use Reporting [10609 – 10609.38]

10609. (a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.

(b) The Legislature further finds and declares all of the following:

(1) This chapter establishes standards and practices for the following water uses:

(A) Indoor residential use.

(B) Outdoor residential use.

(C) CII water use.

(D) Water losses.

(E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.

(2) This chapter further does all of the following:

(A) Establishes a method to calculate each urban water use objective.

(B) Considers recycled water quality in establishing efficient irrigation standards.

(C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.

(D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.

(E) Requires annual reporting of the previous year's water use with the urban water use objective.

(F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.

(3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.

(4) This chapter preserves the Legislature's authority over long-term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:

(A) Requiring the Legislative Analyst to conduct a review of the implementation of this chapter, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other issues the Legislative Analyst deems appropriate.

(B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.

(C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.

(c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:

(1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.

(2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.

(3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

(4) The state should identify opportunities for streamlined reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

10609.2. (a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.

(b) Standards shall be adopted for all of the following:

(1) Outdoor residential water use.

(2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) A volume for water loss.

(c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.

(d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

(e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

10609.4. (a) (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.

(2) Beginning January 1, 2025, and until January 1, 2030, the

standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(b) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall be made to the chairpersons of the relevant policy committees of each house of the Legislature by January 1, 2021, and shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

(2) The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

10609.6. (a) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.

(2) (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(B) The standards shall apply to irrigable lands.

(C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.

(b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.

(c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

10609.8. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.

(b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

10609.9. For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:

(a) Evapotranspiration adjustment factors, as applicable.

(b) Landscape area.

(c) Maximum applied water allowance.

(d) Reference evapotranspiration.

(e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

10609.10. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.

(b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:

(1) Recommendations for a CII water use classification system for California that address significant uses of water.

(2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.

(3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.

(c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.

(d) (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.

(a) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

10609.12. The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.

10609.14. (a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective.

(b) Appropriate variances may include, but are not limited to, allowances for the following:

(1) Significant use of evaporative coolers.

(2) Significant populations of horses and other livestock.

(3) Significant fluctuations in seasonal populations.

(4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.

(5) Significant use of water for soil compaction and dust control.

(6) Significant use of water to supplement ponds and lakes to sustain wildlife.

(7) Significant use of water to irrigate vegetation for fire protection.

(8) Significant use of water for commercial or noncommercial agricultural use.

(c) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.

(d) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.

(e) The board shall post on its Internet Web site all of the following:

(1) A list of all urban retail water suppliers with approved variances.

(2) The specific variance or variances approved for each urban retail water supplier.

(3) The data supporting approval of each variance.

10609.15. To help streamline water data reporting, the department and the board shall do all of the following:

(a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.

(b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.

(c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

10609.16. The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:

(a) Determining the irrigable lands within the urban retail water supplier's service area.

(b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.

(c) Using landscape area data provided by the department or alternative data.

(d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.

(e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.

(f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

10609.18. The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.

10609.20. (a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:

(1) Aggregate estimated efficient indoor residential water use.

(2) Aggregate estimated efficient outdoor residential water use.

(3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.

(4) Aggregate estimated efficient water losses.

(5) Aggregate estimated water use in accordance with variances, as appropriate.

(d) (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.

(2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.

(3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:

(A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.

(B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.

(4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:

(A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.

(B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.

(C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.

(e) (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.

(2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

10609.21. (a) For purposes of Section 10609.20, and notwithstanding paragraph (4) of subdivision (d) of Section 10609.20, "existing facility" also includes the North City Project, phase one of the Pure Water San Diego Program, for which an environmental impact report was certified on April 10, 2018.

(b) This section shall become operative on January 1, 2019.

10609.22. (a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use shall be composed of the sum of the following:

(1) Aggregate residential water use.

(2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) Aggregate water losses.

10609.24. (a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

10609.25. As part of the first report submitted to the department by an urban retail water supplier no later than January 1, 2024, pursuant to subdivision (a) of Section 10609.24, each urban retail water supplier shall provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027.

10609.26. (a) (1) On and after January 1, 2024, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.

(2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.

(3) The board shall share information received pursuant to this subdivision with the department.

(4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.

(b) On and after January 1, 2025, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier

address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

(c) (1) On and after January 1, 2026, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.

(2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.

(3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.

(d) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

10609.27. Notwithstanding Section 10609.26, the board shall not issue an information order, written notice, or conservation order pursuant to Section 10609.26 if both of the following conditions are met:

(a) The board determines that the urban retail water supplier is not meeting its urban water use objective solely because the volume of water loss exceeds the urban retail water supplier's standard for water loss.

(b) Pursuant to Section 10608.34, the board is taking enforcement action against the urban retail water supplier for not meeting the performance standards for the volume of water losses.

10609.28. The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly report relating to water production, water use, or water conservation.

10609.30. On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.

(a) The report shall describe all of the following:

(1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.

(2) The accuracy of the data and estimates being used to calculate urban water use objectives.

(3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.

(6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.

(7) Any other issues the Legislative Analyst deems appropriate.

10609.32. It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:

(a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.

(b) What enforcement actions have been taken, if any.

(c) The accuracy of the data and estimates being used to calculate urban water use objectives.

(d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

10609.34. Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.

10609.36. (a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.

(b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

(c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

10609.38. The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. General Declaration and Policy [10610 – 10610.4]

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California’s businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state’s communities and agricultural production, and strengthening local and regional drought planning are critical to California’s resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the

foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

CHAPTER 2. Definitions [10611 – 10618]

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.3. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Drought risk assessment" means a method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

10617.5. "Water shortage contingency plan" means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

10618. "Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

CHAPTER 3. Urban Water Management Plans
ARTICLE 1. General Provisions [10620 – 10621]

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce

preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage

contingency plan as part of the supplier's general rate case filings.

(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

CHAPTER 3. Urban Water Management Plans

ARTICLE 2. Contents of Plans [10630 – 10634]

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

10630.5. Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including,

where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors,

including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in

gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

10632. (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(A) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(B) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

10632.1. An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

10632.2. An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in

subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

10632.3. It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

10632.5. (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the serv`ice area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the

amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

CHAPTER 3. Urban Water Management Plans
ARTICLE 2.5. Water Service Reliability [10635]

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate

change conditions, anticipated regulatory changes, and other locally applicable criteria.

(d) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(e) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(f) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

CHAPTER 3. Urban Water Management Plans

ARTICLE 3. Adoption and Implementation of Plans [10640 – 10645]

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its

water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. Miscellaneous Provisions [10650 – 10657]

10650. Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the

preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

10657. The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

Appendix D: Dept. of Water Resources UWMP Checklist

City of Ukiah 2020 Urban Water Management Plan

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	**Sections 1, 3, 4, 6, and 9**
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	**Sections 2, 3, 4, 5, 6, 7, 8, and 9**
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	**Section 1 Appendix A**
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	**Section 1 Appendix K**
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	**Section 1 Appendix K**
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	**Section 1, Appendix K**
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	**N/A**
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	**Section 2**
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	**Sections 2.4 and 6.4**
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	**Section 2.5.1**
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	**Sections 2 and 6**
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	**Section 2.5**
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	**Sections 2 and 6**
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	**Sections 6.5 to 6.8**
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	**Sections 6.5 to 6.8, Section 9.4 and Appendix G**
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	**Section 4.3, 6.8, and 9**
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	**Section 3, 4, 6, 7, and 8**
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	**Sections 6.6, Section 9, Appendix G**
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	**Section 6.8**
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	**Sections 2.4.1, 6.4, and 7.5. Appendix M**
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	**Sections 6.6 to 6.7. Appendix F**
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	**Section 6.7. Appendix F**
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	**N/A - City is Retail**
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	**N/A - No Adjustments. Sections 6.7. Appendix F**
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	**Sections 3.5, 4.2.1, 4.3.2, 6.8.1 to 6.8.3, 7.6 to 7.7, and 9.2 to 9.3**
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	**Sections 6.5.2 and 6.7.3, Appendix F**
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	**Section 7.5**
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	**Sections 2.4.1, 6.4, and 7. Appendix M.**
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	**Section 3**
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	**Section 3.4 to 3.6**
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	**Sections 3.3 to 3.6**

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Sections 3.2 to 3.6
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 3.2, Appendix L
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 2.6, Section 3.2
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Sections 3.2, Appendix L
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 3.2, Appendix L
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Sections 3.2
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 3.3 to 3.6, Section 7.5
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 3.5
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Sections 4.1 to 4.3
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Sections 4.3
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Sections 4.3 to 4.4
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Sections 4.3 to 4.4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Sections 4.3 to 4.4
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Sections 4.4
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	N/A
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Sections 4.1 to 4.2
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Sections 3.6, 4.4, and 7.6 to 7.9
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 3.7
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Entire Section 5
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 3.4 to 3.6, Section 7.6 to 7.9, Section 8, and Section 9
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Sections 7.4 to 7.9
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Sections 7.5 to 7.8, Section 8. and Section 9
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Sections 7.4 to 7.5
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Sections 7.4 to 7.9
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Sections 7.4 to 7.9
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Sections 2.4, 6.4, 7.1 to 7.5
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Sections 5.4.2 and entire Section 8
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Entire Section 7 and Section 8.4
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.11
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.4 and 8.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	**Section 7.5, Section 8.4 and 8.5**
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	**Sections 8.6 to 8.11**
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	**N/A**
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	**Section 3.3 to 3.7, Section 4, Section 7.7 to 7.9, Section 8.6 to 8.8**
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	**Section 8.6 to 8.8, Tables 8.5 to 8.6**
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	**Section 8.6 to 8.8, Table 8.6**
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	**Section 8.6, Table 8.5**
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	**Section 8.6 to 8.11, Tables 8.5 & 8.6**
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	**Section 8.7.1 Appendix N**
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	**Section 8.7**
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	**Section 8.6.4, Section 8.8, Table 8.5, Table 8.6**
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	**Section 8.6 to 8.8, Table 8.5 & 8.6**
x		Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	**Section 8.1 to 8.3**
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	**Section 8.6, 8.6.4**
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	**Section 8.7**
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	**Section 8.9**
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	**Section 8.9**
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	**Section 8.6, 8.6.6, and 8.9**
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	**Section 8.8**
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	**Section 8.6, 8.6.5, Tables 8.5 & 8.6**
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Section 8.11, and Appendix O**
x	x	Section 8.12	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	**Section 1.2 and Appendix O**
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	**N/A - City is Retail**
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	**Entire Section 9 and Appendix G**
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, and K**
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, and K**
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	**Section 1.2, Appendices A, B, K, and O**
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	**N/A**
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	**TBD**

Appendix E: Dept. of Water Resources UWMP Data Tables

City of Ukiah 2020 Urban Water Management Plan

DRAFT Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA2310003	City of Ukiah	5,030	3,032
	TOTAL	5,030	3,032
NOTES: The number of municipal connections for the City is taken from the City's DWR Public Water System Statistics. This was reported in August of 2020. Volume of Water Supplied is based on the City's Metered Water Deliveries. Potable water supplied (surface + groundwater) was about 3,030 AF in 2020.			

DRAFT Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

DRAFT Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (select from drop down)	
Unit	AF
NOTES:	

DRAFT Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
NOTES: N/A - City Uses Local Water Sources Only

DRAFT Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	16,061	16,350	16,639	16,928	17,217	17,506

NOTES: According to the California Department of Finance (DoF), population of the City of Ukiah in January 2018 was estimated at 16,226 persons. As shown in Table 2.2 of the Housing Element Update 2019-2027, between 2000 and 2010, the City added 545 residents, or 0.35% annual growth rate, to its population. According to the DoF, population of the City of Ukiah in 2013 was 16,065 and a population of 16,470 was projected in 2020 (Mendocino County Housing Element 2014-2019 Update). The DoF used an annual growth rate of 0.36% for their projections, which is very close to the annual growth rate between 2000 and 2010 of 0.35%. As a result, this annual growth rate of 0.36% was used for the City's population projections for 2025-2045.

DRAFT Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual			
Use Type *(Add additional rows as needed)*	2020 Actual		
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Single Family			817
Multi-Family			817
Commercial			748
Industrial			55
Institutional/Governmental			
Landscape			209
Groundwater recharge			
Saline water intrusion barrier			
Agricultural irrigation			
Wetlands or wildlife habitat			
Sales/Transfers/Exchanges to other agencies			
Losses			359
Other			27
		TOTAL	3,032
NOTES:			

DRAFT Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected						
Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*		2025	2030	2035	2040	2045 (opt)
Single Family		769	763	757	751	744
Multi-Family		769	763	757	751	744
Commercial		706	701	695	689	683
Industrial		52	52	51	51	50
Institutional/Governmental						
Landscape		199	197	195	194	192
Groundwater recharge						
Saline water intrusion barrier						
Agricultural irrigation						
Wetlands or wildlife habitat						
Sales/Transfers/Exchanges to other agencies						
Sales/Transfers/Exchanges to other agencies						
Losses		293	291	289	286	284
Other Potable						
Other Non-Potable						
Other		26	25	25	25	25
	TOTAL	2,814	2,792	2,770	2,746	2,723
NOTES:						

DRAFT Submittal Table 4-3 Retail: Total Gross Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	3,032	2,814	2,792	2,770	2,746	2,723
Recycled Water Demand* *From Table 6-4*	2,671	2,875	2,852	2,825	2,796	2,785
TOTAL WATER USE	5,703	5,689	5,644	5,595	5,542	5,508
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES: This Standard Table from DWR not properly accounting for recycled water. "Recycled Water" figures shown above reflect total wastewater treated at the City's WWTP. Not the amount of recycled water produced.						

DRAFT Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2020	359
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: Calculated from City of Ukiah Supply and Demand Tables for year 2020. Official AWWA Water Loss Audit for 2020 is Pending.	

DRAFT Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	See below
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES: The City's per-capita water use has decreased by an average of 1.5% annually over the past 20 years. Low-income water needs are discussed in Section 6.8.2. The projected rate of decline in the water consumption (GPCD) is 0.5% annually. It is practical to assume that water use efficiency will continue to increase on its own over the next couple of decades.	

DRAFT Submittal Table 5-1 Baselines and Targets Summary
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1995	2004	233	186
5 Year	2003	2007	216	
*All values are in Gallons per Capita per Day (GPCD)				
NOTES: See SBx7-7 tables in Appendix F and Section 6 of the UWMP.				

DRAFT Submittal Table 5-2: 2020 Compliance

Retail Supplier or Regional Alliance Only

Actual 2020 GPCD*	Optional Adjustments to 2020 GPCD Enter "0" if no adjustment is made *From Methodology 8*					2020 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2020 GPCD*		
168	0	0	0	0	168	168	Yes

**All values are in Gallons per Capita per Day (GPCD)*

NOTES: 168 GPCD has been determined by using the City's Total Water Use, Including Losses, which equals to total production volumes. For 2020, this is 2,673 (Metered Water Use) + 359 (Losses) = 3,030 AF (Total Water Production). Then, 3,030 AF * 325,851 gallons/AF / 31,125 persons / 365 days = 168 GPCD.

DRAFT Submittal Table 6-1 Retail: Groundwater Volume Pumped

☐	Supplier does not pump groundwater. The supplier will not complete the table below.
☐	All or part of the groundwater described below is desalinated.

Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016	2017	2018	2019	2020
Add additional rows as needed						
Alluvial Basin	Ukiah Valley Groundwater Basin	915	1,265	1,036	1,748	1,507
TOTAL		915	1,265	1,036	1,748	1,507

NOTES: See Section 3 of the UWMP.

DRAFT Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2020 service area covered by wastewater collection system *(optional)*					
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Add additional rows as needed						
City of Ukiah	Estimated	2,671	City of Ukiah	Ukiah Wastewater Treatment Plant	Yes	
Total Wastewater Collected from Service Area in 2020:		2,671				
NOTES: Wastewater Estimates Based on a Water to Wastewater Return Ratio of 0.75.						

DRAFT Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020											
☐	No wastewater is treated or disposed of within the UWMP service area. The Supplier will not complete the table below.										
							2020 volumes				
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level *Drop down list*	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Add additional rows as needed											
Ukiah Wastewater Treatment Plant	Percolation ponds	Within the WWTP		Percolation ponds	Yes	Tertiary	2,671	1,929	742	0	
						Total	2,671	1,929	742	0	0
NOTES:											

DRAFT Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐ Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water:	
Name of Supplier Operating the Recycled Water Distribution System:	
Supplemental Water Added in 2020 (volume) *Include units*	
Source of 2020 Supplemental Water	

Beneficial Use Type	Potential Beneficial Uses of Recycled Water (Describe)	Amount of Potential Uses of Recycled Water (Quantity) *Include volume units*	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020	2025	2030	2035	2040	2045 (opt)
Agricultural irrigation			Irrigation to agricultural lots and softball fields		742	1,180	1,180	1,180	1,180	1,180
Landscape irrigation (excludes golf courses)										
Golf course irrigation						220	220	220	220	220
Commercial use										
Industrial use										
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment										
Wetlands or wildlife habitat										
Groundwater recharge (IPR)*	Percolation ponds				1,929	1,475	1,452	1,425	1,396	1,385
Surface water augmentation (IPR)*										
Direct potable reuse										
Other *(Provide General Description)*										
				Total:	2,671	2,875	2,852	2,825	2,796	2,785
Internal Reuse (*not counted towards Statewide Recycled Water volume*).										

**IPR - Indirect Potable Reuse*

NOTES: See Section 4 of UWMP. Phase 4 of the recycled water will expand recycled water use. City plans to use this water for agricultural and recreational purposes.

DRAFT Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

☐ Recycled water was not used in 2015 nor projected for use in 2020. The Supplier will not complete the table below.

Use Type		2015 Projection for 2020	2020 Actual Use
Agricultural irrigation			
Landscape irrigation (excludes golf courses)		465	742
Golf course irrigation		220	
Commercial use			
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		685	742

NOTES: See Standard DWR Table 6-4 in the City's 2015 UWMP

DRAFT Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 4.3.1	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
Phase 4 Recyled Water Project	The fouth phase is expected to be completed by 2023, which will expand the recyled water system by 400 AFY to serve the Ukiah Valley Golf Course, Ukiah High School, an agricultural field, adjacent parks, and softball fields.		400
		Total	400
NOTES:			

DRAFT Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						
NOTES: See Section 3 and 7 of the City's UWMP. The City's surface and groundwater supplies are more than enough to meet the City's needs. However, the City may explore plans for additional groundwater wells for reasons of redundancy/resiliency.						

DRAFT Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Surface water (not desalinated)	Russian River Ranney Collector & Well #3	1,522	Drinking Water	
Groundwater (not desalinated)	Ukiah Valley Groundwater Basin	1,507	Drinking Water	
Recycled Water	City of Ukiah Wastewater Treatment Plant	742	Recycled Water	
Total		3,771		0
NOTES:				

DRAFT Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		**2025**		**2030**		**2035**		**2040**		**2045** *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed											
Surface water (not desalinated)	Russian River (Pre-1914 Right)	2,027	2,027	2,027	2,027	2,027	2,027	2,027	2,027	2,027	2,027
Surface water (not desalinated)	Russian River (Permit 12952)	14,480	14,480	14,480	14,480	14,480	14,480	14,480	14,480	14,480	14,480
Groundwater (not desalinated)	Ukiah Valley Groundwater Basin	4,677	4,677	4,677	4,677	4,677	4,677	4,677	4,677	4,677	4,677
Recycled Water	City of Ukiah Wastewater Treatment Plant	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400
Total		22,584	22,584	22,584	22,584	22,584	22,584	22,584	22,584	22,584	22,584
NOTES: See Section 3, 4, and 7 of the UWMP.											

DRAFT Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020*	**Available Supplies if Year Type Repeats**	
		☑ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location Section 7.5.3	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	2017	21,184	100%
Single-Dry Year	2011	11,534	100%
Consectutive Dry Years 1st Year	2012	11,534	100%
Consectutive Dry Years 2nd Year	2013	11,534	100%
Consectutive Dry Years 3rd Year	2014	11,534	100%
Consectutive Dry Years 4th Year	2015	11,534	100%
Consectutive Dry Years 5th Year	2016	11,534	100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

NOTES: This table is better clarified by Section 7 of the UWMP. The surface water supplies are not anticipated to be restricted, but may be restricted to some degree by the SRWCB (Permit 12952 only). The City's groundwater supplies are not expected to be reduced for droughts lasting up to 5 years. See Section 7.5.

DRAFT Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	22,584	22,584	22,584	22,584	22,584
Demand totals *(autofill from Table 4-3)*	5,689	5,644	5,595	5,542	5,508
Difference	16,895	16,940	16,989	17,042	17,076

NOTES: See Section 7 of the 2020 UWMP. This table is auto-filled by DWR and not properly showing conditions. "Demand" in this tables appears to include potable and recycled water demand, with "recycled" water including full recycled water and treated wastewater percolated at the WWTP.

DRAFT Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals	11,534	11,534	11,534	11,534	11,534
Demand totals	3,063	3,040	3,016	2,992	2,967
Difference	8,471	8,494	8,518	8,542	8,567
NOTES: See Section 7 of the 2020 UWMP.					

DRAFT Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025	2030	2035	2040	2045 (Opt)
First year	Supply totals	11,534	11,534	11,534	11,534	11,534
	Demand totals	3,081	3,059	3,036	3,012	2,988
	Difference	8,453	8,475	8,498	8,522	8,546
Second year	Supply totals	11,534	11,534	11,534	11,534	11,534
	Demand totals	3,134	3,111	3,088	3,064	3,039
	Difference	8,400	8,423	8,446	8,470	8,495
Third year	Supply totals	11,534	11,534	11,534	11,534	11,534
	Demand totals	2,987	2,965	2,943	2,920	2,896
	Difference	8,547	8,569	8,591	8,614	8,638
Fourth year	Supply totals	11,534	11,534	11,534	11,534	11,534
	Demand totals	2,983	2,961	2,939	2,916	2,892
	Difference	8,551	8,573	8,595	8,618	8,642
Fifth year	Supply totals	11,534	11,534	11,534	11,534	11,534
	Demand totals	2,978	2,956	2,933	2,909	2,884
	Difference	8,556	8,578	8,601	8,625	8,650
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
NOTES: See Section 7 of the 2020 UWMP.						

DRAFT Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

2021	Total
Total Water Use	3,081
Total Supplies	11,534
Surplus/Shortfall w/o WSCP Action	8,453
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	308
Revised Surplus/(shortfall)	8,761
Resulting % Use Reduction from WSCP action	10%

2022	Total
Total Water Use	3,134
Total Supplies	11,534
Surplus/Shortfall w/o WSCP Action	8,400
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	313
Revised Surplus/(shortfall)	8,714
Resulting % Use Reduction from WSCP action	10%

2023	Total
Total Water Use	2,987
Total Supplies	11,534
Surplus/Shortfall w/o WSCP Action	8,547
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	299
Revised Surplus/(shortfall)	8,846
Resulting % Use Reduction from WSCP action	10%

2024	Total
Total Water Use	2,983
Total Supplies	11,534
Surplus/Shortfall w/o WSCP Action	8,551
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	298
Revised Surplus/(shortfall)	8,850
Resulting % Use Reduction from WSCP action	10%

2025	Total
Total Water Use	2,978
Total Supplies	11,534
Surplus/Shortfall w/o WSCP Action	8,556
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	298
Revised Surplus/(shortfall)	8,854
Resulting % Use Reduction from WSCP action	10%

DRAFT Submittal Table 8-1		
Shortage Level	Complete Both	
	Percent Shortage Range[1] *Numerical value as a percent*	Water Shortage Condition (*Narrative description*)
Add additional rows as needed		
1	Up to 10%	Shortage Alert
2	Up to 20%	Shortage Condition
3	Up to 30%	Severe Shortage Condition
4	Up to 40%	Critical Shortage Condition
5	Up to 50%	Emergency Shortage Condition
6	>50%	Crisis Shortage Condition
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: Shortage Levels are shown/described in Section 8 of the City's 2020 UWMP.		

Submittal Table 8-2: Demand Reduction Actions			
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
Add additional rows as needed			
Shortage Level 1	Landscape - Restrict or prohibit runoff from landscape irrigation	Up to 10%	Yes
Shortage Level 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Up to 20%	Yes
Shortage Level 3	CII - Lodging establishment must offer opt out of linen service	Up to 30%	Yes
Shortage Level 4	Landscape - Prohibit all landscape irrigation	Up to 40%	Yes
Shortage Level 5	Other	Up to 50%	Yes
Shortage Level 6	Other	Greater than 50%	Yes
NOTES: Only one sample from each stage is listed. See UWMP Section 8 for complete list of demand reduction actions.			

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
Shortage Level 1	Expand Public Information Campaign	Up to 10%	
Shortage Level 2	Improve Customer Billing	Up to 20%	Billing can be used to flag high use.
Shortage Level 3	Transfers	Up to 30%	Coordination with adjacent agencies to prepare for possible need of water if conditions worsen.
Shortage Level 4	Other purchases	Up to 40%	Possible rental of purchase of potable water tanks, or potable pumps.
Shortage Level 5	Implement or Modify Drought Rate Structure or Surcharge	Up to 50%	
Shortage Level 6	Other actions (describe)	Greater than 50%	Mobilize potable water trucks. Decrease pressure in water mains.
NOTES: Only one sample from each stage is listed. See UWMP Section 8 for complete list of demand reduction actions.			

DRAFT Submittal Table 8-4 Retail: Minimum Supply Next Three Years			
	2021	2022	2023
Available Water Supply	11,534	11,534	11,534
NOTES: See Section 8.10 of UWMP.			

DRAFT Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Ukiah	☑	☑
Calpella County Water District	☑	☑
Greater Ukiah Chamber of Commerce	☑	☑
Water Conservation Improvement District	☑	☑
Mendocino Local Agency Formation Commission	☑	☑
Mendocino County Water Agency	☑	☑
Mendocino Environmental Center	☑	☑
Millview County Water District	☑	☑
Redwood Valley County Water District	☑	☑
Ukiah Valley Sanitation District	☑	☑
Sonoma Water	☑	☑
Willow County Water District	☑	☑
Rogina Water Company	☑	☑
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Mendocino County	☑	☑

Appendix F: Dept. of Water Resources SBx7-7 Tables

City of Ukiah 2020 Urban Water Management Plan

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	3,059	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	
[1]If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. [2] *The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*			
[3]The ending year must be between December 31, 2004 and December 31, 2010.			
[4]The ending year must be between December 31, 2007 and December 31, 2010.			
NOTES: See Section 6.7.2 of the UWMP.			

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2010 - 2020) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES: See Section 2.5 of the UWMP.	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1995	14,977
Year 2	1996	15,088
Year 3	1997	15,263
Year 4	1998	15,351
Year 5	1999	15,403
Year 6	2000	15,497
Year 7	2001	15,622
Year 8	2002	14,747
Year 9	2003	16,009
Year 10	2004	16,029
5 Year Baseline Population		
Year 1	2003	16,009
Year 2	2004	16,029
Year 3	2005	16,020
Year 4	2006	15,960
Year 5	2007	15,959
2020 Compliance Year Population		
2020		16,061
NOTES: Current Population values shown in Section 2.5. Past population based on Dept. of Finance data, and match the population numbers shown in the 2015 UWMP (Appendix F).		

SB X7-7 Table 4: Annual Gross Water Use *								
Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Deductions**					**Annual Gross Water Use**
			Exported Water	**Change in Dist. System Storage** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use**	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	3,879	-	-	-	-	-	3,879
Year 2	1996	4,036	-	-	-	-	-	4,036
Year 3	1997	3,910	-	-	-	-	-	3,910
Year 4	1998	3,762	-	-	-	-	-	3,762
Year 5	1999	4,223	-	-	-	-	-	4,223
Year 6	2000	4,097	-	-	-	-	-	4,097
Year 7	2001	4,088	-	-	-	-	-	4,088
Year 8	2002	4,164	-	-	-	-	-	4,164
Year 9	2003	3,870	-	-	-	-	-	3,870
Year 10	2004	4,131	-	-	-	-	-	4,131
10 - 15 year baseline average gross water use								**4,016**
5 Year Baseline - Gross Water Use								
Year 1	2003	3,870	-	-	-	-	-	3,870
Year 2	2004	4,131	-	-	-	-	-	4,131
Year 3	2005	3,753	-	-	-	-	-	3,753
Year 4	2006	3,833	-	-	-	-	-	3,833
Year 5	2007	3,744	-	-	-	-	-	3,744
5 year baseline average gross water use								**3,866**
2020 Compliance Year - Gross Water Use								
2020		3,030	-	-	-	-	-	**3,030**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: See Section 6.7.2 of the UWMP. Volumes shown above match the 2015 UWMP (no changes from 2015 UWMP).

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	Groundwater and Surface Water
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	3,879		3,879
Year 2	1996	4,036		4,036
Year 3	1997	3,910		3,910
Year 4	1998	3,762		3,762
Year 5	1999	4,223		4,223
Year 6	2000	4,097		4,097
Year 7	2001	4,088		4,088
Year 8	2002	4,164		4,164
Year 9	2003	3,870		3,870
Year 10	2004	4,131		4,131
5 Year Baseline - Water into Distribution System				
Year 1	2003	3,870		3,870
Year 2	2004	4,131		4,131
Year 3	2005	3,753		3,753
Year 4	2006	3,833		3,833
Year 5	2007	3,744		3,744
2020 Compliance Year - Water into Distribution System				
2020		3,030		3,030

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: See Section 6.7.2 of the UWMP. Volumes shown above match the 2015 UWMP (no changes from 2015 UWMP).

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	14,977	3,879	231
Year 2	1996	15,088	4,036	239
Year 3	1997	15,263	3,910	229
Year 4	1998	15,351	3,762	219
Year 5	1999	15,403	4,223	245
Year 6	2000	15,497	4,097	236
Year 7	2001	15,622	4,088	234
Year 8	2002	14,747	4,164	252
Year 9	2003	16,009	3,870	216
Year 10	2004	16,029	4,131	230
10-15 Year Average Baseline GPCD				**233**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	16,009	3,870	216
Year 2	2004	16,029	4,131	230
Year 3	2005	16,020	3,753	209
Year 4	2006	15,960	3,833	214
Year 5	2007	15,959	3,744	209
5 Year Average Baseline GPCD				**216**
2020 Compliance Year GPCD				
2020		16,061	3,030	**168**
NOTES: See Section 6.7.2 of the UWMP. Volumes shown above match the 2015 UWMP (no changes from 2015 UWMP).				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	233
5 Year Baseline GPCD	216
2020 Compliance Year GPCD	168
NOTES: See Section 6.7.2 of the UWMP. Baseline volumes the same as the 2015 UWMP (no changes from 2015 UWMP).	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *See UWMP DWR webpage or contact staff for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES: See Section 6.7.2 of the UWMP. Target Method is the same as the 2015 UWMP.		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
233	**186**
NOTES: See Section 6.7.2 of the UWMP. Baseline and Target are the same as the 2015 UWMP.	

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
186	233	**209**
NOTES: See Section 6.7.2 of the UWMP. Figures shown above match the 2015 UWMP.		

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
186	233	**209**
NOTES: See Section 6.7.2.		

SB X7-7 Table 9: 2020 Compliance								
Actual 2020 GPCD	Confirmed 2020 Target	Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2020 GPCD	2020 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2020?**
168	186	-	-	-	-	168	168	**YES**
NOTES: See Section 6.7.2 of the UWMP. Figures shown above match the 2015 UWMP (no changes from 2015 UWMP).								

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES: See Section 2.5 of the UWMP.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	16,061
NOTES: See Section 2.5 of the UWMP.	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Exported Water ***	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	**2020 Gross Water Use**
	3,030	-	-	-	-	-	**3,030**
*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES: See Section 6.5 to 6.7 of the UWMP.							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment Complete one table for each source.			
Name of Source	Groundwater and Surface Water		
This water source is *(check one)* **:**			
☑	The supplier's own water source		
☐	A purchased or imported source		
Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* (+/-)	Corrected Volume Entering Distribution System
	3,030	-	3,030
[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*			
NOTES: See Section 3 and Section 6.5 to 6.8 of UWMP.			

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
3,030	16,061	**168**
NOTES: See Section 6.5 to 6.8 of UWMP.		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
168	-	-	-	-	168	186	**YES**
[1] *All values are reported in GPCD* [2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*							
NOTES: See Section 6.7.2 of UWMP.							

Appendix G: AWWA Water Audits (2016-2019)

City of Ukiah 2020 Urban Water Management Plan

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Validator Provided

Audit Information:

Utility: Ukiah PWS ID: 2310003

System Type: Potable Audit Period: Calendar 2016

Utility Representation: Michelle Whyburn, Sean White

Validation Date: 5/23/2017 Call Time: 3pm Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 75 Data Validity Band (Level): Band IV (71-90)

ILI: 1.16 Real Loss: 31.05 (gal/conn/day) Apparent Loss: 8.85 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 2.7%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

Water Audit Validator: Reinhard Sturm / Brett Snider (support) Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

WSO CAVANAUGH Stewardship Through Innovation

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Utility Provided

Water System Name: City of Ukiah **Water System ID Number:** 2310003 **Water Audit Period:** Calendar 2016

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

Replace production meters outside of allowable parameters, physical audit of customer meters and use and upgrading financial system software.

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, ***Water Audits and Loss Control Programs, Manual M36, Fourth Edition*** and in the Free Water Audit Software version 5.

Sean White	Director of Water/Sewer Utilities		9/28/17
Executive Name (Print)	Executive Position	Signature	Date

Level 1 Validation Certificate

This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 10/15/2019

Water Supplier

Supplier Name:	City of Ukiah
Supplier Participants:	Michelle Whyburn, Sean White

Validator

Validator:	Colin Stief, Water Systems Optimization
Validator Qualifications:	Water Audit Validator Certificate from the AWWA California Nevada Section

Key Audit Metrics

Data Validity Score:	72	
ILI:	2.44	
Real Loss:	45.62	gal / conn / day
Apparent Loss:	9.87	gal / conn / day
Non-Revenue Water as Percent of Cost of Operating System:	2.9%	

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:	City of Ukiah
Water Supplier Public Water System ID:	2310003
Water Audit Period:	CY 2018

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

Monthly audits and increased calibrations.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):	Michelle Whyburn
Executive Position:	Water Treatment Plant Supervisor
Signature:	*Michelle Whyburn*

Date	11/19/19

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Ukiah (2310003)
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	9	941.427	MG/Yr	3		4.860	MG/Yr
Water imported:			MG/Yr				MG/Yr
Water exported:			MG/Yr				MG/Yr
WATER SUPPLIED:		**936.567**	MG/Yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	3	838.156	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	9	1.121	MG/Yr			
Unbilled unmetered:	9	0.498	MG/Yr		0.498	MG/Yr
AUTHORIZED CONSUMPTION:		**839.775**	MG/Yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

96.793 MG/Yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:	2.341	MG/Yr	0.25%		MG/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	12.781	MG/Yr	1.50%	MG/Yr
Systematic data handling errors:	5	2.095	MG/Yr	0.25%	MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **17.218** MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **79.575** MG/Yr

WATER LOSSES: **96.793** MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **98.412** MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	62.0	miles
Number of active AND inactive service connections:	9	4,779	
Service connection density:		77	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	85.0	psi

COST DATA

Total annual cost of operating water system:	10	$3,415,890	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$3.04	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$363.56	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 72 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Billed metered
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

Level 1 Validation Certificate

Calendar Year 2019

This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 10/23/2020

Water Supplier

Supplier Name:	City of Ukiah
Supplier Participants:	Michelle Whyburn, Jaron Thiele

Validator

Validator:	Isabel Szendrey Water Systems Optimization
Validator Qualifications:	Water Audit Validator Certificate from the AWWA California Nevada Section

Key Audit Metrics

Data Validity Score:	56	
ILI:	2.39	
Real Loss:	44.82	gal / conn / day
Apparent Loss:	7.44	gal / conn / day
Non-Revenue Water as Percent of Cost of Operating System:	1.9%	

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:	City of Ukiah
Water Supplier Public Water System ID:	2310003
Water Audit Period:	CY 2019

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

Monthly audits and increased verifications/calibrations of equipment.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):	Michelle Wagenet
Executive Position:	Water Treatment Plant Supervisor
Signature:	Michelle Wagenet
Date	12/15/20

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Ukiah (2310003)
Reporting Year: 2019 1/2019 - 12/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	938.757	MG/Yr	3			MG/Yr
Water imported:	n/a		MG/Yr				MG/Yr
Water exported:	n/a		MG/Yr				MG/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 938.757 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	3	836.740 MG/Yr			
Billed unmetered:	n/a	0.000 MG/Yr			
Unbilled metered:	9	8.516 MG/Yr			
Unbilled unmetered:	5	2.347 MG/Yr		2.347	MG/Yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 847.603 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption)

91.153 MG/Yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		2.347 MG/Yr	0.25%		MG/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	1	8.538 MG/Yr	1.00%		MG/Yr
Systematic data handling errors:	5	2.092 MG/Yr	0.25%		MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 12.977 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 78.177 MG/Yr

WATER LOSSES: 91.153 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 102.016 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	62.0	miles
Number of active AND inactive service connections:	8	4,779	
Service connection density:		77	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	5	85.0	psi

COST DATA

Total annual cost of operating water system:	10	$4,539,999	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$3.22	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$340.93	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 56 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Customer metering inaccuracies

Appendix H: Land Use Element (with 2018 Amendment)

City of Ukiah 2020 Urban Water Management Plan

4 LAND USE

THE LAND USE ELEMENT is one of the seven mandatory elements California law requires to be part of a General Plan. The purpose of the Land Use Element is to identify the locations and types of land uses that are to be designated throughout the City and Planning Area. Land use classifications are intended to show the future use of lands during the life of the Plan.

The Land Use Element provides broad classifications for how land can be used. These classifications are the foundations upon which the land development code — zoning and subdivision regulations — are developed. These implementing regulations determine the precise land uses that are permitted or conditionally permitted on a piece of property. The General Plan is not intended to be as precise in identifying specific land uses.

Traditionally, land use designations were first applied by creating a General Plan Land Use Map and then defining why one parcel is "commercial" while another down the same street might be "residential." In contrast, the Ukiah General Plan and Growth Management Program builds a series of layers that identify important resource and infrastructure issues that have an effect on the *density* and *intensity* of land use.

All policies developed within the General Plan come to fruition with the assignment of land use classifications. A culmination of all General Plan policy programs, the Land Use Element defines what kinds of uses can occur and where they can occur. Decisions on land use designations are based on the goals of the entire general plan.

The Land Use Element is organized with an introduction describing the role of the Element. This is followed by policy programs related to "legally existing non-conforming land uses." The future growth of the City limits is next, defining policies related to annexation and land use in the Sphere of Influence. Land use classifications, descriptions of the purposes, typical uses within each classification, and siting policies comprise the balance of the Element.

4.01 Introduction

Land use designations broadly define the potential uses of a site. For instance, a site designated within the General Plan for residential use may be developed with a residential use; it may not, however, be developed with a commercial or industrial use. Each of these types of uses carries a different economic value to the property owner. In some cases the use allowed under the General Plan land use designation may be the highest and best use in terms of economic benefit to the property owner but, then again, it may not be. Economic benefit to the property owner is not a criterion for determining the appropriate land use designation. Rather, decision making bodies review the goals, policies and implementation measures contained within the entire General Plan and make land use designations which facilitate the accomplishment of the Plan's goals and implementation of the Plan's policies and implementation measures.

The designation of a piece of land for a particular use does not mean that the use will be developed. Many other factors influence the actual development of a site including the desires of the property owner, the presence or absence of infrastructure improvements (roads, water, sewer, etc.) and the marketplace.

If the market does not economically justify developing a parcel into a particular land use, it will remain undeveloped or under-developed until market conditions change.

In some situations, a land use may be proposed that the public is willing to "subsidize" because of the overall or long-term benefit delivered to the community. The re-allocation of incremental taxes[1] in the Redevelopment Area is an example of the public benefit subsidy of market forces. Other public subsidies to encourage new development or redevelopment in the area include fee waivers, fast-track permit processing, or special tax abatements. In limited situations, the City or County can provide financial support through the sale of bonds or interest reductions.

The *physical features* of the Ukiah Valley make it an attractive place to live. These features also provide development constraints[2] such as the flood plains, steep hillsides, prime agricultural lands, and unstable geologic conditions. These development constraints limit the likelihood of Ukiah turning into a sprawling hill-to-hill, developed, urban area.

*Infrastructure*is commonly viewed as roads, water supply, and sewage disposal. It also involves all facets of connecting people to commerce. This includes telecommunications, electric power, police protection, fire protection, local staff personnel, public buildings, parks, and the ability of the City, County, and special districts to maintain or improve those services.

Land cannot be relocated nor can it be renewed. Designation of its use will have a long-lasting effect on the particular parcel being evaluated and on other lands in the surrounding area. Although a parcel of land may have a number of potential uses — some desired by the property owner, some desired by the public, and others directed by Plan policies — some of these uses may have to be limited to ensure that the parcel's use reflects the goals and policies of the General Plan.

The impacts and or requirements of one land use may be in direct conflict with other land uses. For instance, industrial land uses often produce loud noises and require the presence of hazardous materials. Were a residential land use to be located directly adjacent to an industrial use conflicts might exist between the two: the risks associated with the use of hazardous materials may be intolerable given the presence of young children and old people (sensitive populations) nearby, the noise produced by industrial uses may be intolerable given the residential nature of the adjacent land use. When two land uses adjoin that have mutually exclusive requirements, they are considered to be "incompatible." Sometimes incompatible land uses are separated with a "buffer."[3] A buffer may take the form of a physical feature—such as the Russian River, US 101, the railroad, streams, or canyons. It may also be other land uses—such as landscaping, greenbelts, or even the nonaccess side of recreational areas.

The Land Use Element is organized to identify the broad land use classifications and also the criteria that are used to classify a parcel of land within the classification. The term "land use classification" and "land use designation" both have the same meaning and refer to the written criteria and location on the General Plan Land Use Map. The terms "district" or "zone" refer to how a parcel is categorized in the land development code and on the zoning map. Although all zoning districts must be consistent with the General Plan classification (residential zones can only be located within residential districts), there may be

[1]Incremental taxes are the revenues collected by the Redevelopment Agency to reinvest in its Redevelopment Area.

[2]A *constraint* is a physical characteristic of a site that limits potential development by increasing the potential cost beyond that of a feasible return or makes site development an unsafe public hazard.

[3]A *buffer* is a physical separation between developed portions of two adjoining parcels. The buffer may be a natural feature, such as the Russian River, or it may be an undeveloped strip of landscaping or native terrain that provides a physical separation.

more zones than General Plan classifications for land. The Land Use Element contains a "Land Use Population Density and Building Intensity" chart to provide a further explanation.

4.02 Legally Existing Non-Conforming Land Uses

4.02.01 Summary of major findings

When a General Plan is re-written, land use classifications may change for all parcels in a neighborhood to reflect the future development pattern desired for that area. When this occurs, there are sometimes land uses which were legally approved and permitted prior to the adoption of the re-written General Plan that no longer conform to the land use classification's requirements. These land uses, which are colloquially called *grandfathered* land uses, are actually *legally existing non-conforming land uses*. This term means that the use was legally in place prior to the adoption of the Plan but it no longer conforms to the permitted uses allowed by the revised General Plan.

Similarly, there are structures that have been in the same location for many years —such a long time that the structure may even pre-date zoning or planning requirements. These structures may have been used over the years for a variety of uses that are suited to the structure but have never "conformed" to zoning codes. This type of structure is called a *legally existing non-conforming structure*. It is entitled to similar policy protections as legally existing non-conforming land uses — provided that continuous use is maintained. It is the objective of the Land Use Element to ensure that all legally existing uses of land shall continue to be allowed regardless of the new land use classification implemented by this Plan.

References to "codes" in this section refer to land use and zoning codes; the Uniform Building Code (UBC) is not covered under this reference. This section of the General Plan does not have any policy program that relates to whether a structure was built to the applicable standards of the UBC.

California law allows standards to be applied that protect the established property rights and ensure that a use or structure can be reestablished if it is unintentionally destroyed in a fire or other disaster. In the event of a disaster resulting in damage or destruction of a land use, the property owner may be entitled to rebuild the legally existing non-conforming use or structure to the same density or intensity that existed prior to the damage, without being required to obtain a conditional use permit, provided that the rebuilding begins within a twenty-four month period of time following the event. The structure itself, however, would be required to comply with current building code standards and current site development regulations.

Within the incorporated City limits, no further development or expansion of a non-conforming land use is permitted, a long-standing City zoning code standard. The goal of this policy is to ensure that legally existing non-conforming land uses do not develop into problem land uses due to expansion or enlargement. The County, because of its historical development patterns, has conditionally permitted the expansion of legally existing non-conforming land uses. In order to expand, a conditional use permit must be approved by the Planning Commission. In reviewing a conditional use permit for enlargement of a

legal non-conforming land use, the Planning Commission considers the type of expansion and its effects on the surrounding area. The County also considers what type of conforming development has occurred surrounding the non-conforming land use. The expansion may warrant a need to upgrade buildings to meet the County's current building code and site development standards (such as parking, landscaping, or other site development standards). The County has long maintained a policy that "similar" or "less intensive" uses may replace legally existing non-conforming land uses.

Explanation VI.4–XX: Summary of policies for legally existing, non-conforming land uses

1. A legally existing non-conforming land use shall be permitted to continue under the provisions of any legally-issued building or zoning permit.
2. The use may be continued or re-established provided that it is not abandoned for a period of more than twenty-four consecutive calendar months.
3. The County shall have the flexibility to determine whether a proposed replacement of a non-conforming use is "similar to" or "less intense" than the original legally-existing non-conforming land use. If such a finding is supported, the County may approve a change of non-conforming land use.
4. Within the City and unincorporated County, a legally existing land use may be expanded upon the discretionary consideration of a conditional use permit.
5. In the event of a partial or complete, destruction, the use may be re-established without a use permit to the same or lesser density or intensity as existed prior to the destruction, but must meet current building standards and site development regulations.

Structures and uses which do not conform to land use regulations and cannot demonstrate their legal existence — having been built (structure) or begun (use) without City or County permits — shall not be afforded the same rights and protections of legally existing non-conforming structures and uses. California law has long established that a use, structure, or parcel of land that was created in violation of ordinances or regulations cannot be "grandfathered."

The City and County development codes may establish an "amnesty" date before which all existing structures and uses are considered to be legally established. Record keeping for older projects in both the City and the County is far from comprehensive. This makes it difficult to determine when some older land uses were initiated or structures built. Uses and structures that are determined to have commenced or been built before the amnesty date will be presumed to be legally existing land uses or structures.

4.02.02 General Plan goals, policies, and implementing programs

Goal LU-1: Protect legally-existing, non-conforming land uses.

Policy LU-1.1: Continued use of legally existing non-conforming land uses is allowed in conformance with approved permits.

Implementation Measure LU-1.1(a): Legally-existing non-conforming land uses may continue operations under original permits following adoption of regulations that make the use non-conforming.[4] [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Community Development, County Department of Planning and Building]

Implementation Measure LU-1.1(b): As long as the use is continuous, legally-existing non-conforming land uses shall be permitted to continue operations without conforming to new General Plan or other codes enacted after the establishment of the use. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Community Development, County Department of Planning and Building]

Implementation Measure LU-1.1(c): In the event of a complete or partial destruction of a legally existing non-conforming land use, allow reconstruction to the same or lesser density or intensity in conformance with the current General Plan and building codes.[5] [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Community Development, County Department of Planning and Building]

Implementation Measure LU-1.1(d): The City or County may conditionally approve an expansion of a legally existing non-conforming land use through the Conditional Use Permit process. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* County ◆ *Agency/Department responsible:* County Department of Planning and Building]

Policy LU-1.2: Allow reestablishment of legally existing non-conforming land uses that have been abandoned for twenty-four months or less.

Implementation Measure LU-1.2(a): The City or County shall have the authority to make findings that a legally existing non-conforming land use may be replaced by a subsequent non-conforming land use if the subsequent use is "similar to" or "less intense" than the use it is replacing. Such a change in land use shall occur within twenty-four months of the abandonment of the original legally-existing non-conforming land use. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* County ◆ *Agency/Department responsible:* County Department of Planning and Building]

Goal LU-2: Illegally established non-conforming uses and structures cannot become "legally existing."

Policy LU-2.1: Enforce current land use and zoning codes and site development standards when uses or structures have never been legally established.

Implementation Measure LU-2.1(a): Uses or structures which were never established in conformance with applicable land use or zoning codes, land use or zoning plans, or land use or zoning regulations shall be required to seek appropriate permitting under provisions in effect at the time of discovery of the illegal use or structure. Failure

[4]In the event that the use or structure was legally established prior to permitting requirements, the standard applied to the use or structure shall be to ensure conformance with basic public health and safety requirements.

[5]If there are specific circumstances unique to the project site that would preclude reconstruction of the use if strict conformance to the site development standards or current zoning standards were applied, a variance may be considered through the normal variance review process. This footnote is a part of Implementation Measure LU-1a(3) for purposes of clarification.

to be able to conform to current regulations shall not be a basis for approval of a variance as a remedy for the use's or structure's inability to conform to current land use or zoning codes. Abatement of an illegal use or structure pursuant to the City or County zoning codes shall be a permitted remedy. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City and County Planning]

Policy LU-2.2: Consider special circumstances when determining if a use or structure is not legally existing.

Implementation Measure LU-2.2(a): City and County zoning codes sections addressing non-conforming uses or structures may, at the option of the agency, include a threshold date — based on agency building or planning records — to be used to define that a structure built or use established prior to the date is presumed to be valid. The property owner of a use or structure believed to be illegally existing shall provide tangible proof that the use or structure predates the cut-off date in order for the City or County to make the appropriate finding that the use is valid. [*Timeframe for completion:* Short-term[6] planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Departments]

4.03 Land use policies

4.03.01 Summary of major findings

When it comes to land use policies, there are two significant competing sets of interest. One is the objectives of a property owner to maximize the financial value or equity of property. The other is local government's the overall vision of the Community, and maintaining an inventory to meet the long-range needs of its citizens. Sometimes the objectives of property owners and local government coincide. Sometimes the two interests diverge. The Land Use Element — and its policies displayed graphically on the Land Use Map — represents the balance between interests as defined by the City and the County for the area of the General Plan.

Combining the policies from all of the elements provides a comprehensive foundation for assigning land use classifications. Some of the issues considered with land use include (1) *constraints* such as slopes, floodplain, and noise contours; (2) *resources* — agricultural lands, the Russian River corridor, riparian corridors, and grazing lands; and (3) *infrastructure* — transportation corridors, alternatives to the car, levels of service, sewer, water, fire protection, and other governmental services.

Individual land use categories — residential, commercial, industrial, and resource — have siting criteria and characteristics that are used to fine tune the allocation of land uses in the General Plan.

4.03.01(A) Agricultural lands.

Agricultural lands and urban areas need to be separated by a stable limit to urban expansion. This concept is to prevent the "domino" effect in which one agricultural parcel converts to an urban use followed by the next and the next and so on. Maintaining agricultural lands is an important land use policy within the General Plan. The Policy is built from the "right to farm" provisions in the Open Space and

[6]Although this is assigned to the short-term planning period, the City or County may implement it at any point in time that the agency updates its zoning code or finds it appropriate to add an amendment for this measure.

Conservation Element which protects active agricultural lands in the Valley. Agriculturally-viable soil is a fixed resource — it cannot be replaced.

4.03.01(B) Residential uses.

While the Housing Element focuses solely on the City's needs to ensure lands for 775 new residential units over the next five years, the County also has residential land requirements for the Ukiah Valley. The Mendocino Council of Governments — which is responsible for assigning the "fair share" housing needs — identifies that the unincorporated County in the *Ukiah Valley Area* has a five year housing need of 1,431 units.[7] Residential land allocations must ensure that (1) there is adequate land area within the County to meet this need over the next five years; and (2) that County residentially-designated lands annexed into the City result in a transfer of the regional housing fair share from the County to the City.

Because the Sphere of Influence proposes to be the ultimate City boundaries, the land uses in the Sphere should be at population densities and building intensities compatible with those permitted in the City. New residential land use patterns need to be located in areas where the new populations can be served by local government without placing undue fiscal strains on the new property owners, the City, the County, or various special districts. Urban-scale land uses — low, medium, and high density residential — generally need to be located west of U.S. Highway 101 where there are adequate public facilities and services.

West of the river there is a generally adequate system of roads, feasible means of providing transit, closer proximity to employment, and fewer conflicts with environmental constraints. The vision to maintain quality of life issues and resource protection is best achieved with urban development locating west of the highway.

4.03.01(C) "Urban" areas within the Ukiah Valley: Calpella, the Forks, North State, and Talmage

There are four distinct areas in the General Plan that define where new urban-scale land uses may be sited. These are (1) the City of Ukiah; (2) the Ukiah Sphere of Influence;[8] (3) the Rural Communities (Calpella, The Forks, Talmage) and the North State Complex; (4) Master Plan Areas.[9]

The City of Ukiah is the central city to the Ukiah Valley — and much of Mendocino and Lake counties — serving as a regional center of employment, shopping, and housing. As a full service City, Ukiah is able to provide services to urban development in a fiscally responsible manner.

The Ukiah Sphere of Influence represents an area that may be the ultimate City limits during the life of the General Plan (a twenty year period). Virtually all portions of the proposed Sphere are located within range of city services. With the potential for annexation, the Sphere of Influence is a likely area in which urban land uses may be sited.

Within the unincorporated Planning Area there are three Rural Communities — Calpella, Talmage, and The Forks. *Calpella* is a community developed around a lumber mill which is now closed. The

[7]Mendocino County Board of Supervisors, *Mendocino County General Plan Housing Element* (Ukiah: Mendocino County, April 26, 1993), Table 10.2-5, page I-61. The data in the Unincorporated Ukiah area includes lands outside of the General Plan Planning Area.

[8]The Sphere of Influence referred to in the General Plan is based on the Sphere of Influence proposed by the Plan and not the current adopted Sphere. The final boundaries of the Sphere are subject to adoption by the Mendocino County Local Agency Formation Commission.

[9]The *Lovers Lane Specific Plan Area,* which is an type of Master Plan Area is within the City's Sphere of Influence.

community has a mix of all densities and character of residential uses, commercial, and industrial land uses. Calpella is recognized as an area in which future community land uses may be sited. *The Forks* is a former train station at the forks of the Russian River branches. The area is a central commercial and industrial community that connects rural residential communities north and east of the Russian River branches with the main highway and the City of Ukiah. *Talmage* also has a mixture of residential densities, limited commercial uses, and agriculturally-related industries. It also has a private religious institution, the City of Ten Thousand Buddhists. Talmage has served as an agrarian center, and community belief is that this role should continue, and intense commercial or non-agriculturally related industrial uses should not be proposed in this area.

The *North State Complex* is not a Rural Community of residential, commercial, and industrial uses. Rather, it is a central point of business and commerce for portions of the unincorporated County. The area has long been developed with heavy industrial uses, such as the Masonite Mill and the Louisiana Pacific Mill. The intent of the North State Complex is to become an exclusive commercial and industrial area.

Master Plan Areas are a new classification in the Ukiah Valley. Master Plan Areas are intended to cover lands proposed for "specific plans," "area plans," or as "planned unit developments.[10] A *Specific Plan* is called out in California law as an adopted plan that provides precise development standards and policies for an area of land. State law specifies what must be included in a Specific Plan. . Sometimes a private developer, the City, or County would prefer to have a less precise development proposal to be considered for adoption. The role of the Master Plan Area is to permit an area within the Ukiah Valley to be designated for more precise, site specific studies prior to approving subdivisions or other uses. This is to be called a "Master Plan Area." A Master Plan area permits the following:

- Amending the General Plan to show an area of one or more ownerships as a location for which a separate planning document has been prepared.
- Preparing an area plan for the Master Plan Area that will identify land use and other development and environmental policies applicable to the defined area.
- Master Plans need not address all elements of the General Plan, but only those elements and policies applicable to the area. However, General Plan policies not addressed in the Master Plan still apply to the Master Plan area.
- Master Plans must be consistent with the General Plan.
- The Master Plan Area land use classification is to be applied to the parcels contained within a Master Plan or a Specific Plan at the time of adoption by the City or County. If the General Plan is undergoing an update or revision, and a Master Plan or Specific Plan is being prepared, the revised or updated General Plan may show the subject property as a Master Plan Area.

4.03.02 General Plan goals, policies, and implementing programs

Goal LU-3: Protect agricultural lands from urban encroachment.

Policy LU-3.1: Retain agricultural lands as areas in which urban land uses shall be precluded.

[10]While the General Plan was being prepared, a Specific Plan proposal is pending for the Lovers Lane area north of the City.

Implementation Measure LU-3.1(a): The Land Use Map shall depict locations for urban land uses such as the City of Ukiah, the City of Ukiah Sphere of Influence, the Rural Communities, and the North State Complex. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Commissions]

Implementation Measure LU-3.1(b): Densities for new parcels within the Agricultural land use classification on the Land Use map shall be limited to one dwelling per forty or more acres. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Department of Planning and County Department of Planning and Building]

Implementation Measure LU-3.1(c): Densities for new parcels within the Rural Residential land use classification on the Land Use map shall be limited to one dwelling unit per one or more acres. At a minimum, the density shall be based on the siting criteria identified in the Plan, Population Density and Building Intensity. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Department of Planning and County Department of Planning and Building]

Implementation Measure LU-3.1(d): Densities for new parcels within the Remote Residential land use classification on the Land Use map shall be limited to one dwelling unit per forty or more acres. At a minimum, and depending on the slope of the parcel, the density shall be based on the siting criteria identified in the Plan and on Table VI, VI.4, 4–44, 44, Population Density and Building Intensity. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Department of Planning and County Department of Planning and Building]

Implementation Measure LU-3.1(e): Densities for new parcels within the Range and Resource Land use classification shall be limited to one dwelling unit per one hundred and sixty or more acres. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Department of Planning and County Department of Planning and Building]

Implementation Measure LU-3.1(f): No commercial or industrial land uses shall be permitted outside of the urban areas (the City of Ukiah, the City of Ukiah's Sphere of Influence, the Rural Communities, and the North State Street Complex) of the General Plan, unless defined as agriculturally related. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Commissions]

Implementation Measure LU-3.1(g): No land uses shall be approved for which a finding can be substantiated that the new use will have an unmitigated adverse impact on existing agricultural land uses and businesses. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Commissions]

Goal LU–4: Balance the housing needs of the City and County.

Policy LU–4.1: The City shall respect the County's need to provide an adequate inventory of land to accommodate its fair share of housing for the unincorporated Planning Area.

Implementation Measure LU-4.1(a): As a condition of annexation of residential lands from the County, the City's Housing Element shall be amended to increase the City's housing fair share by the number of needed housing units the County is surrendering. The County's Housing Element shall be amended to reflect the reduction in housing "fair share." [*Timeframe for completion:* Ongoing *Measure applies to:* City ◆ planning period ◆ *Agency/Department responsible:* City Council]

Implementation Measure LU-4.1(b): In reviewing applications for development within the unincorporated County submitted to the City for comment, the City shall give consideration to the County's regional "fair share" housing needs. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City ◆ *Agency/Department responsible:* Planning Department]

Goal LU-5: Generally urban residential land uses shall be located west of the Russian River.

Policy LU-5.1: Locate Low Density, Medium Density, and High Density Residential Land uses predominantly west of the Russian River and near urban areas.

Implementation Measure LU-5.1(a): The following table shall identify where urban residential land use densities may be located within the Ukiah Valley: [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Departments]

Table VI.4-42: Urban Residential Land Use Siting

Classification	Units/Acre	City of Ukiah	Sphere of Influence	Rural Community	Remainder of Planning Area
Rural Residential	1 du/acre or less	✔	✔	✔	✔
Low Density	1-6 du/acre	✔	✔	✔	✔
Medium Density	1-14 du/acre	✔	✔	✔	
High Density	1-28 du/acre	✔	✔	✔	

Goal LU-6: Utilize Master Plan Areas to meet precise planning needs.

Policy LU-6.1: Allow the use of Master Plan Areas to provide for mixed use development, transit-oriented development, and other precise-planning needs for larger ownerships or groups of ownerships.

Implementation Measure LU-6.1(a): Master Plan Areas may be initiated through General Plan Amendments by property owners, the City, or the County as a means of meeting comprehensive planning needs or special and unique circumstances that are best served through a planning document that focuses on a particular area. [*Timeframe*

for completion: Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Departments]

Implementation Measure LU-6.1(b): Master Plan Area policies shall be consistent with the General Plan, although Master Plan Area policies may be more specific and precise than the General Plan, or the policies may address more issues than identified in the General Plan. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Departments]

Implementation Measure LU-6.1(c): Policies within the General Plan that are not specifically addressed in a Master Plan shall apply to the Master Plan Area. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Department]

Implementation Measure LU-6.1(d): When a Master Plan is adopted, the General Plan land use map shall be amended to show the area of the Master Plan as the "[Name of Plan] Master Plan Area," with the notation to "refer to the [Name of Plan] Master Plan." Adopting the Master Plan shall be deemed the action that also amends the General Plan land use map. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Department]

Implementation Measure LU-6.1(e): Specific Plans meeting the requirements of California law may be substituted for Master Plans when it is the preferable planning program. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Department]

Implementation Measure LU-6.1(f): Master Plans shall be adopted utilizing the same process as a General Plan amendment. [*Timeframe for completion:* Ongoing planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* Planning Department]

Implementation Measure LU-6.1(g): The area of the Lovers Lane Specific Plan shall be identified on the Land Use Map as the "Lovers Lane Master Plan Area." Any other master plans or specific plans that are in progress shall be identified in the General Plan as the "[Name of Plan] Master Plan Area." [*Timeframe for completion:* Short-term planning period ◆ *Measure applies to:* City and County ◆ *Agency/Department responsible:* City Planning Department, County Department of Planning and Building]

4.04 Resource lands

4.04.01 Agricultural Land Use (AG)

4.04.01(A) Summary of major findings

Purpose: The Agricultural Lands classification applies to lands which are suited for and are used for production of crops, most lands under agricultural preserve contracts, land having present or future potential for agricultural production, and contiguous or intermixed smaller parcels on which non-compatible uses could jeopardize the agricultural use of agricultural lands. Lands within the AG classification are protected from encroachment of incompatible uses by the "Right to Farm" provisions of the Open Space and Conservation Element. Agriculture lands are intended to include both the growing, raising, and harvesting of agricultural produce, fruit, or livestock. In addition, based on performance standards established in the development code, uses related to the production or processing of agricultural products may be permitted or conditionally permitted.

4.04.01(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Single family dwellings, orchards, row crops, irrigated pasture, grazing land, vineyards, Christmas tree farms, farm and ranch labor housing, agriculturally-related industries, wineries, food processing; mineral resource extraction.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the AG land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, Master Plan Areas, and the remainder of the Unincorporated Planning Area.

Access: No requirements for farming, orchards, or ranching. Processing and production may have limitations based on the proposed use and traffic generation.

Access to new structures: New related uses, such as food processing or wineries, may be required to have paved access depending on the type of general traffic, public access, and other issues.

Design review: Exempt for individual single family dwellings, farms, ranches, and orchards. Wineries or processing facilities may be required to be reviewed.

Maximum building intensity: No limitation for farms, ranches, and orchards. Agricultural product processing facilities may have limits through the use permit process.

Maximum residential density: One dwelling unit per forty acres of land area.

Second dwellings: One second dwelling subject to an administrative permit within the unincorporated Planning Area. Labor housing may be permitted with an administrative use permit or conditional use permit review.

Special development issues: Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

Development alternative: Density transfer and cluster development permitted.

4.04.02 Range and Resource Lands (RL)

4.04.02(A) Summary of major findings

Purpose: The Range and Resource Lands (RL) classification applies to lands which are suited for and are appropriately retained for the grazing of livestock, timber production, and mineral extraction and production. The classification includes other lands generally in range use, intermixed smaller parcels and other contiguous lands, the inclusion of which is necessary for the protection and efficient management of range lands. The Range and Resource Lands classification includes lands which have been identified and are classified as mineral resource lands, and lands utilized for commercial timber harvest and reforestation. Range and Resource Lands may also include lands which are appropriate for conservation as natural resources, such as steep hillsides.

4.04.02(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Single family dwellings, agricultural uses, forestry, cottage industries, farm and ranch labor housing, uses determined to be related to and compatible with ranching, conservation, processing, and development of natural resources, recreation, utility installations, mineral resource excavation, extraction, and processing.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the RL land use classification may be located in the City of Ukiah Sphere of Influence, and the remainder of the Unincorporated Planning Area.

Access: No requirements for farming, orchards, or ranching. Processing and production may have limitations based on the proposed use and traffic generation.

Access to new structures: New related uses, such as food processing or wineries, may be required to have paved access depending on the type of general traffic, public access, and other issues.

Design review: Exempt for individual single family dwellings, farms, ranches, and orchards. Wineries or processing facilities may be required to be reviewed.

Maximum building intensity: No limitation for farms, ranches, and orchards. Agricultural product processing facilities may have limits through the use permit process.

Maximum residential density: One dwelling unit per one hundred and sixty acres of land area.

Second dwellings: One second dwelling subject to an administrative permit within the unincorporated Planning Area. Labor housing may be permitted with an administrative use permit or conditional use permit review.

Special development issues: Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

Development alternative: Density transfer and cluster development permitted.

4.04.03 Remote Residential (RMR)

4.04.03(A) Summary of major findings

Purpose: The Remote Residential (RMR) classification applies to lands that might also meet the "Rural Residential" criteria, except that the parcels are on steep slopes or at the top of ridgelines. Generally, RMR parcels do not have direct access to a publicly-maintained paved road.

4.04.03(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Single family residences, agricultural uses, cottage industries, public facilities, conservation and development of natural resources, and recreation, utility installations.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the RMR land use classification may be located in the remainder of the Unincorporated Planning Area.

Access: Paved or gravel, public or private road.

Maximum density: One dwelling per forty to eighty or more acres.

Second dwellings: One second dwelling subject to an administrative permit within the unincorporated Planning Area.

Special development standards: With the exception of density and parcel size, the standards of the RR classification apply.

Development alternative: Density transfer and cluster development permitted.

4.05 Residential Land Use

4.05.01 Density, Density transfer, and second units

4.05.01(A) Density and density transfer.

The General Plan is prepared with each land use identified in terms of density. Density is the amount of land area needed for each dwelling unit. Although this is the reverse of how most people think of zoning — which establishes a *minimum size of a parcel* — density allows for more flexibility. By not establishing a minimum parcel size in the General Plan, the City and County Planning Commissions have more flexibility in developing zoning regulations, site development standards, and an ability to review a project based on site specific considerations.

The following is an example of this flexibility: Assume a subdivider has a ten acre parcel with a General Plan density which allows up to four units per acre. This translates into an ability to create 40 developable lots. Were a minimum parcel size established, in this case ¼ -acre lots, the subdivider would have to create 40 one quarter (0.25) acre parcels. This would allow the subdivider very little flexibility in lot layout and design. If the 10-acre original parcel contained sensitive land areas, such as wetlands, riparian corridors, landslide areas, etc., there would be very little a developer could do to avoid impacting these areas. However, if the General Plan designates a density only, the subdivider can design the subdivision to keep sensitive lands undeveloped and place the forty development sites on smaller parcels. The City and County can make the determination if the project meets General Plan goals. This process is known as a "density transfer;" the density from one portion of the property was transferred to other portions of the same property[11].

If the subdivision were to be approved with the forty units on eight acres with two acres remaining in open space, the City or County would zone the property into the appropriate base zoning district (Rural Residential (RR) or Single Family Residential (R1)) and combine it with a classification which restricts the property from being further subdivided. This General Plan classification is the *Existing Lot Size (X)* designation. The "X" nomenclature will be added to the City and County zoning codes as a "combining"

[11]Density Transfers can also refer to the ability to transfer the development of one parcel to a completely different parcel. This, however, is not the type of density transfer referred to in this section.

or "overlay" district. The "X" serves as a full disclosure to future buyers that the property cannot be further subdivided.

4.05.02 Rural Density (RR) Residential

4.05.02(A) Summary of major findings

Purpose: The RR classification applies to single family residences, residential dwellings on large parcels, and estate residential lands. The RR classification is intended to encourage local small scale food production (farming) in portions of the Planning Area which are not well suited for large scale commercial agriculture as a result of current or potential land uses in the area, slope, soils characteristics, parcel size, or general location. Lands within the RR classification with a density of one unit per ten acres or less are

intended to remain as large parcels unless it is infeasible for surrounding lands to be used for agricultural purposes. One of the objectives for retaining a larger parcel size in the Planning Area, even though a specific parcel may not be suitable for agricultural use, is to ensure that nearby or adjoining agricultural lands are not impacted by residential uses. Through the use of policies related to site characteristics, the RR classification is intended to have multiple densities beginning at one dwelling unit per one acre of gross land area. In extreme cases, up to eighty or more acres may be required.

4.05.02(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable land uses: Single family residences, small scale agriculture, businesses in the home or cottage industries, public facilities, conservation and development of natural resources. Although clustering of dwelling units is permitted, residential dwellings in the RR classification are to be detached single family homes.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the RR land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, Master Plan Areas, and the remainder of the Unincorporated Planning Area, with the exception of the North State Complex.

Access: Within the City, new parcels shall be served by roads with a level of service of A, B, or C.

Within the unincorporated Planning Area, new parcels of less than five acres shall be served by roads with a level of service of A, B, C, or D. New parcels served by roads with levels of service of E, or F shall be five acres or larger.

Access to new structures: Inside City limits, driveways shall be paved; in unincorporated areas, driveways may be gravel or paved.

Design review:[12] Not required, except in hillside areas. Planned Unit Developments and Master Plan areas within the RR land use shall include design standards in the Plan.

Maximum density: One single family dwelling per one acre of gross land area[13], except as follows:

A range of larger parcel sizes based on increasing average parcel slope shall be required on hillsides when the average parcel slope is equal to or greater than the percentage specified in the Hillside Development ordinance enacted to carry out the General Plan. For an interim basis, the percentage shall be 21% or greater;

[12]*Design review* means the public or agency review of the aesthetics of development: building appearance and character, colors, landscaping, location of parking, siting of the structure on its building site, and other issues related to the appearance characteristics of the development.

[13]Within the unincorporated area of the County, parcels within the RR-1 or RR-2 classification may be 40,000 or 80,000 square feet of gross land area respectively.

Within the unincorporated Planning Area, parcel sizes may range from one (1) to eighty (80) or more acres. Within areas with severe slopes or other development constraints, new parcels may be precluded and densities established at one single family dwelling per existing parcel.

On roads with a gravel surface: One single family dwelling per five acres.

Special development issues: Access roads or driveways in hillside areas shall be limited to a grade accessible to City or Fire District equipment and within the City, the access roads or driveways shall be paved.

Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

Density transfer and cluster development permitted, although the City or County may require a one acre minimum parcel size even with clustering.

Geotechnical conditions on specific sites may require larger parcel sizes or constrained building envelopes.

When parcels are in areas that for environmental or other reasons cannot be further subdivided, the *Existing Lot Size (X)* classification is combined with the RR classification. A designation of RR-X means that the property cannot be further subdivided.

4.05.03 Low Density (LDR) Residential

4.05.03(A) Summary of Major Findings

Purpose: The Low Density Residential classification is intended to provide lands for detached or attached single family residences. This designation is the traditional suburban style or City neighborhood style development density. The LR classification is for lands within the City, the Sphere of Influence, Master Plan Areas, and within Rural Communities, or large subdivisions or planned unit developments.

4.05.03(A) General Plan policies identifying standards and **requirements for the implementing program for this zone**

Examples of allowable uses: Single family dwellings, in the County the LR classification includes mobile home parks within the maximum permitted density, businesses in the home or cottage industries; public facilities; places of public assembly.

Siting issues for new parcels or new construction:

Siting issues for new parcels or new construction:

Location: Parcels to be included in the LR land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, Master Plan Areas, and fronting North State Street between The Forks and Calpella Rural Communities.

Access: New parcels may be located on roads classified as County Rural Collector, Major Collector, Minor Collector, Residential, or on North State Street between The Forks and Calpella Rural Communities, with a level of service of A, B, or C, and on roads with a Level of Service D in the unincorporated Planning Area.

Access to new structures: Paved surface required for densities higher than one dwelling unit per acre.

Design review: Not required. Planned Unit Developments and Master Plan areas within the LR land use shall include design standards in the Plan.

Maximum density:[14] One to six dwelling units per one acre of gross land area with public water and public sewer; one dwelling unit per 12,000 square feet of gross land area with public water or public sewer; one dwelling unit per one acre of gross land area with well and septic system. On roads with a Level of Service of C and D in the City only, E, or F, the maximum density is one unit per five acres of gross land area.

Special development issues: New dwelling units in the LR classification may be attached or detached single family units. When parcels are in areas that for environmental or other reasons cannot be further subdivided, the *Existing Lot Size (X)* classification is combined with the LR classification. A designation of LR-X means that the property cannot be further subdivided.

Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

Density transfer and cluster development permitted.

4.05.04 Medium Density (MDR) Residential

4.05.04(A) Summary of Major Findings

Purpose: Medium Density Residential lands are intended to provide land area for a range of densities and a variety of housing types and ownerships, including townhomes, multiple family residential development, mobile home parks, and more urban-scale density development. Lands classified for MR densities shall be located within the incorporated City, Ukiah Sphere of Influence, Master Plan areas, or Rural Communities. MR lands are intended to be located in proximity to parks, schools, and public services.

[14]/In the AG, RMR, RL, LR, and the Medium and High Density Residential classifications, density is used as the standard for number of units per acre rather than parcel size to allow flexibility in development design. The size of parcel is an issue reviewed as a part of the overall project design related to its specific site. The maximum density within the classification cannot be exceeded.

4.05.04(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Single family dwellings, duplex or triplex units, apartments, townhomes, planned unit development, mobile homes parks, places of assembly, public facilities, businesses in the home that generate minimal onsite customer traffic. Three or more units on a single parcel are considered "multiple family residential," even if the units are detached.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the MR land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, and Master Plan Areas.

Access to new structures: Paved surface required.

Design review: Required; individual single family homes constructed on individual parcels and not as part of a planned unit development or Master Plan Area are exempt.

Maximum density: One to fourteen dwelling units per one acre of gross land area with public water and public sewer; one dwelling unit per 12,000 square feet of gross land area with public water or public sewer; one dwelling unit per one acre of gross land area with well and septic.

Second dwellings: Not applicable. Two single family dwellings or a duplex are permitted uses.

Special development issues: Landscaping and onsite open space or recreation areas are required for projects when design review is required. On roads with a level of service of E or F, the maximum density is one dwelling unit per existing parcel. Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas. Density transfer and cluster development permitted.

4.05.05 High Density (HDR) Residential

4.05.05(A) Summary of Major Findings

Purpose: High Density (HR) Residential lands are intended to be used to site apartment or townhome projects to meet the diverse needs of the population in terms of mixed types and affordability of housing. The HR classification is permitted within the incorporated City, the Sphere of Influence, and in the Rural Communities of Calpella, The Forks. The HR classification is also permitted as a part of a planned unit development or Master Plan Area. The HR classification is also intended to provide opportunities for limited neighborhood-directed commercial development that is designed to serve the needs of a residential area.

4.05.05(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Single family dwellings, duplex or triplex units, apartments, townhomes, planned unit development, mobile homes parks, places of assembly, public facilities, businesses in the home that do not generate or require onsite customer traffic in order to succeed. Conditional uses may include neighborhood-directed commercial uses in high density residential neighborhoods — a convenience store, video rental, laundromat, hair stylist, or similar types of uses that are sized and intended to serve the needs of the immediate neighborhood area are appropriate uses. Three or more units on a single parcel are considered "multiple family residential," even if the units are detached.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the HR land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, Master Plan Areas.

Access: New parcels may be located on roads classified as Arterial, Major Collector, Minor Collector, or County Rural Collector with a level of service of A, B, C, or D.

Access to new structures: Paved access required.

Design review: Required; individual single family residences on an existing single family parcel, unless part of a planned development or other project where design review is required, are exempt.

Maximum density: One to twenty-eight dwelling units per one acre of gross land area with public sewer and public water; one dwelling unit per 12,000 square feet of gross land area with public water or public sewer; one dwelling unit per one acre with well and septic.

Second dwellings: Not applicable. Two single family dwellings or a duplex are permitted uses.

Special development issues: Landscaping and onsite open space or recreation areas are required if design review is required. On roads with a level of service of E or F, the maximum density is one dwelling unit per existing parcel. Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas. Density transfer and cluster development permitted.

4.06 Economic development land uses

4.06.01 Commercial ©

4.06.01(A) Summary of major findings

Purpose: The Commercial © classification applies to lands appropriate for a variety of commercial uses. Lands classified Commercial shall sited be within the City of Ukiah, Ukiah Sphere of Influence, Master Plan Areas, or Rural Communities. Commercial lands shall be served by the publicly-maintained roads classified as Arterial, County Rural Collector, or Major Collector and in locations where future growth is anticipated. Commercial lands identify those areas of the General Plan where commerce and business may occur. Commercial uses may be managed and more precisely defined through the assignment

of individual zoning districts. This ensures land use compatibility reflecting site specific conditions and requirements.

4.06.01(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Primary uses include retail, service businesses, general commercial, shopping centers, shopping malls, public facilities, places of public assembly, parking lots, and residential uses.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the C land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, North State Complex, and Master Plan Areas.

Zoning discretion: The City and County have the discretion to control the building intensity through the use of different zoning districts within the "C" classification. The City and County may specify zones that manage land uses on the basis of compatibility with adjoining land use or zoning. These controls may include limits to the types of uses — such as offices, "light" commercial, medical offices, or convenience services — that are less impactive on the neighboring land uses, particularly as the proposal relates to adjoining residential land uses.

Access: Commercial parcels may be located on County Rural Collectors, Arterial or Major Collector roads with a level of service of A, B, C, or D.

Access to new structures: Paved surface required.

Design review: Required; single family residential dwellings on existing parcels are exempt from design review, except that at the time of conversion to a non-single family residential use, the property is subject to design review prior to the issuance of any permits, including business licenses.

Maximum building intensity: With the exception of the Downtown Master Plan area when off-site parking is provided through a parking district, the maximum lot coverage shall be forty percent of the gross land area. Residential densities are up to twenty-eight dwelling units per acre provided that both public water and public sewer are available.

Public facilities: Connection to public water supply and public sewage disposal (where available) are required for new commercial development. If public water or public sewer are not available, new commercial development shall comply with the requirements of the Division of Environmental Health.

Second dwellings: Not applicable.

Special development issues: Landscaping and onsite parking required when design review is required. Exterior lighting shall be shielded from glare onto off-site properties. Conformance to noise standards required. Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

4.06.02 Industrial (I)

4.06.02(A) Summary of Major Findings

Purpose: Industrial lands are intended to identify those areas of the General Plan where manufacturing and major employment uses may occur. The Industrial classification applies to lands suited for industrial uses where public facilities and services (transportation systems, utilities, fire protection, water, and sewage disposal) exist or can be efficiently provided. Industrial uses may be sited where there can be the least impact to proximate uses and where the potential for environmental disruption is minimal or can be adequately controlled. Industrial uses may be managed through individual zoning districts to ensure a level of land use compatibility that reflects site specific conditions and requirements. New Industrial lands are intended to be located in the City limits, the Sphere of Influence, Master Plan Areas, or within the Calpella or The Forks Rural Communities or the North State Complex. Industrial uses are not permitted in the Talmage Rural Community. The Pinoleville Rancheria is a mixture of lands owned by the Pomo Indians and some private parcels. The County has long allowed a unique mixture of industrial uses on small parcels as well as property owner residences. Within the Pinoleville Rancheria, single family residences are allowed on lands designated as "I." Otherwise no residential uses, other than a caretaker, are permitted within the I classification.

4.06.02(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Primary uses: Processing and manufacturing, public facilities, places of assembly, fabrication and assembly, business centers, business parks, office parks, mixed commercial, office, and industrial sites. Limited live-work uses shall also be permitted.

Siting issues for new parcels or new construction:

Location: Parcels to be included in the I land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas—except Talmage, North State Complex, and Master Plan Areas.

Zoning discretion: The City and County have the discretion to control the building intensity through the use of different zoning districts within the "C" classification. The City and County may specify zones that manage land uses on the basis of compatibility with adjoining land use or zoning. These controls may include limits to the types of uses — such as offices, "light" commercial, medical offices, or convenience services — that are less impactive on the neighboring land uses, particularly as the proposal relates to adjoining residential land uses.

Access: Industrial parcels may be located on County Rural Collectors, Arterial or newly constructed or improved Major Collector roads with a level of service of A, B, C, or D.

Access to new structures: Paved surface required.

Design review: Required.

Maximum building intensity: Maximum lot coverage shall be sixty percent of the gross land area.

Public facilities: Connection to public water supply and public sewage disposal are required for new development in the City. Industrial uses in the unincorporated area may be exempt from water or sewer connection if approved by the Division of Environmental Health.

Second dwellings: Not permitted.

Special development issues: Lands classified as I shall be located within the incorporated City, Ukiah Sphere of Influence, Master Plan Areas, the Rural Communities of Calpella or The Forks, or the North State Complex. Landscaping and onsite parking required. Exterior lighting shall be shielded to prevent glare on off-site properties. Other than a single mobile home for a caretaker, no residential uses are permitted in the I classification. In the Pinoleville Rancheria one single family unit is permitted and a second unit is permitted upon review and approval of an administrative permit. Conformance to noise standards required. Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

4.06.03 North State Complex

4.06.03(A) Summary of major findings

Purpose: The North State Complex identifies a fixed area that serves the long-term commercial and industrial development needs outside of the City. The Complex is not a land use classification, but an area into which commercial and industrial ("C" and "I") land uses may be placed. This area has long been developed with heavy industrial uses, including Masonite Hardboard and Louisiana Pacific. There are also a variety of community facilities and services, places of employment, and limited retail shopping. Although there are some residences and mobile home parks within the area, residential uses are not compatible with the density and intensity of commercial and industrial development in the area. Except for caretakers at industrial sites, new residential uses shall not be permitted, administrative, or conditional land uses regardless of the zoning district applied to a parcel.

4.06.03(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Primary uses: Industrial — Processing and manufacturing, public facilities, places of assembly, fabrication and assembly, business centers, business parks, office parks, mixed commercial, office, and industrial sites. Commercial — retail, service businesses, general commercial, shopping centers, shopping malls, public facilities, places of public assembly, parking lots, and residential uses.

Siting issues for new parcels or new construction:

Location: Along North State Street from US 101 to the south boundary of The Forks Rural Community Area.

Access: Industrial and commercial parcels may be located on County Rural Collectors, Arterial or newly constructed or improved Major Collector roads with a level of service of A, B, C, or D.

Access to new structures: Paved surface required.

Design review: Required.

Maximum building intensity: Per the "C" or "I" classification requirements.

Public facilities: Industrial uses in the unincorporated area may be exempt from water or sewer connection if approved by the Division of Environmental Health.

Residential uses: Not permitted in the "I" classification. A single caretaker's unit in a mobile home may be allowed with an administrative use permit from the County.

Second dwellings: Not permitted.

4.06.04 Rural Community (RC)

4.06.04(A) Summary of major findings

Purpose: The Rural Community (RC) classification applies to Calpella, The Forks, and Talmage. This classification is directed to the unincorporated communities within the Planning Area. Calpella, The Forks, and Talmage provide a variety of community facilities and services, places of employment, and limited retail shopping. The RC classification used in the General Plan allows flexible and diverse land uses within the communities in order to provide a centralized area that serves its businesses and residents. A Rural Community serves as compact urban-style development. Land uses may be assigned through specific zoning in conformance with Table IV-4. There are exceptions to the general siting provisions: In Talmage, industrial uses are not permitted in order to maintain its agrarian nature.

The Forks Rural Community is intended to be an area where higher density residential and commercial uses can be located. Rather than threaten the long-term economic viability of commercial and industrial uses in the North State Complex, The Forks RC is intended to focus on a mixture of residential, commercial, and industrial uses. One of the industrial uses in The Forks is the Parnum Construction materials yard. This long-established land use is the primary industry in The Forks. New residential development needs to be sited and site designed to protect the industrial uses in the area.

Talmage was built in response to the construction of a State Mental hospital in the area in 1892. The State hospital was a huge, self sustaining complex, including a dairy, garden, houses for workers, staff, and patients. All of the buildings which were built in the late 1800's related directly to the hospital. The hospital complex currently serves as the City of Ten Thousand Buddhas Center. The Rural Community classification is used to maintain the town's existing character encouraging in-fill of undeveloped lots. Commercial is intended to be limited to uses that serve the area or are needed as to support agribusiness in the Valley. Industrial uses are not otherwise allowed. The community is not a growth area in the

Valley. This means that the General Plan does not intend for new urban growth to expand from Ukiah across the river towards Talmage or to expand the General Plan-defined Rural Community boundaries.

4.06.04(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses:[15] Single family dwellings, duplex, triplex, multi-family, apartments, mobile home parks, commercial, home occupations, cottage industries, industrial, public facilities, public services, public assemblies, utility installations.

Siting issues for new parcels or new construction:

Location: As designated on the General Plan land use map as "Rural Community." No Industrial uses are permitted in Talmage.

Access: New parcels may be located on any classification of road.

Access to new structures: Paved surface required.

[15]With the exception that industrial uses are not permitted in the Talmage Rural Community.

Table VI.4–43: Land Use/Zoning Criteria in Rural Communities‡

Public facilities and road classifications	IND	COML	Residential Density HIGH	MED	LOW	PUB
Roads and Highways: Functional Service Classifications						
Major or minor arterial	●†	●	●	●	✖	●
Rural collector	■†	●	●	●	■	●
Residential (paved)	✖	✖	●	●	●	●
Residential (unpaved)	✖	✖	✖	■	■	●
Public Facilities and Services: Sewage disposal and water supply						
Public/community water and sewer	●†	●	●	●	●	●
Public/community water or septic	■	●	■	■	●	●
Individual well and septic	■	■	✖	■	●	●

● = Generally acceptable land use • ■ = Conditionally acceptable • ✖ = Not acceptable
†Industrial uses are not permitted in the Talmage Rural Community

‡Within Rural Communities, selection of precise zoning districts is a discretionary action. This table identifies the minimum siting criteria necessary for a class of zone (industrial, commercial, multi-family, single family) to be considered. Other criteria — including wetlands, flood plain, availability of public facilities and services —may also affect the approval of a specific zone on a specific parcel.

Design review: Required for all uses except single family homes on individual parcels.

Maximum building intensity: Maximum lot coverage for commercial uses shall be forty percent and industrial uses shall be thirty percent of the gross land area.

Maximum density: Within water and sewer districts - One to twenty-eight dwelling units per acre; Within water or sewer districts — one unit per twelve thousand square feet; Not in a water or sewer district — one dwelling per acre.

Selection of land use classification for zoning purposes: The following table shows the minimum siting criteria that are used in judging the appropriate zoning district for a parcel of land within a Rural Community. No industrial uses are permitted in Talmage.

Public facilities: Connection to public water supply and public sewage disposal are required when available; for new commercial development. Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

Second dwellings: Permitted subject to discretionary approval and review of an administrative permit by the County on parcels within single family residential zoning districts only and within the County's RC zoning district.

Special development issues: Landscaping and onsite parking required except for individual single family homes on individual parcels that are not a part of a planned development or other subdivision requiring design review.

Exterior lighting shall be shielded to prevent glare on off-site properties. Other than a single mobile home for a caretaker, no residential uses are permitted in Industrial zones.

Conformance to noise standards required for commercial and industrial uses.

Fire safety standards per the requirements of the responsible fire protection agency shall be satisfied within both incorporated and unincorporated areas.

Density transfer and cluster development are permitted.

4.07 Recreation and public land uses

4.07.01 Recreation land uses (REC)

4.07.01(A) Summary of major findings

Purpose: The Recreation land use is intended to identify recreation facilities with generally unrestricted access. REC lands apply to public parks and recreation facilities, quasi-public recreation facilities within residential development, and private parks or recreation facilities such as campgrounds or private golf courses.

4.07.01(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Campgrounds, parks, baseball fields, soccer fields, BMX tracks, RV parks, golf courses, country club facilities.

Siting issues: Parks may be located in either residential or commercial areas. Site size or proximity to noise sensitive land uses are based on the proposed use of the REC lands. New developments around an existing park (or planned within a proposed development) should provide convenient bicycle and pedestrian paths within the development that provide easy and convenient access to area parks.

Location: Parcels to be included in the REC land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, Master Plan Areas, and the remainder of the Unincorporated Planning Area.

Second dwellings: Permitted subject to an administrative or conditional use permit in the unincorporated Planning Area.

Application requirements: Independent facilities on REC land uses are to be subject to the conditional use permit process. Parks or common area facilities within a planned project are to be considered as a part of the overall project approval.

4.07.02 Public (P)

4.07.02(A) Summary of major findings

Purpose: Public land uses include identification of lands owned by public agencies — the City, County, School, and special districts, and quasi-public utilities such as Pacific Gas & Electric and Pacific Bell. Public land uses identify facilities that are unlikely during the life of the Plan to be considered surplus property because of the extent or nature of the existing facility. The P classification is the equivalent of the County's Public Lands and Public Services classification.

4.07.02(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Public utility facilities, utility installations, school facilities, administrative and medical facilities, civic uses, cemeteries, conservation and natural resource conservation areas.

Siting criteria: Based on project-specific requirements.

Location: Parcels to be included in the P land use classification may be located in the City of Ukiah, City of Ukiah Sphere of Influence, Rural Community areas, Master Plan Areas, and the remainder of the Unincorporated Planning Area.

4.07.03 Open Space (OS)

4.07.03(A) Summary of major findings

Purpose: The Open Space classification is intended to be applied as a combining classification with one of the base land use classifications (Residential, Commercial, Industrial, or Resource and Agriculture) to lands not suited for development or to land most valuable in its undeveloped state. Factors limiting the development of land would include such constraints as unstable soils, high fire hazard, remote location, poor access, or susceptibility to flooding. Valuable natural areas could include rare and endangered species and habitat, wildlife corridors, riparian vegetation zones, or wild and scenic rivers. The OS classification is the equivalent of the County's Open Space classification.

4.07.03(B) General Plan policies identifying standards and requirements for the implementing program for this zone

Examples of allowable uses: Single family dwellings, agriculture, conservation and development of natural resources, mineral extraction, recreation, essential utility installations.

Application requirements: One single family dwelling per parcel where compatible with the purpose of the Open Space classification. A conditional use permit is required in the unincorporated Planning Area. All other uses except for agriculture require a conditional use permit.

State law requires general plans to establish standards of population density and building intensity. Estimates for population in the land use categories are based on an average household of 2.5 persons, except for the High Density Multifamily Residential designation, which is based on an average of 2.1 person per household. If there is a discrepancy between dwelling units per acre and persons per acre, the number of dwelling units per acre shall govern.

Table IV.4-44 Population Density and Building Intensity

Land Use Designations	Maximum Population Density	Maximum Building Intensity
Agricultural Land Use (AG)	0.062 persons per acre	1 dwelling units 40 per acres
Range and Resource Lands (RL)	0.015 persons per acre	1 dwelling units 160 per acres
Remote Residential (RMR)	0.062 persons per acre	1 dwelling units 40 per acres
Rural Density Residential (RR)	2.5 persons per acre	1 dwelling units per acre
Low Density Residential (LDR)	15 persons per acre	6 dwelling units per acre
Medium Density Residential (MDR)	35 persons per acre	14 dwelling units per acre
High Rural Density Residential (HDR)	58.8 persons per acre	28 dwelling units per acre
Commercial (C)	58.8 persons per acre	28 dwelling units per acre FAR 0.4
Industrial (I)	4.2 persons per acre	20 live/work units per acre
Public (P)	n/a	FAR 0.4

Note: This table does not reflect the actual population density or building intensity for existing development, rather it illustrates the maximum potential for vacant and underdeveloped parcels.

RESOLUTION NO. 2019-48

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF UKIAH AMENDING THE LAND USE ELEMENT OF THE UKIAH GENERAL PLAN TO INCORPORATE THE SB 244 ANALYSIS RELATED TO DISADVANTAGED UNINCORPORATED COMMUNITIES

WHEREAS, Government Code Section 65300 requires each legislative body and planning agency to prepare and adopt a comprehensive, long-term general plan for the physical development of the city; and

WHEREAS, the City of Ukiah General Plan was adopted on December 6, 1995; and

WHEREAS, Senate Bill (SB) 244, codified in Government Code Section 65302.10, requires that on or before the next revision of a city or county housing element, and each revision thereafter, a city or county to review and update its general plan, as necessary to address the presence of Disadvantaged Unincorporated Communities, as defined, within its sphere of influence or outside but surrounded by City territory, and would require the updated general plan to include specified information; and

WHEREAS, on September 27, 2019**,** the City of Ukiah completed this analysis, entitled, "City of Ukiah SB 244 Analysis," and made a copy available to the public; and

WHEREAS, the City has prepared an amendment to the Land Use Element of the Ukiah General Plan in compliance with Government Code Section 65302.10 by insertion of the City of Ukiah SB 244 Analysis into the Land Use Element as "Appendix A;" and

WHEREAS, under California Environmental Quality Act (CEQA) Guidelines §15306 and §15183 the proposed General Plan Land Use Element amendment is exempt from environmental review because the proposed amendment consists exclusively of data collection and does not propose amendments to the Land Use Map or land use policies, nor does it propose a change in density, or growth within the City limits or sphere of influence, and it can be seen with certainty that there is not a possibility that the activity may have a significant effect on the environment; and

WHEREAS, the Planning Commission considered the matter on October 9, 2019, and found that the proposed General Plan Amendment supported the purpose of SB 244, and is consistent with the Ukiah General Plan; and

WHEREAS, it is deemed in the interest of orderly development and important to the protection of health, safety, and general welfare of the residents to amend the Ukiah General Plan by incorporating the SB 244 Analysis into the Land Use Element of the General Plan.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ukiah as follows:

The Land Use Element of the Ukiah General Plan is hereby amended to incorporate "City of Ukiah SB 244 Analysis," dated September 27, 2019, as "Appendix A" of the Ukiah General Plan, based on the Findings in Attachment 1.

PASSED AND ADOPTED on this 23rd day of October, 2019, by the following roll call vote:

AYES: Councilmembers Orozco, Brown, Scalmanini, Crane, and Mayor Mulheren
NOES: None
ABSENT: None
ABSTAIN: None

Maureen Mulheren, Mayor

ATTEST:

Pam Mathias, Deputy City Clerk

ATTACHMENT 1

FINDINGS
GENERAL PLAN AMENDMENT #2019-01
AMENDING THE LAND USE ELEMENT OF THE UKIAH GENERAL PLAN TO INCORPORATE AS APPENDIX A THE "CITY OF UKIAH SB 244 ANALYSIS" RELATED TO DISADVANTAGED UNINCORPORATED COMMUNITIES

The following findings are supported by and based upon information contained in the Staff Report, General Plan, other supporting documentation, and the public record:

1. The proposed amendment is deemed to be in the public interest.

2. The proposed General Plan Amendment is consistent and compatible with the General Plan.

3. The potential impacts of the proposed amendment have been assessed and have been determined not to be detrimental to the public health, safety, or welfare.

4. The proposed Amendment has been processed in accordance with the applicable provisions of the California Government Code and the California Environmental Quality Act (CEQA).

DISADVANTAGED UNINCORPORATED COMMUNITIES

INTRODUCTION

Senate Bill 244 (SB 244) requires cities to identify and describe disadvantaged unincorporated communities (DUCs) inside or near its boundaries. The purpose of this legislation is to begin to address the lack of access to basic community infrastructure, such as sidewalks, clean drinking water, and adequate waste processing in unincorporated communities. This lack of investment threatens health and safety, and results in further economic, social, and educational inequality. SB 244 requires cities and counties to include DUCs in long-range planning to produce a more efficient delivery system of services and infrastructure. One of the core aims of SB 244 is to address the complex legal, financial, and political barriers that contribute to regional inequity and infrastructure deficiencies.

This paper is organized into the following sections:

Introduction 1
DUC Identification Methodology 4
Communities Identified 7
Infrastructure Deficiency Analysis 10
Key Terms 33
References 34

Based on the requirements of SB 244, this analysis includes an assessment of infrastructure, covering water, wastewater, storm drainage, and structural fire protection facilities and services; infrastructure needs or deficiencies for each of the identified DUCs; and potential funding mechanisms that could resolve any identified infrastructure deficiencies. SB 244 defines a DUC as a fringe, island, or legacy community that meets the following criteria:

- Contains 10 or more dwelling units in close proximity to one another;
- Is either within a city sphere of influence (SOI), is an island within a city boundary, or is geographically isolated and has existed for more than 50 years; and
- Has a median household income that is 80 percent or less than the statewide median household income (MHI).

SB 244 distinguishes three types of DUCs based on the following definitions:

- "**Island community**" means any inhabited and unincorporated territory that is surrounded or substantially surrounded by one or more cities or by one or more cities and a county boundary or the Pacific Ocean.
- "**Fringe community**" means any inhabited and unincorporated territory that is within a city's sphere of influence.
- "**Legacy community**" means a geographically isolated community that is inhabited and has existed for at least 50 years.

As demonstrated in the following sections, all of the DUCs identified in this analysis match the definition of a fringe community.

Table 1 summarizes the findings from this DUC analysis, which is described in depth in the following sections. As shown in the table, there are no infrastructure deficiencies for water, wastewater, or stormwater drainage in Ukiah DUCs. However, based on information from the Ukiah Valley Fire Authority (UVFA), the identified DUCs have structural fire protection deficiencies due to the water infrastructure for fire connection in these areas: the majority of the fire connections in the identified DUCs are standpipes or wharf hydrants, which do not produce the normal fire flows of a standard hydrant.

TABLE 1
INFRASTRUCTURE IN DISADVANTAGED UNINCORPORATED COMMUNITIES
UKIAH
2019

DUC Identifier	Water*	Wastewater	Stormwater Drainage	Structural Fire Protection
South of the City of Ukiah City Limits				
DUC #1	■	■	■	□
DUC #2	■	■	■	□
DUC #3	■	■	■	□
DUC #4	■	■	■	□
DUC #5	■	■	■	□
North of the City of Ukiah City Limits				
DUC #6	■	■	■	□
DUC #7	■	■	■	□
DUC #8	■	■	■	□
DUC #9	■	■	■	□
DUC #10	■	■	■	□
DUC #11	■	■	■	□

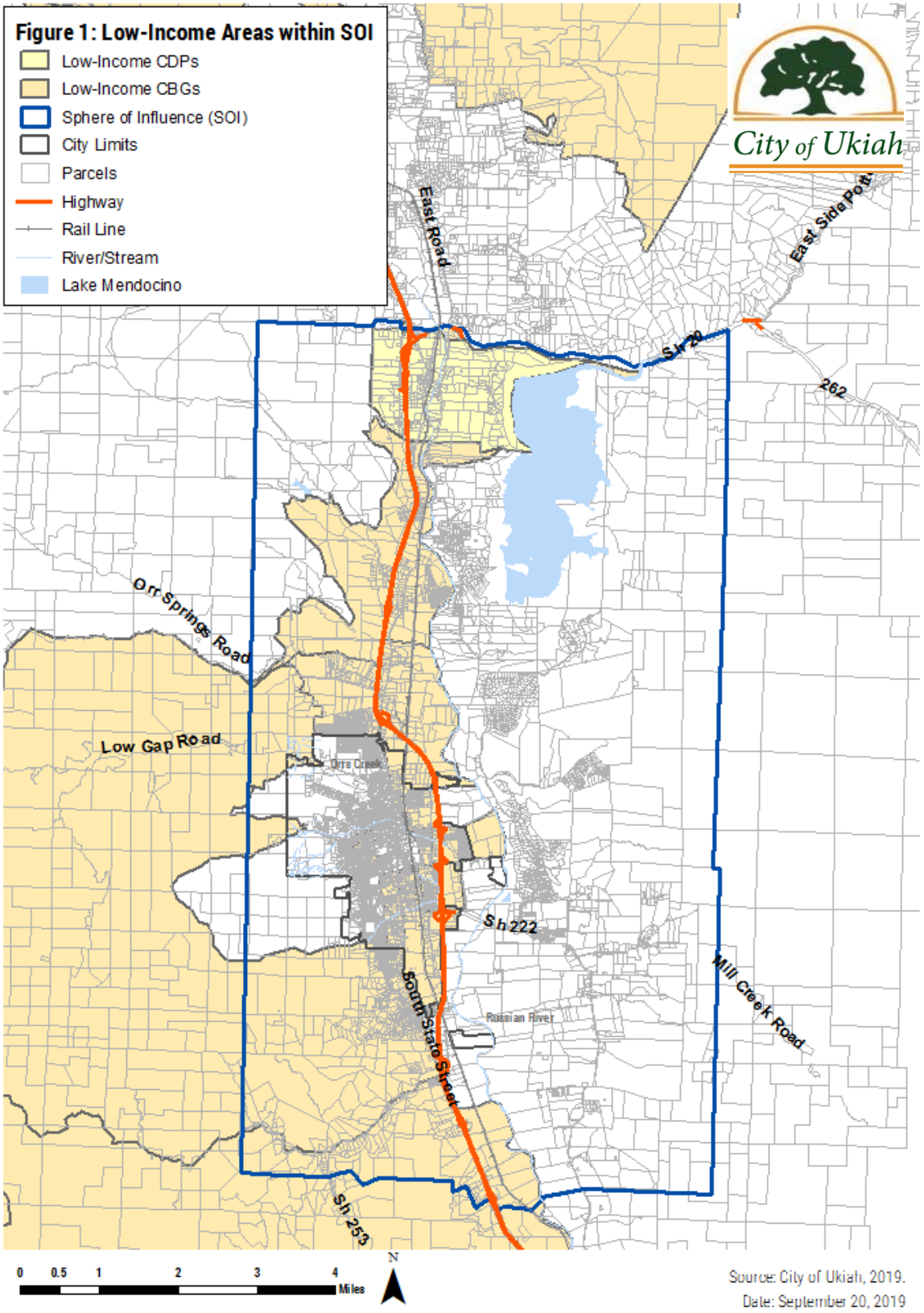
KEY:
■ No Deficiencies
□ Deficient
*Although the most recent data available indicates overall water capacity may be sufficient in these areas, the existing water infrastructure does not provide adequate water access for fire suppression protection in any of the identified DUCs. For this reason, all identified DUCs have fire suppression and safety services deficiencies.

DUC IDENTIFICATION METHODOLOGY

While SB 244 describes the general characteristics of DUCs, it does not provide specific guidance on how to identify them. To assist local governments in addressing the requirements of SB 244, the Governor's Office of Planning and Research (OPR) published a technical advisory memo in February 2013 titled: Senate Bill 244: Land Use, General Plans, and Disadvantaged Communities. The memo recommends data sources for identifying income status and mapping resources for identifying "communities" as defined by SB 244. Based on the guidance provided by OPR, the City identified DUCs in the Ukiah area by following the steps described below.

STEP 1. LOW-INCOME STATUS

- First, the City identified unincorporated areas between the City limits and SOI that had a MHI that was 80 percent or less than the statewide MHI. This was done by looking at Census Block Groups (CBGs) and Census Designated Places (CDPs) that met the low-income threshold using income data from the 2013-2017 American Community Survey (ACS). From 2013-2017, the statewide MHI was $67,169, which set the low-income threshold of 80 percent or less than the statewide average, was $53,735. Figure 1 shows the areas that had MHI at or below $53,735.


Figure 1: Low-Income Areas within SOI
Low-Income CDPs
Low-Income CBGs
Sphere of Influence (SOI)
City Limits
Parcels
Highway
Rail Line
River/Stream
Lake Mendocino
City of Ukiah
East Road
East Side Path
Sh 20
262
Orr Springs Road
Low Gap Road
Orrs Creek
Sh 222
South State Street
Russian River
Mill Creek Road
Sh 253
0 0.5 1 2 3 4 Miles
N
Source: City of Ukiah, 2019.
Date: September 20, 2019

STEP 2. RESIDENTIAL PROXIMITY

- Next, within the areas identified as having a MHI of $53,735 or less, the City identified groupings of dwelling units that were in close proximity to each other and that were also similar in form to the density of residential areas typically located in suburban and urban communities. This was done using satellite imagery from Google Earth to locate areas with more than 10 dwellings in close proximity to each other.

STEP 3. GROUND TRUTHING

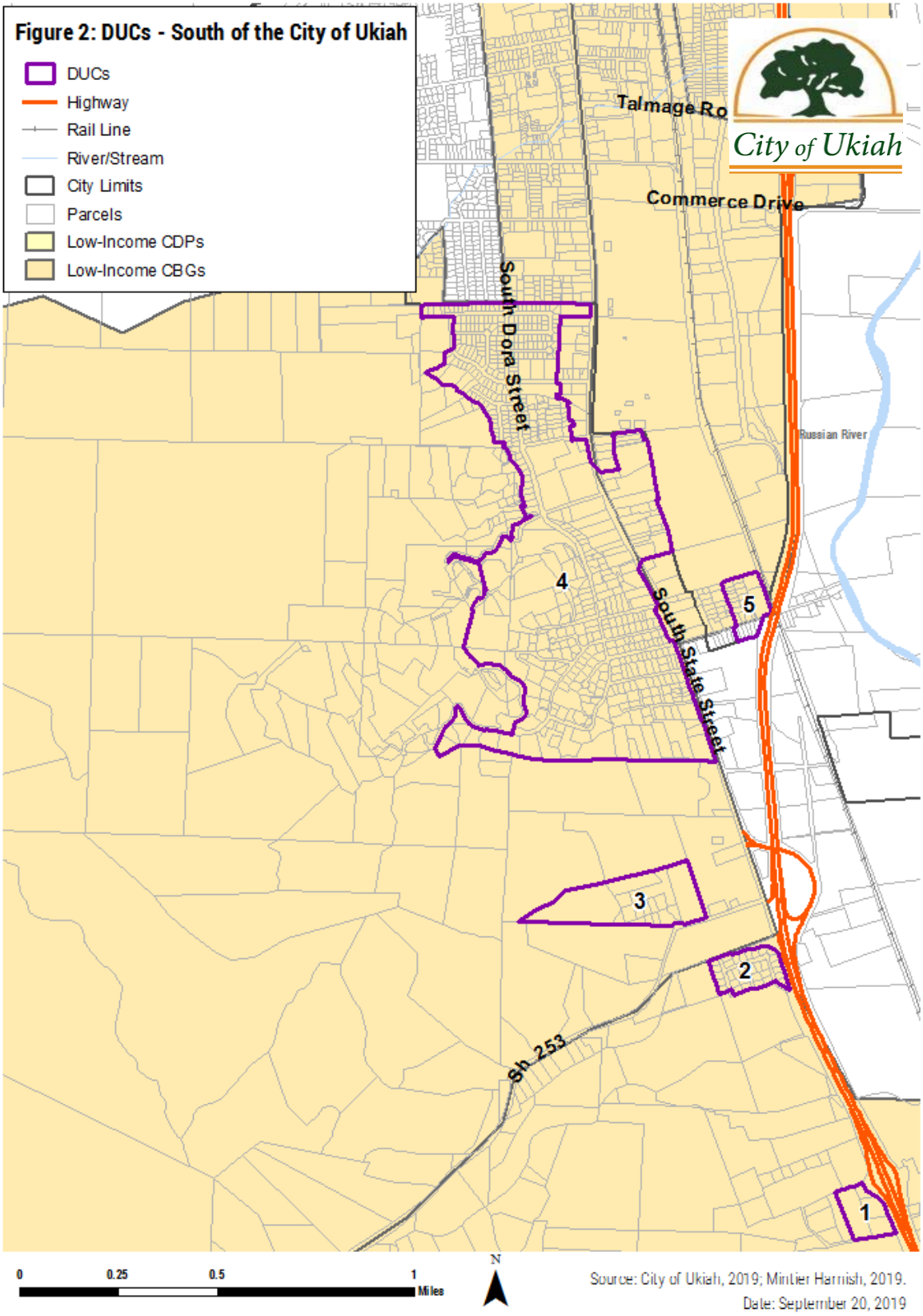
- After identifying potential DUCs based on the thresholds described in SB 244 and the most recent data available, the City reviewed the identified communities to confirm they matched the intent of the SB 244 analysis and that the digital data sources used match current realities. City staff concluded that the 11 DUCs identified through the above process were valid and appropriate as defined under State law.

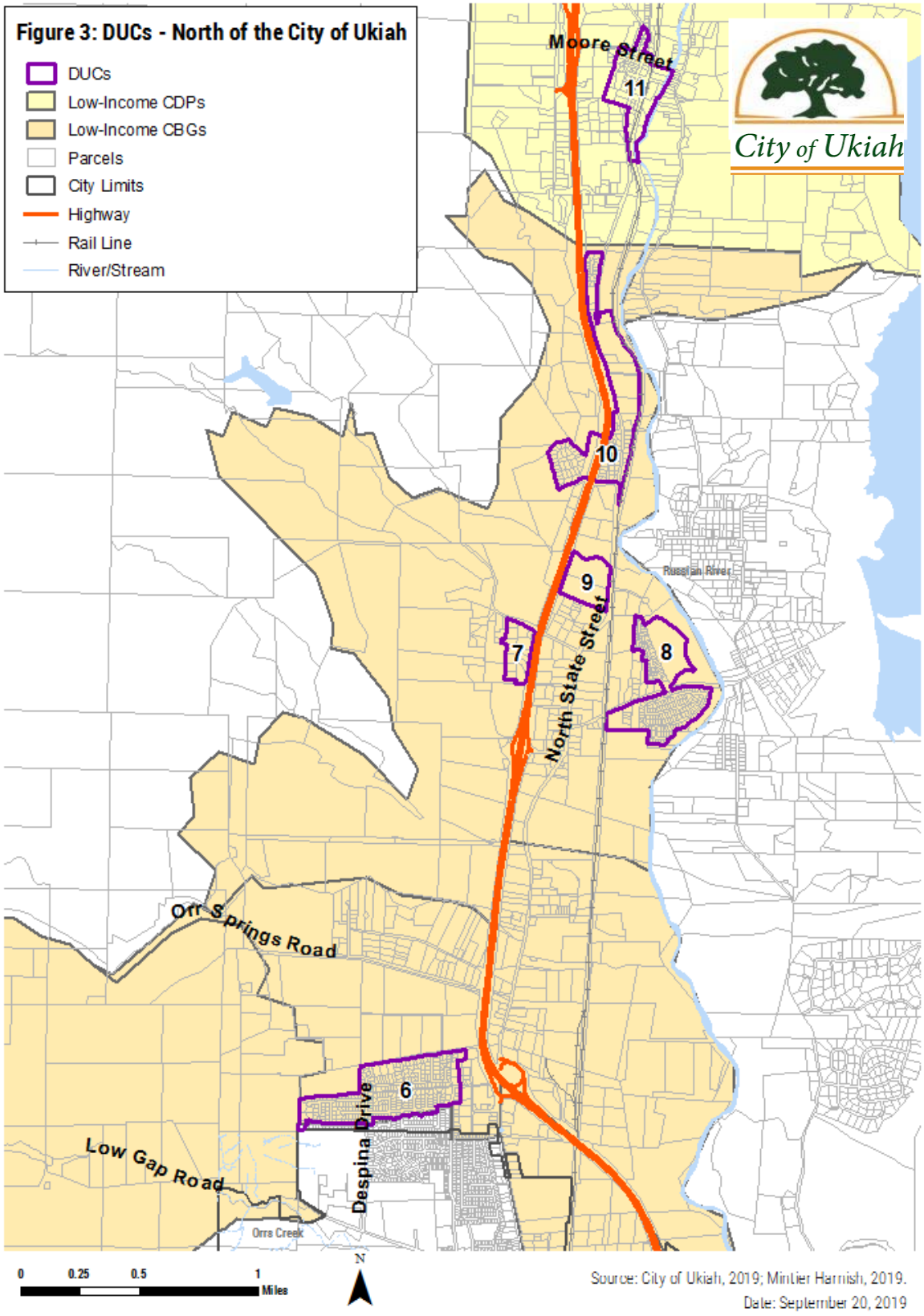
COMMUNITIES IDENTIFIED

The DUCs that the City identified are "Fringe Communities," as defined by SB 244. Table 2 lists the DUCs in the Ukiah SOI by size (in acres), the approximate number of dwelling units for each DUC, and the number of parcels in each community. Figure 2 shows the DUCs that are south of city limits, and Figure 3 shows the DUCs north of city limits.

TABLE 2
IDENTIFIED DISADVANTAGED UNINCORPORATED COMMUNITIES
UKIAH
2019

DUC Identifier	DUC Size (acres)	# of Dwelling Units (approximate)	# of Parcels
South of the City of Ukiah City Limits			
DUC #1	8.4	15	4
DUC #2	8.8	30	32
DUC #3	29.0	15	16
DUC #4	255.0	680	578
DUC #5	8.5	25	26
North of the City of Ukiah City Limits			
DUC #6	66.1	330	295
DUC #7	16.7	25	17
DUC #8	59.7	270	213
DUC #9	22.9	150	2
DUC #10	72.0	200	108
DUC #11	32.7	35	61
TOTAL	**579.8**	**1,775**	**1,352**


Figure 2: DUCs - South of the City of Ukiah
DUCs
Highway
Rail Line
River/Stream
City Limits
Parcels
Low-Income CDPs
Low-Income CBGs
City of Ukiah
Talmage Ro
Commerce Drive
South Dora Street
Russian River
South State Street
4
5
3
2
1
Sh 253
0
0.25
0.5
1
Miles
N
Source: City of Ukiah, 2019; Mintier Harnish, 2019.
Date: September 20, 2019


Figure 3: DUCs - North of the City of Ukiah
DUCs
Low-Income CDPs
Low-Income CBGs
Parcels
City Limits
Highway
Rail Line
River/Stream
Moore Street
11
City of Ukiah
10
9
7
8
North State Street
Russian River
Orr Springs Road
6
Despina Drive
Low Gap Road
Orrs Creek
0
0.25
0.5
1
Miles
N
Source: City of Ukiah, 2019; Mintier Harnish, 2019.
Date: September 20, 2019

INFRASTRUCTURE DEFICIENCY ANALYSIS

SB 244 requires an analysis of infrastructure services for each DUC. This section first provides an overview of service providers in the Ukiah SOI that provide infrastructure facilities or services in the DUCs. The subsequent section describes the services provided by each provider within each DUC consistent with the requirements of SB 244.

OVERVIEW OF SERVICE PROVIDERS WITHIN THE UKIAH SOI

SB 244 calls for "an analysis of water, wastewater, stormwater drainage, and structural fire protection needs or deficiencies" for all identified DUCs. Within the Ukiah SOI, public water and wastewater services are provided by special districts. Where public water and wastewater services are not provided, onsite systems (e.g., private wells and septic systems) are used. Private wells and septic systems were not evaluated in this report. The following is an overview of how services are provided within the DUCs in the Ukiah area.

WATER

Potable water service within DUCs in Ukiah SOI is provided primarily by special districts, although several DUCs are reliant on individual wells. Special districts that provide water services include:

- Calpella County Water District (DUC #11)
- Mendocino County Russian River Flood Control and Water Conservation Improvement District (DUCs #1, #2, #3, #5, #6, #7, #8, #9, #10, and #11)
- Millview County Water District (DUCs #6, #7, #8, #9, and #10)
- Willow County Water District (DUCs #1, #2, #3, and #5, and approximately 95 percent of DUC #4)

A small portion (approximately 5 percent of the total area) of DUC #4 relies on private wells.

WASTEWATER

Wastewater collection and treatment services are provided to DUCs in the Ukiah SOI through a combination of onsite septic systems (both individual septic and community septic systems) and special districts. Special districts that provide wastewater services include:

- Calpella County Water District (DUC #11)
- Millview County Water District (DUC #8)
- Ukiah Valley Sanitation District (DUCs #2, #3, #4, #5, and #6)

DUCs #1 and #7, #9, #10 rely on septic tanks.

STORMWATER DRAINAGE

Nearly half of the Ukiah DUCs are provided with stormwater drainage services by Mendocino County (County). The other DUCs rely on roadside ditches to collect stormwater runoff. Services are provided as the following:

- Mendocino County (DUCs #4, #6, #10, and #11)

- DUCs #1, #2, #3, #5, #7, #8, and #9 rely on roadside ditches.

Structural Fire Protection

Fire protection services within the Ukiah SOI are provided by Ukiah Valley Fire Authority and the Redwood Valley-Calpella Fire District. The Ukiah Valley Fire Authority (UVFA) jointly manages, equips, maintains and operates all-risk fire, emergency medical and rescue services to the City and Fire District. Services are provided as the following:

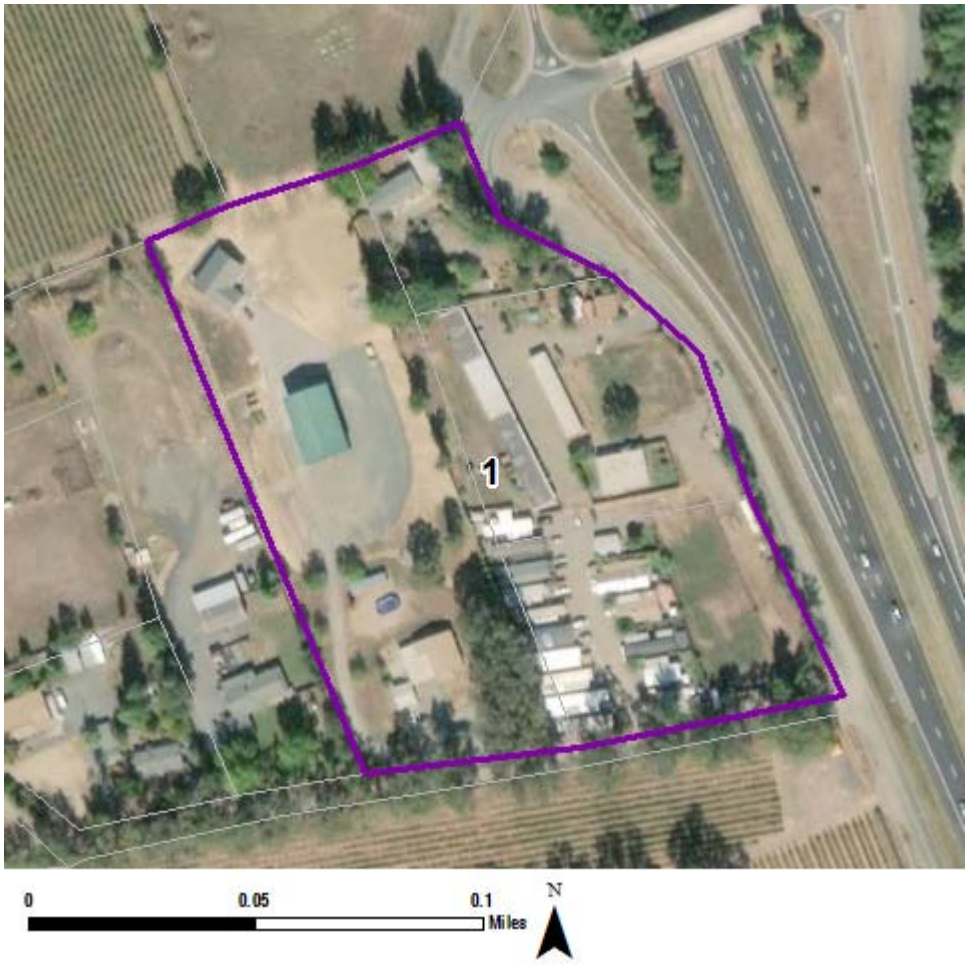
- Redwood Valley-Calpella Fire District (DUC #11)
- Ukiah Valley Fire Authority (DUCs #1, #2, #3, #4, #5, #6, #7, #8, #9, and #10)

DUC SERVICE PROFILES

For each of the 11 identified DUCs in the Ukiah SOI, the City consulted with the Mendocino Local Agency Formation Commission (LAFCo) and researched available data and reports to determine how water, wastewater, stormwater drainage, and structural fire protection services are provided. The Mendocino LAFCo information was derived primarily from published Municipal Service Reviews (MSRs) and SOI update reports. The following are analyses of how each DUC is being served.

DUC #1

DUC #1 is located at the northwest corner of Burke Hill Road and Bisby Avenue, west of Redwood Highway. This area includes 4 parcels totaling approximately 8 acres, with approximately 15 mobile homes. This area is commonly known as Ukiah Mobile Estates.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provide raw water for irrigation and to municipal water purveyors within this area.

The Willow County Water District (WCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the WCWD distributes approximately 1,200 acre-feet of water per year for domestic and landscape and agricultural irrigation uses. Water usage is about 20 percent residential and 80 percent commercial/industrial. The WCWD maintains a storage capacity of 1.348 million gallons in nine storage tanks strategically located throughout the WCWD. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the WCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – There is no community wastewater system in place for this community. Septic tanks are used by residents for wastewater disposal. Because no data has been recently presented suggesting the septic capacity is not sufficient for this community, there appear to be no wastewater deficiencies in this community.

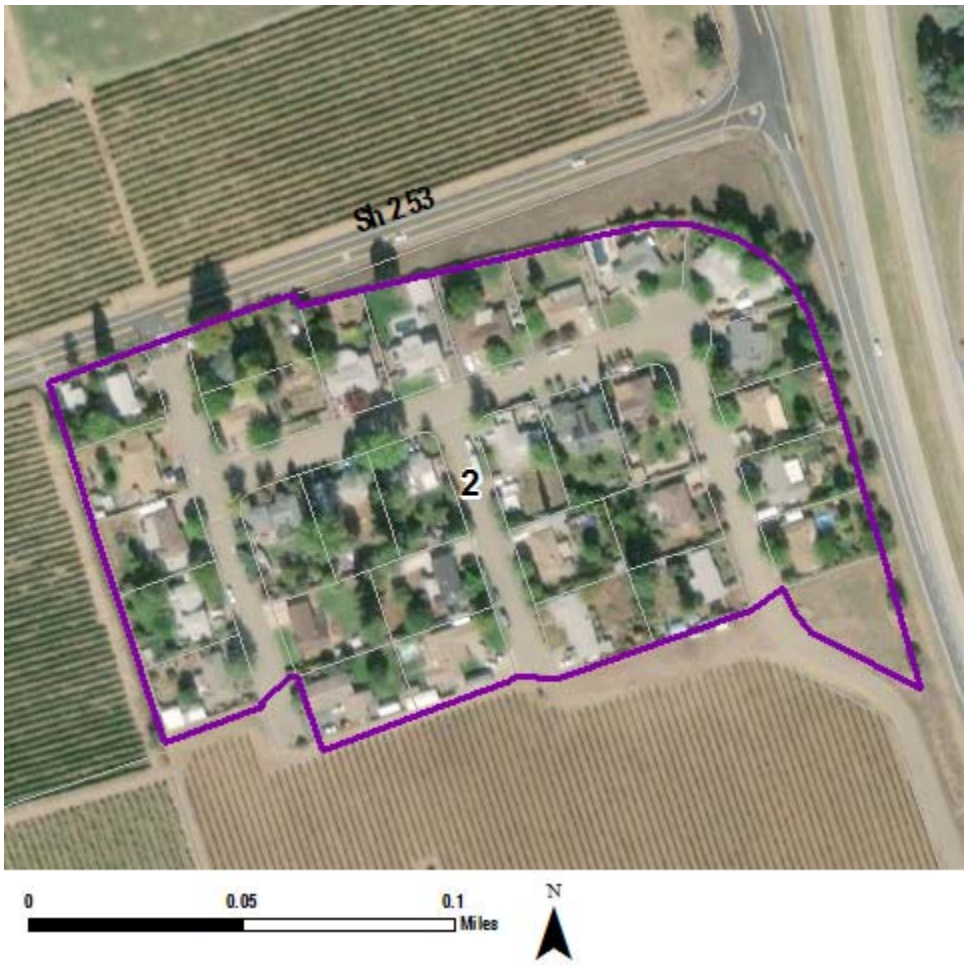
Stormwater Drainage – Storm drainage capture and transport is limited since there is no community storm drain system in place for this community. In lieu of a storm drain system, there are roadside ditches that are used to manage and transport stormwater runoff for the area. The use of roadside ditches have led to less ponding and localized flooding, but during large rain events, localized flooding and ponding may still occur. Based on the availability of stormwater runoff capture and transport through roadside ditches, there appear to be no stormwater drainage deficiencies in this community.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, and tenant changes that are within its service area and require a building permit. UVFA Station 1 (South Station), located at 1500 S. State Street, is the closest station to DUC #1. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season, CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational, can assist UVFA during large fire incidents.

Water infrastructure for fire connections is inadequate in this area (there are no fire hydrants), limiting availability to adequate fire suppression systems. In lieu of an adequate fire suppression system and existing water serving infrastructure, all UVFA fire trucks are required to carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #2

DUC #2 is located at the southwest corner of Boonville Road (Highway 253) and South State Street, west of Redwood Highway. This area includes 32 parcels totaling nearly 9 acres, with approximately 30 single-family homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Willow County Water District (WCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the WCWD distributes approximately 1,200 acre-feet of water per year for domestic and irrigation uses. Water usage is about 20 percent residential and 80 percent commercial/industrial. The WCWD maintains a storage capacity of 1.348 million gallons in nine storage tanks strategically located throughout the WCWD. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the WCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

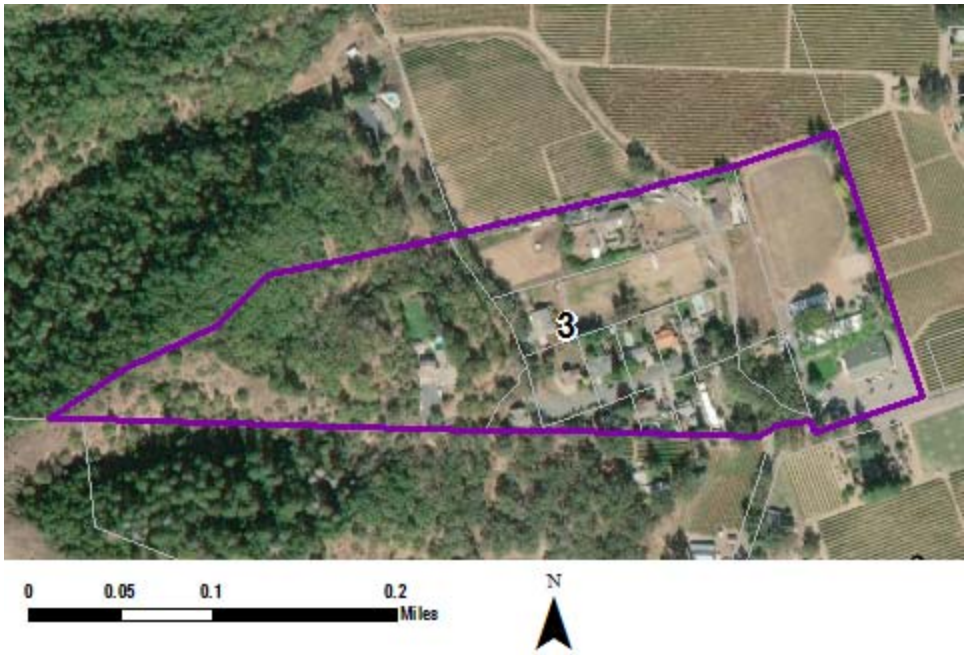
Wastewater – The Ukiah Valley Sanitation District (UVSD) provides wastewater service to this community. The City owns the collection system and a Wastewater Treatment Plant (WWTP), while the UVSD owns the collection system within its jurisdictional boundaries. The UVSD contracts via a Participation Agreement to the City of Ukiah for use of the City-owned WWTP and for maintenance of its collection system. Based on the most recent data available from the Ukiah Valley Sanitation District and Mendocino LAFCo, there do not appear to be wastewater deficiencies in this community.

Stormwater Drainage – Storm drainage capture and transport is limited since there is no community storm drain system in place for this community. In lieu of a storm drain system, there are roadside ditches which are used to manage and transport stormwater runoff for the area. The use of roadside ditches have led to less ponding and localized flooding, but during large rain events, localized flooding and ponding may still occur. Based on the availability of stormwater runoff capture and transport through roadside ditches, there do not appear to be stormwater drainage deficiencies in this community.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 1 (South Station), located at 1500 S. State Street, is the closest station to DUC #2. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #3



DUC #3 is located north of Zaina Lane and South Stipp Lane, west of Redwood Highway, near Stipp Ranch. This area includes 16 parcels totaling approximately 29 acres with approximately 15 homes.

Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Willow County Water District (WCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the WCWD distributes approximately 1,200 acre-feet of water per year for domestic and irrigation uses. Water usage is about 20 percent residential and 80 percent commercial/industrial. The WCWD maintains a storage capacity of 1.348 million gallons in nine storage tanks strategically located throughout the WCWD. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the WCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – The Ukiah Valley Sanitation District (UVSD) provides wastewater service to this community. The City owns the collection system and a Wastewater Treatment Plant (WWTP), while the UVSD owns the collection system within its jurisdictional boundaries. The UVSD contracts via a Participation Agreement to the City of Ukiah for use of the City-owned WWTP and for maintenance of its collection system. Based on the most recent data available from the Ukiah Valley Sanitation District and Mendocino LAFCo, there do not appear to be wastewater deficiencies in this community.

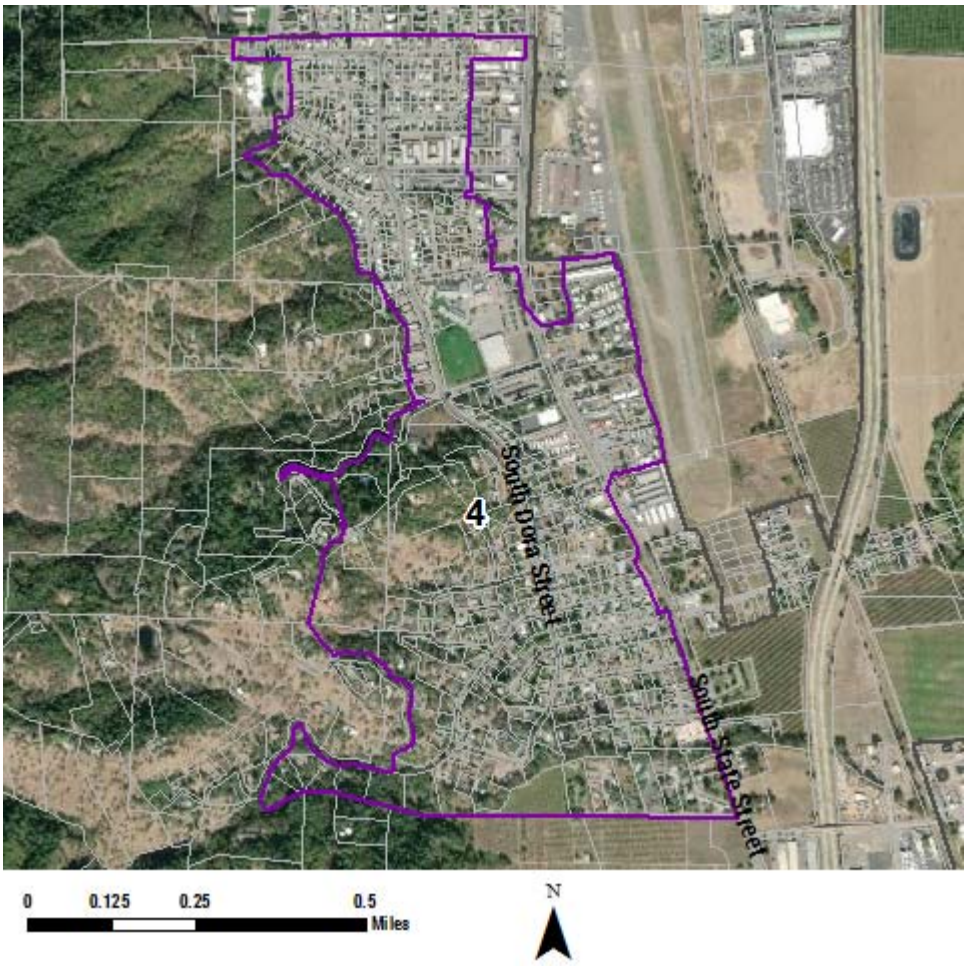
Stormwater Drainage – Storm drainage capture and transport is limited since there is no community storm drain system in place for this community. In lieu of a storm drain system, there are roadside ditches which are used to manage and transport stormwater runoff for the area. The use of roadside ditches have led to less ponding and localized flooding, but during large rain events, localized flooding and ponding may still occur. Based on the availability of stormwater runoff capture and transport through roadside ditches, there do not appear to be stormwater drainage deficiencies in this community.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 1 (South Station), located at 1500 S. State Street, is the closest station to DUC #3. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #4

DUC #4 is located adjacent to the southwestern part of the city limits. This area spans from Jefferson Lane to the north and Gobalet Lane to the south and includes 578 parcels totaling 255 acres with approximately 680 single-family and multifamily (i.e., apartments, townhomes) homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area. DUC #4 is served by both a

water district and private wells. Approximately 95 percent of the area is served by the Willow County Water District (WCWD), while the remaining 5 percent, located on the far southwest point of the community, rely on individual wells.

The Willow County Water District (WCWD) receives water from the RRFC, then treats and distributes the water to most of DUC #4. During a normal year, the WCWD distributes approximately 1,200 acre-feet of water per year for domestic and irrigation uses. Water usage is about 20 percent residential and 80 percent commercial/industrial. The WCWD maintains a storage capacity of 1.348 million gallons in nine storage tanks strategically located throughout the WCWD. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the WCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – The Ukiah Valley Sanitation District provides wastewater service to this community. The City owns the collection system and a Wastewater Treatment Plant (WWTP), while the UVSD owns the collection system within its jurisdictional boundaries. The UVSD contracts via a Participation Agreement to the City of Ukiah for use of the City-owned WWTP and for maintenance of its collection system. Based on the most recent data available from the Ukiah Valley Sanitation District and Mendocino LAFCo, there do not appear to be wastewater deficiencies in this community.

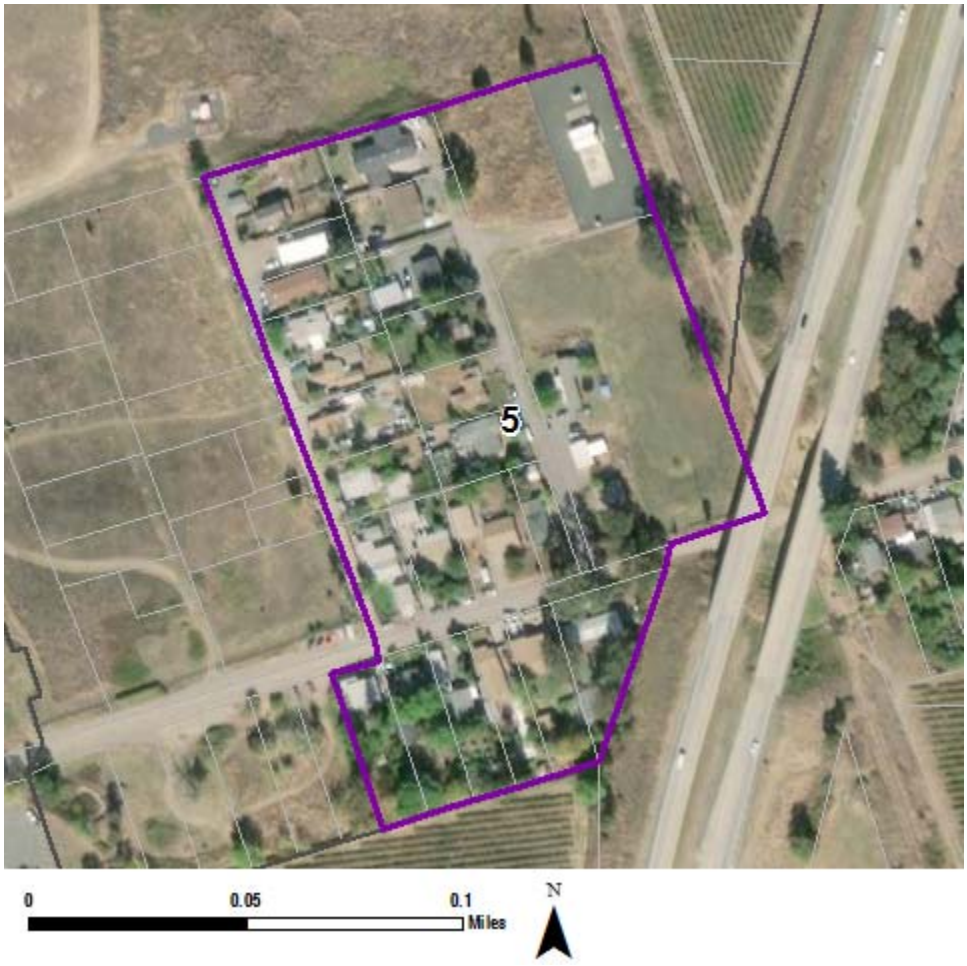
Stormwater Drainage – The County manages a storm drain collection system for this community. Based on data from the most recent MSR, for this area does not appear to have infrastructure deficiencies related to stormwater drainage.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 1 (South Station), located at 1500 S. State Street, is the closest station to DUC #4. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #5

DUC #5 is located adjacent to the southern part of the city limits along Pomo Lane and Townsend Lane to the north of Norgard Lane. This area includes 26 parcels totaling nearly 9 acres with approximately 25 single-family homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Willow County Water District (WCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the WCWD distributes approximately 1,200 acre-feet of water per year for domestic and irrigation uses. Water usage is about 20 percent residential and 80 percent commercial/industrial. The WCWD maintains a storage capacity of 1.348 million gallons in nine storage tanks strategically located throughout the WCWD. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the WCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – The Ukiah Valley Sanitation District provides wastewater service to this community. The City owns the collection system and a Wastewater Treatment Plant (WWTP), while the UVSD owns the collection system within its jurisdictional boundaries. The UVSD contracts via a Participation Agreement to the City of Ukiah for use of the City-owned WWTP and for maintenance of its collection system. Based on the most recent data available from the Ukiah Valley Sanitation District and Mendocino LAFCo, there do not appear to be wastewater deficiencies in this community.

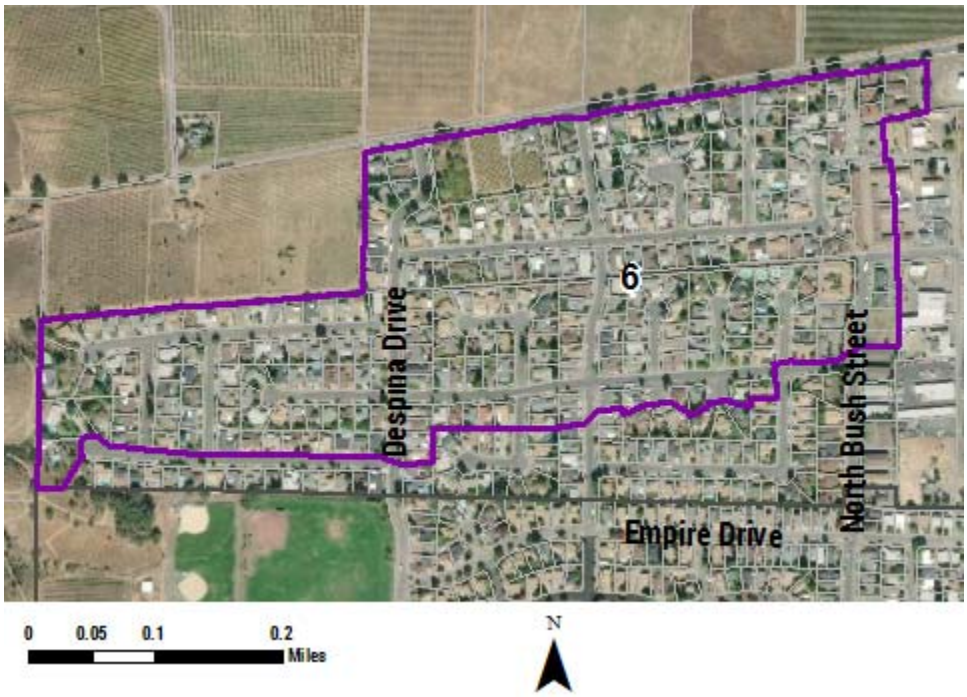
Stormwater Drainage – Storm drainage capture and transport is limited since there is no community storm drain system in place for this community. In lieu of a storm drain system, there are roadside ditches which are used to manage and transport stormwater runoff for the area. The use of roadside ditches have led to less ponding and localized flooding, but during large rain events, localized flooding and ponding may still occur. Based on the availability of stormwater runoff capture and transport through roadside ditches, there do not appear to be stormwater drainage deficiencies in this community.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 1 (South Station), located at 1500 S. State Street, is the closest station to DUC #5. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #6

DUC #6 is located between the northern part of the city limits to Lovers Lane, to the west of Millview Road and Kuki Road. This area includes 295 parcels spanning approximately 66 acres with approximately 330 single-family and multifamily (i.e., apartments) homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Millview County Water District (MCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the MCWD distributes approximately 1,460 acre-feet of water per year. Water usage is approximately 75 percent for residential purposes, while commercial uses account for approximately 15 percent and the remaining 10 percent for industrial and miscellaneous purposes. The MCWD has a storage capacity of 3.24 million gallons. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the MCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – The Ukiah Valley Sanitation District provides wastewater service to this community. The City owns the collection system and a Wastewater Treatment Plant (WWTP), while the UVSD owns the collection system within its jurisdictional boundaries. The UVSD contracts via a Participation Agreement to the City of Ukiah for use of the City-owned WWTP and for maintenance of its collection system. Based on the most recent data available from the Ukiah Valley Sanitation District and Mendocino LAFCo, there do not appear to be wastewater deficiencies in this community.

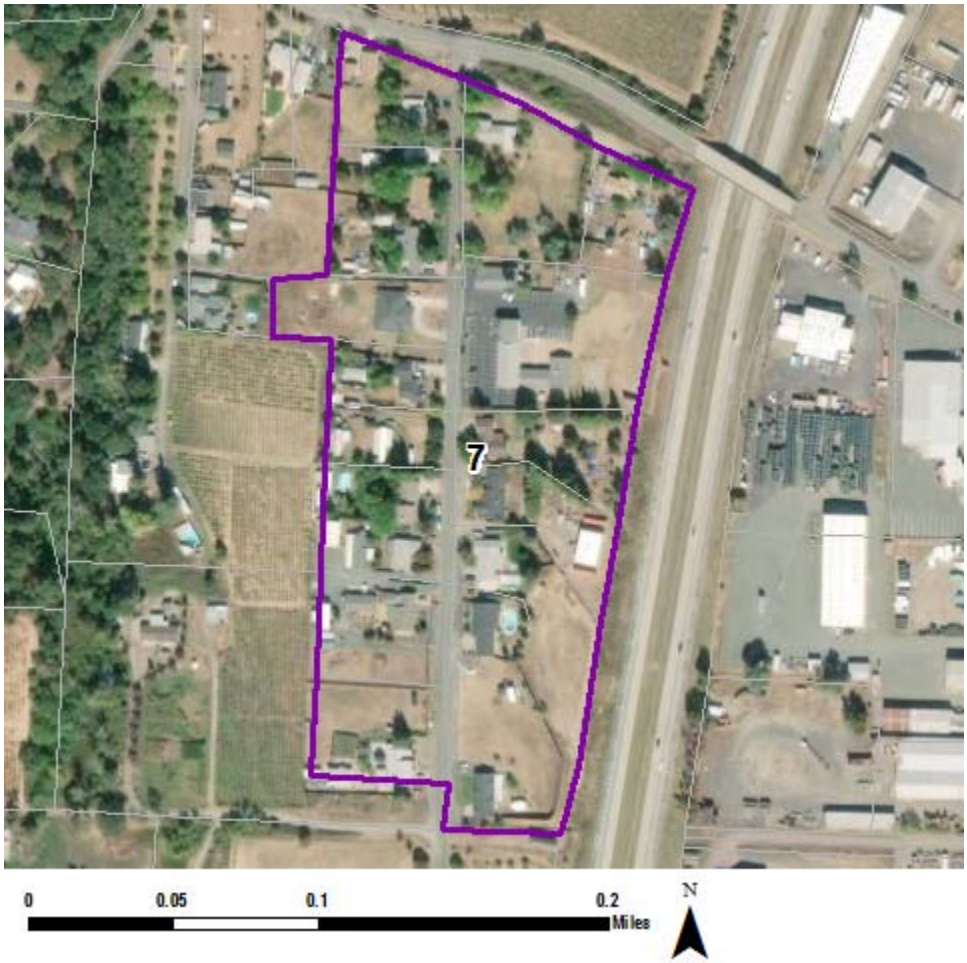
Stormwater Drainage – The County manages a storm drain collection system for this community. Based on data from the most recent MSR, for this area does not appear to have infrastructure deficiencies related to stormwater drainage.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UFVA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UFVA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 2 (North Station), located at 1800 N. State Street, is the closest station to DUC #6. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #7

DUC #7 is located between Parducci Road to the north, Redwood Highway to the east, Ben Road to the south, and Aldo Lane to the west. This area includes 17 parcels spanning nearly 17 acres with approximately 25 single-family homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Millview County Water District (MCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the MCWD distributes approximately 1,460 acre-feet of water per year. Water usage is approximately 75 percent for residential purposes, while commercial uses account for approximately 15 percent and the remaining 10 percent for industrial and miscellaneous purposes. The MCWD has a storage capacity of 3.24 million gallons. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the MCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – There is no community wastewater system in place for this community. Septic tanks are used by residents for wastewater disposal. Because no data has been recently presented suggesting the septic capacity is not sufficient for this community, there appear to be no wastewater deficiencies in this community.

Stormwater Drainage – Storm drainage capture and transport is limited since there is no community storm drain system in place for this community. In lieu of a storm drain system, there are roadside ditches which are used to manage and transport stormwater runoff for the area. The use of roadside ditches have led to less ponding and localized flooding, but during large rain events, localized flooding and ponding may still occur. Based on the availability of

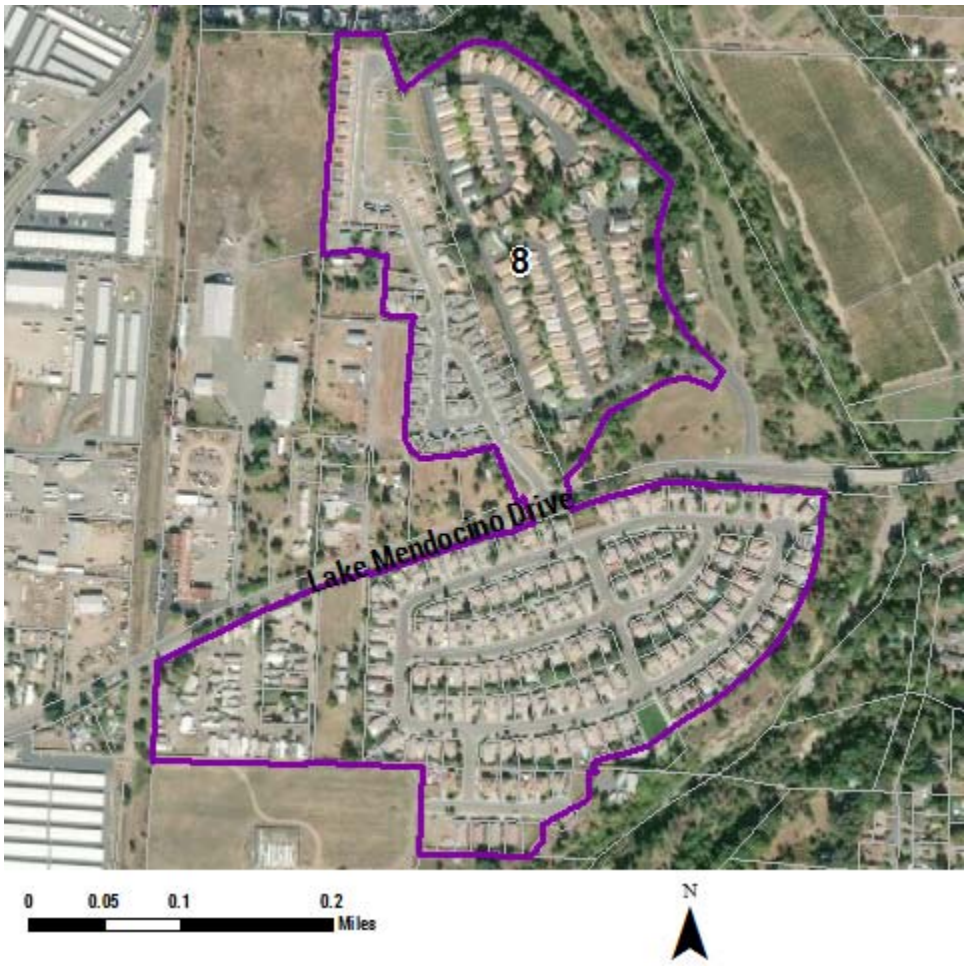
stormwater runoff capture and transport through roadside ditches, there do not appear to be stormwater drainage deficiencies in this community.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 2 (North Station), located at 1800 N. State Street, is the closest station to DUC #7. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #8

DUC #8 is located between Estrella Court and Malaga Court to the north, the Russian River to the east, Riverview Drive to the south, and Redwood Highway to the west. This area includes 213 parcels spanning nearly 60 acres with approximately 270 single-family and mobile homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Millview County Water District (MCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the MCWD distributes approximately 1,460 acre-feet of water per year. Water usage is approximately 75 percent for residential purposes, while commercial uses account for approximately 15 percent and the remaining 10 percent for industrial and miscellaneous purposes. The MCWD has a storage capacity of 3.24 million gallons. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the MCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – There is no community wastewater system in place for this community. Septic tanks are used by residents for wastewater disposal. Because no data has been recently presented suggesting the septic capacity is not sufficient for this community, there appear to be no wastewater deficiencies in this community.

Stormwater Drainage – The County manages a storm drain collection system for this community. Based on data from the most recent MSR, for this area does not appear to have infrastructure deficiencies related to stormwater drainage.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 2 (North Station), located at 1800 N. State Street, is the closest station to DUC #8. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #9

DUC #9 is located between York Creek to the north, N. State Street to the east, 3rd Street to the south, and Redwood Highway to the west. This area covers 2 parcels spanning nearly 23 acres with approximately 150 mobile homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area. The Millview County Water District (MCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the MCWD distributes approximately 1,460 acre-feet of water per year. Water usage is approximately 75 percent for residential purposes, while commercial uses account for approximately 15 percent and the remaining 10 percent for industrial and miscellaneous purposes. The MCWD has a storage capacity of 3.24 million gallons. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the MCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – There is no community wastewater system in place for this community. Septic tanks are used by residents for wastewater disposal. Because no data has been recently presented suggesting the septic capacity is not sufficient for this community, there appear to be no wastewater deficiencies in this community.

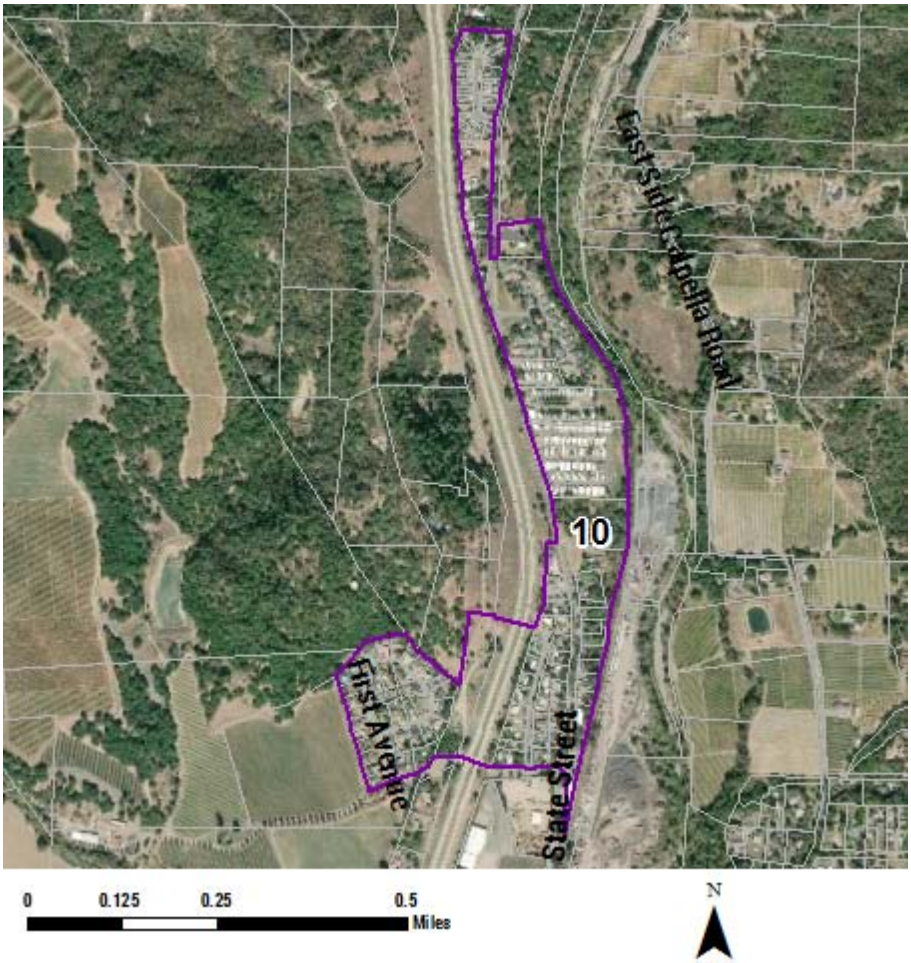
Stormwater Drainage – Storm drainage capture and transport is limited since there is no community storm drain system in place for this community. In lieu of a storm drain system, there are roadside ditches which are used to manage and transport stormwater runoff for the area. The use of roadside ditches have led to less ponding and localized flooding, but during large rain events, localized flooding and ponding may still occur. Based on the availability of

stormwater runoff capture and transport through roadside ditches, there do not appear to be stormwater drainage deficiencies in this community.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 2 (North Station), located at 1800 N. State Street, is the closest station to DUC #9. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #10



DUC #10 includes a community west of Redwood Highway that is around 1st Avenue, and residences along N. State Street to the east of Redwood Highway that span from Agnes Lane to the north, Russian River to the eat, and Pomo Lane to the south. This area covers 108 parcels spanning approximately 72 acres with approximately 200 single- family and mobile homes.

Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Millview County Water District (MCWD) receives water from the RRFC, then treats and distributes the water to this area. During a normal year, the MCWD distributes approximately 1,460 acre-feet of water per year. Water usage is approximately 75 percent for residential purposes, while commercial uses account for approximately 15 percent and the remaining 10 percent for industrial and miscellaneous purposes. The MCWD has a storage capacity of 3.24 million gallons. Based on data contained in the 2013 Ukiah Valley Special Districts MSR, the MCWD would have sufficient capacity to meet anticipated demand- and consequently, it does not appear there are water deficiencies.

Wastewater – There is no community wastewater system in place for this community. Septic tanks are used by residents for wastewater disposal. Because no data has been recently presented suggesting the septic capacity is not sufficient for this community, there appear to be no wastewater deficiencies in this community.

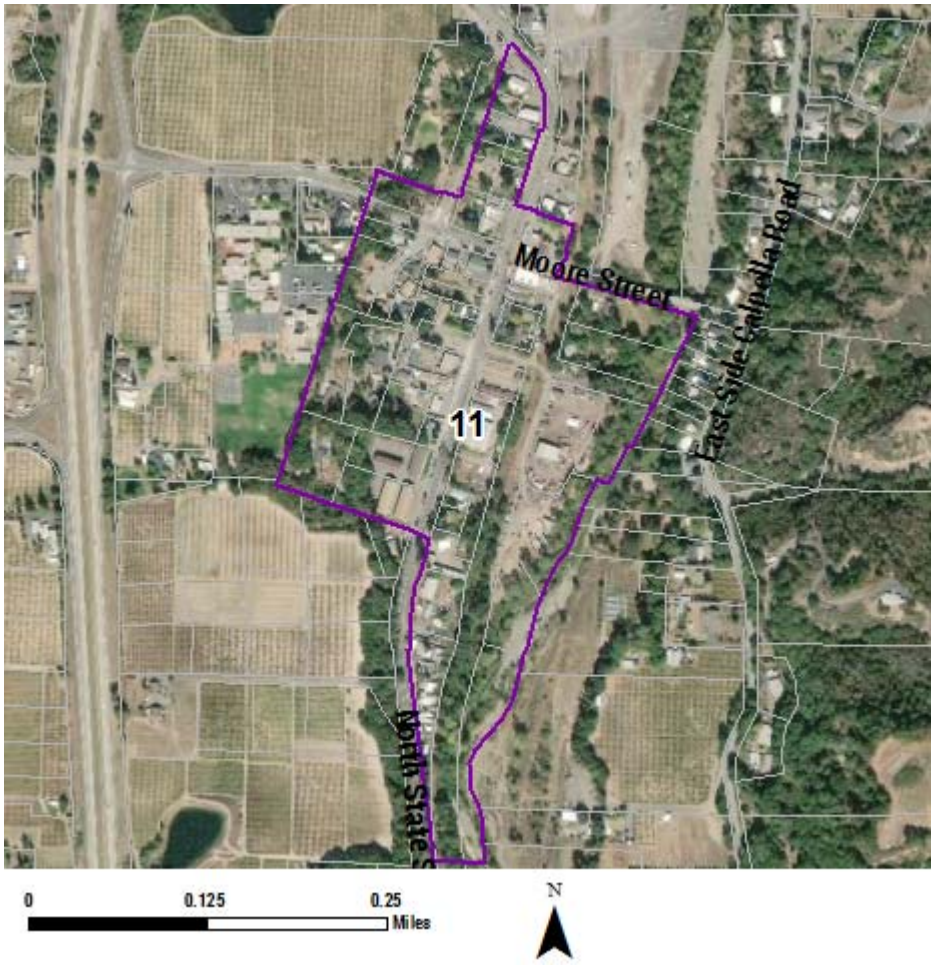
Stormwater Drainage – The County manages a storm drain collection system for this community. Based on data from the most recent MSR, for this area does not appear to have infrastructure deficiencies related to stormwater drainage.

Structural Fire Protection – Fire protection is provided to this community by Ukiah Valley Fire Authority (UVFA). The UVFA provides structural, wildland fire suppression, and emergency medical services. UVFA staff are trained to provide emergency medical service at the Basic Life Support (BLS) level and are the first responders to these types of calls. The UVFA reviews all applications for new commercial construction, multi-unit housing, occupancy changes, or tenant changes that are within its service area and require a building permit. UVFA Station 2 (North Station), located at 1800 N. State Street, is the closest station to DUC #10. This station is staffed full time, 24 hours a day, seven days a week, 365 days a year. During peak fire season CalFire operates CalFire Station Ukiah, part of the Mendocino Unit, located at 2690 N. State Street. This station is not staffed full-time, but when operational can assist UVFA during large fire incidents.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

DUC #11

DUC #11 is the center of Calpella and includes residences along N. State Street that span from the intersection of N. State Street and 3rd Street to the north, Russian River to the east, and portions of Moore Street and Hopkins Street. This area includes 61 parcels spanning nearly 33 acres with approximately 35 single-family homes.



Water – The Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFC) provides raw water for irrigation and to municipal water purveyors within this area.

The Calpella County Water District receives water from the RRFC, then treats and distributes the water to this area. Based on the 2013 Ukiah Valley Special Districts Municipal Service Review (MSR), the water infrastructure capacity is sufficient, but the District overall lacks additional water capacity. The lack of water supply leads to a potential of meeting future demands without purchasing water from other sources. There are no reported changes since the 2013 MSR.

Wastewater –The Calpella County Water District serves over 100 sewer connections and operates a wastewater treatment plant. The capacity of the plant was increased to 80,000 gpd. In 2007, the average daily flow rate was estimated at 32,000 gallons. The CCWD has additional treatment capacity and can accommodate up to 1,000 residents, which is about 300 more than the current population within the CCWD service area. Based on the most recent data available from the CCWD and Mendocino LAFCo, there do not appear to be wastewater deficiencies in this community.

Stormwater Drainage – The County manages a storm drain collection system for this community. Based on data from the most recent MSR, for this area does not appear to have infrastructure deficiencies related to stormwater drainage.

Structural Fire Protection – The Redwood Valley-Calpella Fire District (RVCFD) provides structural fire protection, wildland fire protection, emergency medical services, rescue, hazardous materials response, and fire prevention for Calpella. The District is dispatched by CALFire. RVCFD operates one fire station in Redwood Valley at 8481 East Road in Redwood Valley. Within Calpella and the outlying area, The District relies on its 2,000-gallon water tender, agricultural irrigation ponds, and cisterns constructed by property owners as part of a residential building permit. In 2016, water supply for firefighting in the outlying areas is considered "marginally adequate," especially during time of drought. RVCFD is exploring other means to augment its existing water supplies, either through mutual aid tanker support from other fire agencies; or through acquisition of additional water tenders. The core of capital improvement needs for RVCFD are generally planned in the budget and are underway, which includes a 10-year program to replace its vehicles.

The area has access to fire hydrants. However, the majority of fire connections are standpipes or wharf hydrants, which do not produce the fire flows of a standard hydrant. The fire connections are sufficient for small isolated fires, but for major fires, UVFA must use water tenders. All fire trucks also carry water onboard for fire suppression. Based on these water infrastructure issues, there are fire protection service deficiencies in this community.

POTENTIAL INFRASTRUCTURE FUNDING SOURCES

There are Federal and State programs that could potentially help address existing deficiencies identified in the communities discussed above. Table 3 provides a brief summary of programs that could provide funding to address infrastructure deficiencies in DUCs.

TABLE 3
POTENTIAL INFRASTRUCTURE FUNDING SOURCES

Program Name	Agency	Program Description
Community Development Block Grants (CDBG)	United States Housing and Urban Development Department (HUD)	These grants can fund the construction of projects such as water and sewer facilities, street maintenance, as well as other public work projects.
Community Facilities Direct Loan and Grant Program	United States Department of Agriculture and Rural Development	This program provides funding to develop essential community facilities in rural areas.
Impact Fees	Local Governments	Development Impact Fees can be imposed for new development, in order to acquire funding to construct capital facilities. Applying development impact fees to projects does have substantial limitations under The Mitigation Fee Act, sections 66000.
Taxation	Local Governments and Public Agencies	In 1982 the California State Legislature enacted the Community Facilities Act, commonly referred to as Mello-Roos. This act authorized local jurisdictions to establish community facility districts, which would directly serve as another funding mechanism for financing public work projects, and even public services. This method of revenue generation potentially could be used to finance projects that will make the necessary improvements to the deficiencies in these communities.
Clean Water State Revolving Fund (CWSRF)	The State Water Resources Control Board	CWSRF provides financial assistance for a wide range of water infrastructure projects. It is a partnership between the US EPA and states governments. States have the flexibility to fund a range of projects that address their highest priority water quality needs. Using a combination of federal and state funds, CWSRF provides loans to eligible recipients to construct municipal wastewater facilities and decentralized wastewater treatment systems, among other projects.
Emergency Community Water Assistance Grants	United States Department of Agriculture Rural Development	This program helps eligible communities prepare for, or recover from, an emergency that threatens the availability of safe, reliable drinking water for households and businesses.
Safe Drinking Water State Revolving Fund	California Department of Public Health	The Drinking Water State Revolving Fund (DWRSF) program assists public water systems in financing the cost of drinking water infrastructure projects needed to achieve or maintain compliance with Safe Drinking Water Act (SDWA) requirements.

TABLE 3 POTENTIAL INFRASTRUCTURE FUNDING SOURCES		
Program Name	**Agency**	**Program Description**
Bonds	Local Governments	Bonding is a funding mechanism that can be used specifically to fund large infrastructure projects in disadvantaged communities. There are three bond types: revenue bonds, lease revenue bonds, and obligations bonds. • Revenue bonds are typically ensured by the project that is being constructed. A common revenue bond infrastructure project would be a water treatment facility. Once the bond is paid, the facility operation and ownership is turned over to the jurisdiction. • Lease revenue bonds are secured by either a non-profit or privately financed group, that constructs the infrastructure project, then leases the completed facility back to the jurisdiction, until the costs of the bond have been paid for. Once the bond is paid, the facility operation and ownership is turned over to the jurisdiction. • General obligation bonds are issued for the improvement and enhancement of real property. Local governments have the ability to raise property taxes in order to cover the costs of the bond and infrastructure project. Unlike the previous two types of bonding methods, the general obligation bond, does require voter approval.
Household and Small Water System Drought Assistance Program	State Water Resources Control Board	The State Water Resources Control Board authorized $5 million to assist individual households and small water systems to address drought-related drinking water emergencies. Funding is available as low interest loans and/or grant based on recipient's income and affordability.
Integrated Regional Water Management	California Department of Water Resources	The IRWM Grant Programs include funding for planning, community involvement, implementation, and companion grant programs that support sustainable groundwater planning and water-energy programs and projects.
Proposition 84	State Water Resources Control Board	The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act (Prop 84) provides funding for capital costs on projects addressing excessive stormwater runoff, including projects related to the collection of stormwater, and treatment of water to reduce contamination.
State Water Quality Control Fund: Cleanup and Abatement Account	State Water Resources Control Board	The Cleanup and Abatement Account (CAA) was created to provide public agencies with grants for the cleanup or abatement of pollution when there are no viable responsible parties available to undertake the work. Eligible entities include public agencies, as well as certain not-for-profit organizations and tribal governments that serve a disadvantaged community and that have the authority to clean up or abate the effects of a waste.

KEY TERMS

Community. An inhabited area within a city or county that is comprised of no less than 10 dwelling units adjacent or in close proximity to one another.

Disadvantaged Unincorporated Community (DUC). A fringe, island, or legacy community in which the median household income is 80 percent or less than the statewide median household income.

Island Community. Any inhabited and unincorporated territory that is surrounded or substantially surrounded by one or more cities or by one or more cities and a county boundary or the Pacific Ocean.

Fringe Community. Any inhabited and unincorporated territory that is within a city sphere of influence.

Legacy Community. A geographically isolated community that is inhabited and has existed for at least 50 years.

Local Agency Formation Commission (LAFCo). The commission designated by the State Legislature within each county to provide for the orderly growth and development within said county, including the review and evaluation of proposals for formation of special districts, incorporation of cities, annexation to special districts or cities, consolidation of districts, and merger of districts with cities. Each LAFCo is empowered to approve, disapprove, or conditionally approve such proposals.

Municipal Service Review (MSR). A comprehensive study designed to better inform LAFCo, local agencies, and the community examining the provision of municipal services for the area.

Sphere of Influence (SOI). A plan for the probable physical boundaries and service area of a local agency, as determined by the Local Agency Formation Commission (LAFCo).

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Municipal Service Review and Sphere of Influence Update – FINAL. Adopted May 1, 2017.

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Mendocino County. http://www.co.mendocino.ca.us. September 2019.

Mendocino LAFCo. http://mendolafco.org. September 2019.

Ukiah Valley Sanitation District. www.uvsd.org. September 2019.

DATA

U.S. Census Bureau. 2013-2017 American Community Survey (ACS) data.

Appendix I: Housing Element (2019-2027 Update)

City of Ukiah 2020 Urban Water Management Plan

City of Ukiah



Housing Element Update 2019-2027

Draft completed: July 12, 2019
Adopted: October 23, 2019
Certified by HCD: December 5, 2019

Prepared by:
City of Ukiah Community Development Department
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SECTION 1: INTRODUCTION

A. Purpose

Ukiah is located in southeast central Mendocino County along the Highway 101 corridor and near the east/west intersection of Highway 20, two hours north of the Golden Gate Bridge. Incorporated in 1876, Ukiah is the largest city and county seat in Mendocino County. The City's first General Plan was adopted in 1974, and the City is currently in the process of completing a General Plan Update that will map out the vision for community development through 2040.

The Housing Element, one of the seven State-mandated elements of the General Plan that sets forth the City's plan for housing in the community, was last adopted on June 1, 2016 for the 2014-2019 Planning Cycle. The California Department of Housing and Community Development certified the City's Housing Element later that same year. In accordance with State Housing Element Law, this Housing Element has been updated for the 2019-2027 Planning Cycle. To be responsive to the policy changes at the State level brought about by the 2017 Housing Bills package and to address the local Ukiah community's focus on housing, the Housing Element has undergone substantive changes in format and content. The Element was prepared by the City of Ukiah Community Development Department, with assistance from the State Department of Housing and Community Development.

B. Legal Framework and Statutory Requirements

The 2019-2027 Housing Element represents the City of Ukiah's efforts to fulfill requirements under the State Housing Element Law and responds to Ukiah's housing needs by identifying policies and implementing actions for meeting those needs. State law defines the general topics that Ukiah's Housing Element must cover. Specifically, the element must: (1) document housing related conditions and trends; (2) provide an assessment of housing needs; (3) identify resources, opportunities and constraints to meeting those needs; and (4) establish policies, programs and quantified objectives to address housing needs.

State law establishes requirements for all portions of the General Plan. However, for the Housing Element, the State requirements tend to be more specific and extensive than for other elements. The purpose of a Housing Element is described in Government Code §65583.

> *"The housing element shall consist of an identification and analysis of existing and projected housing needs and a statement of goals, policies, quantified objectives, financial resources, and scheduled programs for the preservation, improvement, and development of housing. The housing element shall identify adequate sites for housing, including rental housing, factory-built housing, mobilehomes, and emergency shelters, and shall make adequate provision for the existing and projected needs of all economic segments of the community."*

While jurisdictions must review and revise all elements of their General Plan on a regular basis to ensure that they remain up to date, State law requires that Housing Elements be reviewed and updated at least every five years. The process of updating Housing Elements is to be initiated by the State through the regional housing needs process, as described later in this document. The regional housing needs process was recently conducted in 2018.

State law is also quite specific in terms of what the Housing Element must contain:

1. “An assessment of housing needs and an inventory of resources and constraints relevant to the meeting of these needs…”

2. “A statement of the community’s goals, quantified objectives, and policies relative to the maintenance, preservation, improvement, and development of housing…”

3. “A program that sets forth a schedule of actions during the planning period, each with a timeline for implementation, that may recognize that certain programs are ongoing, such that there will be beneficial impacts of the programs within the planning period, that the City of Ukiah is undertaking or intends to undertake to implement the policies and achieve the goals and objectives of the housing element through the administration of land use and development controls, the provision of regulatory concessions and incentives, the utilization of appropriate federal and state financing and subsidy programs when available…”

4. The Housing Element must: (1) identify adequate sites with appropriate zoning densities and infrastructure to accommodate the housing needs for groups of all household income levels, including adoption of minimum density and development standards and rezoning of sites; and (2) address and, where appropriate and legally possible, remove governmental and nongovernmental constraints to the maintenance, improvement, and development of housing, including housing for all income levels and housing for persons with disabilities.

5. An assessment of homeless needs and the opportunity for the creation of emergency shelters and transitional/supportive housing. The opportunity must encourage these facilities while providing flexibility for existing local strategies and cooperative efforts.

6. An evaluation of Military Compatibility and whether or not the City of Ukiah meets one of the three criteria that require measures to ensure compatibility.

Per requirements listed in SB 1087, the City of Ukiah will also ensure the adopted Housing Element is provided to water and sewer providers.

C. General Plan Consistency

California Government Code requires internal consistency among the various elements of the General Plan. Ukiah’s General Plan was adopted in 1996, and the Circulation Element was amended in 2004. Upon adoption, the 2019-2027 Housing Element will become part of the City’s General Plan. City Staff has reviewed the goals and polices of other General Plan Elements and have not located any inconsistencies. Therefore, the Ukiah General Plan does not need to be amended based on adoption of the 2019-2027 Housing Element. The City is currently (2019) in the process of preparing a comprehensive update of its General Plan- the 2040 Ukiah General Plan. Adoption of the 2040 General Plan may necessitate revisions to the Housing Element to maintain internal consistency, and the City will maintain this consistency as future General Plan updates are completed.

As housing development projects are proposed and the City undertakes housing activities, the goals and policies of all General Plan Elements are examined to ensure consistency. In the event that a proposed project or housing activity is inconsistent with the General Plan, the

project applicant or City Staff could initiate an amendment to the General Plan to accommodate the project or activity. This process involves internal staff review, CEQA compliance, a public hearing before the Planning Commission, and a public hearing before the City Council.

This Housing Element Update has been guided by the goals and polices of the existing General Plan. The General Plan includes the following Vision Statements:

"We envision development that provides a mix of housing types and prices."

"We envision aesthetically designed, affordable housing, planned to encourage walking, bicycling, and public transit."

D. Public Participation and Community Outreach

Recognizing the importance of engaging the community in a dialogue about housing- defining problems and creating solutions- the City deployed a collaborative public participation approach and extensive outreach effort to help ensure appropriate housing goals and policies were more efficiently and effectively evaluated, developed, and implemented. The following steps were taken to engage community members and housing stakeholders in this process:

1. Release of a Community Housing Satisfaction Survey in December 2017 in advance of the City beginning the update process of the Housing Element. The City received responses from 385 survey participants.

2. Development of a Housing Element webpage on the Projects page of the City's website. The City distributed information and updates on the webpage throughout the development of the Housing Element: https://www.cityofukiah.com/projects/housing-element-update/.

3. Advertising of two community housing workshops, including email notifications and phone calls to a list of nearly 100 local stakeholders of developers, lenders, housing advocacy groups, water and sewer providers, and representatives of local tribes. Both meetings were advertised for at least two weeks prior to the meeting date and also announced during televised City Council meetings prior to the two dates. Announcements were also posted on the City of Ukiah's Facebook page.

4. Presentations and tables/booths at Hispanic community events and meetings, including *Ukiah Vecinos en Acción*, *Latinx*, and the Mexican Consulate.

5. Development of a press release sent to local media outlets. This press release was picked up by the primary local newspaper in the region, *The Ukiah Daily Journal*. A series of news articles was written by *The Ukiah Daily Journal* about the updating of the City's Housing Element, which helped increase public awareness.

6. Posting of flyers announcing the two workshops in both English and Spanish at lower income housing developments across the City.

7. Hosting of two Community Housing Workshops:

Community Housing Workshop #1

The City of Ukiah hosted the first Community Housing Workshop on March 21, 2019, from 5:30 pm to 7:30 pm. Over 100 local stakeholders were invited; approximately 40 people attended. City staff made a presentation describing the Housing Element Update process and State requirements, Regional Housing Needs Allocation, and an overview of the existing (2014-19) Housing Element goals and programs. The existing goals were evaluated with the public's input in mind and goals were revised and added based on this input.

Community Housing Workshop #2



The City of Ukiah hosted a second Community Housing Workshop on April 25, 2019, from 5:30 pm to 7:30 pm. Over 100 stakeholders/residents were again invited, including additional individuals that had been asked to be added to the invitation list; 31 attended. City staff made a presentation of key updated housing and demographic data that had been collected since the first workshop and included a summary of comments received from the first workshop. Attendees participated in exercises to arrive at suggested goals and policies and voted for those policies that were most important to them.

The input received at both workshops is summarized in Appendix A and has been incorporated into the Housing Element where applicable. Also included in Appendix A is a list of stakeholders invited to participate in the Housing Element Update process. Appendix B contains the results of the Community Housing Satisfaction Survey.

SECTION 2: HOUSING NEEDS ASSESSMENT

The City of Ukiah strives to achieve a balanced housing stock that meets the needs of all economic segments of the community. To understand what housing needs exist in Ukiah and what the City can do to address those needs, a review of the existing housing stock and housing market must first be completed. This section of the Housing Element discusses the major components of existing housing needs in the City of Ukiah, including population, employment, household demographics, and housing stock characteristics.

TABLE 2.1
HOUSING NEEDS ASSESSMENT – AT-A-GLANCE

City Area Size	4.72 square miles
Vacant/Underutilized Land	166 acres (2019) (105 acres in 2016, 108 acres in 2009)
Vacant Residential Units (%)	3.0% (2017)
Occupied Housing Units	93.5% (2017)
Persons Per Household	2.61 (2017)
Median Age	34.8
Sex Percentages	Females = 49.9 (7,935) Males = 50.1% (7,982)
Median Income	$43,480 (2017)
Senior Citizens (over age 65)	2,229 (2017)
Children Under 5 Years Old	1125 (7.1%) (2017)
Individuals Below Poverty Level	17% (2017) (20% in 2016)
Total Housing Units	6,336 (2017)
Owner-Occupied Housing Units	2,490 (42%) (2017)
Renter-Occupied Housing Units	3,433 (58%)
Median Single Family Home Rental	$982 (2017) $949 (2016) $928 (2015)
Median Home Sales Price	$357,800 (March 2019)
Extremely Low Income Households	840 (2015)
Mobile Homes	297 (2017)
Homeless Shelter Statistics (2017-2018)	An average daily bed count of 44 adults and 9 children between November and April 2017-2018. 21 people achieved permanent housing during the same time frame.
Free Meals Served at Plowshares and Meals on Wheels	61,017 (342 children) in 2018
People who Speak a Language Other Than English at Home	4,349 (29%)
Average Household Size	2.48 people in 2019 (2.47 in 2010)
Those in the Labor Force	6,708 in 2017 (6,451 in 2016)
Largest Employers	Ukiah Valley Medical Center, County of Mendocino, Costco, Ukiah Unified, Mendocino College
Female Heads of Household	714 in 2017
Unemployment Rate	Ukiah: 7.1% (January 2019) Mendocino County: 5.2% (January 2019) California: 4.2% (January 2019)

Source: *State Department of Finance; Mendocino County Economic/Demographic Profile, CED Chico; Mendocino County Workforce Investment Board Economic Scorecard*

A. Population Characteristics

1. Population Growth

According to the California Department of Finance, population of the City of Ukiah in January 2018 was estimated at 16,226 persons. As shown in Table 2.2, the annual growth rate between 1990 and 2018 (current) averaged approximately 0.3%. Between 2000 and 2010, the City added 545 residents, or 3.7%, to its population. This compares to growth rates of 12.3% for the State of California, 1.3% for Mendocino County, 6.4% for the City of Fort Bragg, and a loss of 1.3% for the City of Lakeport during the 2000-2010 period (see Table 2.3).

TABLE 2.2
POPULATION GROWTH TRENDS (1990-CURRENT)

Year	Population	Change	% Change Over Period	Average Annual Growth Rate
1990	14,599			
2000	15,497	901	6.2%	0.6%
2010	16,042	575	3.7%	0.4%
Current	16,226	151	1.1%	0.1%

Source: California Department of Finance

TABLE 2.3
POPULATION TRENDS COMPARISONS (2000-2010)

Jurisdiction Name	2000	2010	Change (2000-2010)	
			Number	%
Mendocino County	58,407	59,171	764	1.3%
City of Fort Bragg	6,814	7,251	437	6.4%
City of Lakeport	4,820	4,758	-62	-1.3%
State of California	33,873,086	38,041,430	4,168,344	12.3%
City of Ukiah	**15,497**	**16,042**	**545**	**3.5%**

Source: California Department of Finance

Overall, the City of Ukiah's population has increased moderately over the past nearly 30 years, with a more accelerated increase in the last four years (see Table 2.4). Projections from the California State University Chico Center for Economic Development- Mendocino County Economic/Demographic Profile show this trend continuing.

TABLE 2.4
RECENT LOCAL POPULATION TRENDS (2015-2018)

Jurisdiction Name	2015	2018	Change (2015-18)	
			Number	%
Mendocino County	59,598	59,985	387	0.1%
City of Fort Bragg	7,377	7,512	135	1.8%
City of Lakeport	5,097	5,134	37	0.1%
City of Ukiah	**15,785**	**16,226**	**441**	**2.8%**

Source: California Department of Finance

2. Age Characteristics

Census 2010 indicates that Ukiah's population has a median age of 35.9, which is over five years younger than the County at 41.5 (see Table 2.5). Although the median age has increased slightly over the last 10 years, possibly reflecting an aging population, the majority of the population, at 52.9%, are in the age ranges of 15 to 54 years. This compares to 49.9% in Mendocino County.

TABLE 2.5
AGE COMPARISONS (2000-2010)

Age Group	% Ukiah (2000)	% Ukiah (2010)	% Mendocino County (2010)
Under 5 Years	7.0%	7.3%	6.1%
5-14 Years	14.8%	13.3%	12.1%
15-24 Years	14.3%	13.9%	11.9%
25-34 Years	13.9%	14.4%	12.1%
35-44 Years	14.2%	11.6%	11.7%
45-54 Years	13.3%	12.9%	14.2%
55-64 Years	8.3%	12.1%	16.4%
65-74 Years	6.0%	6.5%	8.6%
75 and Over	8.2%	8.0%	6.8%
Median Age	35	35.9	41.5

Source: 2000 and 2010 U.S. Census

3. Gender and Race/Ethnicity

The City of Ukiah has a nearly equal gender distribution, with 48% males and 52% females and similar age distribution of the two sexes. This is similar to the population by gender distribution in Mendocino County.

TABLE 2.6
POPULATION BY GENDER COMPARISON (2010)

	City of Ukiah, California		Mendocino County, California	
Male	7,739	48.1%	43,983	50.1%
Female	8,336	51.9%	43,858	49.9%

Source: 2010 U.S. Census

Between 2000 and 2010, Ukiah became increasingly diverse in its racial and ethnic composition. This trend follows state and national trends. In Ukiah, the White population still constituted substantially more than half of the City residents in 2010, but Census 2010 reported the White population decreased by 7.4% since 2000. The Hispanic population grew 8.4% in the 10-year period, from 19.3% in 2000 to 27.7% in 2010. Of the Hispanic population, 25.3% were of Mexican ethnicity. Over 20% of Ukiah is either some other race or two or more races.

TABLE 2.7
POPULATION DISTRIBUTION BY RACE (2000-2010)

Race	Percent (2000)	Percent (2010)
White	79.5	72.1
Hispanic	19.3	27.7
African American	1.0	1.1
American Indian and Alaska Native	3.8	3.7
Asian	1.7	2.6
Native Hawaiian/Pacific Islander	0.1	0.2
Other	9.7	14.8
Two or More Races	4.3	5.5

Source: 2000 and 2010 U.S. Census

4. Economic Characteristics

Employment has an important impact on housing needs. Incomes associated with different jobs and the number of workers in a household often determines the type and size of housing a household can afford. Typically, employment growth leads to housing demand, while the reverse is true when employment is reduced.

a. Occupations and employment trends

Ukiah benefits from its location on the Highway 101 corridor, near the Highway 20 east/west interchange, and its close proximity (60 miles) to Santa Rosa and the Sonoma County wine region. Ukiah's economy, although modest in size compared to the Bay Area and other denser urban regions to the south, is the employment hub of both the Lake and Mendocino County regions.

Of the U.S. Census Bureau-estimated 6,708 employed Ukiah residents in 2017, the biggest concentrations in employment sectors were in educational, healthcare, and social assistance services (24.5%), arts, entertainment, recreation, and accommodation and food services (13.1%), retail (12.6%), and professional, scientific, management, and administrative and waste management services (8.4%). Although there were some similar concentrations in employment sectors to those of Ukiah, Countywide employment numbers differed with concentrations in professional, scientific, management, and administrative and waste management services (23.1%), wholesale trade (13.6%), educational, healthcare, and social assistance services (10.7%), agriculture, forestry, fishing and hunting, and mining (8.0%), and professional, scientific, management, and administrative and waste management services (8.0%).

The 2007-2009 economic recession coupled with the loss of Redevelopment funding in 2012 produced a negative economic impact from which many small, rural California communities have not recovered. Regardless, the U.S. Census Bureau estimated an 11% employment rate increase in Ukiah, while Mendocino County as a whole experienced a 2.9% decrease. During this period, Ukiah added nearly 700 jobs during this period of otherwise slow economic activity.

Additionally, employment trends show a large concentration of people in educational, food services, and retail trade within Ukiah. These jobs typically offer a lower wage scale, suggesting the need for low, moderate, and "middle-income" housing in Ukiah. Household income

distributions in Table 2.12 confirm this conclusion- over 57% of Ukiah households have annual incomes between $15,000 and $75,000.

b. Unemployment

According to the State Employment Development Department, 7,360 Ukiah residents were in the labor force as of January 2019, with an unemployment rate of 7.1 percent. The unemployment rate in Mendocino County is 5.2 percent.

TABLE 2.8
CHANGE IN EMPLOYMENT COMPARISONS

	Ukiah					Mendocino County				
	2009		2017		2009-2017	2009		2017		2009-2017
	Number	Percent	Number	Percent	Percent Change	Number	Percent	Number	Percent	Percent Change
Civilian employed population 16 years and over	6,037	100%	6,708	100%	11.1%	38,188	100%	37,084	100%	-2.9%
Agriculture, forestry, fishing and hunting, and mining	120	2.0%	352	5.2%	3.2%	2,165	10.3%	2,356	6.4%	-2.3%
Construction	548	9.1%	326	4.9%	-4.2%	3,944	7.9%	2,970	8.0%	-1.3%
Manufacturing	435	7.2%	451	6.7%	-0.5%	3,012	2.9%	2,455	6.6%	-0.5%
Wholesale trade	206	3.4%	158	2.4%	-1.0%	1,090	13.6%	907	2.4%	-0.7%
Retail trade	859	14.2%	843	12.6%	-1.6%	5,198	3.6%	4,785	12.9%	-0.9%
Transportation and warehousing, and utilities	324	5.4%	322	4.8%	-0.6%	1,385	1.4%	997	2.7%	0.4%
Information	53	0.9%	108	1.6%	0.7%	521	4.3%	673	1.8%	-0.4%
Finance and insurance, and real estate and rental and leasing	329	5.4%	278	4.1%	-1.3%	1,643	8.4%	1,456	3.9%	-0.4%
Professional, scientific, and management, and administrative and waste management services	361	6.0%	562	8.4%	2.4%	3,198	20.1%	2,970	8.0%	3%
Educational services, and healthcare and social assistance	1,354	22.4%	1,640	24.5%	3.1%	7,681	10.7%	8,549	23.1%	1.2%
Arts, entertainment, and recreation, and accommodation and food services	658	10.9%	877	13.1%	2.2%	4,093	4.3%	4,423	11.9%	1.3%
Other services, except public administration	297	4.9%	291	4.3%	-0.6%	1,652	6.8%	2,094	5.6%	-0.2%
Public administration	493	8.2%	500	7.5%	-0.7%	2,606	5.7%	2,449	6.6%	0.7%

Source: American Community Survey, Census Bureau Population Estimates Program

B. Household Characteristics

1. Household Size

A city's number of households can increase or decrease even in periods of little to no population growth, because of adult children leaving at home, divorce, economic conditions, and through birth and death within the general population. The average number of persons occupying each household is known as household size and is expressed in terms of the number of persons per household. Typically, the number of persons per household is slightly higher in owner occupied households than in renter households. This trend was true in Ukiah, to a lesser extent than the State, with average number of persons per household at 2.47 in 2000 and 2.48 in 2010 (see Table 2.9).

TABLE 2.9
HOUSEHOLD SIZE BY TENURE

Year	Persons per Household by Tenure					
	City of Ukiah			State of California		
	Homeowner	Renter	Average	Homeowner	Renter	Average
2000	2.46	2.47	2.47	2.93	2.79	2.87
2010	2.52	2.46	2.48	2.95	2.83	2.90

Source: 2000 and 2010 U.S. Census

TABLE 2.10
HOUSEHOLD SIZE COMPARISON (2000-2010)

Household Size	Number (2000)	Number (2010)	Percent (2000)	Percent (2010)
1 Person	1,927	2,064	32.2	33.5
2 Persons	1,805	1,797	30.2	29.2
3 Persons	946	910	15.8	14.8
4 Persons	693	679	11.6	11.0
5 Persons	331	367	5.5	6.0
6 Persons	156	190	2.6	3.1
7 Persons	127	151	2.1	2.5
Totals	5,985	6,158		

Source: 2000 and 2010 U.S. Census

Of the 6,158 households in the City of Ukiah, 3,611 (58.6%) consisted of families, 1,809 (29.4%) consisted of households with children under 18 living at home; and 2,317 (or 37.6%) households being headed by married couples. Of the married couple households, 1,012 (16.4%) had children under the age of 18 living at home.

Overall, there were similar numbers in household size between 2000 and 2010 (see Table 2.10). The number of single-person households increased slightly in 2010, as did the number of 5, 6, and 7 person households. This could be due to the economic recession, with more children living at home in 2010 compared to 2000.

2. Household Income

Household income is an indication of wealth in a community and therefore directly connected to the ability of residents to afford housing. As household income increases, a household is more likely to be a homeowner. As household income decreases, a household is more likely to pay a disproportionate amount of their income for housing or reside in overcrowded or inadequate housing.

For planning and funding purposes, the California Department of Housing and Community Development (HCD) has developed the following income categories based on the Area Median Income (AMI) of a county or metropolitan area (such as Mendocino County):

- Extremely Low Income: households earning up to 30 percent of the AMI
- Very Low Income: households earning between 31 and 50 percent of the AMI
- Low Income: households earning between 51 percent and 80 percent of the AMI
- Moderate Income: households earning between 81 percent and 120 percent of the AMI.
- Above Moderate Income: households earning over 120 percent of the AMI.

TABLE 2.11
2018 STATE INCOME LIMITS

Mendocino County 4-Person Area Median Income: $64,800	Income Category	Number of Persons in Household							
		1	2	3	4	5	6	7	8
	Extremely Low (less than 30%)	13650	16910	21330	27750	30170	34590	39010	42800
	Very Low (31-50%)	22700	25950	29200	32400	35000	37600	40200	42800
	Low (51-80%)	36300	41500	46700	51850	56000	60150	64300	68450
	Median Income	45350	51850	58300	**64800**	70000	75150	80350	85550
	Moderate (81-120%)	54450	62200	70000	77750	83950	90200	96400	102650

Source: California Department of Housing and Community Development, 2019 Income Limits

Combined, the extremely low, very low, and low income groups are referred to as lower income. Units affordable to income groups in these categories are typically referred to as “affordable housing” and often constructed and/or rented with some type of public assistance. Approximately 48 percent of Ukiah households were in the lower income categories, while 52 percent were in the moderate or above income category (see Table 2.12).

TABLE 2.12
HOUSEHOLDS BY INCOME CATEGORY (2011-2015)

Income Category (% of County AMI)	Ukiah		Mendocino County	
	Households	Percent	Households	Percent
Extremely Low (30% or less)	840	8.9%	4,575	13.4%
Very Low (31-50%)	1,105	18.2%	5,050	14.8%
Low (51-80%)	950	15.7%	6,040	17.8%
Moderate or Above (over 80%)	3,165	52.3%	18,380	54.0%
Totals	**6,060**	**100%**	**34,015**	**100%**

Source: U.S. Department of Housing and Urban Development, 2011-15 Comprehensive Housing Affordability Strategy (CHAS)

According to the 2013-17 American Community Survey, nearly 8 percent of Ukiah households had incomes lower than $10,000, while nearly 30 percent had incomes lower than $25,000. Approximately 26 percent of households had incomes between $25,000 and $49,999, and about the same percent had incomes between $50,000 and $99,999. Approximately 18 percent

of households are estimated to have earned $100,000 or more annually in 2013-2017. By comparison, the County's income distribution during this time period was relatively the same, with slightly more households in the income range of $50,000 to $99,999 (see Table 2.13).

TABLE 2.13
HOUSEHOLD INCOME DISTRIBUTION COMPARISON (2017)

	Ukiah		Mendocino County	
	Number	**Percent**	**Number**	**Percent**
Total Households	**5,923**	**100%**	**34,182**	**100%**
Less than $10,000	459	7.7%	2,494	7.3%
$10,000 to $14,999	493	8.3%	2,758	8.1%
$15,000 to $24,999	810	13.7%	4,200	12.3%
$25,000 to $34,999	765	12.9%	4,044	11.8%
$35,000 to $49,999	797	13.5%	4,600	13.5%
$50,000 to $74,999	1,014	17.1%	6,148	18.0%
$75,000 to $99,999	507	8.6%	3,795	11.1%
$100,000 to $149,999	753	12.7%	3,826	11.2%
$150,000 to $199,999	129	2.2%	1,211	3.5%
$200,000 or more	196	3.3%	1,106	3.2%

Source: 2013-2017 American Community Survey, Census Bureau Population Estimates Program

C. Housing Affordability

1. Overpayment (cost burden)

The Department of Housing and Urban Development (HUD) establishes that a household is "cost-burdened," i.e. overpaying for housing, if it spends more than 30 percent of gross income on housing-related costs. For renters, housing-related costs may be the gross rent (contract rent plus utilities), whereas for a homeowner housing-related costs may include mortgage payment, utilities, insurance, and real estate taxes. A "severe housing cost burden" occurs when a household pays more than 50 percent of its income on housing costs. The number of households overpaying for housing is an important indicator of local housing market conditions as it reflects the affordability of housing in the community.

Table 2.14 represents overpayment data by income group for Ukiah, derived from the 2011-15 HUD Comprehensive Housing Affordability Strategy (CHAS). Approximately 53 percent of renters paid more than 30 percent of their income on housing compared to 36 percent of owners. The households with the highest incidence of cost burden were very low income renters, of which 79.1% overpaid for housing. Other high incidences of cost burden were found with low income renters and owners, of which 69.6% and 69.2%, respectively, paid more than 30 percent of their income on housing. Extremely low income households, both renters and owners, experienced the highest cumulative overall incidence of cost burden (68.8% and 72.7%, respectively) for all income groups.

TABLE 2.14
HOUSEHOLDS OVERPAYMENT BY TENURE (2011-2015)

Household Income Group	Renters	Owners	Total
Extremely Low (0-30% AMI)	785	55	840
Cost Burden >30%	540	40	580
%Cost Burden >30%	68.8%	72.7%	69.0%
Very Low (31-50% AMI)	980	125	1,105
Cost Burden >30%	775	35	810
%Cost Burden >30%	79.1%	28%	73.3%
Low (51-80% AMI)	625	325	950
Cost Burden >30%	435	225	660
%Cost Burden >30%	69.6%	69.2%	69.5%
Moderate or Above (>80% AMI)	1,175	1,990	3,165
Cost Burden >30%	150	605	755
%Cost Burden >30%	12.8%	30.4%	23.9%
Total	**3,565**	**2,495**	**6,066**
Cost Burden >30%	1,900	905	2,805
%Cost Burden >30%	53.3%	36.3%	46.2%

Source: HUD 2011-15 Comprehensive Housing Affordability Strategy (CHAS)

2. Overcrowding

The Census defines an overcrowded household as one that has more than one person per room, not including hallways, kitchens, or bathrooms. Severe overcrowding is defined as households with more than 1.5 persons per room. High prevalence of overcrowding can indicate a community does not have adequate supply of affordable housing, especially for large families. Overcrowding also tends to deteriorate existing housing stock. Therefore, maintaining a reasonable supply of housing and alleviating overcrowding is important for enhancing the quality of life in Ukiah.

Between 2011 (data from the 2014-19 Housing Element) and 2013-2017, overcrowding in owner occupied households nearly doubled, from 3.8 percent in 2011 to 6.3 percent in 2013-17 (see Table 2.15). Overcrowding in renter occupied households decreased slightly, from 4.7 percent in 2011 to 2.9 percent in 2013-17. However, the Census documentation may not fully represent the actual condition in the City, as the City also receives complaints of persons living in unauthorized rooms/units, such as garages, sheds, and room conversions.

TABLE 2.15
OVERCROWDED HOUSING UNITS

Occupants Per Room	Owner Occupied		Renter Occupied		Total	
	Households	Percent	Households	Percent	Households	Percent
2011 American Community Survey						
Total overcrowded (More than 1.0 persons/room)	102	3.8%	164	4.7%	266	4.3%
Severely overcrowded (More than 1.5 persons/room	0	0%	62	1.8%	62	1.0%
2013-17 American Community Survey						
Total overcrowded (More than 1.0 persons/room)	158	6.3%	100	2.9%	258	4.4%
Severely overcrowded (More than 1.5 persons/room	43	1.7%	48	1.4%	91	1.5%

Source: U.S. Census Bureau, 2011 and 2013-2017 American Community Survey

D. Special Needs Populations

Certain segments of the population may have more difficulty in finding decent, safe, affordable housing due to their special needs. State law requires an analysis of the special housing needs of seniors, disabled persons (including persons with developmental disabilities), large families, female-headed households, farmworkers, and people experiencing homelessness.

The following sections provide a detailed discussion of the housing needs facing each particular special needs population, as well as resources available to address their housing needs.

1. Seniors

Senior-headed households face a unique set of circumstances that affect their needs for housing, primarily due to physical disabilities and limitations; fixed, limited incomes; and health care costs. Many seniors may also rely on public transportation, especially those with disabilities.

Table 2.16 shows senior households by tenure in Ukiah, compared to Mendocino County. Although there are more total renters than owners in Ukiah, 58 percent compared to 42 percent, respectively, the reverse is true for senior-headed households- at 42.7 percent renters compared to 57.3 percent owners. There are significantly more seniors who are owners in Mendocino County compared to Ukiah, at 77 percent and 57.3 percent, respectively.

TABLE 2.16
SENIOR HOUSEHOLDS BY TENURE

	Total Population		Senior-headed Households	
	Percent Owner	Percent Renter	Percent Owner	Percent Renter
Ukiah	42.0%	58.0%	57.3%	42.7%
Mendocino County	59.2%	40.8%	77.0%	23.0%

Source: 2013-17 U.S. Census Bureau, American Community Survey

Resources

The following are affordable senior apartments located in Ukiah:

- Sun House Senior Apartments, 431 S. Main Street – 42 Units
- Creekside Village, 751 Waugh Lane – 39 Units
- Jack Simpson School View Apartments, 1051 N. Bush Street – 30 Units
- North Pine Street Apartments, 148 Gibson Street – 10 Units
- Walnut Village, 1240 N. Pine Street – 47 Units

Additional resources for seniors include the following:

- Ukiah Senior Center – transportation services, senior peer counseling, workshops and support groups, assistance with tax preparation, lunch and dinner services.
- Multipurpose Senior Services Program – housing assistance, personal care assistance, social services, supportive services and nutrition assistance.

- Ukiah Indian Senior Center – meals on wheels, transportation for medical appointments, congregate dining and nutrition assistance.
- Mendocino County Adult & Aging Services – adult protective services, in-home support services and veterans services.
- Area Agency on Aging – plans, coordinates and implements community-based support programs for seniors and their caregivers.
- City of Ukiah City Assistance for Relief through Energy Support (C.A.R.E.S.) – an extension of a program offered by the Salvation Army, C.A.R.E.S. provides financial assistance for electric utility bills to income eligible households.

2. Persons with Disabilities

A disability is a physical or mental impairment that substantially limits one or more major life activity. Persons with disabilities often require affordable housing located near shopping, services, and public transit. The living arrangements for persons with disabilities depend on the severity of the disability. Many disabled persons live at home in an independent environment with the help of other family members or assisted care services. Other disabled persons may require assisted living and supportive services in special care facilities.

The majority of persons with disabilities live on an income that is significantly lower than the non-disabled population. The Task Force on Family Diversity estimates that at least one-third of all persons with disabilities in the United States lives in poverty. Persons with disabilities have the highest rate of unemployment relative to other groups. For most, their only source of income is a small fixed pension afforded by Social Security Disability Insurance (SDI), Social Security Insurance (SSI), or Social Security Old Age and Survivor's Insurance (SSA), which will not adequately cover the cost of rent and living expenses even when shared with a roommate. In addition, persons with disabilities often experience discrimination in hiring and training. When they find work, it tends to be unstable and at low wages.

According to the 2017 American Community Survey, an estimated 14 percent of Ukiah residents (2,249 persons) have one or more disabilities. Among the disabilities tallied, ambulatory and independent living difficulties were most prevalent. Among the elderly population, ambulatory and hearing difficulties were most prevalent (see Table 2.17).

TABLE 2.17
DISABILITY STATUS (2013-2017)

	% of Disabilities Tallied			
	Age 5-17	**Age 18-64**	**Age 65+**	**Total**
With a hearing difficulty	0.5%	1.5%	21.6%	23.6%
With a vision difficulty	0.0%	0.8%	5.6%	6.4%
With a cognitive difficulty	--	4.4%	12.1%	16.5%
With an ambulatory difficulty	--	7.3%	24.2%	31.5%
With a self-care difficulty	--	2.8%	9.7%	12.5%
With an independent living difficulty	--	6.3%	18.0%	24.3%
Total disabled persons	**14**	**2,209**	**1,943**	**4,166**

Source: 2013-2017 American Community Survey

Developmental Disabilities

Chapter 507, Statutes of 2010 (SB 812), which took effect January 2011, amended state housing element law to require the analysis of people with disabilities to include an evaluation of the special housing needs of persons with developmental disabilities. A "developmental disability" is defined as a disability that originates before an individual becomes 18 years old; continues, or can be expected to continue, indefinitely; and constitutes a substantial disability for that individual. This includes intellectual disability, cerebral palsy, epilepsy, and autism.

According to a Consumer Count completed by the California Department of Developmental Services in March 2019, there were a total of 466 persons in Ukiah with a developmental disability- 206 persons between the ages of 0 to 17 and 260 persons over the age of 18.

Resources

The City makes rehabilitation funds available to income qualified households for accessibility improvements. The Housing Rehabilitation Program, funded by both State Community Development Block Grant (CDBG) and Home Investment Partnerships Program (HOME) funds, has been designed in part to address these needs by providing affordable loans to assist disabled renters and owners improve their units with accessibility features.

Regarding new affordable housing construction activities, in 2017, the City created a Housing Trust Fund- the Ukiah Housing Trust Fund- and in 2018, released a $500,000 Notice of Funding Availability (NOFA). The City intends to utilize funds in the Ukiah Housing Trust Fund to assist in the development of housing for lower income and special needs residents.

The City also regularly supports funding applications to HOME and other federal and state funding programs, and in 2018 was awarded $5.1 million in HOME funds for the development of Ukiah Senior Apartments, a new 31-unit affordable senior housing apartment complex. The construction of this complex is anticipated to start in 2019-2020.

A list of organizations with specific services to support persons with disabilities includes, but may not be limited to, the following:

- Redwood Coast Regional Center- prenatal diagnostic services, early intervention supports and services, lifelong individualized planning and service coordination, employment and day services, family support and residential care.
- Manzanita Services- peer counseling, care management, life skills and SSI advocacy.
- Redwood Community Services – adult behavioral health therapy, specialty mental health, whole person care and therapeutic behavioral services.

Both the federal Fair Housing Act and the California Fair Employment and Housing Act impose an affirmative duty on local governments to make reasonable accommodations (i.e., modifications or exceptions) in their zoning and other land-use regulations when such accommodations may be necessary to afford disabled persons an equal opportunity to use and enjoy a dwelling. For example, it may be a reasonable accommodation to allow covered ramps in the setbacks of properties that have already been developed to accommodate residents with mobility impairments. The City allows homeowners to build ramps into single-family dwellings to allow first floor access for physically disabled residents. Such ramps or guardrails are permitted to intrude into the standard setbacks required under zoning, and are subject only to a building permit. This provision eliminates the need to obtain a zoning variance.

Efforts to Remove Regulatory Constraints for Persons with Disabilities

The State has removed any City discretion for review of small group homes for persons with disabilities (six or fewer residents). The City does not impose additional zoning, building code, or permitting procedures other than those allowed by State law. There are no City initiated constraints on housing for persons with disabilities caused or controlled by the City. The City does not have siting requirements between group homes, defined in the City's Zoning Code as Community Care Facilities.

Zoning and Other Land Use Regulations

As part of this Housing Element Update, the City conducted a comprehensive review of its zoning laws, policies and practices for compliance with fair housing laws. The City has not identified any zoning or other land-use regulatory practices that could discriminate against persons with disabilities and impede the availability of such housing for these individuals.

The City of Ukiah defines "family" as an individual, or two (2) or more persons living together as a single household within a dwelling unit.

3. Large Households

Large family households are defined by the U.S. Census Bureau as households containing five or more persons. Due to the limited supply of adequately sized units to accommodate large family households, large families face an above-average level of difficulty in locating adequately-sized, affordable housing. Even when larger units are available, the cost is generally higher than that of smaller units. The lack of supply, compounded with the low-incomes of larger families, results in many large families living in overcrowded conditions.

According to the 2012-2016 American Community Survey, of the 2,252 householders living alone, 64.7 percent were renters and 35.3 percent were owners. At 53.1 percent, renters also comprised a higher number of large households, compared to 46.9 percent of owners with large household sizes.

TABLE 2.18
HOUSEHOLD SIZE BY TENURE (2016)

Household Size	Total Owner Occupied		Total Renter Occupied		Totals	
	Number	Percent	Number	Percent	Number	Percent
Householder living alone	796	35.3%	1,456	64.7%	2,252	100%
2-4 persons	1,565	55.6%	1,252	44.4%	2,817	100%
Large households (5+ persons)	281	46.9%	318	53.1%	599	100%

Source: 2012-2016 American Community Survey

Resources

Low and moderate income large households can benefit from many of the same programs (outlined in this section under other special needs groups) that benefit other special needs households. The City uses CDBG, HOME, and Ukiah Housing Trust Funds to assist in the construction of family housing and provide first-time homebuyer assistance to qualified families.

4. Single-Parent households

Single-parent households, particularly female-headed families with children, often require special consideration and assistance because of their greater need for affordable housing and accessible day care, health care, and other supportive services. These households often have less income compared to two-parent households.

According to the 2010 U.S. Census, an estimated 21 percent of Ukiah households were headed by single parents (Table 2.19). Per the 2012-2016 American Community Survey (Table 2.20), households headed by women with children comprised approximately 19 percent (661 households) of all households in Ukiah and households headed by women without children comprised 5.3 percent (179 households). Out of the 31% of Ukiah households living below the poverty line, 11% were female-headed households.

TABLE 2.19
SINGLE-PARENT HOUSEHOLDS (2010)

	Total Households	Single-Parent Households	Percent Total Households	Percent Single-Parent Households
Ukiah	6,158	1,294	21.0%	44.4%
Mendocino County	34,945	6,135	17.6%	37.4%
Fort Bragg	2,863	537	18.8%	45.4%
Willits	1,914	463	24.2%	41.9%

Source: 2010 U.S. Census

TABLE 2.20
FEMALE-HEADED HOUSEHOLDS (2016)

	Female-headed Households with Children		Female-headed Households without Children		Female-headed Households under the Poverty Level		Total Families under the Poverty Level	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Ukiah	661	19.4%	179	5.3%	386	11.0%	1,062	31.0%
Mendocino County	1,398	9.9%	863	6.1%	791	6.0%	2,573	18.0%
Fort Bragg	240	15.6%	115	7.5%	153	10.0%	419	27.0%
Willits	250	22.89%	110	10.1%	116	11.0%	365	33.0%

Source: 2012-2016 American Community Survey

Resources

The City has provided first time homebuyer loans to single-parent households in the past through CDBG and HOME-funded programs. Additionally, several local organizations provide social services to assist female-headed households and other special needs households:

- Redwood Community Services (Family Strengthening Services Program and Crisis Line)
- FIRST 5 Mendocino Family Resource Services
- Pinoleville Native American Head Start & Early Head Start
- North Coast Opportunities Head Start Child Development Program
- Mendocino County Department of Social Services

5. Farmworkers

Ukiah is located in the most urbanized portion of Mendocino County paralleling the Highway 101 corridor. There are no working farms within the City limits, but there are working orchards and vineyards adjacent to the City, particularly to the east along the Russian River.

The *Assessment of the Demand for Farm Worker Housing and Transportation in Mendocino County* prepared in 2008 by the California Institute for Rural Studies found that in 2006, there were 4,163 farm workers in Mendocino County. Of those, 1,416 worked in Mendocino County for seven months or more, 673 worked in Mendocino County for 3 to 6 months, and 2,074 worked in Mendocino County for less than three months. The Assessment found that the majority of farm workers Mendocino Countywide lived in single family residences, rented individual rooms in single family residences, and lived in labor camps, apartments or trailers. The Assessment also found that 47 percent of farm workers lived in the Ukiah Valley.

The U.S. Department of Agriculture (USDA) completed an *Agricultural Census* in 2012. The number of farmworkers had increased to 5,314 since the 2006 Study by the California Institute for Rural Studies. The USDA Census also reported 498 total farms in Mendocino County. There were 376 permanent farmworker employees living in 21 permanent employee housing facilities, and 183 seasonal farmworker employees living in a total of 8 seasonal employee housing facilities in Mendocino County. 559 total employees lived in a total of 29 employee housing facilities. Additional information regarding farmworkers is contained in Table 2.20.

TABLE 2.21
FARMWORKERS BY DAYS WORKED (MENDOCINO COUNTY)

150 Days or More	
Farms	252
Workers	1,442
Farms with 10 or More Workers	
Farms	44
Workers	929
Fewer than 150 Days	
Farms	407
Workers	3,872

Based on this information, it is concluded that the majority of farm workers who live within the City limits live in single family homes, apartments, or mobile homes/trailers.

According to the 2009-2017 ACS, 352 persons, or 5.2 percent of the City's labor force, were employed in the agriculture, forestry, fishing, hunting, and mining industry (see Table 2.8).

Resources

State Public Health and Safety Code Section 17021.5 requires employee housing with accommodations for six or fewer employees be allowed by right and treated as a single family residence rather than a dormitory, boarding house, hotel or other similar term implying that the employee housing is a business run for profit.

The City zoning ordinance allows single family residences by right in the R-1 (Single Family Residential) zoning district. The R-1 zoning district does not limit the number of persons living in a residence, or preclude a group of employees, students, or other non-related persons from occupying the residence. In both the R-2 (Medium Density Residential) and R-3 (High Density Residential) zoning districts, single family dwellings, duplexes, condominiums, apartment houses, and room and board residences are allowed by right without the requirement for a use permit.

Additionally, single family residences and accessory (second) dwelling units are allowed by right in the C-N (Neighborhood Commercial) zoning district, and condominiums and accessory dwelling units (ADUs) are allowed by right in the C-1 (Community Commercial) zoning district. ADUs are also allowed by right in the C-2 (Heavy Commercial) zoning district.

The City zoning ordinance also contains an *Agriculture Exclusive* (A-E) zoning district. While no land within the City is zoned A-E, the regulations allow by-right "one family dwellings, trailers and accessory buildings, and farm buildings of all kinds…" Nothing in the statutes limits the number of dwelling units or how many persons can occupy the units. This includes bunkhouses of 36 beds or less and up to 12 units of farmworker housing in all zones that allow agricultural uses in the same manner other agricultural uses are allowed, as defined in Health and Safety Code 17021.6.

Because of the flexibility inherent throughout the City's zoning code related to housing for farmworkers and the relatively small size of the City's farmworker population, the housing needs of this group are addressed through its standard affordable housing strategies.

6. Homeless

"Homelessness" as defined by the U.S. Department of Housing and Urban Development (HUD), describes homeless individuals (not imprisoned or otherwise detained) who:

- Lack a fixed, regular, and adequate nighttime residence and includes a subset for an individual who resided in an emergency shelter or a place not meant for human habitation and who is exiting an institution where he or she temporarily resided;
- Will imminently lose their primary nighttime residence;
- Are unaccompanied youth and families with children and youth who are defined as homeless under other federal statutes who do not otherwise qualify as homeless under this definition; and
- Are fleeing, or are attempting to flee, domestic violence, dating violence, sexual assault, stalking, or other dangerous or life-threatening conditions that relate to violence against the individual or a family member.

In 2018, the County of Mendocino contracted with Robert Marbut, Ph.D. to produce a report on homelessness in Mendocino County. Titled "*Homelessness Needs Assessment and Action Steps for Mendocino County*," the report presented observations and findings, and

recommended a series of action steps for addressing homeless issues Countywide. Both the Mendocino County Board of Supervisors and Ukiah City Council adopted the report, but most of the recommendations were primarily applicable to the County because the County is the jurisdiction that facilitates and oversees the existing services to address homelessness.

The 2018 Homelessness Needs Assessment completed by Dr. Marbut counted between 172 and 188 individuals experiencing homelessness in Ukiah.

Previously, the 2017 Mendocino County Point-in-Time (PIT) Count reported a total of 1,238 homeless individuals in Mendocino County. This consisted of 113 individuals in an emergency shelter, 47 in transitional housing, and 1,078 who were unsheltered. Of these homeless individuals, the PIT count reported 824, or 67 percent, were male and 1,026, or 83 percent, were white. The PIT Count did not separate by location in their totals.

Resources

The County of Mendocino has primary responsibility for providing regional homeless services. Ukiah is part of the Mendocino County Homeless Services Continuum of Care (MCHSCoC) system that provides services for the homeless and is comprised of local government jurisdictions and government agencies, nonprofit service and housing providers, and organizations from the faith community.

Additional resources consist of emergency day and overnight shelters, transitional housing, emergency and supportive services, hotel vouchers, and other voucher assistance programs. Below is a list of homeless supportive services in Ukiah.

Emergency Shelters

Emergency shelters offer temporary overnight sleeping accommodations for generally up to 30 days. Currently, one emergency shelter is operating in the City of Ukiah- the Homeless Services Community Center operated by Redwood Community Services. This facility provides overnight shelter for up to 60 individuals for a six-month period during the winter (November through April). The Homeless Services Community Center has also been approved for a Day Resource Center, which will provide social services and case management for homeless persons. The Day Resource Center is currently under construction.

Transitional Housing

Transitional housing is designed to be a bridge between shelter and permanent housing, providing housing for homeless persons for six months to two years. Transitional housing also typically integrates other “wrap-around” social services and counseling programs to assist in the homeless individual’s transition to self-sufficiency. Transitional shelters offer housing, case management, and support services. A list of local transitional housing resources includes:

- The Ford Street Project, Family Transitional Housing Program – serves up to six families with children under the age of 18; room and board is included in the program fees, which are paid for by the families.
- The Ford Street Project, Unity Village – 12 two-bedroom units for families with children under the age of 18.

A program has been added to review and amend the zoning code to allow both supportive and transitional housing in all residential zones pursuant to SB 2.

Homeless Shelter Overlay District

On September 2, 2015 the City Council adopted a homeless shelter overlay district, in accordance with the provisions of SB 2. The area of the overlay was preferred given its proximity to an emergency shelter that had ceased operations in 2012, during the previous Housing Element planning period.

Analysis of Capacity and Suitability of Overlay to Accommodate Homeless Population

Encompassing ±13.73 acres, the homeless shelter overlay district allows homeless shelters by right (without the requirement of a conditional use permit). There are nine separate parcels within the overlay district, all within the Heavy Commercial and Manufacturing zoning districts. None of the parcels are vacant, nor were they vacant at the time of adoption of the overlay district in 2015, but there is a large portion (±1 acre) of one parcel that has an open field. Improvements on the parcels include 6,000-23,000 square foot warehouses, single family residences, garages, barns, and a church. One of the parcels is currently the site of a residential substance use disorder[1] recovery treatment center. There are no active industrial uses or known environmental contamination, hazardous gases, air pollution, etc. The overlay zone has good proximity to public transit, located a quarter mile from one bus stop and a half mile from a second bus stop. The overlay zone is located approximately one mile from an existing job center and other public and private services. These services are accessible via public transit.

Conversion of the warehouses into homeless facilities is possible within the overlay district. Utilizing the existing homeless facility on South State Street as a measure of realistic capacity for homeless shelters in the overlay district, the existing overlay district can accommodate 457 beds for homeless persons. However, given existing constraints within the district, the overlay district should be further evaluated to ensure its continued suitability. A program has been added to re-evaluate the Homeless Shelter Overlay District for possible amendment and consideration of options to maintain compliance with SB 2.

Homeless facilities are also permitted in other zoning districts, upon approval of a use permit from the Ukiah Planning Commission, including: C-N (Neighborhood Commercial), C-1 (Community Commercial), C-2 (Heavy Commercial), PF (Public Facilities), M (Manufacturing), R-1 (Single-Family Residential), R-2 (Medium Density Residential), and R-3 (High Density Residential).

E. Housing Stock Characteristics

The characteristics of the housing stock, including type, age, condition, availability, tenure, and affordability are important in determining the housing needs for the community. This section explores each of those sections and analyzes if the current housing supply meets the needs of existing and future residents of Ukiah.

1. Housing Type

[1] These centers may still be referred to as drug abuse centers. The US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration now refers to drug abuse as “Substance Use Disorder”.

California Department of Finance housing estimates in January 2018 show the majority (55 percent) of the City's housing stock is comprised of single family detached homes. The second most common type of housing was multi-family (19 percent). Between 2010 and 2018, there continued to be very few 2-4 unit complexes or mobile homes.

It should be noted that these numbers do not reflect results from the City's adoption of a new accessory dwelling unit ordinance in late 2017, nor do they reflect the City's deployment of various initiatives related to a 2017 Housing Strategy.

TABLE 2.22
HOUSING UNITS BY TYPE

Type of Housing	2010		2018	
	Number	Percent	Number	Percent
Single Family Detached	3,596	55%	3,600	55%
Single Family Attached	412	6%	412	6%
Two to Four Attached	839	13%	841	13%
Five plus Attached (Multi-Family)	1,237	19%	1,279	19%
Mobile Home	439	7%	440	7%
Totals	6,523	100%	6,572	100%

Source: 2010 and 2018 California Department of Finance Population and Housing Estimates

2. Housing Stock Age and Condition

If not properly and regularly maintained, housing can deteriorate neighborhood housing conditions, decreasing property values and impacting neighborhood pride and quality of life. Typically, housing over 30 years of age is more likely to have needs for rehabilitation.

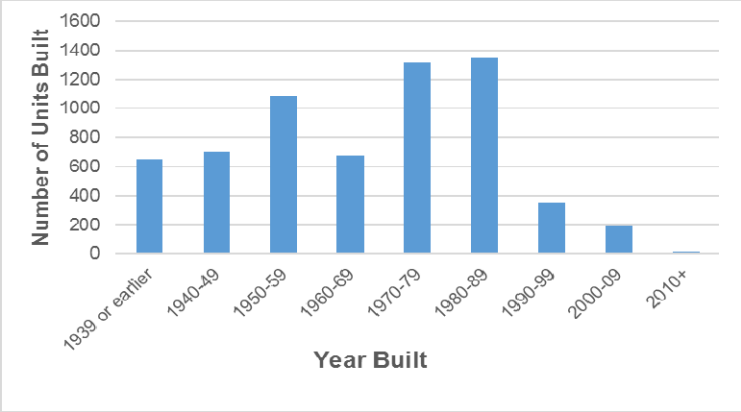
A Housing Conditions Survey completed by the City of Ukiah in 2008 revealed that 77 percent of the local housing stock was more than 25 years old. As depicted in Table 2.21, Ukiah's housing stock has further aged. Over 90 percent of all housing stock in the City of Ukiah was built in 1989 or earlier and is over 25 years of age. Only 3.3 percent of housing stock is newer (built in the year 2000 or later), and until quite recently very few new housing units were constructed.

TABLE 2.23
HOUSING STOCK AGE

Year Built	Number of Units	Percent
2010 and later	17	0.3%
2000 to 2009	191	3.0%
1990 to 1999	357	5.6%
1980 to 1989	1,346	21.2%
1970 to 1979	1,318	20.8%
1960 to 1969	675	10.7%
1950 to 1959	1,081	17.1%
1940 to 1949	700	11.0%
1939 or earlier	651	10.3%
Total units	6,336	100%

Source: 2013-17 American Community Survey, 5-Year Estimates
Please note: housing units were produced in 2010 and later that are not recorded on the above Table or below Figure. Data is used only from ACS for consistency purposes.

FIGURE 2.1
HOUSING STOCK AGE DISTRIBUTION (2013-2017)



Since the City has not completed a housing conditions survey since 2008, data was utilized from the 2008 Survey and cross-referenced with current local conditions observed by City of Ukiah Building Division staff and updated data within this Housing Element. Table 2.23 provides an estimate of current housing stock conditions. A program has been added for the City to complete a new housing conditions survey within the next Housing Element planning cycle.

TABLE 2.24
HOUSING STOCK CONDITIONS

Housing Type	Sound	Minor	Moderate	Substantial	Dilapidated	Total
Single	2,528	939	510	35	0	4,012
Mobile	277	103	56	4	0	440
Duplex	530	197	107	7	0	841
Multifamily	806	299	162	12	0	1,279
Total	4,141	1,538	835	58	0	6,572
Percent	63.0	23.4	12.7	0.9	0.0	100.0

Sources: 2008 City of Ukiah Housing Conditions Survey, 2018 California Dept. of Finance, 2019 City staff survey

The City of Ukiah Building Division operates a building code enforcement program in an effort to improve overall housing conditions in the community. Enforcement violations are investigated as complaints are received from residents. The City also provides housing rehabilitation assistance to lower income residents through the City's CDBG and HOME programs, as funding becomes available.

3. Housing Tenure and Availability

Housing tenure and vacancy rates are important indicators of the supply and cost of housing. Housing tenure refers to whether a unit is owned or rented.

a. Housing Tenure

In 2000, there was close to an even distribution of owner-occupied and renter-occupied units in Ukiah, at 48.4 percent and 51.6 percent, respectively. By 2010, this trend had begun to shift,

and Ukiah was a majority renter-occupied community (over 56 percent). Throughout this same period, Mendocino County was predominantly owner-occupied.

TABLE 2.25
HOUSEHOLDS BY TENURE COMPARISON (2010 – 2016)

	2010		2016	
	Number	Percent	Number	Percent
Ukiah				
Owner-occupied	2,673	43.4%	2,642	43.1%
Renter-occupied	3,485	56.6%	3,492	56.9%
Mendocino County				
Owner-occupied	20,601	59.0%	19,764	57.1%
Renter-occupied	14,344	41.0%	14,830	42.9%

Source: 2010 U.S. Census, 2012-2016 American Community Survey

b. Vacancy Rates

Vacancy rates are an important indicator of the adequacy of housing supply for all economic segments of the community. High vacancy rates usually indicate low demand, and low vacancy rates can indicate high demand and/or inadequacy of supply. Generally, a “healthy” vacancy rate for the single-family housing market is considered as two to three percent; and between seven and eight percent is considered sufficient for the multi-family housing market.

According to the 2010 Census, the overall vacancy rate in Ukiah was 5.3 percent, including units vacant for seasonal or occasional use, rented and sold units that were vacant at the time of the Census, and other unclassified vacant units (see Tables 2.25 and 2.26).

Additional vacancy data was obtained from the 2013-2017 American Community Survey, to demonstrate the vacancy rate over the last approximately 17 years. Vacancy rates in 2010 increased by nearly 100 percent compared to 2000, and this was likely due to the slumping economy at that time. As the economy has recovered, the vacancy rates have again approached 2000 levels (see Table 2.26).

TABLE 2.26
OCCUPANCY STATUS OF HOUSING UNITS

	2000	2010
For rent	54	136
For sale only	24	73
Rented or sold, not occupied	16	20
For seasonal, recreational, or occasional use	12	25
For Migratory Workers	0	0
All Other Vacant	46	76
Total	152	330

Source: 2000 and 2010 U.S. Census

TABLE 2.27
OVERALL VACANCY BY TENURE

Year Built	2000	2010	2017
Rental vacancy rate	1.7%	3.7%	2.8%
Owner vacancy rate	0.8%	2.6%	0.2%
Overall vacancy rate	**2.5%**	**5.3%**	**3.0%**

Source: 2000 and 2010 U.S. Census, 2013-2017 American Community Survey

Understanding that Ukiah has low rental and owner vacancy rates seems to be a sentiment shared by the community. In 2018, a community housing survey was completed by the City. Over 70 percent of survey respondents listed the number one issue or barrier with obtaining suitable housing for their households as “home/rent prices” (54.9 percent) or “lack of available housing inventory” (17 percent). Similar comments were received at both housing workshops the City hosted to discuss and gather public input and ideas on the Housing Element Update. A copy of the full results of the survey is contained in Appendix B.

The City has added an implementation program to address housing production overall.

4. Housing Costs and Affordability

Median home prices in Ukiah and Mendocino County have been steadily increasing since the economic recovery. With the exception of 1-bedroom units, rental prices have also increased.

TABLE 2.28
CHANGES IN MEDIAN HOME SALES PRICES

Jurisdiction	2017 Median Sale Price	2018 Median Sale Price	Percent Change in Median Sale Price
Ukiah	$329,500	$350,350	6%
Mendocino County	$340,850	$358,800	5%

Source: Zillow.com

TABLE 2.29
CHANGES IN AVERAGE MONTHLY RENT PRICES

City	Unit Type	2015	2016	2017
Ukiah	Studio	$963	$967	-
	1 Bedroom	$702	$640	$691
	2 Bedroom	$968	$973	$1,016
	3 Bedroom	$1,200	$1,268	$1,334
Fort Bragg	Studio	-	-	-
	1 Bedroom	$538	$615	$673
	2 Bedroom	$1,089	$1,071	$1,098
	3 Bedroom	$1,766	$1,698	$1,688

Source: 2013-2017 American Community Survey

F. Assisted Affordable Housing Units

Assisted housing developments, or “at-risk units,” are defined as multifamily rental housing developments that receive government assistance under Federal, State, and/or local programs, and which are eligible to convert to market-rate due to termination (opt-out) of a rent subsidy contract, mortgage prepayment, affordability covenant, or other expiring use restrictions within 10 years of the beginning of the housing element planning period. The next “at-risk” housing analysis period is 2019-2029.

State Government Code §65863.10 requires that owners of Federally-assisted properties provide notices of intent to convert their properties to market-rate 12 months prior and again at six months prior to the expiration of their contract, opt-outs, or prepayment. Owners must provide notices of intent to public agencies, including HCD and the local public housing authority, as well as to all impacted tenant households. There are three general cases that can result in the conversion of publicly assisted units:

1. Prepayment of HUD Mortgages: Section 221(d)(3). Section 202 and Section 236: A Section 221(d)(3) is a privately owned project where the U. S. Department of Housing and Urban Development (HUD) provides either below market rate loans or a subsidy to the tenants. With Section 226 assistance, HUD provides financing to the owner to reduce the costs for tenants by paying most of the interest on a market rate mortgage. Additional rental subsidy may be provided to the tenant. Section 202 assistance provides a direct loan to non-profit organizations for project development and rent subsidy for low income tenants. Section 202 provides assistance for the development of units for physically handicapped, developmentally disabled, and chronically mentally ill residents.

2. Opt-outs and expirations of project based Section 8 contracts: Section 8 Project Based Vouchers (Sec. 8) is a federally funded program that provides subsidies to the owner of a pre-qualified project for the difference between the tenant’s ability to pay and the contract rent. Opt-outs occur when the owner of the project decides to opt-out of the contract with HUD be pre-paying the remainder of the mortgage. Usually, the likelihood of opt-outs increases as the market rents exceed contract rents.

3. Other: Expiration of the low income use period of various financing sources, such as the Low-Income Housing Tax Credit (LIHTC), bond financing, density bonuses, California Housing Finance Agency (CFHA), Federal Home Loan Bank of San Francisco Affordable Housing Program (AHP), Veterans Assistance Supportive Housing (VASH) United States Department of Agriculture (USDA), Community Development Block Grants (CDBG) and Home Investment Partnerships Program (HOME) funds. Generally, bond-financed properties expire according to a qualified project period or when the bonds mature. Former properties funded with Redevelopment Agency funds generally require a minimum affordability term of 30 years.

There are a range of publicly assisted rental housing affordable to lower and moderate income households in Ukiah. Table 2.27 provides a summary listing of affordable projects in the City. Overall, 52 projects totaling 537 rental housing units in the City include affordable units. 534 units are set aside specifically for lower and moderate income households.

TABLE 2.30
INVENTORY OF ASSISTED RENTAL HOUSING

Project Name and Address	Total Units	Assisted Units	Funding Source(s)	Earliest Date of Conversion	# of Units at Risk
Duane Hill Terrace 600 N Orchard Avenue	32	32	CTCAC, HOME	2067	0
McCarty Manor 741 Waugh Lane	40	40	USDA/RD, Sec. 8, LIHTC	2068	0
Orchard Manor 610 Orchard Avenue	64	63	USDA/RD, Sec. 8, LIHTC	Perpetuity	0
Orchard Village 548 Ford Street	48	47	USDA/RD, Sec. 8, LIHTC	Perpetuity	0
Creekside Village 751 Waugh Lane	44	44	Sec. 8	2027	44
Jack Simpson 1051 North Bush Street	30	30	Sec. 8	Perpetuity	0
North Pine Street 148 Gibson Street	10	10	Sec. 8	Perpetuity	0
Walnut Village 1240 North Pine Street	48	48	Sec. 8	2027	48
Gibson Court 148 Gibson Court	17	17	Sec. 8, HOME	2031	0
Garden Court 875 S Orchard Avenue	10	10	HOME	2026	10
Willow Terrace 237 East Gobbi Street	38	38	LIHTC	2074	0
Holden Street 490 South Dora	6	6	Sec. 8	Perpetuity	0
Summer Creek Village 755 Village Circle	64	64	LIHTC, HOME, Sec. 8	06/28/2059	0
Ukiah Green C/O PPMG 1120 Mulberry Street	38	38	USDA	2033	0
Ukiah Green South C/O PPMG 1130 Mulberry Street	41	41	USDA	2035	0
114 Poulos Court	1	1	Sec. 8	Perpetuity	0
1504 S Dora Street	1	1	Sec. 8	Perpetuity	0
1542 Lockwood Drive	1	1	Sec. 8	Perpetuity	0
195 Wabash Avenue #1	1	1	Sec. 8	Perpetuity	0
195 Wabash Avenue #2	1	1	Sec. 8	Perpetuity	0
195 Wabash Avenue #3	1	1	Sec. 8	Perpetuity	0
212 Irvington Drive	1	1	Sec. 8	Perpetuity	0
213 Irvington Drive	1	1	Sec. 8	Perpetuity	0
213 Tedford Avenue	1	1	Sec. 8	Perpetuity	0
214 Tedford Avenue	1	1	Sec. 8	Perpetuity	0
239 Burlington Drive	1	1	Sec. 8	Perpetuity	0
625 Leslie Street	1	1	Sec. 8	Perpetuity	0
627 Leslie Street	1	1	Sec. 8	Perpetuity	0
635 Leslie Street	1	1	Sec. 8	Perpetuity	0
637 Leslie Street	1	1	Sec. 8	Perpetuity	0
735 Cindee Drive	1	1	Sec. 8	Perpetuity	0
739 Cindee Drive	1	1	Sec. 8	Perpetuity	0
741 Cindee Drive	1	1	Sec. 8	Perpetuity	0

743 Cindee Drive	1	1	Sec. 8	Perpetuity	0
745 Cindee Drive	1	1	Sec. 8	Perpetuity	0
803 Cindee Drive	1	1	Sec. 8	Perpetuity	0
805 Cindee Drive	1	1	Sec. 8	Perpetuity	0
813 Cindee Drive	1	1	Sec. 8	Perpetuity	0
823 Cindee Drive	1	1	Sec. 8	Perpetuity	0
825 Cindee Drive	1	1	Sec. 8	Perpetuity	0
833 Cindee Drive	1	1	Sec. 8	Perpetuity	0
835 Cindee drive	1	1	Sec. 8	Perpetuity	0
College Court Apartments 1461 North Bush Street	7	7	Sec. 8	Perpetuity	0
Sun House Apartments 170 Cleveland Lane	42	41	Sec. 8 VASH, LIHTC, AHP, County CDBG, City UHTF	2032	0
Total	616	613			102

Sources: 2019 City staff survey, California Housing Partnership

Preservation of At-Risk Housing

Within the 2019-2029 “at-risk” housing analysis period, three projects are considered at risk of converting to market-rate housing. These projects offer 102 housing units, and all 102 of the units are affordable to lower income households. Two of the projects, Creekside Village and Walnut Village, are affordable to households with project-based Section 8 rental subsidies. The third project, Garden Court, has expiration of an affordability restriction put in place by the developer’s use of HOME funds for the project.

In an interview with the property owner of Garden Court, the property owner stated they will make sure there is continued affordability, presumably in perpetuity. But the property owner also mentioned that the funding on this project is complex, which is complicated by being in the airport compatibility zone of the 1996 Airport Comprehensive Land Use Plan. Airport compatibility has been listed as a constraint in Section 5.

Creekside Village is a 44-unit apartment project constructed in 1983, with a project-based Section 8 contract for rent subsidies. Walnut Village is a 48-unit apartment constructed in 1979 with a Section 8 contract also due to expire in 2027. The property owner, a locally based affordable housing developer and property management company, can choose to opt out of Section 8 or to renew the Section 8 with HUD.

While the new Section 8 contracts are subject to a periodic renewal process, the approval is fairly automatic. If the property owner decides to allow the Section 8 program to lapse, the tenants would be notified and would have one year to relocate. Subject to funding availability, HUD and the local Housing Authority, the Community Development Commission of Mendocino County, would make Section 8 housing-choice vouchers available to the tenants. Tenants could decide to use the voucher at the project or at a different location.

Costs of Construction/Replacement vs. Costs of Preservation

In addition to identifying units at risk of converting to market rate housing, Government Code Section 65583(a)(8)(B) requires a comparison of costs to replace lost units through construction or rehabilitation to the cost of preserving the existing units.

Using local data, the average new construction/development cost for multi-family rental housing is $347,437 per unit. For 102 at-risk units, this would require $35,538,574. The cost estimate includes land acquisition, construction costs, permits, on- and off-site improvements, and other related costs. By comparison, the estimated cost of preservation of multi-family rental housing is $200,221 per unit.[2] For 102 at-risk units, preservation costs are estimated at $20,422,542.

As can be seen from the estimates, the cost of preservation is far less than the cost of replacement of at-risk units. Another factor is that not all units identified as being at-risk are in need of rehabilitation, but may simply require acquisition in order to be preserved as affordable units. This will further reduce the costs of preservation.

An *At-Risk Unit Program* was started during the 2014-2019 Housing Element but not fully established. Development of this program has been listed as a priority in this 2019-2027 Housing Element Update. It is expected that at a minimum, this Program will involve the City contacting qualified non-profit organizations or other agencies and exploring opportunities to assist and facilitate the ownership transfer of "at-risk" units. Potential funding sources may include programs operated and administered by the State Department of Housing and Community Development and Ukiah Housing Trust Fund.

Further, the City of Ukiah is strongly committed to the preservation of affordable housing units and therefore has identified the following resources in an effort to save such at-risk units.

Preservation Resources

Efforts by the City to retain low-income housing must be able to draw upon two basic types of preservation resources: organizational and financial. A list of potential qualified entities for preserving at-risk units is contained in Appendix C. This list is periodically updated on the Policy & Research webpage of the California Department of Housing and Community Development.

The following is a list of potential funding sources considered a part of the City's overall plan for preservation of at-risk units. The number and availability of programs to assist cities and counties in increasing and improving their affordable housing stock is limited and public funding for new projects is unpredictable. The following programs are local, State and federal programs. Some are managed locally by the City, under the auspices of the Ukiah Housing Trust Fund.

1) Home Investment Partnership (HOME) Program: This Program was created under Title II of the Cranston-Gonzales National Affordable Housing Act enacted on November 28, 1990. For the City of Ukiah, HOME funds are made available on an annual or bi-annual competitive basis through the HCD small cities program. Approximately $500,000 is available to develop and support affordable rental housing and homeownership affordability. Activities include acquisition, rehabilitation, construction, and rental assistance. The City uses HOME funds primarily for first-time homebuyers (homeownership assistance) and owner-occupied rehabilitation. Loan repayments received through these programs are reused to provide funding for additional activities. The City has also been awarded HOME funds for new affordable rental housing projects.

2) Community Development Block Grant (CDBG) Program: For the City of Ukiah, CDBG funds are made available on an annual or bi-annual competitive basis through the HCD small

[2] This figure was calculated as follows: 1) cost of acquisition is an average of the price of all current multifamily housing properties on sale from a survey of Loopnet on July 4, 2019; 2) cost of rehabilitation is assumed to be 50 percent of the cost of acquisition; and 3) financing and other costs are assumed to be 15 percent of acquisition plus rehabilitation costs.

cities program. Between $500,000 and $1 million is generally available to support affordable rental housing acquisition, reconstruction, and rehabilitation and homeownership affordability. Eligible activities are varied and include such activities as acquisition, infrastructure improvements, public facilities rehabilitation, public services, owner occupied housing rehabilitation, and homeownership assistance. Proceeds from those activities are deposited into a revolving loan fund established from low interest loans for rehabilitation and homeownership assistance and could be a potential resource for preservation activities.

3) City of Ukiah Low and Moderate Income Housing Asset Funds (LMIHAF): Bond proceeds from the City's former redevelopment agency have been deposited into the LMIHAF for use by the City's successor housing agency on affordable housing activities. Two-thirds of all LMIHAF funds must be utilized on activities for lower income households with gross annual income less than 60% of the area median income for Mendocino County. The City Council has authorized $500,000 for affordable housing activities in fiscal year 2019-20. LMIHAF funds can be utilized for a variety of programs, including but not limited to the following:

   - Rental Rehabilitation Programs
   - Acquisition/Rehabilitation Programs
   - Homeownership Assistance
   - Rental Housing Construction

4) Community Development Commission of Mendocino County Housing Authority (CDC Housing Authority): The CDC Housing Authority administers a variety of housing programs including Section 8, Shelter Plus Care, and Veterans Housing (VASH) rental assistance. The CDC Housing Authority also owns and manages affordable housing units throughout Mendocino County.

5) Community Reinvestment Act (CRA): Federal law requires that Banks, Savings and Loans, Thrifts, and their affiliated mortgaging subsidiaries, annually evaluate the credit needs for public projects in communities where they operate. Part of the City's efforts in developing preservation programs will be to continue to meet with local lenders to discuss future housing needs and applicability of the CRA Act. Although an unpredictable resource, it is important to maintain working relationships for future problem solving.

6) Low Income Housing Tax Credit Program (LIHTC): This program provides for federal and State tax credits for private developers and investors who agree to set aside all or an established percentage of their rental units for low-income households for no less than 30 years. Tax credits may also be utilized on rehabilitation projects, contributing to the preservation program.

SECTION 3: PROJECTED HOUSING NEEDS

Under California law, every city and county has a legal obligation to respond to its fair share of the projected future housing needs in the region in which it is located. For Ukiah and other Mendocino County jurisdictions, the regional housing need allocation (RHNA) is determined by the Mendocino Council of Governments (MCOG), based upon an overall regional need number established by the State. The fair share numbers establish goals to guide local planning and development decision making.

A. Regional Housing Needs Allocation

In 2018, the MCOG in partnership with representatives from local city and County jurisdictions met and agreed upon the local fair share housing needs.

TABLE 3.1
REGIONAL HOUSING NEEDS ALLOCATION
2019-2027

Income Category	Units
Very Low (0-50% AMI)	86
Low (51-80% AMI)	72
Moderate (81% to 120% AMI)	49
Above Moderate (120%+ AMI)	32
Total	**239**

Note: Units serving extremely low-income households are included in the "very low" category.

To enable the City of Ukiah to meet RHNA goals, the City must evaluate its capacity to provide available sites to meet projected future housing needs. The City must demonstrate it has or will make available adequate sites with appropriate zoning and development standards and with services and facilities to accommodate the RHNA.

TABLE 3.2
REGIONAL HOUSING NEEDS ALLOCATION COMPARISONS

Years	Very Low	Low	Moderate	Above Moderate	Total
2014-2019	11	7	7	20	45
2019-2027	**86**	**72**	**49**	**32**	**239**

The 2019-2027 Housing Element planning cycle is an eight-year period. However, even with this increase in the planning period of three years, housing production expected by HCD over the next eight years is substantially higher (more than 200 percent) than the 2014-19 Housing Element planning cycle. These numbers reflect the demand and need for housing in Ukiah, as reflected in the Housing Needs Assessment.

B. Housing Needs for Extremely Low-Income Households

Extremely low-income is defined as households with income less than 30 percent of Area Median Income (AMI). According to HCD, the area median income in the City of Ukiah as of April 26, 2018 (the date of the last release of median income data from the State) is $60,600 for a family of four. For extremely low income households, this results in an income of $25,100 or less for a four-person household. Many families and individuals receiving public assistance, such as social security insurance (SSI) or disability insurance are considered extremely low-income households. At the same time, a minimum wage worker could be considered an extremely low-income household with an annual income of approximately $22,000 or less. Food service workers making sandwiches at a local deli or preparing coffee at a local cafe could be earning $11 per hour. Pay in these types of jobs, which are fairly common in Ukiah, could qualify workers as extremely low income households.

Existing Extremely Low Income Needs: In 2015, 840 extremely low-income households resided in the City, representing 14 percent of the total households. This was up slightly from 2014 when there were 819 extremely low income households, or 13 percent of total households. Most extremely low-income households are renters (785) and experience a high incidence of housing problems. For example, many of extremely low-income households faced housing problems (defined as cost burden greater than 30 percent of income and/or overcrowding and/or without complete kitchen or plumbing facilities) and most were in overpayment situations. See Table 2.14 for additional details.

Projected Extremely Low Income (ELI) Needs: The Comprehensive Housing Affordability Strategy (CHAS) data indicates that there are 55 owner and 785 renter ELI households in the City of Ukiah. Of the ELI households, approximately 73 percent of owners and 69 percent of renters pay greater than 30 percent of their income on housing costs.

To calculate the projected ELI housing needs, the City assumed 50 percent of its 2019-2027 low-income RHNA would be extremely low-income households. As a result, from the low income RHNA of 86 units, the City has a projected need of 43 units for extremely low-income households. Many extremely low-income households will be seeking rental housing and most likely facing an overpayment, overcrowding or substandard housing condition. Some extremely low-income households could also be special needs populations. To address the range of needs, the City will deploy a detailed housing plan including promoting a variety of housing types, such as single-room occupancy (SRO) units and small lot subdivisions.

To address the housing needs of extremely low-income households, the City will continue programs and strategies created and deployed in the previous (2014-2019) planning period:

1. Identify and meet with nonprofit builders who specialize in building housing for extremely low-income households. This effort is designed to build a long-term partnership in development, gain access to specialized funding sources, identify the range of local resources and assistance needed to facilitate the development of housing for extremely low-income households, and promote a variety of housing types, including higher density, multifamily supportive, single room occupancy and shared housing.

2. Work in conjunction with other agencies to address the needs of the extremely low income households in the City. At least annually and on an on-going basis contact agencies and developers to facilitate implementing the program. Actions to be considered for inclusion in the program include prioritizing City funding, supporting grant

and other applications for funding, and exploring housing types and construction methods to promote housing for ELI citizens.

3. Deploy Ukiah Housing Trust Fund resources to assist in facilitating construction of new housing for extremely low-income households.

4. Support funding applications in support of new housing construction for ELI households.

5. Deploy residential rehabilitation programs through CDBG and/or HOME.

C. Housing Production Since 2014

The City of Ukiah has implemented a variety of incentive-based programs over the preceding five years in an attempt to increase housing production for all economic segments of the community. These include creation of a housing trust fund- the Ukiah Housing Trust Fund, creation of a new Housing Division within the Department of Community Development, development and implementation of a new (2017) Housing Strategy designed to increase production of affordable and middle-income market-rate housing (see Appendix D), and deployment of other programmatic strategies. The result has been a significant increase in new housing construction starts, all of which are infill, as depicted below in Table 3.3.

TABLE 3.3
HOUSING PRODUCTION (2014-2018)

Income Level	RHNA (2014-2019)	2014	2015	2016	2017	2018	Total Units to Date	Total Remaining RHNA (2014-2019)
Very Low (0-50%)	11	0	31	0	0	37	68	0
Low (51-80%)	7	0	10	0	0	0	10	0
Moderate (81-120%)	7	0	0	0	0	35	35	0
Above Moderate (120% +)	20	0	5	7	4	16	32	0
Total Units	**45**						**145**	**0**

SECTION 4: SITES INVENTORY AND ANALYSIS

A. Approved Projects and Entitled Units

Since the Housing Element planning period begins August 15, 2019, the City of Ukiah can take RHNA credit for new units approved or planned as of August 15, 2019. City staff compiled an inventory of all residential projects with a housing component that are, as of August 15, 2019, approved or planned and anticipated to be built by the end of the current Housing Element planning period (August 15, 2027). For approved and planned projects, deed-restricted affordable units are inventoried as lower-income.



An entitlement was approved on February 28, 2018 by the Ukiah Planning Commission for Ukiah Senior Apartments, to be located at 763 South Oak Street. This will be a 31-unit apartment complex, with 30 units for low-income senior households and one manager's unit. The City applied for and was awarded $5.1 million in Home Investment Partnerships (HOME) Program funds to assist the developer in funding the project. The project is anticipated to begin construction in 2019-2020 and will be completed well before August 15, 2027.

B. Vacant and Underutilized Land

Government Code Section 65583.2(c) requires as part of the analysis of available sites that the City of Ukiah demonstrate the projected residential development capacity of the sites identified in the housing element can realistically be achieved. The City must also determine whether each site in the inventory can accommodate some portion of its share of the regional housing need by income level during the planning period.

The inventory must include the following:

- Vacant and underutilized sites zoned for residential use;
- Vacant and underutilized sites zoned for nonresidential use that allow residential development or can be redeveloped for residential use;
- A list of properties by assessor parcel number (APN);
- The size, general plan designation, and zoning of each property;
- A description of environmental constraints;
- A description of existing planned water, sewer, and other dry utilities supply, including the availability and access to distribution facilities; parcels included in the inventory must have sufficient access to these services;
- Sites identified as available for housing for above moderate-income households in areas not served by public sewer systems. This information need not be identified on a site-specific basis;
- Number of units that can be "realistically accommodated"; and
- A reference map that shows the location of all identified sites.

The City of Ukiah completed a new vacant and underutilized list and associated analysis as part of the Housing Element Update. The analysis identified vacant and underutilized sites within the current city limits, and then evaluated each site based on current zoning designations, documented constraints, and State requirements. This analysis found that the City has available capacity for housing suitable for low-income and very low-income groups (161 units) and available housing capacity suitable for moderate and above moderate-income groups (165 units).

State law provides a default density which jurisdictions can use as a threshold to determine appropriate lower-income housing sites (includes very-low and low-income groups). For the City of Ukiah, sites allowing at least 15 dwelling units per acre (du/ac) are considered by the State to be appropriate for lower-income housing. The zoning districts of High Density Residential (R-3), Community Commercial (C-1), Heavy Commercial (C-2), Urban General (UG), Urban Center (UC), and Downtown Core (DC) can support lower-income housing since their maximum densities are 28 du/ac.

State law also stipulates that sites for lower-income housing must be a half-acre or larger, unless the City is able to demonstrate that smaller sites were successfully developed during the prior planning period for an equivalent number of lower-income housing units. Generally, however, it is assumed that sites smaller than a half-acre are not large enough to accommodate multifamily units. Sites smaller than a half-acre typically accommodate single-family homes, duplexes, and fourplexes, which are assumed to be moderate-income housing types. This analysis was completed on a site specific level and some parcels smaller than one-half-acre were determined to be able to accommodate higher density. Small parcels under the same ownership on adjacent parcels may be consolidated into larger sites for identifying lower-income housing sites, provided the zoning allows the appropriate density.

Methodology

The site selection analysis was conducted using data from the City of Ukiah, Mendocino County, and the Federal Emergency Management Agency (FEMA).

1. Initial Site Identification

Density Assumptions

To begin, zoning districts were identified that allowed residential development. Only parcels within these zoning districts were studied for the sites inventory. Table 4.1 shows the zoning districts evaluated and their development assumptions. These densities and assumptions are consistent with development applications historically received within each zoning district.

TABLE 4.1
ZONING DISTRICTS THAT ALLOW RESIDENTIAL DEVELOPMENT

A. Zoning District	B. Min Lot Size	C. Max du/ac	D. Min du/ac
Single-Family Residential (R1H) Hillside	10,000	4	0.1
Single-Family Residential (R-1)	6,000	7	1
Medium Density Residential (R-2) Districts	3,000	14	1
High Density Residential (R-3)	1,500	28	1
Neighborhood Commercial (C-N)	7,000	6	1
Community Commercial (C-1)	1,500	28	1
Heavy Commercial (C-2)	1,500	28	1
Downtown Zoning Code			
General Urban (GU)	4,500	28	10
Urban Center (UC)	4,500	28	15
Downtown Core (DC)	2,500	28	15

Source: City of Ukiah Zoning Code, 2019
Note: Max and min du/ac refers to the maximum and minimum number of units permitted per acre, a measure of housing density.

In calculating the number of units that could realistically be built on each site, the analysis started with the maximum density allowed within each zoning designation. As described in Section 5, due to the City nearing build-out, demand for housing citywide, and the City's commitment to housing production for affordable and middle-income households outlined in the City of Ukiah Housing Strategy it is reasonable to assume developers will seek to develop at the maximum allowable density. This includes commercial zoning districts that currently permit high density residential development. All multi-family projects developed in commercial zones within the last 5 years have either maximized density on the parcel and/or applied for an additional density bonus to further increase density (see Section 5- B.4. on page 82 for additional details).

Next, a site specific analysis was completed to obtain realistic development capacity. This included analyzing existing use and development, surrounding uses, access, infrastructure capacity, slope and other environmental constraints, setbacks, landscaping and parking requirements, as well as allowable densities and building area required by code.

In accordance with GC 65583.2(c)), vacant sites identified in the last two housing element planning periods or nonvacant sites identified in one housing element planning period identified to accommodate housing for lower income households were removed from the list.

Identifying Vacant Sites

An initial list of vacant parcels was identified using the Mendocino County Assessor parcel database (April 2019). Assessor's use codes for vacant parcels were as follows:

- 00 – Vacant Residential
- 10 – Vacant Commercial
- 30 – Vacant Industrial

Additionally, parcels were identified where the improvement value equaled “$0” or “Unavailable” in the Assessor data, which suggested that the parcels could be vacant. Vacancy on these parcels was verified through a review of aerial photography. A field survey consisting of windshield surveying and site visits were also performed to verify the vacancy of parcels.

Identifying Underutilized Sites

An initial list of underutilized parcels was identified using the improvement values of each parcel provided in the Assessor data. Parcels identified where the improvement value was less than $20,000 suggested that the parcels were underutilized to a degree that would make them more likely to redevelop within the planning period. Site specific analyses and site visits were also preformed to verify the underutilization of parcels.

2. Constraints

Airport Compatibility

Based on the Mendocino County Airport Comprehensive Land Use Plan (ACLUP), airport compatibility zones around the Ukiah Municipal Airport create constraints on residential development, regardless of the underlying zoning district.

- Zone A does not allow residential development, and therefore no parcels within Zone A were included in the inventory.
- Zone B1 allows a parcel size of 10 acres with restrictions (Appendix D, ACLUP). For the purposes of this analysis, one unit is assumed per parcel. Zone B1 is appropriate for above moderate-income housing.
- Zone B2 allows a minimum parcel size of 2 acres (Appendix D, ACLUP). For the purposes of this analysis, one unit is assumed per parcel. Zone B2 is appropriate for above moderate-income housing.
- Zone C allows a maximum density of 15 du/ac which meets the default density requirement set by HCD for this area. Sites within Zone C can be counted toward the lower-income housing RHNA, depending on its underlying zone. In certain cases, such as in Low Density Residential areas where the maximum density is 7 du/ac, the allowed maximum density in the underlying zoning district would not qualify a site to be counted as lower-income housing.
- Zone D has no restrictions other than uses that are hazards to flight, and so the underlying zoning district is relied upon to determine the allowed density.

Table 4.2 summarizes the Airport Compatibility Zone Criteria used for this analysis.

TABLE 4.2
AIRPORT COMPATIBILITY ZONE CRITERIA

Zone	Location	Maximum Residential Density	Maximum Persons Per Acre	Income Category
A	Runway Protection Zone or within Building Restriction Line	0	10	n/a
B1	Approach/Departure Zone and Adjacent to Runway	10 acres	60	Above-Moderate
B2	Extended Approach/Departure Zone	2 acres	60	Above-Moderate
C	Common Traffic Pattern	15 du/ac	150	Lower-Income
D	Other Airport Environs	No Limit	No Limit	Any

Many sites across all income categories had reduced capacity due to the lower maximum density requirements in Airport Compatibility Zones A, B1, B2, and C. For example, parcels with zoning that allow up to 28 du/ac but are also located in the B2 zone, are not suitable for lower-income housing because they are limited to one unit per 2 acres based on B2 zone criteria.

Flood Zones

The 1-percent annual chance flood is also referred to as the base flood, or 100-year flood. For this analysis, we considered the 100-year flood zone to be a constraint to all residential development. The 100-year flood zone contains Food Hazard Zones A, AE, V, and VE, as defined by FEMA. All parcels within the 100-year flood zone were removed as being available sites.

Steep Slopes

Steep slopes were considered to be a constraint since these topographical challenges result in lower densities and necessitates specialized site design to accommodate for the terrain, resulting in a more expensive development process. Slope modeling data was not available for this analysis, however, all parcels within the Hillside District were considered to be constrained by steep slopes. Site specific analyses using City development standards were completed for each parcel containing steep slopes and a conservative estimate using two units per acre (although City code and General Plan allows 6 units per acre) was applied. This development intensity is consistent with other development currently existing within the Hillside zoning district. All parcels in the Hillside District are considered only for above moderate-income housing and were not considered to be suitable for housing lower-income groups.

Fire Hazard

Severe fire hazards exist west of the city, but not within city limits. This does not necessarily eliminate the fire risk to the potential sites, but for the purposes of this analysis, the sites were not considered to be constrained by fire hazard areas.

Seismic Hazard

The Alquist-Priolo fault line runs northeast of the City. However, no part of the City falls within the fault zone. Therefore, seismic hazards were not considered to be a constraint to residential development within the city.

3. Vacant and Underutilized Sites Inventory

Table 4.3 lists all parcels evaluated by APN, ownership, location, existing use, zoning, general plan designation, size, realistic development capacity, population, applicable income group category, and known constraints. Potential unit capacity is determined by multiplying acreage with the assumed buildout density as described above. All sites can be accommodated by infrastructure, unless otherwise noted.

In 2018, the estimated persons per household in Ukiah was 2.5 (California Department of Finance). Potential unit capacity is multiplied by 2.5 persons per unit to estimate the number of people each site could accommodate. Sites that are a half-acre or larger, are zoned to allow 15 du/ac or more, and are not constrained by the 100-year flood, steep slope, or Airport Compatibility Zones A, B1, and B2, are categorized as suitable for housing very low- and low-income groups. Sites that are either smaller than a half-acre, are zoned to allow under 15 du/ac, and are not constrained by the 100-year flood or Airport Compatibility Zone A are categorized as suitable for housing moderate and above-moderate-income groups.

Figure 4.1 shows a map of all identified parcels and constraints. Figure 4.2 shows a map of identified vacant parcels. Figure 4.3 shows a map of identified underutilized parcels.

TABLE 4.3: VACANT AND UNDERUTILIZED INVENTORY

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
Very-Low/Low Vacant Parcels												
1	00230155	763 S Oak St	Vacant	C1	C	0.88	38,332	31	77	Very-Low/Low	C	Undeveloped but approved for an entitlement for Ukiah Senior Apartments (31 units) project in Feb 2018. Expected to be developed within 1-2 years.
2	00237027	None Assigned. Corner of Clara & N Orchard	Vacant	C1	C	0.67	29,185	15	37	Very-Low/Low	None	Undeveloped. Realistic development capacity- 22,806 sf available to build up to15 multi-family units. Due to need for housing and citywide build-out, expected to be developed within planning period.
3	17903025	700 E Perkins St	Vacant	C1	C	1.24	54,014	25	62	Very-Low/Low	None	Undeveloped. Realistic development capacity- 37,800 sf available for up to 25 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
4	17903028	730 E Perkins St	Vacant	C1	C	0.58	25,264	16	40	Very-Low/Low	None	Undeveloped. Realistic development capacity- up to 16 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
5	17906104**	705 E Perkins St	Vacant	C1	C	0.52	22,651	14	35	Very-Low/Low	None	Minor improvements including parking lot. Realistic development capacity for up to 14 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
Very-Low/Low Vacant Parcels Subtotal						***3.89***	***169,446***	***101***	***251***			
Moderate/Above-Moderate Vacant Parcels												
6	00111126	None Assigned. Corner of Dora & N Spring	Vacant	R1	LDR	0.16	6,969	2	5	Mod/Above-Mod	None	Undeveloped and surrounded by single family dwellings (SFDs). Realistic development capacity- based on lot restrictions site could be developed with up to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
7	00114239*	179 Park Pl	Vacant	R1	LDR	0.41	17,859	2	5	Mod/Above-Mod	None	Mostly undeveloped but some topographical lot restrictions. Surrounded by SFDs. Realistic development capacity of up to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
8	00114244	169 Park Pl	Vacant	R1	LDR	0.27	11,761	2	5	Mod/Above-Mod	None	Undeveloped. Surrounded by SFDs. Could build up to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
9	00114245	169 Park Pl	Vacant	R1	LDR	0.24	10,454	2	5	Mod/Above-Mod	None	Undeveloped. Some lot restrictions including road access. Realistically could build 2 units- SFD and accessory dwelling unit (ADU). Due to need for housing and citywide build-out, expected to be developed within planning period.
10	00121404	None Assigned. Near S Barnes St & W Clay St	Vacant	R1	LDR	0.54	23,522	3	7	Mod/Above-Mod	D; None	Undeveloped. Lot restrictions and zoning restrict number of units that can be realistically developed to 3. Could increase density if merging with parcel 00121409. Due to need for housing and citywide build-out, expected to be developed within planning period.
11	00125323	None Assigned. Oak Park Ave Between W Clay St & Jones St	Vacant	R1	LDR	0.47	20,473	3	7	Mod/Above-Mod	D; None	Undeveloped and surrounded by SFDs. Realistic development capacity for up to 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
12	00142036	271 Mendo-cino Pl	Vacant	R1	LDR	0.46	20,037	2	5	Mod/Above-Mod	D; Slope	Undeveloped. Although larger lot, topographical restrictions limit to realistic maximum of 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
13	00211480	None Assigned. Behind existing homes on Oak St.	Vacant	R1	LDR	0.15	8,464	2	5	Mod/Above-Mod	None	Undeveloped. Needs road access but realistically could develop 2 units- an SFD and ADU. Due to need for housing and citywide build-out, expected to be developed within planning period.
14	00301059	1010 Helen Ave	Vacant	R1	LDR	0.15	6,534	2	5	Mod/Above-Mod	D; None	Undeveloped; surrounded by SFDs. Due to lot restrictions, maximum development capacity of 1 SFD and 1 ADU. Due to need for housing and citywide build-out, expected to be developed within planning period.
15	00302124	None Assigned. Cochrane Ave Between 410 & 420	Vacant	R1	LDR	0.14	6,098	1	2	Mod/Above-Mod	D; None	Undeveloped. Due to setback limitations realistic development capacity is 1 unit. Due to need for housing and citywide build-out, expected to be developed within planning period.
16	00311056	None Assigned. At the terminus of Redwood Ave	Vacant	R1	LDR	0.29	12,632	2	5	Mod/Above-Mod	D; Slope	Undeveloped. Existing slope constraints allow a realistic development maximum of 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
17	00311079	1080 Helen Ave	Vacant	R1	LDR	0.50	21, 780	3	7	Mod/Above-Mod	D; None	Undeveloped flag lot; surrounded by SFDs. Due to lot limitations realistic development capacity is 3 units maximum. Due to need for housing and citywide build-out, expected to be developed within planning period.
18	00352055	None Assigned. Off of S Dora St Near Washington behind homes	Vacant	R1	LDR	0.16	6.969	2	5	Mod/Above-Mod	D; None	Undeveloped; surrounded by SFDs. Due to lot size, setbacks, and access limitations, realistic development capacity is up to 2 units. Expected to be developed within the planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
19	00352056	None Assigned. Off of S Dora St near Washington behind homes	Vacant	R1	LDR	0.15	6,534	2	2	Mod/Above-Mod	D; None	Undeveloped; similar to parcel 00352055 and same owner. Due to lot size, setbacks, and access limitations, realistic development capacity is up to 2 units. Expected to be developed within the planning period.
20	00354065	None Assigned. On Cresta near Wabash. Adjacent To 191 Cresta Dr	Vacant	R1	LDR	0.21	9,147	2	5	Mod/Above-Mod	D Slope	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
21	00354066	191 Cresta Dr	Vacant	R1	LDR	0.20	8,712	2	5	Mod/Above-Mod	None	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
22	00357217	None Assigned. Cooper Ln near Betty St	Vacant	R1	LDR	0.19	8,276	2	5	Mod/Above-Mod	C	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
23	00357218	None Assigned. Cooper Ln near Betty St	Vacant	R1	LDR	0.21	9,221	2	5	Mod/Above-Mod	None	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
24	00309045	21 Betty St	Vacant	R2	MDR	0.13	5,662	1	2	Mod/Above-Mod	C; Limited access	Undeveloped. Parcel has some access and lot size limitations and realistically could accommodate one SFD. Due to need for housing and citywide build-out, expected to be developed within planning period.
25	00211432	670 N State St	Vacant	C1	C	0.31	13,503	9	22	Mod/Above-Mod	None	Undeveloped, surrounded by residential development.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
												Realistically could accommodate up to 9 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
26	00214611	528 N State St	Vacant	C1	C	0.31	13,815	9	22	Mod/Above-Mod	None	Undeveloped, surrounded by residential development. Realistically could accommodate up to 9 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
27	00230153	638 S State St	Vacant	C1	C	0.26	11,325	3	7	Mod/Above-Mod	C	Undeveloped but given lot limitations and setbacks only 4,550 sf could be realistically developed, setting maximum capacity at 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
28	00204047	None Assigned. On Low Gap Rd in between N State St & Mazzoni St	Vacant	C2	C	0.21	9,147	6	15	Mod/Above-Mod	None	Undeveloped, narrow lot sets realistic development capacity at up to 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
29	00228110*	190 Cleveland Ln	Vacant	C2	C	0.19	8,403	6	15	Mod/Above-Mod	None	Undeveloped. Existing lot limitations sets realistic development capacity at not more than 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
30	00313065	1137 S Dora St	Vacant	CN	C	0.41	17,859	6	15	Mod/Above-Mod	D; None	Undeveloped; but existing lot size limitations and setbacks removes 300 sf and zoning limits density. Realistic development capacity is not more than 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
31	00226307	None Assigned. Corner of	Vacant	GU	C	0.10	3,257	2	5	Mod/Above-Mod	C	Undeveloped; surrounded by commercial development. Zoning allows up to 28 du/acre but lot

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
		W Clay St & S Oak St										and setback limitations limit realistic development capacity to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
32	00350014	None Assigned. Access from Helen Ave and Foothill Ct	Vacant	R1	LDR	7.56	329,313	12	30	Mod/Above-Mod	Slope	Existing slope constraints allow for 299,000 sf (6 ac) of lot to be developed. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre setting realistic development capacity at 12 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
33	00104002***	None Assigned. Access off of W Stanley St	Vacant	R1H	LDR	36.97	1,610,413	2	5	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with a 5 acre lot; 2 units are possible on this parcel and are expected to be developed within the planning period given need for housing and citywide build-out.
34	00104065***	500 Lookout Drive	Vacant	R1H	LDR	6.29	273,992	2	5	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 2 units is possible on this parcel and is expected to be developed within the planning

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
												period given need for housing and citywide build-out.
35	00104082***	360 S Highland Ave	Vacant	R1H	LDR	29.63	1,290,682	12	30	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 12 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
36	00104084***	None Assigned. Access from Highland Ave	Vacant	R1H	LDR	10.08	439,084	4	10	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 4 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
37	00104088***	None Assigned. Access from Highland Ave	Vacant	R1H	LDR	8.45	368,081	4	10	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 4 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
38	00104092	335 Janix Dr	Vacant	R1H	LDR	4.77	207,781	8	20	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre; a maximum of 8 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
39	00104093***	335 Janix Dr	Vacant	R1H	LDR	4.86	211,701	2	5	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 2 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
Moderate/Above-Moderate Vacant Parcels Subtotal						***115.43***	***5,000,718***	***124***	***308***			
Very-Low/Low Underutilized Parcels												
40	00304079; 00304077*; 00304078*;	210 E Gobbi St	Underutilized	C1;C2	C	2.4	22,098	36	90	Very-Low/Low	B2	Underutilized; existing community garden on-site. Application for $500,000 in Ukiah Housing Trust Fund received in 2018 for 40 low income housing units but due to airport constraints, realistic development potential is 36 units. This site consists of three parcels suitable for development. Two of the parcels, 00304077 and 00304078, were listed in the prior planning period. The third parcel, 00304079, was not listed. However, realistically all three

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
												parcels will be developed at one time and this will also maximize development potential on the site. Program 2h to allow by right housing development on these parcels has been added. Due to need for housing and citywide build-out, expected to be developed within planning period.
41	00357407**	817 Waugh Ln	Underutilized	R3	HDR	1.66	72,309	24	60	Very-Low/Low	C	Underutilized with existing SFD and minor outbuildings. Existing topographical and lot limitations, plus airport constraints, set realistic development capacity at up to 24 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
Very-Low/Low Underutilized Parcels Subtotal						***4.06***	***94,407***	***60***	***150***			
Mod/Above-Mod Underutilized Parcels												
42	00104061	None Assigned. Parcel off of Hillview Ave	Underutilized	R1	LDR	3.23	140, 698	14	35	Mod/Above-Mod	D; None	Partially developed with residential and/or commercial. Due to existing lot limitations, approximately 30% of the lot has been removed for potential development capacity. Lot area for development is expected to be 87,000 sf and would accommodate up to 14 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
43	00125129	438 Mcpeak St	Underutilized	R1	LDR	0.18	7,840	1	2	Mod/Above-Mod	D; None	Partially developed with residential and/or commercial. Existing lot limitations and development set future realistic development capacity at 1 unit. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
44	00126618	611 W Clay St	Underutilized	R1	LDR	0.29	12,632	2	5	Mod/Above-Mod	D; None	Partially developed with residential and/or commercial. Given existing development on site, realistic development capacity is 1 SFD and 1 ADU (2 units). Due to need for housing and citywide build-out, expected to be developed within planning period.
45	00142034	275 Mendocino Pl	Underutilized	R1	LDR	0.98	42,688	6	15	Mod/Above-Mod	D; Slope	Partially developed with residential and/or commercial. Given existing topographical, development, and lot limitations including slope constraints, realistic development capacity anticipated at no more than 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
46	00142041	145 Mendocino Pl	Underutilized	R1	LDR	0.84	36,590	5	12	Mod/Above-Mod	D; Slope	Partially developed with residential and/or commercial. Given existing topographical, development, and lot limitations including slope constraints, realistic development capacity anticipated at no more than 5 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
47	00113052	1217 W Standley Ave	Underutilized	R1H	LDR	1.18	51,400	1	2.5	Mod/Above-Mod	Slope	Partially developed with residential and/or commercial. Given existing development on site plus slope limitations, realistic development capacity is 1 SFD and 1 ADU (2 units). Due to need for housing and citywide build-out, expected to be developed within planning period.
48	00212404	217 Ford St	Underutilized	R2	MDR	0.22	9,583	3	7	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus topographical limitations, realistic development capacity is

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
												no more than 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
49	00213309	308 Clara Ave	Underutilized	R2	MDR	0.22	9,582	3	7	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus topographical limitations, realistic development capacity is no more than 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
50	00215305	221 Norton St	Underutilized	R3	HDR	0.46	20,037	2	5	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus slope limitations, realistic development capacity is 1 SFD and 1 ADU (2 units). Due to need for housing and citywide build-out, expected to be developed within planning period.
51	00208004	170 Low Gap Rd	Underutilized	C1	C	0.17	7,405	4	10	Mod/Above-Mod	None	Partially developed with residential and/or commercial but parcel is largely undeveloped/vacant. Realistic development capacity is up to 4 units and expected to be developed within the planning period.
52	00211436	678 N State St	Underutilized	C1	C	0.22	9,583	1	2	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus lot limitations, realistic development capacity is 1 unit. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
Moderate/Above-Moderate Underutilized Parcels Subtotal						***7.77***	***197,757***	***41***	***100.5***			
Very-Low/Low Vacant Parcels Subtotal						**3.89**	**169,446**	**101**	**251**			
Moderate/Above-Moderate Vacant Parcels Subtotal						**115.43**	**5,000,718**	**124**	**308**			
Very-Low/Low Underutilized Parcels Subtotal						**4.06**	**94,407**	**60**	**150**			
Moderate/Above-Moderate Underutilized Parcels Subtotal						**7.77**	**197757**	**41**	**100.5**			
Totals Very-Low/Low Vacant + Underutilized Parcels						**7.95**	**263,853**	**161**	**401**			
Totals Moderate/Above-Moderate Vacant + Underutilized Parcels						**123.2**	**5,19,8475**	**165**	**408.5**			
		LEGEND: **Zoning**: R1- Single Family Residential; R1h-Single Family Residential, Hillside Combining District; R-2- Medium Family Residential; R-3- High Density Residential; C1- Community Commercial; CN-Neighborhood Commercial; C2-Heavy Commercial; GU-General Urban; DC- Downtown Core; UC-Urban Center. **General Plan**: LDR- Low Density Residential; MDR- Medium Density Residential; HDR- High Density Residential; C-Commercial. **Constraints** (Airport Influence Zones): B2-Extended Approach/Departure Zone; C-Common Traffic Pattern; D-Other Airport Environs. *= Identified in both 2009-2014 and 2014-2019 HE cycles ** = Neither of these sites were identified in the prior planning period. ***= R1H regulations require a 5 acre lot for parcels with 30-50% slopes. NOTE: All parcels have access to infrastructure and utilities unless otherwise noted								

FIGURE 4.1
VACANT AND UNDERUTILIZED SITES AND CONSTRAINTS

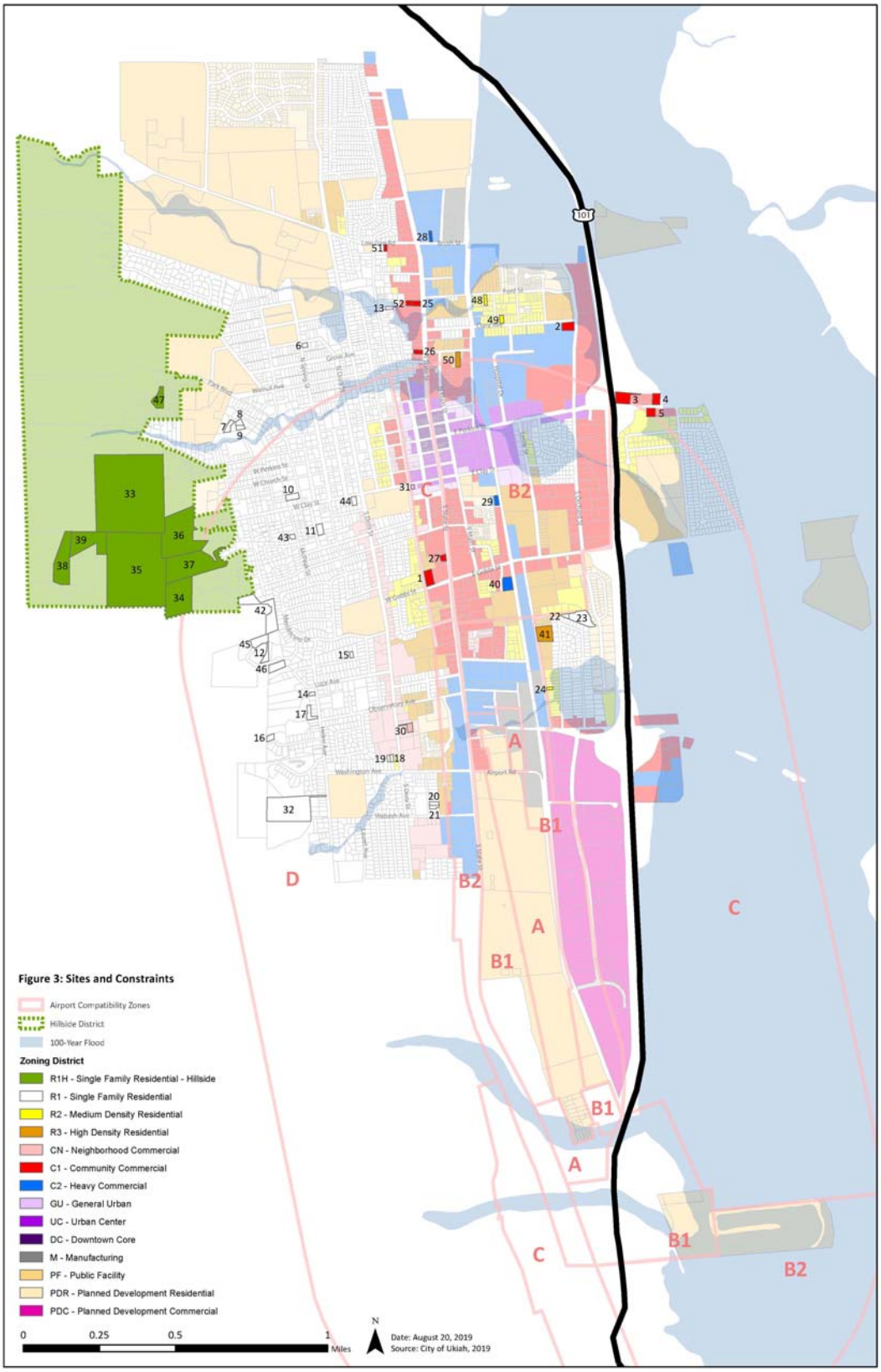


FIGURE 4.2
VACANT SITES

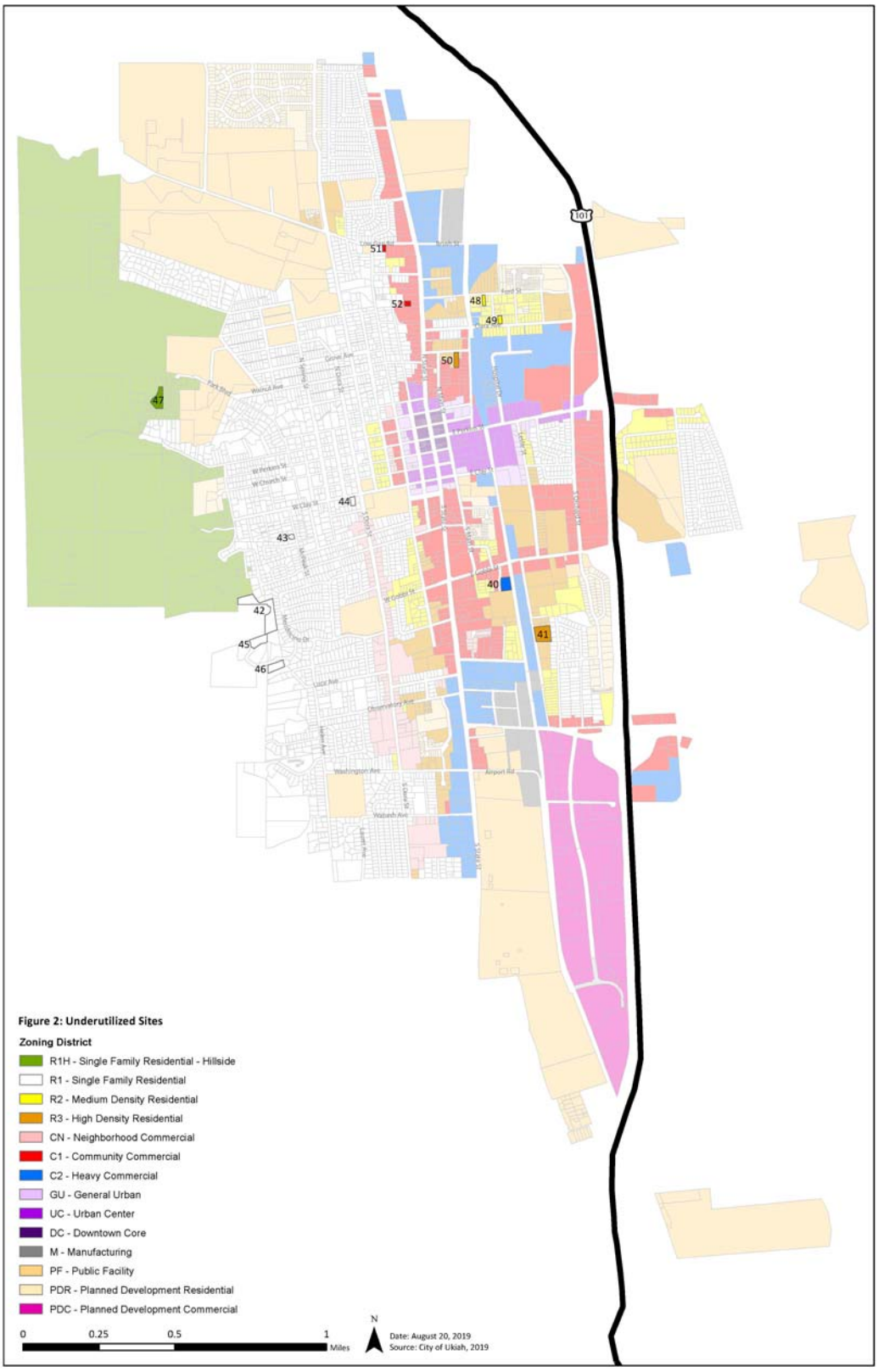
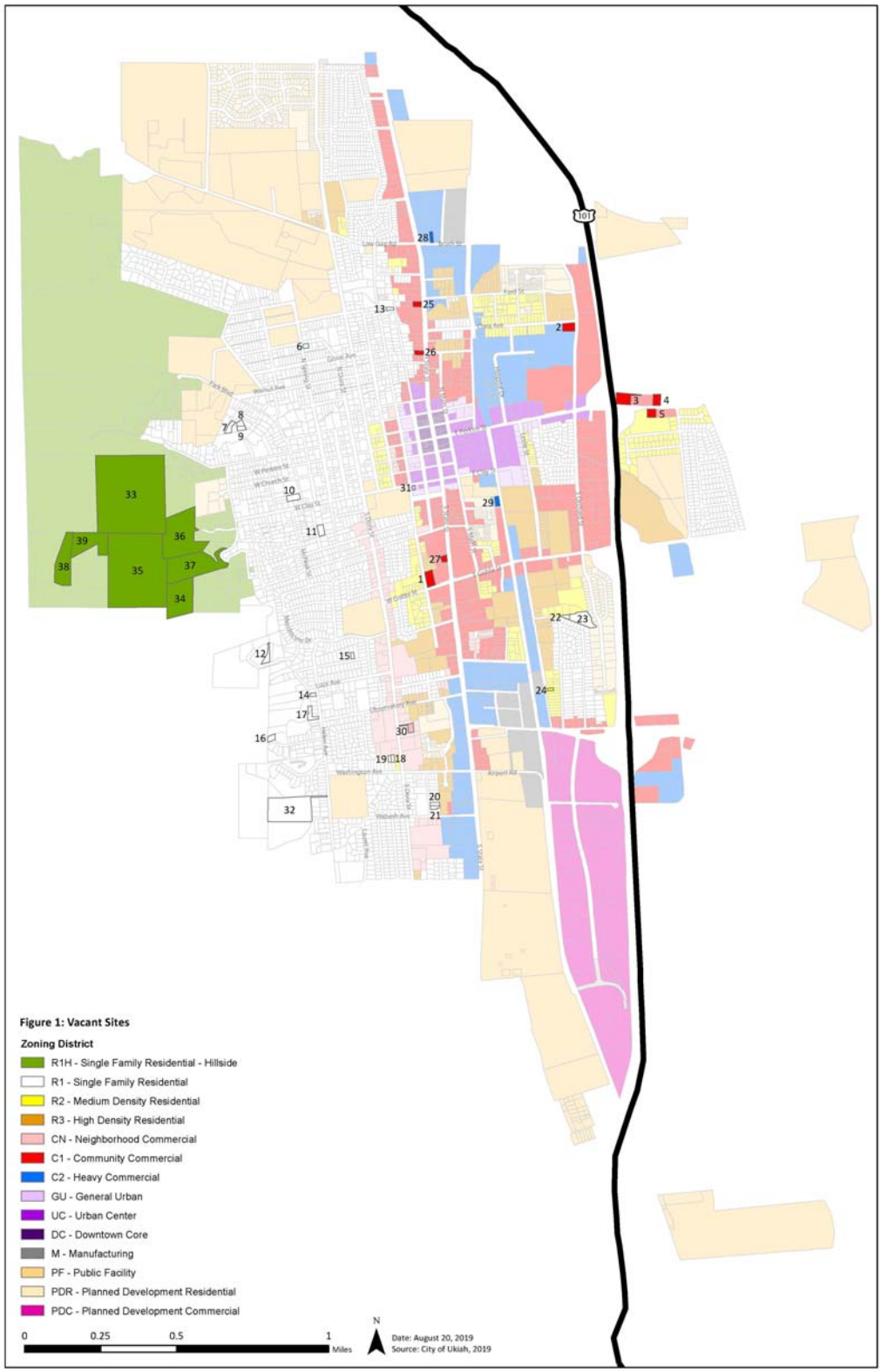


FIGURE 4.3
UNDERUTILIZED SITES



SUMMARY OF FINDINGS

According to the 2018 RHNA prepared by the Mendocino Council of Governments, the City of Ukiah is responsible for identifying adequate sites, with appropriate zoning, to support 86 very low-income housing units and 72 low-income housing units, for a total of 158 lower income housing units, and 49 moderate-income and 32 above moderate-income housing units, for a total of 81 moderate and above moderate housing units. This analysis shows that the city has capacity for 161 very-low and low-income housing units and 165 moderate and above-moderate income housing units. In 2018, the estimated persons per household in Ukiah was 2.5 (California Department of Finance). After applying this estimate to the maximum capacity for lower-income units, the city would be able to accommodate an additional 401 people in low and very-low-income housing, and 408 additional people in moderate and above-moderate-income housing. Table 4.4 shows a summary of these findings.

TABLE 4.4
SUMMARY OF HOUSING CAPACITY BY INCOME LEVEL

	Very Low	Low	Moderate	Above Moderate
RHNA	86	72	49	32
Vacant Sites Capacity		101		124
Underutilized Sites Capacity		60		41
RHNA Total		*158*		*81*
Existing Capacity		*161*		*165*
Housing Capacity Surplus		***+3***		***+84***
Population Capacity		*401*		*408*

Program Considerations

Although there is enough capacity to meet and exceed the RHNA allocation, the City has added the following programs to more proactively plan for the provision of additional housing opportunities in the future:

- **Amend C1 and C2 Zones to allow by-right housing development, with objective design and development standards.**

  This program would make it easier for developers to build housing and that lower income housing will be built on parcels zoned C1 and C2 within the planning period. This is especially relevant since all identified vacant parcels for lower income housing have C1 or C2 zoning.

- **Amend the R-2 Zone to allow up to 15 du/ac instead of 14 du/ac.**

  This program would allow the City to use sites with R-2 zoning toward the lower income RHNA allocation, based on Ukiah's default density of 15 du/ac. This program would create more sites that allow by-right lower-income housing in the future.

- **Amend the C-N Zone to increase residential density and allow similar housing types as allowed in R-2.**

  This program would allow more housing types for moderate-income housing, which typically consists of small-lot single-family homes and smaller multifamily developments such as duplexes and fourplexes.

SECTION 5: HOUSING CONSTRAINTS AND OPPORTUNITIES

The City has regulatory constraints (fees/exactions and zoning standards) and environmental constraints like other communities in California. The environmental constraints include traffic, drainage/flood zones, mature trees, and airport compatibility. All of these constraints affect future development to varying degrees, and each site listed in the Vacant and Underutilized Land Survey (Appendix E), was examined not only for the presence of constraints, but to what degree the constraints would impact the future development of housing.

The following sections provide an analysis of potential and actual constraints to housing development, as well as an evaluation of whether the potential constraint has been addressed through past policies or will need to be addressed in the future. Where needed, specific policies and programs to address identified constraints are outlined in the Housing Goals, Policies, and Programs section of the Housing Element Update. Additionally, this section summarizes opportunities for energy conservation, as they relate to new residential development in Ukiah.

A. Governmental Constraints

1. Zoning Code

Through its Zoning Code, the City of Ukiah enforces minimum site development standards for new residential uses. The City has lot coverage, setbacks, height limitations and other regulatory constraints to development. While these zoning standards are typical, the City does not have a Floor Area Ratio (FAR) standard, which limits development in other communities. The City also has a Planned Development overlay zoning classification, providing the opportunity for increased flexibility for development projects, a density bonus for new affordable housing projects, and allows high density residential uses within its commercial zoning districts. In 2018, as a part of the City's 2017 Housing Strategy, City Staff developed a residential density calculation ordinance applicable to mixed-use and medium density (R-2) residential projects. The impact of the ordinance was to increase density by at least one to three units per acre.

The City's current zoning code allows for a variety of housing types throughout the City. Individual single family residences are allowed by right in all residential districts and within the Neighborhood Commercial (CN) district. Second dwelling units are allowed by right within all residential districts and commercial districts and accessory dwelling units (ADUs) are allowed by right in the Single Family Residential (R-1) zoning district. Multiple family residential apartment units are allowed by right in R-2 and R-3 zoning districts and permitted in all commercial zoning districts with the securing of a Use Permit. Table 5.1 includes a summary of permit type required for each housing type within each zoning district. Table 5.2 includes development standards within those districts. Figure 5.1 is a map of the zoning districts within the City.

The City does not have any locally adopted ordinances such as an inclusionary housing ordinance or short-term rental ordinance that impact the cost or supply of housing.

TABLE 5.1
PLANNING PERMIT REQUIREMENTS BY ZONING DISTRICTS

	R1	R2	R3	CN	C1	C2	M	R1H	GU	UC	DC
Single Family Residence	A	A	A	A	UP	UP	--	UP	A	A	--
Manufactured Homes/ Factory Built Homes*	A	A	A	--	--	--	--	--	--	--	--
Second/Accessory Dwelling Unit	A	A	A	A	A	A	--	UP	A	A	--
Duplex	--	A	A	--	UP	--	--	--	A	A	--
Condominiums	UP	A	A	--	A	--	--	UP	A	A	A
Multifamily	--	A	A	--	UP	UP	--	--	A	A	--
Dwelling Groups	--	UP	UP	--	--	--	--	--			
Mobile home park	--	--	UP	--	UP	--	--	--	--	--	--
Mixed Use (Residential & Commercial)	--	--	--	UP	UP	UP	--	--	A	A	A

NOTES:
A (Allowed by right); UP (Allowed through approval of a Use Permit); -- (Not allowed)
Within the R2 zoning district single-family dwelling on a three thousand (3,000) square foot lot (1 side 0 lot line and 1 side 5-foot setback provided that "0" lot lines are contiguous) may be allowed through obtaining a UP.
Second/Accessory Dwelling Units are allowed on lots developed with a single-family residence.
Within the GU, UC and DC zoning districts, mixed use residential/commercial is allowed on floors above the ground floor or behind a ground floor use. A major use permit is required to allow on the street frontage of the ground floor.
Dwelling Group is defined as a group of three (3) or more single-family residences or two (2) or more detached duplex buildings, apartments, condominiums, and occupying a parcel of land in the same ownership and having any yard or court in common. Dwelling group does not include motels.
* Manufactured homes must be certified under the National Manufactured Home Construction and Safety Standards Act of 1974 (42 USC section 5401 et seq.), subject to the following regulations:
A. Foundation System: The manufactured home shall be attached to a permanent foundation system approved by the city building official and designed and constructed pursuant to section 18551 of the State Health and Safety Code.
B. Utilities: All utilities to the manufactured home shall be installed pursuant to City standard practices and policies.
C. Permits: All applicable building, site development, and encroachment permits associated with development of residential property shall be secured prior to any on site construction.

TABLE 5.2
RESIDENTIAL ZONING DISTRICTS AND DEVELOPMENT STANDARDS

Zoning District	Front Yard Setback	Side Yard Setback	Rear Yard Setback	Maximum Height	Maximum Lot Coverage	Required Site Area	Max Density per General Plan	Parking Required
R-1 **Single Family Residential**	20’ 30’ for garages	10’ 5’ for accessory buildings	20’ 5’ for accessory buildings	30’ 20’ for accessory buildings*	N/A	6,000 sq ft 7,000 sq ft. for corner lot	6 dwelling units per acre	2 on-site
R-2 **Medium Density Residential**	15’ 25’ for garages	10’	15’	30’ 20’ for accessory buildings*	N/A	6,000 sq ft 7,000 sq ft for corner lot 3,000 for multi-family	14*** dwelling units per acre	2 Per duplex unit; 1 per bedroom for MFR
R-3 **High Density Residential**	15’ 25’ for garages	5’	10’	40’ 30’ when abutting R-1 or R-2	N/A	6,000 sq ft 7,000 sq ft for corner lot 1,500 for multi-family	28 dwelling units per acre	2 Per duplex unit; 1 per bedroom for MFR
C-N **Neighborhood Commercial**	10’ 15’ for second story	5’ 10’ for second story	10’	30’ 20’ for accessory buildings	40%	7,000 sq ft	28 dwelling units per acre	2 Per duplex unit; 1 per bedroom for MFR
Zoning District	**Front Yard Setback**	**Side Yard Setback**	**Rear Yard Setback**	**Maximum Height**	**Maximum Lot Coverage**	**Required Site Area**	**Max Density per General Plan**	**Parking Required**

C-1 **Community Commercial**	5’ 5’ for second story	0’ unless abutting an R-1, R-2, or R-3 parcel**	0’ unless abutting an R-1, R-2, or R-3 parcel	50’	N/A	6,000 sq ft 7,000 sq ft corner lot 1,500 for multi-family	28 dwelling units per acre	2 Per duplex unit; 1 per bedroom for MFR
C-2 **Heavy Commercial**	5’ 5’ for second story	0’ unless abutting an R-1, R-2, or R-3 parcel	0’ unless abutting an R-1, R-2, or R-3 parcel	40’ 20’ for accessory buildings	N/A	None for commercial 1,500 for multi-family (defaults to R3 standards)	28 dwelling units per acre	2 Per duplex unit; 1 per bedroom for MFR
P-D **Planned Development**	To be determined in the review process	To be determined in the review process	To be determined in the review process	To be determined in the review process	To be determined in the review process	½ acre unless located in the downtown and fulfills other criteria	28 or more units per acre	Flexible

NOTES:

1. ***** 20’ or the maximum height of the main building whichever is less.
2. ****** If abutting an R-1, R-2, or R-3 parcel, then the setback for that residential district applies.
3. *******Application of the 2018 residential density calculation ordinance may yield up to an additional one to three units per acre, depending on lot size and characteristics of the property.
4. The B1 and B2 Airport Compatibility Zones list multiple story offices as “normally not acceptable.” The B2 *Infill Policy* north of the airport limits buildings to two stories.
5. Various residential housing types are allowed or permitted in all of the above zoning districts
6. Parking requirements vary, but are generally less than nearby jurisdictions in an effort to reduce the size of parking lots and to discourage automobile use.
7. Deviation from lot coverage and parking standards are possible with discretionary review.

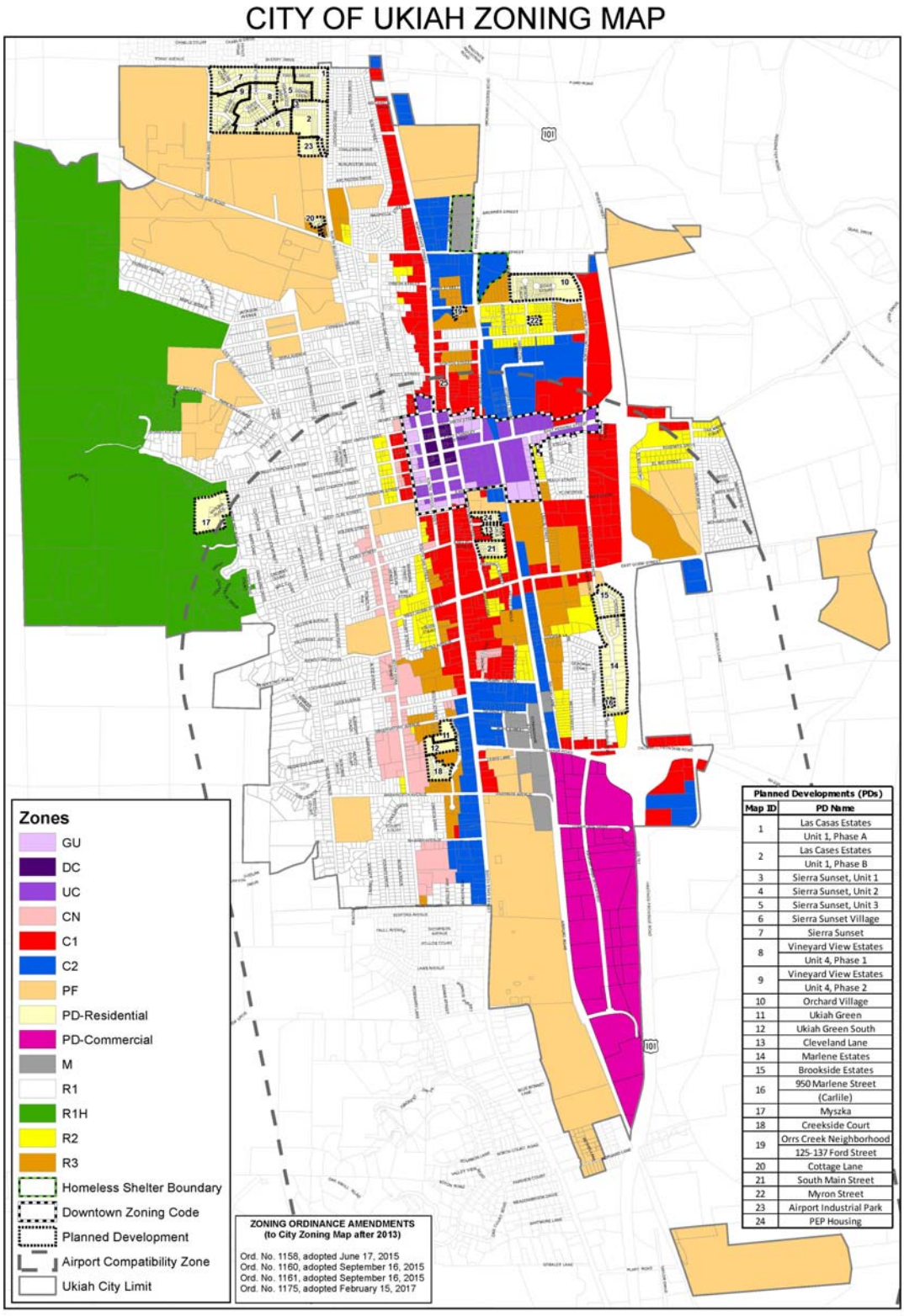
Downtown Zoning Code

The Downtown Zoning Code (DZC) is a form-based code that was adopted in 2012, out of the 2009-2014 Housing Element. The DZC allows for residential development by right in most districts and contains a separate set of development standards. Table 5.2 shows a summary of these standards for density, height, and setbacks, and Figure 5.1 is a map of the zoning designations in the City (areas of the DZC are shown in purple). The DZC also contains specific development standards, such as for landscaping, architectural standards, building orientation, and pedestrian access.

TABLE 5.3
DOWNTOWN ZONING CODE DEVELOPMENT STANDARDS SUMMARY

Standards	GENERAL URBAN (GU)	URBAN CENTER (UC)	DOWNTOWN CORE (DC)	Modification to Standard
RESIDENTIAL DENSITY (Also Subject to Airport Zone Restrictions)				
Minimum	10 units/acre	15 units/acre	15 units/acre	Major Exception
Maximum	28 units/acre	28 units/acre	28 units/acre	Major Exception
LOT STANDARDS (6) (Also Subject to Airport Zone Restrictions)				
Lot Size – Interior	4,500 square feet	4,500 square feet	2,500 square feet	Major Exception
Lot Size – Corner	5,000 square feet	5,000 square feet	3,000 square feet	Major Exception
Lot Width	30 feet minimum	30 feet minimum	30 feet minimum	Major Exception
Lot Depth	70 feet minimum	70 feet minimum	70 feet minimum	Major Exception
Lot Coverage	70% maximum	80% maximum	90% maximum	Major Exception
BUILDING SITING (SETBACKS)				
Front	0 ft. minimum 10 ft. maximum	0 ft. maximum	0 ft. maximum	Major Exception
Front with sidewalk cafe/shopfront	12 ft. maximum	12 ft. maximum	12 ft. maximum	Major Exception
Side	0 ft. minimum 10 ft. maximum	0 ft. minimum 10 ft. maximum	0 ft. minimum 6 ft. maximum	Major Exception
Rear	6 ft. minimum	6 ft. minimum	6 ft. minimum	Major Exception
Rear – corner lot no alley	6 ft. maximum	6 ft. maximum	6 ft. maximum	Major Exception
Rear – with alley	14 ft. from center line	14 ft. from center line	14 ft. from center line	Major Exception
BUILDING HEIGHT				
New building	2 stories minimum 2 stories maximum (8)	2 stories minimum 3 stories maximum (8)	2 stories minimum 4 stories maximum (8)	Major Exception
PARKING REQUIREMENTS				
Residential	1.5 per dwelling unit	1.0 per dwelling unit	1.0 per dwelling unit	Major Exception

FIGURE 5.1


CITY OF UKIAH ZONING MAP
Zones
GU
DC
UC
CN
C1
C2
PF
PD-Residential
PD-Commercial
M
R1
R1H
R2
R3
Homeless Shelter Boundary
Downtown Zoning Code
Planned Development
Airport Compatibility Zone
Ukiah City Limit
ZONING ORDINANCE AMENDMENTS
(to City Zoning Map after 2013)
Ord. No. 1158, adopted June 17, 2015
Ord. No. 1160, adopted September 16, 2015
Ord. No. 1161, adopted September 16, 2015
Ord. No. 1175, adopted February 15, 2017
Planned Developments (PDs)
Map ID
PD Name
1 Las Casas Estates Unit 1, Phase A
2 Las Cases Estates Unit 1, Phase B
3 Sierra Sunset, Unit 1
4 Sierra Sunset, Unit 2
5 Sierra Sunset, Unit 3
6 Sierra Sunset Village
7 Sierra Sunset
8 Vineyard View Estates Unit 4, Phase 1
9 Vineyard View Estates Unit 4, Phase 2
10 Orchard Village
11 Ukiah Green
12 Ukiah Green South
13 Cleveland Lane
14 Marlene Estates
15 Brookside Estates
16 950 Marlene Street (Carlile)
17 Myszka
18 Creekside Court
19 Orrs Creek Neighborhood 125-137 Ford Street
20 Cottage Lane
21 South Main Street
22 Myron Street
23 Airport Industrial Park
24 PEP Housing

Planned Development Combining District

The Planned Development (PD) combining district contained in the Ukiah City Code is used as a tool to allow flexibility in design and development in order to promote economical and efficient use of land. It generally provides a method for deviating from standardized zoning requirements to foster well-planned, creative, and quality development projects. The PD tool is similar to an overlay zoning district that produces a result similar to a rezoning. For example, an affordable senior housing project applicant may propose to overlay the PD zone over an existing R-3 (High Density Residential) zoning district to reduce parking requirements, relax yard setbacks, and reduce access roadway widths. The application requires review and a public hearing by the Planning Commission and a final review and action by the City Council.

Current zoning code regulations do not appear to represent a clear constraint to new housing development. Improvements to the zoning code such as the affordable housing density bonus, accessory dwelling unit ordinance, and residential density calculation ordinance have further reduced the potential for constraints and led to development of new housing throughout the City. Recently a developer praised the City of Ukiah for its proactive approach to removing potential constraints for housing development, stating an intention to seek out additional parcels in Ukiah for development of housing projects.

Although the City has made good progress in recent years removing barriers to housing development and developing incentives to encourage future development, the City also seeks to proactively ensure the potential for additional housing opportunities in the future. As stated in Section 4, the City has added programs focused on removing constraints in the zoning code.

2. Parking

Excessive parking requirements may serve as a constraint by increasing development costs and reducing the amount of land available for additional units or project amenities such as gyms and open space or common areas. The Ukiah City Code generally requires one parking space for one-bedroom apartment units and two spaces for two-bedroom apartment units. Mixed use projects containing a commercial component generally require one space per every 250 square feet of gross leasable space.

Relief from parking requirements may be granted through the discretionary review process in some instances. In any district, the sum of the separate parking requirements for each use in a mixed residential/commercial project may be reduced by not more than 35% where day and night time uses offset parking demand based on documentation that supports a finding of reduced parking demand.

In addition, Parking District 1 within the downtown area offers reduced parking requirements for projects near city parking lots, projects containing pedestrian accessibility to services and projects within certain distances from transit stops. Parking District 1 also contains a variance procedure for further reductions.

In any district, the Community Development Director may approve a reduction in parking requirements not exceeding thirty percent (30%) for housing projects with at least four living units reserved for seniors, disabled persons, emergency shelters, transitional housing, single room occupancies, or other special needs housing with reduced parking demand based on

factors such as age of occupants, disabilities, household size, or other factors that support a finding of reduced parking demand.

Regardless of the flexibility in parking standards mentioned above, City staff has heard from some multi-family housing developers, particularly those that construct housing for market-rate moderate-income households, that the City's parking standards may be unintentionally reducing the number of housing units feasible on a particular site. The City's 2017 Housing Strategy (see Appendix D) also addressed parking standards as a possible constraint to development of middle-income housing and an intention to explore flexible or other parking standards.

Based on the aforementioned, existing parking standards have been identified as a potential constraint to housing development, especially for affordable and moderate-income market rate housing. Therefore, research of flexible or other parking standards has been listed as a Program under the Housing Goals, Policies, and Programs section and will be prioritized for completion within the first few years of implementation of the 2019-2027 Housing Element Update.

3. City Design Guidelines

The City of Ukiah adopted Design Guidelines in 1992 to establish a vision for the City's design character. The Guidelines, although not prescribed as requirements, serve as a bridge between the goals in the General Plan and the requirements of the Zoning Code. The Guidelines are a necessary component of design review for commercial and residential development projects and establish a process for independent evaluation by an appointed Design Review Board, an advisory board to the Zoning Administrator and Planning Commission.

City staff have heard from developers that the existing Design Guidelines do not provide prescriptive design standards and that the project review process is vague. To address these concerns City staff will work with the Design Review Board to seek and develop a set of clear objective design standards and ways to streamline the process.

Although not necessarily a constraint to housing development, the design review process could be streamlined to save time during the development process. This has been listed as a Program under the Housing Goals, Policies, and Programs section.

4. Airport Influence Zones

The Ukiah Municipal Airport is the largest airport in Mendocino County and provides an important regional service, both for public safety purposes and local economic development. Ensuring development that is compatible with existing airport environs is an essential function of the Mendocino County Airport Land Use Commission, which reviews projects under requirements in the existing Airport Comprehensive Land Use Plan.

Adopted in 1996, the existing Plan sets both density and height limitations, including that three-story buildings (other than for public facilities) are disallowed in the B2 Infill area north of the airport.

See Figure 5.2 for the Compatibility Zoning Map from the Mendocino County Airport Comprehensive Land Use Plan. Table 5.3 provides details on the compatibility criteria in each of the compatibility zones.

FIGURE 5.2

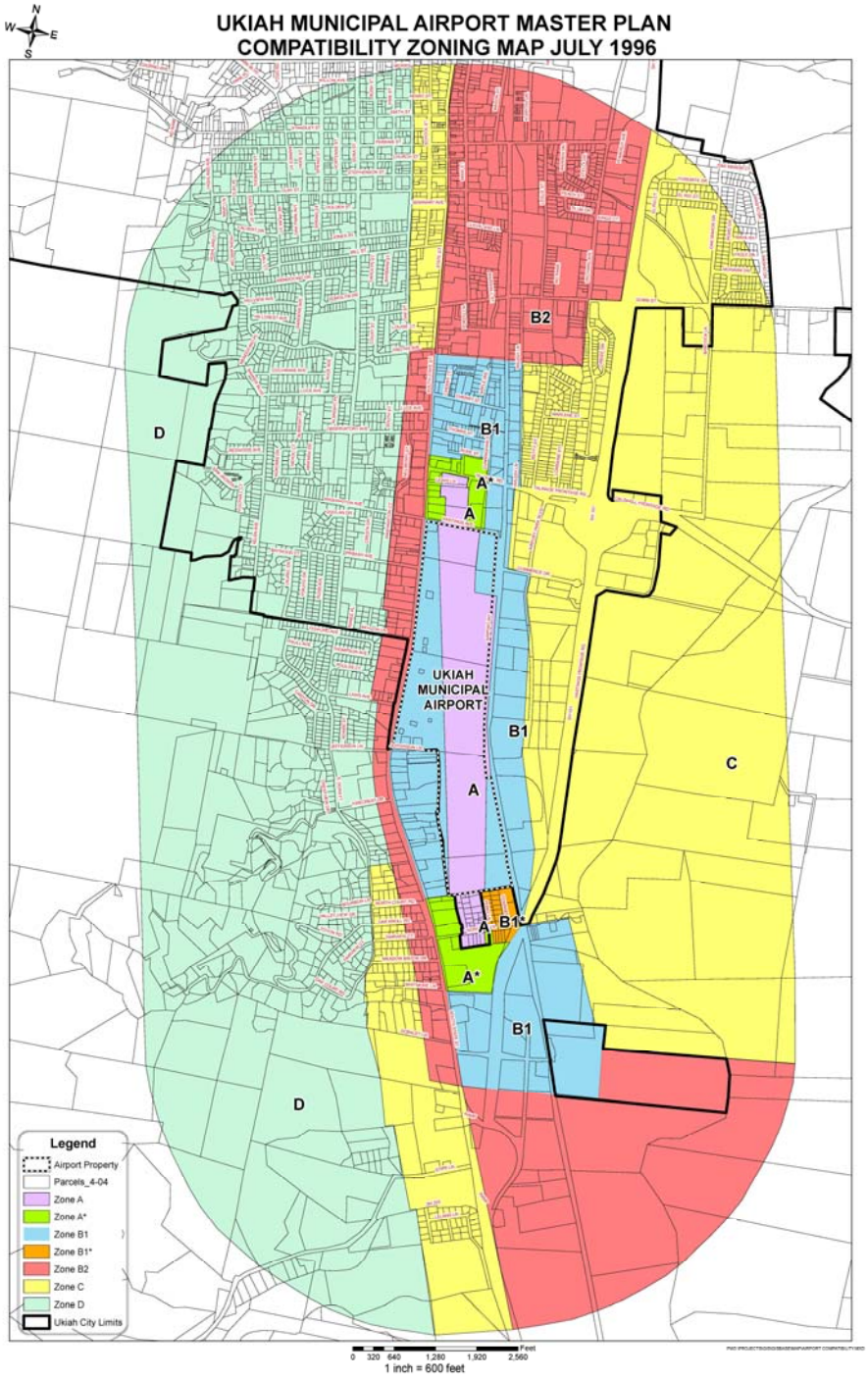

UKIAH MUNICIPAL AIRPORT MASTER PLAN
COMPATIBILITY ZONING MAP JULY 1996
N
W
E
S
B2
B1
A*
A
UKIAH MUNICIPAL AIRPORT
C
D
Legend
Airport Property
Parcels_4-04
Zone A
Zone A*
Zone B1
Zone B1*
Zone B2
Zone C
Zone D
Ukiah City Limits
0 320 640 1,280 1,920 2,560 Feet
1 inch = 600 feet

TABLE 5.4
1996 AIRPORT COMPREHENSIVE LAND USE PLAN COMPATIBILITY CRITERIA
(Excerpt from Table 2A of Plan)

Airport Zone/Location	Open Space Req.	Maximum Densities		
		Residential	Other Uses (people/ac.)	Prohibited Uses / Uses Not Normally Acceptable
A – Runway Protection Zone	All Remaining	0	10	All structures except ones with aeronautical function; objects exceeding FAR Part 77 height limits
B1 – Approach / Departure Zone	30% Required	10 acres	60	Multi-family residential, residential subdivisions
B2 – Extended Approach / Departure Zone	30% Recommended	2 acres	60	Multi-family residential, residential subdivisions

If development projects in the zones listed above can meet the requirements, they can proceed without an Airport Comprehensive Land Use Plan consistency determination from the Mendocino County Airport Land Use Commission (ALUC). However, if any project involves a General Plan amendment, rezoning, or specific plan, or there is a question of compatibility under the City of Ukiah ALUC Referral Procedure, then the project is required to be submitted to the ALUC for a consistency determination.

As noted in the Table, the Ukiah Airport Master Plan indicates that residential subdivisions and multi-family residences are not normally acceptable in the B1 and B2 airport compatibility zones. However, the Plan also indicates that "These uses typically do not meet the density and other development conditions listed. They should be allowed only if a major community objective is served by their location in this zone and no feasible alternative exists."

These constraints result in less opportunity for housing development.

Update to the Mendocino County Airport Comprehensive Land Use Plan

The process of referring a project to the Mendocino County Airport Land Use Commission for a consistency determination, with a possible overrule decision from the Ukiah City Council, can result in months added to the entitlement process timeline, which affordable housing developers in particular often cannot accommodate due to timing requirements of funding sources. City staff has thus been working with the Mendocino County Airport Land Use Commission and Mendocino County Planning and Building Services to facilitate an update to the Airport Comprehensive Land Use Plan.

On February 13, 2019, the City of Ukiah executed a contract with an airport land use planning consultant to complete an update to the Airport Land Use Compatibility Plan (formerly, the Airport Comprehensive Land Use Plan) for Ukiah Municipal Airport. The updated plan will be approved and adopted by the Airport Land Use Commission, with staff support and funding provided by the City Community Development Department and Mendocino County Planning and Building Services.

Despite the potential for constraints due to airport compatibility concerns related to the 1996 Airport Comprehensive Land Use Plan, City staff has found no examples of a housing project being considered inconsistent by the Airport Land Use Commission. Multi-family residential projects have been proposed and approved in the B1 and B2 Infill compatibility zones north of the airport over the past several years, the most notable of these being the 64-unit Summercreek Village affordable housing project, completed in 2001, and the Sun House Apartments 42-unit affordable senior project, completed in 2017.

Although staff have found no examples of a housing project being considered inconsistent, completion of a new Airport Land Use Compatibility Plan is expected to further alleviate the potential for constraints to housing development. Compatibility criteria, noise contours, and airport compatibility zones will be updated with current airport environs and requirements listed in the 2011 California Airport Land Use Planning Handbook. The Airport Land Use Compatibility Plan for Ukiah Municipal Airport is scheduled to be completed and adopted by the Mendocino County Airport Land Use Commission by December 31, 2019.

5. Fees and Exactions

An updated fee schedule was adopted in 2018. Reduced planning permit fees are charged for affordable housing and special needs housing projects (see Table 5.4). The City requires payment of different fees as a condition of development approval. These fees are lower than comparable market-rate fees for technical plan review tasks and for fees charged by other nearby jurisdictions.

TABLE 5.5
2018 PLANNING PERMITS AND RELATED SERVICES FEES

Type of Fee	Fee Amount	Fee Amount for Affordable Housing
Site Development Permit – Major	100% cost recovery	Affordable Housing: 80% cost recovery; Special Needs Housing: 60% cost recovery
Site Development – Minor Level 1	$200	No fee discount
Site Development – Minor Level 2	$600	No fee discount
Use Permit Major	100% cost recovery	Affordable Housing: 80% cost recovery; Special Needs Housing: 60% cost recovery
Use Permit Minor	$600	No fee discount
Variance Major	100% cost recovery	Affordable Housing: 80% cost recovery; Special Needs Housing: 60% cost recovery
Variance Minor Level 1	$200	No fee discount
Variance Minor Level 2	$600	No fee discount

Subdivision Major	100% cost recovery	Affordable Housing: 80% cost recovery; Special Needs Housing: 60% cost recovery
Subdivision Minor	$900	Affordable Housing: $720 Special Needs Housing: $540
Subdivision Exception	100% cost recovery	Affordable Housing: 80% cost recovery; Special Needs Housing: 60% cost recovery
Boundary Line Adjustment	$350	Affordable Housing: $260 Special Needs Housing: $170
Lot Merger	$350	No fee discount
General Plan Amendment	100% cost recovery	No fee discount
Annexation	100% cost recovery	No fee discount
Rezoning	100% cost recovery	No fee discount
Rezoning Planned Unit Development	100% cost recovery	Affordable Housing: 80% cost recovery; Special Needs Housing: 60% cost recovery
Environmental Impact Report (EIR)	Consultant cost plus 15% administration	No fee discount
Specific Plan/Master Plan Review	$2,000-$3,000 deposit; 100% cost recovery	Affordable Housing: $800 deposit; 100% cost recovery Special Needs Housing: $600 deposit; 100% cost recovery
Development Impact Fees	None, except for a specific traffic impact fee associated with the development of the Airport Business Park mixed use shopping center and Gobbi Street and Orchard Avenue traffic signal and storm drain. Residential sewer hook-up fees vary depending upon how many bedrooms are proposed. The fee for a one-bedroom home is $9,820; two bedroom $10,911; and a three bedroom is $12,002. For each bedroom beyond 3, and for a bedroom addition to an existing home, the fee is $1,091.	Developers of affordable housing projects may be eligible for funding and fee deferrals to help finance infrastructure improvements.

Interviews with local developers confirm the City's permitting and impact fees are lower than other Mendocino, Lake, and Sonoma County communities; particularly, fees for building permits. Although fees for water and sewer hook-ups are perceived by the development community as being slightly higher than neighboring communities, the fee deferral program available to housing developers has assisted in mitigating this potential constraint. The typical fees for single-family development are $30,000 and represent 12% of the total development costs ($250,000) per unit. The typical fees for multi-family development are $12,500 per unit and represent 9.5% of the total development costs ($131,000) per unit.

6. Processing and Permit Procedures

Table 5.5 describes the approximate time required and the reviewing body for the City's various permitting procedures. The entitlement process can impact housing production costs, with lengthy processing of development applications adding to financing costs. In general, developers interviewed in the past have indicated that the City's entitlement timeline is shorter or comparable with other jurisdictions in the area. Estimations of the amount of time between entitlement approval and building permit issuance vary but is generally about one month. Nevertheless, the City has included programs and goals to streamline application review.

TABLE 5.6
TIMELINES FOR PLANNING PERMITS

Project Type	Typical Processing Time	Approving Body	Comments
Individual single family house	10 days	Community Development Staff	Plan check prior to issuance of building permit, if needed.
Minor Subdivision	4 to 6 weeks	City Engineer	Processed concurrently with Site Development Permit or Use Permit, if required.
Major Subdivision	3 to 5 months	Planning Commission and City Council	Processed concurrently with Site Development Permit or Use Permit, if required.
Parcel Map	1 to 3 months	City Engineer	None.
Final Map	1 to 2 months	City Engineer/City Council	None.
Multifamily Housing With No Subdivision	3 weeks to 5 months	Community Development Staff or Planning Commission	Depending on the complexity of the project, Minor or Major Site Development Permits may be required.
Multifamily Housing With Major Subdivision	4 to 5 months	Planning Commission	Site Development Permit/Use Permit -and Subdivision Map

Mixed Residential Commercial Use (CUP)	2 to 4 months	Planning Commission	Depending on the complexity of the project, Minor or Major Site Development Permits may be required.
Planned Development Rezoning	4 to 6 months	Planning Commission and City Council	Requires a Rezone, General Plan Amendment and a Precise Development Plan with Planning Commission and City Council approval.
NOTE: The initial step of processing the application is the determination of completeness. If items are missing, staff notifies the applicant and then must wait until the missing items are submitted in order to move forward with project review. Due to this cooperative process, timelines for receiving a complete application are variable and are not included in the processing times listed above. In addition, public notification requirements, review by other agencies or advisory bodies, and set recurring hearing dates for Planning Commission and City Council can result in varied processing times.			

Site Development Permit

The review of a Site Development Permit focuses on architecture, landscaping, parking, and other site design elements. As mentioned above in Section 5(a)(3), the City has an adopted set of design guidelines for projects within and outside of the downtown area to assist with design review during the Site Development Process.

Site development permits are required for the construction of new multiple-family residential, commercial, and industrial structures, or the substantial exterior modification of existing multiple-family residential, commercial, and industrial structures. Projects exempt from the site development permit process include interior building remodels, repair and maintenance of structures or parking areas, minor alterations on building exteriors, and minor accessory structures to established, multiple-family residential, commercial, and industrial buildings. Upon request, the Community Development Director determines whether a project is exempt under this subsection in accordance with the following standards:

1. The project involves an addition of less than one hundred fifty (150) square feet to an existing structure, and the addition would not be highly visible from any public street; or
2. The project involves minor facade modifications that would not significantly change the architectural character or appearance of the structure.

The Design Review Board reviews and makes recommendations to the Zoning Administrator, Planning Commission and City Council on site development permit applications, planned development applications and precise development plans. The Zoning Administrator or Planning Commission conducts a public hearing and decides all applications for site development permits. If the Community Development Director determines that the site development permit application is minor in nature, it will be scheduled for a public hearing before the Zoning Administrator. If the Community Development Director determines that the site development permit application is major in nature, it will be referred to the Planning Commission for public hearing and action.

Processing a typical Minor Site Development Permit takes approximately 2-3 months, while Major Site Development Permits typically take 4-6 months. The Site Development process includes the following steps:

a. Filing an Application

Applications are submitted to the City at the Community Development public information counter at the Ukiah Civic Center – 300 Seminary Avenue, Ukiah. While pre-application review (at no cost, up to one hour) - see Step 2 below - is encouraged, it is not required.

b. Pre-Development Meetings

If Staff or the Applicant requests a Pre-Development meeting (typically for Major permits), the project planner will schedule the project for Pre-Development Meeting which serves as a roundtable discussion between the applicants and various City departments to flush out concerns, answer applicant questions, and to provide the applicants with a preliminary determination regarding possible conditions that may be imposed on the project.

c. Application Completeness

Within approximately two weeks after application submittal, the project planner will determine if enough information has been submitted to fully understand the proposed project. If enough information has been submitted, the application will be deemed “complete.” If not, the project planner will send a detailed “incomplete letter” to the applicant indicating exactly what information is needed to fully understand the proposal.

d. Project Referral

Once an application is preliminarily deemed complete, the project planner will circulate the application materials to all pertinent City departments, as well as applicable outside agencies for review and comment. If comments are received stating more information is needed, this is relayed to the applicant through an incomplete letter. If no outstanding items are identified the application will continue through the process.

e. Environmental Review (California Environmental Quality Act)

Projects that are ministerial in nature, such a construction of a single family residence, accessory dwelling units, and some multifamily projects within certain zoning districts, are allowed by right and do not require environmental review under the California Environmental Quality Act (CEQA). All discretionary projects on the other hand, require environmental review to some degree under CEQA. While many projects within the City limits qualify to use a CEQA exemption due to their location and scope, some, including Site Development Permit applications may require a higher level of environmental review through preparation of an Initial Study. The purpose of this review is to find out if the project will cause any substantial environmental impacts.

f. Public Notice

Once the project planner has completed an analysis of the proposal, and all issues have been resolved, a public notice is published in the local newspaper describing the proposal and when

the required public hearing will be conducted. A public notice is also sent to all property owners within 300 feet of the project site, and the project planner will physically post/stake a notice on the subject parcel. These noticing procedures take place 10 days prior to the public hearing.

g. Public Hearing and Action

The City Zoning Administrator (for Minor SDPs) or Planning Commission (for Major SDPs) will conduct a public hearing, make findings, and take action on the project. If the project is approved, the Zoning Administrator or Planning Commission may impose conditions on the project. See the below two sections for information about typical findings, action, and conditions on site development permits.

Action

The Zoning Administrator reviews, conducts public hearings, and decides upon all minor site development permit applications. The Planning Commission reviews, conducts public hearings, and decides upon all major site development permit applications. Appeals of the Zoning Administrator or Planning Commission actions are heard by the City Council for a final decision.

The Community Development Director can refer any site development permit application to the Planning Commission for consideration and decision-making action.

Findings

The Zoning Administrator and/or Planning Commission makes findings when acting to approve site development permit applications. The findings are to be sufficiently detailed to apprise a reviewing court of the basis of the action by bridging the gap between the evidence and the decision-maker's conclusions, and must be based upon evidence contained in the administrative record. Failure to make findings that support the following determinations will result in a denial of the site development permit application:

1. The proposal is consistent with the goals, objectives, and policies of the City General Plan.

2. The location, size, and intensity of the proposed project will not create a hazardous or inconvenient vehicular or pedestrian traffic pattern.

3. The accessibility of off-street parking areas and the relation of parking areas with respect to traffic on adjacent streets will not create a hazardous or inconvenient condition to adjacent or surrounding uses.

4. Sufficient landscaped areas have been reserved for purposes of separating or screening the proposed structure(s) from the street and adjoining building sites, and breaking up and screening large expanses of paved areas.

5. The proposed development will not restrict or cut out light and air on the property, or on the property in the neighborhood; nor will it hinder the development or use of buildings in the neighborhood, or impair the value thereof.

6. The improvement of any commercial or industrial structure will not have a substantial detrimental impact on the character or value of an adjacent residential zoning district.

7. The proposed development will not excessively damage or destroy natural features, including trees, shrubs, creeks, and the natural grade of the site.

8. There is sufficient variety, creativity, and articulation to the architecture and design of the structure(s) and grounds to avoid monotony and/or a box-like uninteresting external appearance.

Conditions of Approval

Conditions of project approval may be imposed on site development permit applications, such that 1) In approving a site development permit, the Zoning Administrator or Planning Commission may include such conditions as are deemed reasonable and necessary to maintain or assure compliance with listed standards/criteria; and 2) The Zoning Administrator or Planning Commission may condition a site development permit to prohibit occupancy of a project building until an inspection has been made which finds that the project building, landscaping and other required improvements have been completed, and the project complies with all conditions specifically required to be completed prior to occupancy. If a site development permit is so conditioned, the Community Development Director is to notify the City Building Official of such conditions. If a building permit is issued for a building or structure which is subject to a site development permit so conditioned, the Building Official will not approve a final inspection of such building or structure until the conditions have been satisfied.

Use Permit

The primary finding required to approve a Use Permit is that the housing project would not have a detrimental effect on the health, safety, and general welfare of the public. Use Permits are not required for uses allowed by right within the zoning code (such as single family residences and multifamily units in certain zoning districts- see Table 5.1). The Use Permit review process and time is the same as the Site Development Permit Review process, and contains two levels: Minor Use Permits and Major Use Permits. Determining whether a use permit is major or minor depends on the use and impact of the proposed project. New construction on vacant parcels, large additions/expansions to existing buildings, substantial amendments to previously approved permits, and changes in use of existing structure(s) that would require an expansion of an existing parking facility, or that could generate substantial amounts of additional traffic, noise, or other impacts/nuisances are considered major permits. Other small and relatively insignificant applications as determined by the Community Development Director are considered minor. Specific only to the C-N (Neighborhood Commercial) Zoning District, a use permit is required to exceed the maximum 30% floor area ratio standard. A proposal to exceed this standard by less than 10% is considered a minor use permit.

For projects requiring both a Site Development Permit and Use Permit, City Staff consolidates these approvals into one application and process in order to streamline the process. This results in shorter wait times, decreased fees, and one public hearing (rather than two). Additionally, projects requiring a use permit for new construction or exterior modifications need not have a separate site development permit.

Planned Development Rezoning

The Planned Development Rezoning tool provides flexibility with development standards such as lot sizes, yard setbacks, driveway widths, etc. The process is discretionary and generally follows the Site Development Permit and Use Permit process, but involves public hearings

before both the Planning Commission and City Council as it includes a Rezone and General Plan Amendment process. The review process for Planned Development projects takes approximately four to six months. The City offers fee reductions for affordable housing projects.

Building Permit

The Building Division of the Community Development Department prides themselves on responsive and efficient customer service, including inspection scheduling and plan check and building permit issuance. Plan check currently takes 10 to 15 business days, with an additional 5 to 10 days if plans require revisions. Once a building permit is issued, construction may commence immediately.

Code Enforcement

New construction in Ukiah must comply with the 2016 California Building Code, which was adopted with no major revisions. Therefore, there are no extraordinary building regulations that would adversely affect the ability to construct housing in Ukiah.

The City of Ukiah code enforcement activities have become complaint-driven since the elimination of the Code Compliance Coordinator position approximately 10 years ago. However, City staff pursue initial code compliance cases when observed during routine inspection and field observations.

Permit procedures and timelines are comparable or faster than those of similar-sized jurisdictions and do not appear to impose an undue burden or potential constraint to housing development. Although the City lacks a code enforcement division, City staff's efforts related to pursuit of initial code compliance cases and responsiveness to neighbor complaints allows identification and addressing of potential issues before they become significant problems.

Additionally, to further improve customer service and responsiveness staff in the Community Development Department have been cross-trained in the other divisional areas- housing, planning, and building services. Besides providing education and information to help facilitate additional development opportunities, this approach is also leading to exploration of such programs as the potential linking of housing rehabilitation programs with code enforcement activities. This has been listed as a Program to be further explored.

7. Onsite/Offsite Improvement Standards

Water and Sewer

The City of Ukiah's primary water source is the underflow from the Russian River which is classified as Ground Water under Direct Influence for Surface Water. There are four ground water sources located at various points within the City Limits. These sources meet the winter demand and supplement the summer demand. Because of the nature of ground water in the Ukiah Valley, the only requirement that is necessary from water drawn from the wells is the addition of a disinfectant to maintain safe potable water in the distribution system. The City of Ukiah has a high quality supply of cold, clear water.

Water service connection fees are typical of a small rural City and have not resulted in a barrier to affordable housing projects. The City received $34 million in grants and low interest loans to construct phases one through three (of four total phases) of a valley-wide recycled water

infrastructure system. These three phases will serve about 650 acres of agriculture, 20 acres of pasture, three parks, and a school and is planned to be completed in 2019. The project will also provide numerous integrated benefits and meet various State and regional objectives:

- Helps meet State water conservation objectives
- Improves environmental habitat by providing alternative source for frost protection
- Reduces diversions from the Russian River
- Reduces cost associated with wastewater discharge management
- Promotes a vibrant agricultural region
- Demonstrates regional cooperation

The Waste Water Treatment Plant underwent a three-year, $56.5 million improvement project that was completed in 2009. This plant insures continued compliance with permit requirements and the ability to meet future growth in demand. The sewer connection fees charged by the City are identical to those charged by the Ukiah Valley Sanitation District, which provides wastewater service to the unincorporated areas outside the City limits. The fees are considerably less than those charged by cities to the south in Sonoma County.

There is sufficient water and sewer capacity available to serve the identified vacant, underutilized and parcels with realistic development capacity.

Electric

The City owns its own electrical utility and its electrical service connection fees are not only considered reasonable, but are typically less than those charged by the Pacific, Gas and Electric Company (PG&E), which provides electrical service outside the City limits. Additionally, nearly 70% of electricity generated by the City's utility come from renewable sources. The Electric Utility has sufficient capacity to serve new housing construction projects as well as identified vacant and underutilized and parcels with realistic development capacity.

Drainage

The City adopted new *Low Impact Development* (LID) storm water drainage standards which can result in higher costs for housing projects. Ukiah's LID standards are based on the City of Santa Rosa and County of Sonoma Low Impact Development Technical Design Manual.

As part of a 2018 update to the City's Housing Strategy, the City Council directed that staff explore the possibility of an LID offsite mitigation bank. Given that this could further reduce the potential for constraints to housing development, this has been listed as a Program in the Programs, Goals, and Implementing Tasks section of the 2019-2027 Housing Element Update.

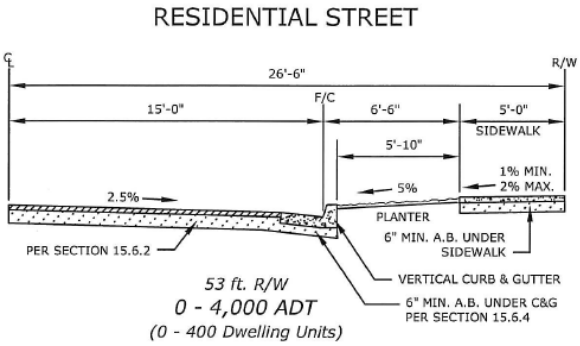
Streets and Street Standards

The City requires streets, curb, gutter and sidewalks, water and sewer connections, electrical connections and landscaping for all new construction, including affordable housing projects.

The City Department of Public Works maintains a *Standard Plans* document that provides housing developers with details and specifications for street, sidewalk, curb, gutter, wheel chair ramps, sewer, water, drains and street tree improvements. All the details and specifications are typical of a small rural city, and present no hardship or unreasonable requirement for housing developers. The specification for a typical residential street, curbs and gutters, and sidewalks

are typical of a small rural city, and have not resulted in a significant barrier to affordable housing projects.

FIGURE 5.3
CURB, GUTTER AND SIDEWALK SPECIFICATIONS



NOTES

1. Typical street section to be used in new residential subdivisions.
2. ADT is Average Daily Traffic.
3. Rolled curb and gutter may be constructed at street elbows and cul-de-sacs if approved.
4. The planter width may only be reduced or the planter removed to meet residential housing densities or to conform to existing street right-of-way if approved.
5. The street section may be modified for infill development.

Landscaping

Affordable housing projects (new construction) are required to landscape 20% of the project site, and this has not presented a significant barrier to past projects. The zoning code does allow a reduction to the amount of landscaping depending upon the size, scale, intensity, and location of the project.

Traffic

Traffic congestion, particularly along the City's major street corridors can affect how some parcels are developed. However, the City's adopted 2018-19 Capital Improvement Program (CIP) identifies street and intersection improvement projects and funding sources to remedy many traffic congestion problems.

Depending upon the number of units and location of a proposed project, including affordable housing proposals, a traffic study may be required. As part of the 2009-2014 General Plan Housing Element update, the City amended its General Plan Circulation Element to relax the roadway level of service from a "C" to a "D" as an interim measure until the City completed a citywide traffic model and further revisions to its Circulation Element. This has removed a barrier to affordable housing development.

It is concluded that the City's required on and off site improvements do not present a significant barrier to the development of affordable housing projects. This is evident because of the continued project approvals for market-rate and affordable housing projects, where onsite and offsite improvements did not present barriers.

8. Housing for Persons with Disabilities

The Zoning Code was amended in 2008 to include provisions for reasonable accommodation. Additionally, planning permit fees for special needs housing projects are discounted in comparison to those assessed for affordable housing projects (which are already discounted in comparison to market-rate housing projects). The City has an existing reasonable accommodation procedure that was evaluated for this 2019-2027 Housing Element Update.

Housing for Persons with Disabilities/Reasonable Accommodation Procedure:

Request: A request for reasonable accommodation may be made by any person with a disability as defined under the federal fair housing act and California fair employment and housing act, or his/her representative or any entity, when the application of a regulation under this chapter acts as a barrier to fair housing opportunities. In general, a person with a disability is a person who has a physical or mental impairment that limits or substantially limits one or more major life activities, anyone who is regarded as having such impairment or anyone who has a record of such impairment. A request for reasonable accommodation may include modifications or exceptions to the regulations, standards, policies and practices for the siting, placement, construction, development or use of housing or housing related buildings, structures and facilities that would eliminate regulatory barriers and provide persons with a disability equal opportunity to housing of their choice.

Application Submittal: A request for reasonable accommodation shall be submitted on an application form provided by the director of the department of planning and community development including documentation of the disability and any other information required to make the determinations required by this section.

Review of Application: Applications for reasonable accommodation shall be reviewed by the Director of the Department of Community Development or designee, or may be referred to the authority taking action on a concurrent application.

In granting an application for reasonable accommodation, the Director may impose any conditions of approval relating to the findings above as deemed practical and necessary including, but not limited to, restoration of the property to its former condition and recording in the office of the county recorder notice thereof.

9. Safety and High Density Housing Management

Working with the Ukiah Police Department, City staff have added Crime Prevention through Environmental Design (CPTED) standards as guidelines to support quality safety practices in development of new housing projects. CPTED was accomplished through implementation of the 2014-2019 Housing Element, and additional details are contained in Appendix F.

B. Nongovernmental Constraints

1. Land Costs

As a part of the research into land costs citywide, City staff reached out to developers and property owners in both the non-profit affordable housing market and market-rate sectors. In general, the developers and property owners reported that the cost of land has increased over the last five years, with current estimates averaging $125,000 to $175,000 per acre. Developers reported very limited availability of land in Ukiah.

The limited supply of residentially designated vacant land in Ukiah contributes to higher land costs in the City when compared to unincorporated areas. While the County has a much greater number of acres of undeveloped land, the environmental and infrastructure constraints associated with these areas often make development cost prohibitive. As a result, high demand for developable land drives up land costs in urbanized areas. The City has listed programs in the updated Housing Element exploring ways within the zoning code to increase housing density, which could reduce the cost of land per dwelling unit. The City also regularly applies density bonuses for affordable housing projects.

Private sector "for-profit" developers typically do not build affordable housing. Offering new units for sale or rent at prices that are affordable to lower income households reduces investment return, and in many cases, is financially infeasible due to high land, labor, and materials costs. This model can be especially challenging in rural areas, due to lower area median incomes not supporting rents that would guarantee a strong return on investment. Consequently, this has led some developers to seek additional incentives to help subsidize projects affordable to moderate-income households.

2. Construction Costs

Local affordable housing builders have reported the cost of construction in Ukiah as comparable to that of neighboring counties of Sonoma and Lake. Typical construction costs have been between $190 and $215 dollars per square foot. However, due in part to the destruction of homes in Mendocino County from the 2017 and 2018 wildfires, and shortages in qualified contractors from the resulting large-scale rebuilding efforts, cost of construction has increased and now ranges between $250 per square foot and $350 per square foot. This data is reported by local affordable housing builders and realty companies.

3. Availability of Financing

The financing of a residential project, particularly affordable housing projects with many different funding sources, is complex. The upfront cash commitment required can be a problem for developers when there is limited net cash flow for adequate return on investment, such as can be the case in rural areas like Ukiah. In checking with local lending institutions, interest rates for housing construction projects typically are between 5.3 percent and 7.75 percent.

To assist affordable housing developers in financing new housing construction projects, the City of Ukiah created the Ukiah Housing Trust Fund (UHTF) in 2017. Besides providing a critical piece of gap funding to developers, the UHTF also allows a competitive edge on Low Income Housing Tax Credit applications, as the UHTF can serve as local match funding. With the dissolution of redevelopment agencies, securing local match funding points on applications for has become more difficult.

It can be difficult for very low, low, and moderate-income first-time homebuyers to acquire sufficient savings and income to pay for a downpayment, closing costs, monthly mortgage, and tax and insurance payments. To address this problem, the City of Ukiah administers the First Time Homebuyer Program (FTHB), a special low-interest, deferred-payment loan program designed to provide "silent" second mortgages of up to 49 percent of the purchase price of a home, not to exceed the loan amount of the first mortgage with a traditional lending institution. The City's FTHB program is funded by a combination of the State Home Investment Partnerships (HOME) Program and State Community Development Block Grant (CDBG). Applicants must demonstrate financial need and pre-approval for a first mortgage; the second mortgage is financed as a three-percent-interest, 45-year deferred loan payment.

The City of Ukiah also has a Housing Rehabilitation Program, as funding becomes available through State CDBG and HOME funds. With rental vacancy rates near one percent, the City will continue to rely upon rental housing rehabilitation programs to maintain the condition of its current housing stock. Rental subsidy programs will also continue to be used locally to assist tenants with rising costs for rent.

4. Typical Densities Built in Zoning Districts

Due to the limited availability of land citywide and the City nearing "build-out," developers typically develop projects at the maximum densities allowed by the City's Zoning Code. In City staff's review of affordable and market-rate multi-family housing projects entitled and/or constructed within the last five years, all projects maximized density and applied for density bonuses, when possible, as shown in Table 5.6 below:

TABLE 5.7
DENSITIES FOR MULTI-FAMILY HOUSING PROJECTS 2014-2019

Project Name	Type	Parcel Size (Acres)	Number of Units	Year Entitled/ Completed	Zoning District	Max Density and/or Bonus
Sun House Apartments	Affordable senior multifamily	1.5	42	2015/2018	C2, PD/HDR*	Zoning change to maximize density
Willow Terrace Apartments	Permanent supportive affordable housing	1.0	38	2017/2019	C1	Yes
Main Street Village	Market-rate apartments	1.21	35	2018/under construction	C1, R3	Yes
Ukiah Senior Apartments	Affordable senior multifamily	0.88	31	2018/applying for funding	C1	Yes

** Planned Development-High Density Residential*

The City adopted a residential density calculation ordinance in 2018 that redefined the method for calculating the density of a parcel by measuring to the Right-of-Way. This effectively provided an additional density bonus for both affordable and market-rate housing development.

The trend of maximizing density in the City's zoning districts is also apparent for other types of residential development, including in commercial zoning districts where residential development is permitted. This is confirmed upon a review of the typical densities built for zoning districts identified in the vacant and underutilized sites inventory (Table 4.3 and Appendix E).

In the R-1 (Single-Family Residential) zoning district, since August 2017 when the City adopted an Accessory Dwelling Unit (ADU) ordinance, 22 percent of new single-family residence applications have also proposed ADUs. An additional 7 ADUs have been constructed on R-1

parcels where a single family residence exists. As indicated in Table 5.6, high density residential projects have been proposed in the zoning districts of R-3 (High-Density Residential), C-1 (Community Commercial), and C-2 (Heavy Commercial). Additionally, a zoning change was approved by the City Council in one of the projects, Sun House Apartments, to accommodate an even greater density. No projects within the last five years have been proposed in the R-1-H (Single-Family Residential- Hillside Combining), the C-N (Neighborhood Commercial), or R-2 (Medium-Density Residential) zoning districts, but these three zoning districts also contain few sites in the site inventory and are typically developed for higher income, “above moderate-income” residents. Projects developed in the Downtown Zoning Code zoning districts of GU (General Urban), UC (Urban Core), and DC (Downtown Core) have generally developed at the maximum density. The Planned Development zoning tool can also be utilized to further increase density. PDs have successfully been utilized throughout the City, such as for the Sun House Apartments.

As such and despite existing constraints, the realistic development potential for infill parcels in the City generally tends to be at or exceeding the number of maximum density in units per acre. This is especially the case for multifamily parcels in zoning districts listed in the site inventory-including for lower income housing projects.

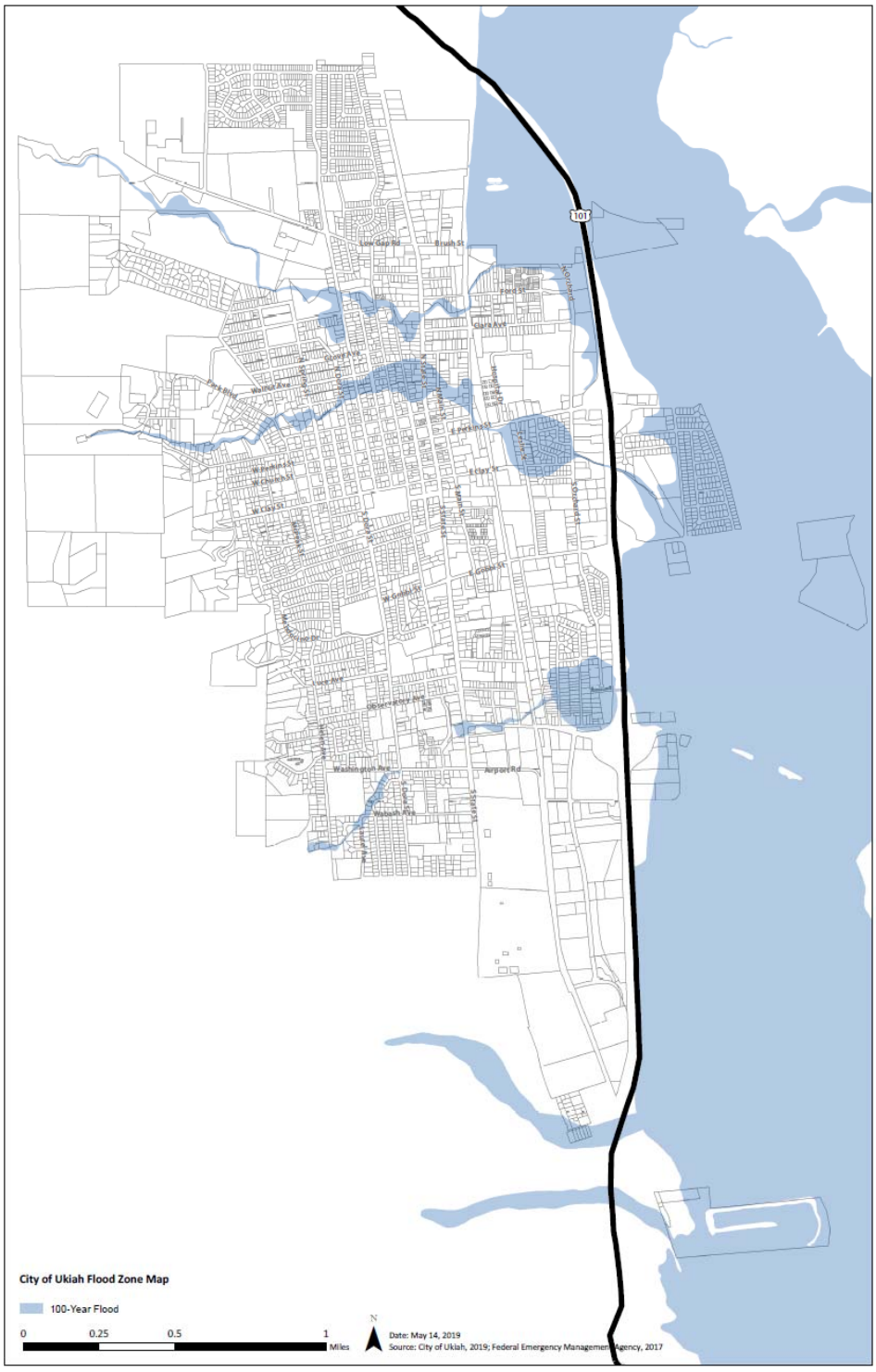
The City continues to be innovative in seeking ways to encourage housing development and maximize density on existing infill parcels. Additional programs to further incentivize the production of housing are included in Section 6.

C. Environmental Constraints

Flood Zones

Projects situated within the 100-year Flood Zone require that structures and roads be elevated and potentially other measures to protect life and property in the event of a 100-year flood event. This represents potential increased cost associated with the future development of these parcels. 100-year flood zones and flood-ways exist in the City, but ample suitable land is available to meet the housing need. Most of the identified vacant and underutilized parcels are not situated in a 100-year flood zone. See Figure 5.4.

FIGURE 5.4
UKIAH FLOOD ZONE MAP



D. Military compatibility

There are no military bases in or near the City of Ukiah or Mendocino County. However, the City is within an SUA (Special Use Airspace) more specifically termed a Military Operations Area (MOA). An MOA is an area of airspace designated for military training activities and requires the City to notify the appropriate military office when it proposes to amend or adopt a new General Plan or when large development projects are proposed. A program has been added requiring these tasks to be accomplished.

E. Opportunities for Energy Conservation

All new buildings in California must meet the standards contained in Title 24, Part 6 of the California Code of Regulations (Energy Efficiency Standards for Residential and Nonresidential Buildings). These regulations were established in 1978 and most recently updated in 2016 with a 2019 update anticipated to be effective on January 1, 2020. All new construction must comply with the standards in effect on the date a building permit application is made.

A Note on Greenhouse Gas Emissions and Global Warming

The greenhouse effect is a natural phenomenon whereby the Earth's heat is trapped in the atmosphere by certain gases. Greenhouse gases thus contribute to maintaining a surface temperature on Earth favorable to life. Industrialization and the population explosion that have occurred over the past 200 years have been accompanied by a substantial increase in the use of fossil fuels such as coal, oil and natural gas, thus leading to an equally considerable increase in greenhouse gas emissions in the atmosphere. The additional greenhouse gas emissions have in turn exacerbated the greenhouse effect, which appears to be the cause of the increase in the temperature of the Earth's surface and the lower layers of its atmosphere.

According to California Assembly Bill 32, "Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

In response to greenhouse gas emissions and global warming, as well as other basic planning principals, green and sustainable building practices, water conservation, energy efficiency, pedestrian orientation, and careful infill development will be emphasized in new housing development projects. Implementing programs have been added to accomplish this goal.

1. Energy Conservation

City of Ukiah Electric Utility Division

The City's Electric Utility Division offers a number of energy conservation incentives and rebates for residential development. These include:

- Energy Efficiency & Solar Program
- Energy Efficiency Air Conditioning and Heat Pump Rebate Program
- Weatherization Rebate Program
- Energy Efficiency Water Heater Rebate Program
- Energy Efficiency Appliance Rebate Program
- Residential Lighting Program
- Residential Equipment Rebate Program

The programs generally include higher incentive rebate amounts for lower income households.

2. Water Conservation

The City has been proactive in water conservation matters and offers both indoor and outdoor water conservation tips on its website. The Planning Commission raises water conservation issues when reviewing proposed development projects and routinely requires native drought tolerant plant species in landscaping plans.

SECTION 6: QUANTIFIED OBJECTIVES

Table 6.1 lists the quantified objectives for the City of Ukiah for the 2019-2027 Housing Element period. As noted in the table, the City of Ukiah has set a target for 239 new residential units in Ukiah by 2027. Although this is the goal identified, the City anticipates deploying additional programs and tools to attempt to exceed the goal. Additionally, the City anticipates establishing owner-occupied and renter-occupied rehabilitation programs for extremely low, low, and moderate income households, assisting in increasing the number of units rehabilitated and conserved/preserved, primarily through future deployment of Ukiah Housing Trust Fund resources. Private market forces are expected to contribute to future rehabilitation efforts for moderate income and above moderate income households.

TABLE 6.1
QUANTIFIED OBJECTIVES, CITY OF UKIAH (2019-2027)

Income Category	New Construction*	Rehabilitation	Conservation/ Preservation	Total
Extremely Low Income	43	5	20	68
Very Low Income	43	10	35	88
Low Income	72	10	40	122
Moderate Income	49	5	0	54
Above Moderate Income	32	35	0	67
Totals	239	65	95	399

Source: City of Ukiah Community Development Department, 2019
***** *The City of Ukiah does not own, manage, or construct housing units. The New Construction objective refers to the number of new units that potentially may be constructed using public and/or private funding sources.*

SECTION 7: HOUSING PLAN

The Housing Plan identifies the City's housing goals, polices, and implementing programs. It consolidates existing strategies and policies into one Plan and presents a balanced and diverse array of policies that cover housing needs identified through this Update, input from the public, and four overall areas of concern: construction, rehabilitation, conservation, and administration. The goals and policies of the Housing Element were organized into concise goal and policy directives. A review of the 2014-2019 Housing Element accomplishments is included in Appendix G and a summary of the below 2019-2027 Goals, Policies and Implementing Programs can be found in Appendix H.

A. Goals, Policies, and Implementing Programs

Goal H-1	**Conserve, rehabilitate, and improve the existing housing stock to provide adequate, safe, sustainable, and decent housing for all Ukiah residents.**

Policies to Support Goal H-1

Policy 1-1: Encourage the rehabilitation of existing residential units.

Policy 1-2: Promote the use of sustainable and/or renewable materials and energy technologies (such as solar and wind) in rehabilitated housing and new housing construction; and reduce greenhouse gas emissions.

Policy 1-3: Preserve at-risk housing units.

Policy 1-4: Promote increased awareness among property owners and residents of the importance of property maintenance to long-term housing quality.

Policy 1-5: Continue to implement effective crime prevention activities.

Implementing Programs

1a: **Implement a residential rehabilitation program**. Emphasize rehabilitation of mobile homes, detached single-family dwelling units, and lower-income multifamily housing projects. Prioritize funding for health and safety repairs, energy efficiency improvements, and ADA accommodations. Assist in completing the rehabilitation of at least 25 lower income housing units in the planning period.

Responsibility: Community Development Department, Housing Services Division

Funding: CDBG, HOME, and/or other local, state or federal sources

Schedule: Ongoing, as funding is available

1b: **Continue the City's Energy Efficiency Public Benefits Fund and renewable energy and energy efficiency rebate programs**.

Responsibility: Electric Utility Department

Funding: Energy efficiency and renewable energy rebate program funds

Schedule: Ongoing, as funding is available

1c: **Support funding or other applications that would preserve/conserve existing mobile home parks.** This might include programs such as the Mobile Home Park Rehabilitation and Resident Ownership Program.

Responsibility: Community Development Department, Housing Services Division.

Funding: N/A – application support through technical assistance.

Schedule: Ongoing, as needed.

1d: **Continue providing informational materials to the public through the Green Building Information Center and at the public counter**. Provide updated information regarding sustainable and green building practices and materials, and provide information on the maintenance of residential units.

Responsibility: Community Development Department, Building Services Division

Funding: Departmental budget

Schedule: Ongoing, as new and relevant information is available.

1e: **Develop standards and design guidelines for residential development in the Medium Density Residential (R-2) and High Density Residential (R-3), Community Commercial (C-1) and Heavy Commercial (C-2) zoning districts.** Given the significant increase in the City's RHNA over the next eight years, the City proposes to create development standards and design guidelines that would both facilitate development at the allowable densities and provide guidance and certainty in design standards to ensure quality housing is developed in the community.

Responsibility: Community Development Department, Planning Services Division

Funding: General Funds and/or other funding if available.

Schedule: Establish development standards and design guidelines by the end of calendar year 2020.

1f: **Develop an At-Risk Units Program.** Maintain an inventory of at-risk affordable housing units and work with property owners and non-profit affordable housing organizations to preserve these units by identifying and seeking funds from Federal, State, and local agencies to preserve the units.

Responsibility: Community Development Department, Housing Services Division

Funding: Ukiah Housing Trust Fund, CDBG, HOME, and/or other funding sources as available and as needed

Schedule: Develop At-Risk Program by the end of calendar year 2020.

1g: **Tenant Education and Assistance for Tenants of At-Risk Projects.** Require property owners to give notice to tenants of their intent to opt out of low-income use restrictions. Provide tenants of at-risk units with education regarding tenant rights and conversion procedures.

Responsibility: Community Development Department, Housing Services Division

Funding: Departmental budget

Schedule: Develop education program and notification procedures by June 30, 2020; implement program on an ongoing basis throughout the 2019-2027 planning period.

Goal H-2	**Expand housing opportunities for all economic segments of the community, including special needs populations.**

Policies to Support Goal H-2

Policy 2-1: Continue to allow placement of manufactured housing units on permanent foundations in residential zoning districts.

Policy 2-2: Encourage the development of a variety of different types of housing.

Policy 2-3: Ensure that adequate residentially designated land is available to accommodate the City's share of the Regional Housing Need. In order to mitigate the loss of affordable housing units, require new housing developments to replace all affordable housing units lost due to new development.

Policy 2-4: Pursue State and Federal funding for very low, low, and moderate income housing developments.

Policy 2-5: Facilitate the production of housing for all segments of the Ukiah population, including those with special needs.

Policy 2-6: Expand affordable housing opportunities for first time homebuyers.

Implementing Programs

2a: **Update the inventory of vacant and underutilized parcels.** Make copies of the inventory available on the City's website and at the public counter for distribution.

Responsibility: Community Development Department, Planning Services Division.

Funding: Departmental budget.

Schedule: Updated annually, by June 30 of each year; posted on the City's website and at the public counter.

2b: **Monitor the rate of conversion of primary residences to short-term rental units.** Research ordinances limiting short-term rentals and present report to City Council.

Responsibility: Community Development Department, Planning Services Division; City Council.

Funding: General Funds.

Schedule: Develop monitoring program by June 30, 2020; annually track number of short-term rentals and present information along with annual progress report to City Council each year; short-term rental ordinance research report due June 30, 2025.

2c: **Monitor the conversion of single family residential homes to commercial uses.** If conversions continue and the City's vacancy rate for homeownership is greater than three percent citywide, the City will design an ordinance that restricts the conversion of single family residences to commercial uses.

Responsibility: Community Development Department, Planning Services Division.

Funding: Departmental budget.

Schedule: Gather data and report findings to City Council by June 30, 2021.

2d: **Pursue additional funding sources to augment the Ukiah Housing Trust Fund, creating a permanent source of funding for affordable housing.** Utilize funding to develop and support affordable housing programs and projects, providing financial assistance to private developers and nonprofit agencies, principally for the benefit of extremely low-income, very low-income, and low-income households. Prepare and/or support the preparation of at least eight applications for additional funding within the 2019-2027 planning period.

Responsibility: Community Development Department, Housing Services Division.

Funding: Low and Moderate Income Housing Asset Fund; other local, State, and Federal funding sources as they become available.

Schedule: Ongoing.

2e: **Continually engage with a variety of housing developers who specialize in providing housing to each economic segment of the community.** This effort is designed to build long-term development partnerships and gain insight into specialized funding sources, particularly in identifying the range of local resources and assistance needed to facilitate the development of housing for extremely low-income (ELI) households and households with special needs, including persons with disabilities and persons with developmental disabilities. This policy is also designed to encourage the production of a variety of housing types, including multi-family supportive, single room occupancy, shared housing, and housing for the "missing middle."

Responsibility: Community Development Department, Housing Services Division; City Manager's Office- Economic Development Section

Funding: Departmental budget.

Schedule: Ongoing community and stakeholder outreach, occurring at least on a quarterly basis and continuing throughout the 2019-2027 planning period.

2f. **Amend the zoning code as follows**:

- **Emergency Shelters.** The City will amend the Zoning Code to redefine homeless facilities as emergency shelters, according to State Government Code.

- **Transitional/Supportive Housing.** Pursuant to SB 2, the City must explicitly allow both supportive and transitional housing in all zones that allow residential uses and supportive and transitional housing is to be only subject to those restrictions applicable to other residential dwellings of the same type in the same zone (note: this is not limited to residential zones). The City will amend the Zoning Code to specifically define transitional/supportive housing as defined in Government Code.

- **Single-Room Occupancy Housing.** The City will amend the Zoning Code to allow Single-Room Occupancy (SRO) units in the medium density residential (R-2) and high density residential (R-3) zoning districts for the purpose of increasing the number of units affordable to extremely low, very low, and low-income persons.

- **Manufactured/Factory-Built Homes.** The City will amend the Zoning Code to define and allow manufactured and factory-built homes in the same manner and use as all other types of residential dwellings in all zoning districts.

Responsibility: Community Development Department, Housing Services Division

Funding: Departmental budget

Schedule: Complete draft Zoning Code amendments by December 30, 2020; secure adoption by June 30, 2021.

2g: **Facilitate the consolidation of smaller, multi-family parcels by providing technical assistance to property owners and developers in support of lot consolidation.** Research and present a report on possible lot consolidation incentives to the Planning Commission and City Council.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Present report to Planning Commission and City Council, with recommendations, by June 30, 2026.

2h: **Ensure capacity of adequate sites for meeting RHNA.** The City of Ukiah has been assigned a Regional Housing Needs Allocation (RHNA) of 239 units for the 2019-2027 Housing Element. To accomplish this mandate by the State, the City will:

- **Update C1 and C2 Zones to allow by-right housing development, with objective design and development standards.** Units allowed by-right will include multifamily, SROs, duplexes, triplexes, and fourplexes.

- **Update the R-2 Zone to allow up to 15 dwelling units per acre instead of 14 dwelling units per acre.**

- **Update the C-N Zone to increase residential density and allow similar housing types as those allowed in R-2.**

- **By-right housing program for select parcels.** Specific to APNs 00304077, 00304078, and 00304079, rezone these parcels at the default density of 15 du/ac. Also rezone these parcels to allow residential use by-right for developments with at least 20% of the units affordable to lower income households.

Responsibility: Community Development Department, Planning Services Division; Planning Commission; City Council

Funding: Departmental budget

Schedule: Develop objective design and development standards per schedule associated with Implementing Program 1e; pursue amendments to the Zoning Code as outlined above by June 30, 2021.

2i: **Monitor residential capacity (no net loss).** Proactively monitor the consumption of residential acreage to ensure an adequate inventory is maintained for the City's RHNA obligations. Implement a project evaluation procedure pursuant to Government Code 65863. Should residential capacity fall below the remaining need for lower income housing, the City will identify and if necessary rezone sufficient sites to accommodate the shortfall and ensure "no net loss" in capacity to accommodate the RHNA.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Ongoing, with annual reports to HCD and the City Council; develop and implement a project evaluation procedure pursuant to Government Code 65863, by June 30, 2021.

2j: **First Time Homebuyer Assistance.** The City of Ukiah offers assistance to eligible first-time homebuyers to purchase new or existing single-family or condominium units in the City. The program utilizes a combination of HOME, CalHome, CDBG, and/or other resources as they become available- through the Ukiah Housing Trust Fund. Restrictions apply and funds are available on a first-come, first-served basis.

Responsibility: Community Development Department, Housing Services Division

Funding: CDBG, HOME, Low and Moderate Income Housing Assets Funds, CalHome, and/or other funding sources as available

Schedule: Ongoing

2k: **Collaborate with local service providers on addressing homelessness.** Continue participation in the Mendocino County Continuum of Care.

Responsibility: City Manager's Office

Funding: N/A

Schedule: Ongoing

2l: **Review existing City processes for compliance with AB 2162.** Revise zoning codes/processes to allow supportive housing by right in zones where multifamily and mixed uses are permitted, including nonresidential zones permitting multifamily uses.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Complete review of existing City processes by June 30, 2020; revise zoning codes/processes by December 31, 2020

2m: **Housing Units Replacement Program.** The City will require replacement housing units subject to the requirements of Government Code, section 65915, subdivision (c)(3) on sites identified in the site inventory when any new development (residential, mixed-use or non-residential) occurs on a site that has been occupied by or restricted for the use of lower-income households at any time during the previous five years. This requirement applies to 1) non-vacant sites; and 2) vacant sites with previous residential uses that have been vacated or demolished.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: The replacement requirement will be implemented immediately and applied as applications on identified sites are received and processed.

2n: **Homeless Shelter Overlay District Evaluation.** Evaluate the Homeless Shelter Overlay District to determine suitability for accommodating the identified number of homeless persons. At the minimum, this evaluation will include an analysis of environmental conditions, physical features, location, and capacity of the zone to accommodate the identified number of homeless persons. Depending on the results of this evaluation, the City will consider options including possible amendment of the District to maintain compliance with SB 2.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Complete evaluation of overlay district on a bi-annual basis, with the first report due to Planning Commission by June 30, 2020. Depending on results of evaluation(s), make recommendations to Planning Commission and/or City Council for options including possible amendment of the District within 6 months of the date the report is due.

Goal H-3	Remove governmental constraints to infill housing development.

Policies to Support Goal H-3

Policy 3-1: Improve building and planning permit processing for residential construction.

Policy 3-2: Encourage the use of density bonuses and provide other regulatory concessions to facilitate housing development.

Policy 3-3: Encourage the development of mixed residential and commercial uses in the commercial zoning districts where the viability of the commercial activities would not be adversely affected.

Implementing Programs

3a: **Research, review and amend the development standards in the zoning code for opportunities to maximize housing development.** Specific areas of research and amendments may include the following:

- **Increasing maximum allowable height for new residential buildings.**
- **Increasing density.**
- **Reducing yard setbacks.**
- **Reducing minimum site area.**
- **Upzoning R-1 (Single-family Residential) and R-1-H (Single-family Residential-Hillside Combining) zoning districts to allow by-right and/or permit other residential building types and densities.**

Responsibility: Community Development Department, Planning Services Division; Planning Commission; City Council

Funding: Departmental budget

Schedule: Complete draft Zoning Code amendments by December 30, 2021; secure adoption by June 30, 2022

3b: **Develop flexible parking policies for new residential development.** The intent of this policy is to reduce parking requirements, especially in zoning districts that allow for lower-income housing developments.

Responsibility: Community Development Department, Planning Services Division; Planning Commission; City Council

Funding: Departmental budget and other funding sources as available

Schedule: Complete draft policy by June 30, 2020

3c: **Explore other policies and regulations that facilitate new infill housing development.** Produce report with recommendations and present to Planning Commission and City Council. Possible areas of research include, but are not limited to, the following:

- Temporary housing options.
- Low Impact Development offsite mitigation.
- Community benefit zoning.

Responsibility: Community Development Department, Planning Services Division; Planning Commission; City Council

Funding: Departmental budget

Schedule: Complete draft report by June 30, 2026

3d: **Facilitate improvements to permit processing to streamline housing development.**

- Continue to work on improving processing procedures and by June 30, 2021 develop a brochure to guide developers through City processes.
- Continue to offer a pre-application conference with project applicants to identify issues and concerns prior to application submittal.

Responsibility: Community Development Department, Planning Services Division, Building Services Division

Funding: Departmental budget

Schedule: Pre-application conferences ongoing; City processing procedures brochure developed by June 30, 2021

3e: **Continue to apply the CEQA infill exemption to streamline environmental review.**

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Ongoing

3f: **Review Site Development Permit and Use Permit Processes.** Produce report for City Council analyzing processes and making recommendations for how to revise processes and/or Ukiah City Code such that project approval process is accelerated.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Report due to City Council by December 31, 2020; process and/or code improvements to be implemented immediately thereafter.

Goal H-4	**Promote well-planned and designed housing opportunities and projects for all persons, regardless of race, gender, age, sexual orientation, marital status, or national origin.**

Policies to Support Goal H-4

Policy 4-1: Promote fair housing practices in the sale or rental of housing with regard to race, color, national origin, ancestry, religion, disability/medical conditions, sex, age, marital status, familial status, source of income, sexual orientation/gender identify, or any other arbitrary factors.

Policy 4-2: Promote and facilitate community awareness of the City of Ukiah's goals, tools, available resources and programs for lower income households.

Implementing Programs

4a: **Continue to collaborate with the Ukiah Police Department and property owners and managers to keep housing safe.** Support the Crime Prevention through Environmental Design standards through continued referral of residential new construction projects to the Ukiah Police Department.

Responsibility: Community Development Department, Planning Services Division, Building Services Division; and Ukiah Police Department

Funding: General Funds

Schedule: Ongoing

4b: **Continue to refer housing discrimination complaints to Legal Services of Northern California, State Fair Employment and Housing Commission, and the U.S. Department of Housing and Urban Development (HUD).**

Responsibility: Community Development Department, Housing Services Division

Funding: Departmental budget

Schedule: Ongoing

4c: **Develop project referral procedural for referral of all proposed General Plan amendments to the appropriate military office for review and comment.** Revise the planning permit application form to include this step of referral.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget

Schedule: Develop referral procedure and revise planning permit application form by December 31, 2019; implement on January 1, 2020.

Goal H-5	Provide support for future housing needs.

Policies to Support Goal H-5

Policy 5-1: Pursue annexation efforts that lead to an orderly expansion of growth, where services are adequate for future residential development.

Policy 5-2: Continue to encourage and facilitate public participation in the formulation and review of the City's housing and development policies.

Policy 5-3: Assume a leadership role in the development of all types of housing in the community.

Implementing Programs

5a: **Maintain a housing resources webpage.** Included on the webpage are resources such as funding sources and programs, affordable housing developers, and a list of publicly assisted housing providers.

Responsibility: Community Development Department, Housing Services Division

Funding: Departmental budget

Schedule: Updated regularly, as new and relevant information is available.

5b: **Complete the update of the 2020 Sphere of Influence, Municipal Service Review, and Ukiah 2040 General Plan.** Include an annexation policy.

Responsibility: Community Development Department, Planning Services Division

Funding: Departmental budget, other funding as available

Schedule: 2020- Sphere of Influence and Municipal Service Review; 2021- Ukiah 2040 General Plan.

5c: Work collaboratively with stakeholder jurisdictions for opportunities to lessen or remove development constraints, and update the housing plan accordingly.

Responsibility: Community Development Department, in conjunction with stakeholder jurisdictions.

Funding: Departmental budget, other funding as available

Schedule: Ongoing, at least on an annual basis.

TABLE 6.2
2014-2019 AND 2019-2027 HOUSING GOALS COMPARISON

2014 – 2019 Housing Goals	2019 – 2027 Housing Goals
Goal H-1: Conserve, rehabilitate, and improve the existing housing stock to provide adequate, safe, energy efficient, and decent housing for all Ukiah residents.	H-1: Conserve, rehabilitate, and improve the existing housing stock to provide adequate, safe, sustainable, and decent housing for all Ukiah residents.
Goal H-2: Provide housing for all economic segments of the community.	H-2: Expand housing opportunities for all economic segments of the community, including special needs populations.
Goal H-3: Expand affordable housing opportunities for persons with special housing needs such as the homeless, mentally ill, physically disabled, households with very low and low to moderate incomes, senior citizens, farm workers, female heads of households with children under 18 years old, first time homebuyers and the developmentally disabled.	Goal H-3: Remove governmental constraints to infill housing development.
Goal H-4: Promote well planned and designed housing opportunities for all persons regardless of race, gender, age, sexual orientation, marital status or national origin.	Goal H-4: Promote well-planned and designed housing opportunities and projects for all persons, regardless of race, gender, age, sexual orientation, marital status, or national origin.
Goal H-5: Use land effectively to meet housing needs and to implement smart growth, green building, and sustainable development policies with a focus on infill development.	Goal H-5: Provide support for future housing needs.
Goal H-6: Maintain a collaborative working relationship with all groups and organizations dedicated to providing affordable housing in the community, and ensure broad public participation in the development of housing goals and policies.	

B. Annual Reporting

California Government Code Section 65400 requires each city and planning agency to prepare an annual report on the status of the General Plan housing element and its progress with implementation. The annual reports are required to contain data assessing progress in meeting the RHNA, a summary of the total number of units which building permits were issued during the reporting period, status report of previous Housing Element goals, policies and implementing programs, etc.

The City will review its annual reports with the Planning Commission and City Council and will submit them to the State Department of Housing and Community Development.

A review of the 2014-2019 Housing Element accomplishments can be found in Appendix G.

APPENDIX A
COMMUNITY HOUSING WORKSHOPS SUMMARY OF INPUT AND LIST OF STAKEHOLDERS

SUMMARY OF PUBLIC COMMENTS

Community Housing Workshop #1, March 21, 2019

On March 21, 2019, the City of Ukiah held a Community Housing Workshop from 5:30 pm to 7:30 pm at the Ukiah Valley Conference Center. Approximately 40 stakeholders/residents attended the first workshop. Staff gave a presentation that included an overview of a Housing Element, State Update requirements, the Regional Housing Needs Allocation, and an overview of the 2014-2019 Housing Element goals and programs status and accomplishments. In addition, a work plan and schedule for completion of the Housing Element Update was provided. Attendees participated in a goal and priority setting exercise and were also given the opportunity to provide general input and comments.

Below is a summary of key housing-related comments received during this first workshop.

2014-2019 HE Goal	Workshop #1 Summarized Comments
H-1: Conserve, rehabilitate, and improve the existing housing stock to provide adequate, safe, energy efficient, and decent housing for all Ukiah residents.	• Many comments related to financial assistance for property maintenance and improvements. • Comment related to rent stabilization. • Implementation of CA Building Code comments regarding energy efficiency.
H-2: Provide housing for all economic segments of the community.	• Providing adequate housing for undocumented immigrants and oversight on property owner to make sure housing is habitable. • Concern about young adults and college students finding housing. • Need for increased HUD housing options and assistance in connecting the HUD Benefit with housing appropriate for the recipient. • The need for tiny/moveable homes.
H-3: Expand affordable housing opportunities for person with special needs such as the homeless, mentally ill, physically disabled, households with very low and low to moderate incomes, senior citizens, farm workers, female heads of households with children under 18 years old, first time homebuyers and the developmentally disabled.	• Add new types of housing projects to the allowed/permitted uses. • Encourage inclusionary housing projects over single-type special needs projects. • Financial assistance for infrastructure development (for new housing projects). • Supply free building plans for accessory dwelling units. • Increase efforts to address homelessness.
H-4: Promote well planned and designed housing opportunities for all persons regardless of race, gender, age, sexual orientation, marital status or national origin.	• Need for tenant/owner educational workshops. • Financial assistance to deal with code enforcement actions. • Financial assistance to make current housing stock more sustainable, green, and efficient. • Need for mobile home repair/replacement assistance.

H-5: Use land effectively to meet housing needs and to implement smart growth, green building, and sustainable development policies with a focus on infill development.	• Regulations for green development in existing housing. • Develop solar facility to support municipal and individual usage. • Focus on rehabilitating existing housing stock with use of incentives. • Relaxing zoning codes and development standards to maximize development potential.
H-6: Maintain a collaborative working relationship with all groups and organizations dedicated to providing affordable housing in the community, and ensure broad public participation in the development of housing goals and policies.	• Similar comments to those summarized for Goals H-2 and H-3.

Community Housing Workshop #2 – April 25, 2019, 5:30 p.m. to 7:30 p.m.

On April 25, 2019, from 5:30 pm to 7:30 pm, the City of Ukiah hosted a second Community Housing Workshop at the Ukiah Valley Conference Center, and 31 stakeholders/residents attended. For this second workshop, City staff gave a presentation of key updated housing and demographic data that had been collected since the first workshop, including a summary of comments received from the first workshop and an overview of existing and preliminary proposed goals Staff prepared based on this input. Staff also replicated this presentation in Spanish in a separate room with two Staff members assisting with translation for Spanish speakers.

Through group discussions and implementation program/policy setting exercises, attendees developed new policies supporting the proposed goals. Then attendees voted for those programs and policies they felt most important for the City to achieve.

A summary of this input is below, with the number of votes by participants per policy indicated in parentheses.

Preliminary Proposed Goals and Policies (and # of votes per policy)
H-1: Conserve, rehabilitate, and improve the existing housing stock to provide adequate, safe, sustainable, and decent housing for all Ukiah residents.
Support example policies in handout, except edit.
Renew & expand solar energy efficiency rebate programs. (3)
Incorporate renewable energy and energy efficient design in all new housing & remodeled housing. (4)
New development shall enhance the neighborhood, and create/maintain the peace and privacy of next door neighbors. (3)
For major remodels, require sustainable upgrades, i.e. attic and subflooring insulation. (2)
Construction and modifications must consider impacts on neighbors, lights and noise. (1)

Enable composting toilets and gray water systems. (2)
Maintain housing stock by not allowing housing to become commercial.
H-2: Support housing opportunities for all economic segments of the community, regardless of race, gender, age, sexual orientation, marital status, or national origin.
Please include the half of the population who earn too much to qualify for low income housing. (3)
Encourage variety of housing types - single family, multifamily, co-op, etc. Studio, 3+ bedrooms, tiny homes, single occupancy unit. (9)
Tiny, moveable homes as right-sized housing. (3)
Consider implementing rent control measures (translated from Spanish written comment)
Provide options/assistance for affordable housing for low-moderate income levels (translated from written Spanish comment)
Consider lowering planning/building permit fees (translated from written Spanish comment)
Increase potential sites for mobile home parks (translated from written Spanish comment)
H-3: Expand affordable housing opportunities for persons with special needs.
Senior housing - market rate (not low income). (5)
Current H3.e should move forward (allow higher density too).
Remove barriers by flexible development standards: reduce setbacks, parking requirements, greater height allowance. (9)
Increase public transportation around affordable housing. (2)
Incentivize new home developers to make houses accessible for aging in place (not necessarily ADA). (4)
H-4: Minimize governmental constraints for infill housing development.
Reduce/defer Planning & Building fees for senior/affordable/special needs housing. (2)
Incentivize increased density (bonus). (1)
Review development standards (height, setbacks) to increase density - zoning ordinance amendments
Investigate use of "moveable" tiny homes as ADUs. (5)
Identify areas of desired growth & support development of infrastructure (water/sewer/electricity). (2)
Streamline design review. Avoid duplicative efforts. (5)
Reducing barriers (height, parking, setbacks, maximum number of floors) for infill development. (1)
Consider deferment of curb, gutter & sidewalk requirement.
Expand live/work/mixed use options in additional commercial zoning districts. (7)
Question requirement of military department review of use permits.
Financial assistance for infrastructure development.
H-5: Use land effectively to meet housing needs and maintain existing housing stock.
Maintain and publish vacant/underutilized, property owner outreach, include R-1 in list for opportunities. (5)
Increase density on underutilized parcels. (6)
Incentivize multi-unit: taxes, fees, timelines.
Predeveloped plans that identify setbacks, including duplex, triplex, 4-plex. (4)
Clearly identify airport zone.

Annexation.
Develop walkways in the new and existing subdivisions through community outreach and imminent domain, if needed.
H-6: Provide support for future housing needs.
Update City Planning codes and Building codes.
Consolidate service districts. (1)
Pursue annexation to logical/natural boundaries. (7)
Offer pre-approved building plans for ADUs, duplexes, triplexes, 4-plexes. (2)
Extend city infrastructure. (1)
Update General Plan w/EIR. (2)
Update zoning district guidelines. (1)
Update Sphere of Influence. (1)
Resolve turf wars. (1)
Pursue low-income grants for market rate housing. (1)
Renew and expand solar energy efficiency rebates. (2)
New subdivisions, regulate trees & foliage to preserve solar access on neighboring parcels. (1)
Incorporate renewable energy & energy efficiency standards into new home design & construction. (6)
Promote pedestrian use into subdivision and design. (2)

LIST OF STAKEHOLDERS

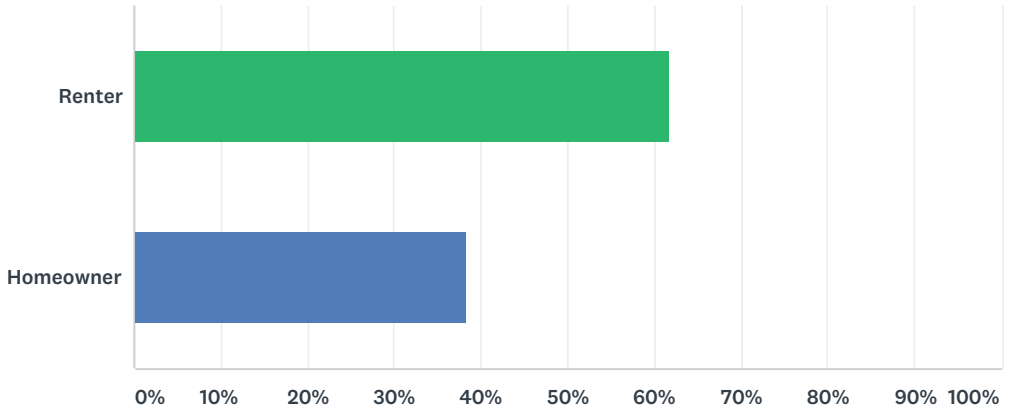
CA Department of Fish and Wildlife
Caltrans
Community Development Commission of Mendocino County
Lake County/City Area Planning
Mendocino Council of Governments
Mendocino County Department of Social Services
Mendocino County Executive Office
Mendocino Board of Supervisors
Mendocino County Air Quality Management District
Mendocino County LAFCO
Mendocino County Planning and Building Services
Mendocino Transit Authority
State Water Resource Control Board
US Army Corps of Engineers
City of Ukiah Design Review Board
City of Ukiah Paths Open Space and Creeks Commission
Greater Ukiah Chamber of Commerce
Community Foundation of Mendocino County
First 5 Mendocino
Food Bank Ukiah/ Ford Street Project
Leadership Mendocino
Legal Services of Northern California
North Coast Opportunities
Manzanita Services Inc.
Redwood Community Services
Ukiah Main Street Program
Ukiah Senior Center
Walk and Bike Mendocino
Mendocino County Farm Bureau
Sustainable Ag Lands Committee
Rural Communities Housing Development Corporation
The DANCO Group
Petaluma Ecumenical Properties Housing
AMG & Associates
The Pacific Companies
Burbank Housing Development Corporation
Healthy Mendocino County- Housing Action Team
Mendocino Latinx Alliance
Ukiah Vecinos en Accion
Climate Action Mendocino
Alliance for Community Endeavors
Wagenseller Neighborhood Association
Walk and Bike Mendocino
North Coast Opportunities
Mendocino Farmers Breaking Down Barriers to Appropriate and Affordable Housing
Andy Wiese Real Estate
Beverly Sanders Realty

Coldwell Banker Mendo Realty
Mendo Realty Property Management
Moreno & Co.-Dan Thomas
Re/Max Full Spectrum
W Real Estate
Realty World Selzer Realty Property Management
Team Mendo of Coldwell Banker Mendo Realty Inc.
Community First Credit Union
Redwood Credit Union
Savings Bank of Mendocino County
Umpqua Bank
Wells Fargo
West America Bank
LACO Associates
North Coast Builders Exchange
SHN, Inc.
Barra Vineyards
Factory Pipe
FlowKana
Mendocino College
Redwood Empire Fairgrounds
Ukiah Unified School District
Ukiah Valley Medical Center
Hopland Utility District
Millview County Water District
Redwood Valley CO.Water District
Willow County Water & Calpella District
River Estates Water
Rogina Water Company
Ukiah Valley Sanitation District
Guillon, Inc.
Montanos Development Corp.
West Business Development
Economic Development and Financing Corporation
Mendocino County Economic Summit Participants
Coyote Valley band of Pomo Indians
Guidiville Indian Rancheria
Pinoleville Pomo Nation
Yokayo Rancheria
Redwood Valley Racheria
Hopland Band of Pomo Indians
Potter Valley Tribe
Northern Circle Indian Housing

APPENDIX B
COMMUNITY HOUSING SATISFACTION SURVEY RESULTS

Q1 Are you a renter or homeowner?

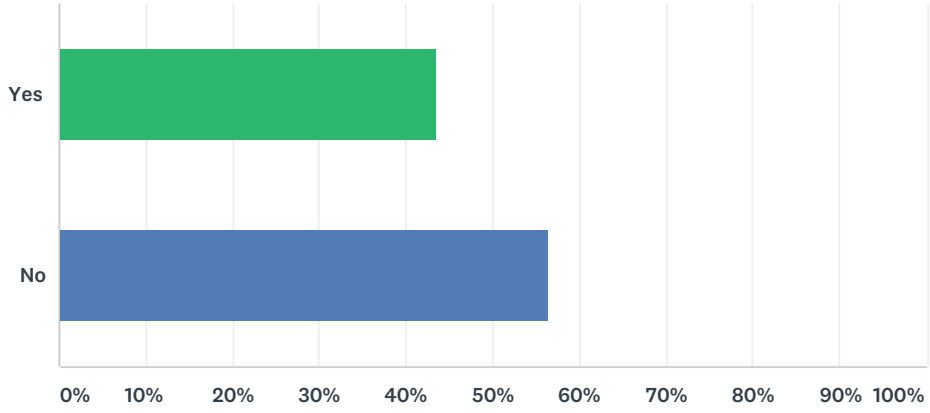
Answered: 383 Skipped: 1



ANSWER CHOICES	RESPONSES	
Renter	61.62%	236
Homeowner	38.38%	147
TOTAL		383

Q2 Are you actively looking for housing?

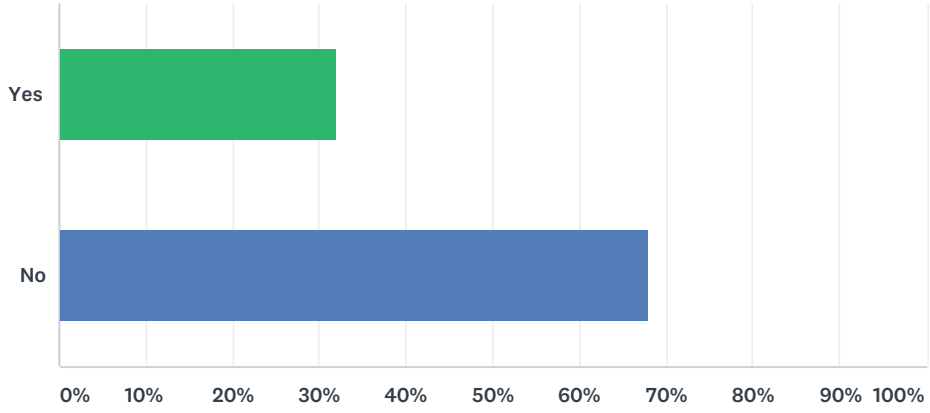
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ANSWER CHOICES	RESPONSES	
Yes	43.49%	167
No	56.51%	217
TOTAL		384

Q3 Are you satisfied with your current housing options?

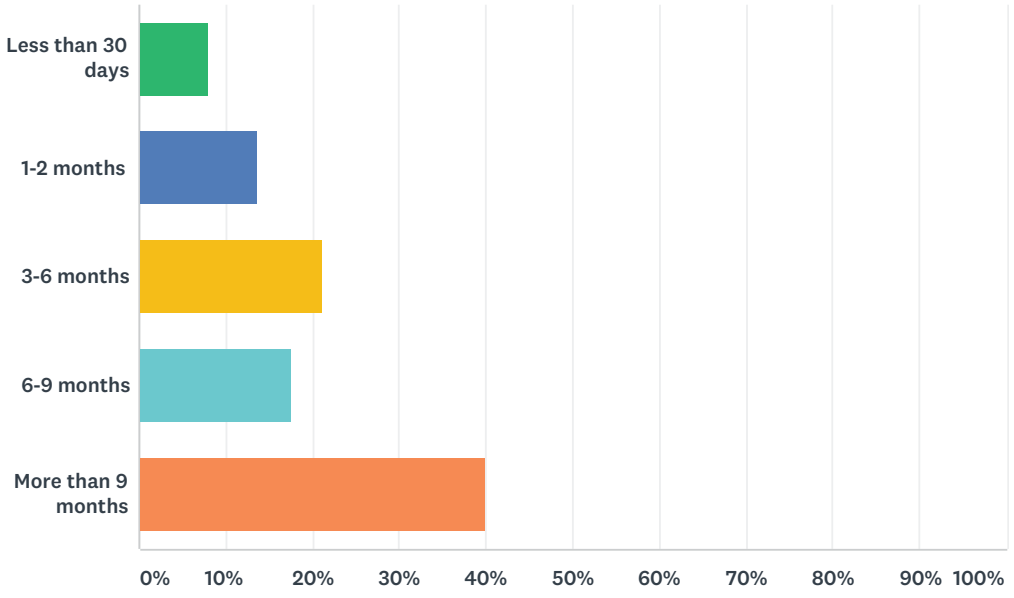
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ANSWER CHOICES	RESPONSES	
Yes	31.94%	122
No	68.06%	260
TOTAL		382

Q4 If you purchased a home or started renting a unit in Ukiah within the last year, how much time did it take you to find the housing unit in which you currently reside?

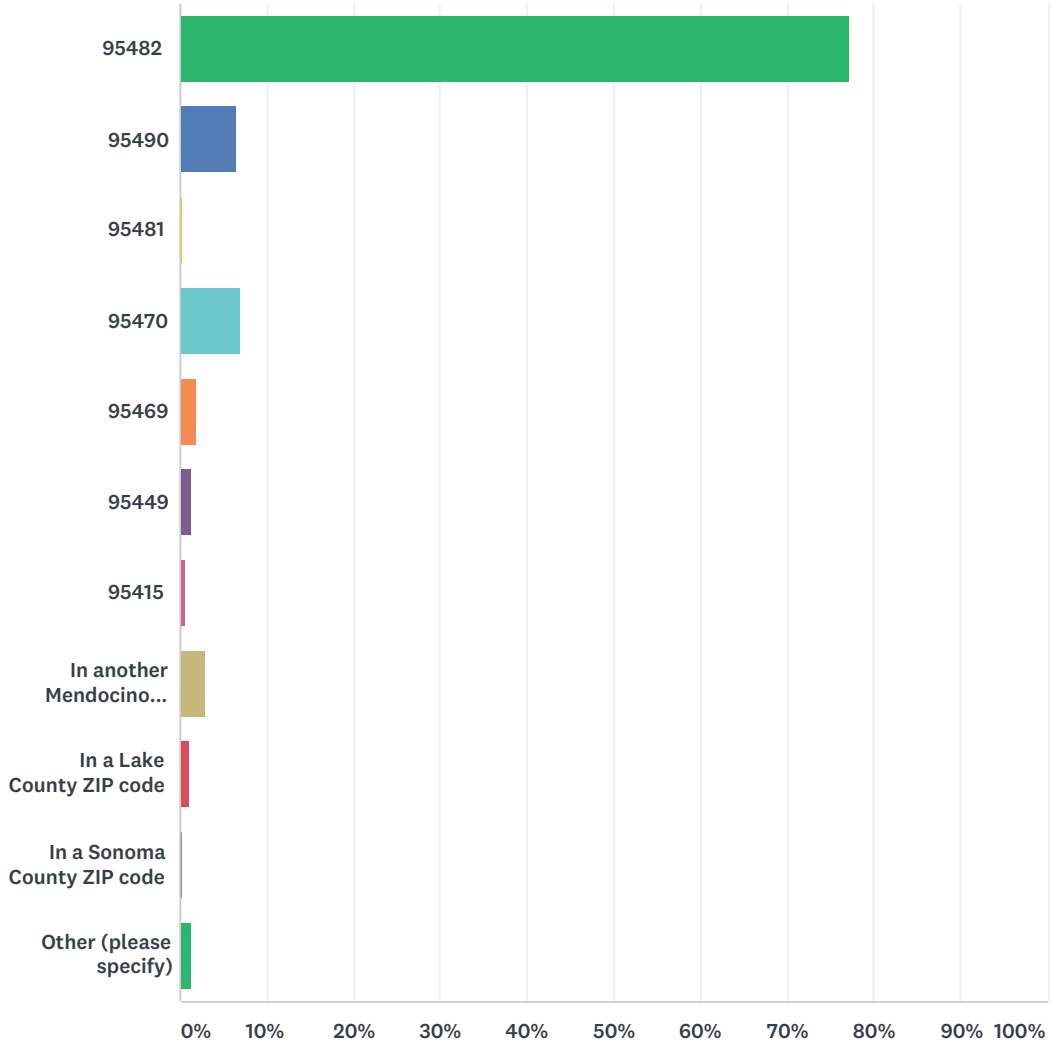
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ANSWER CHOICES	RESPONSES	
Less than 30 days	7.86%	22
1-2 months	13.57%	38
3-6 months	21.07%	59
6-9 months	17.50%	49
More than 9 months	40.00%	112
TOTAL		280

Q5 In what ZIP code is your residence located?

Answered: 382 Skipped: 2

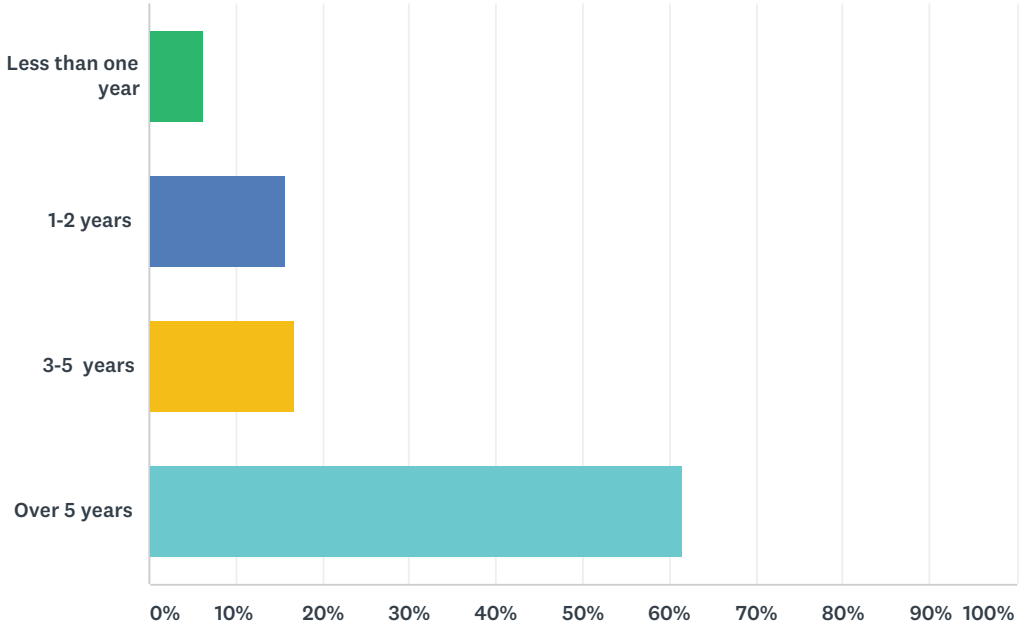


ANSWER CHOICES	RESPONSES	
95482	77.23%	295
95490	6.54%	25
95481	0.26%	1
95470	6.81%	26
95469	1.83%	7
95449	1.31%	5
95415	0.52%	2
In another Mendocino County ZIP code	2.88%	11
In a Lake County ZIP code	1.05%	4
In a Sonoma County ZIP code	0.26%	1

Other (please specify)	1.31%	5
TOTAL		382

Q6 About how long have you resided in your current ZIP code?

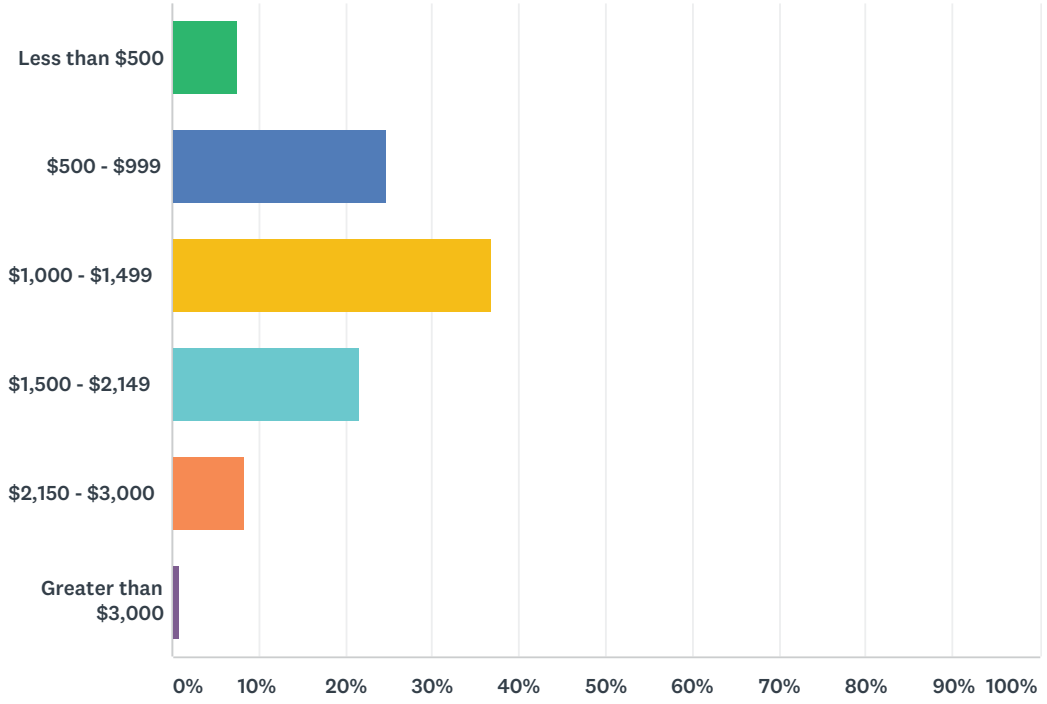
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ANSWER CHOICES	RESPONSES	
Less than one year	6.25%	24
1-2 years	15.63%	60
3-5 years	16.67%	64
Over 5 years	61.46%	236
TOTAL		384

Q7 What is your current rental payment or mortgage payment?

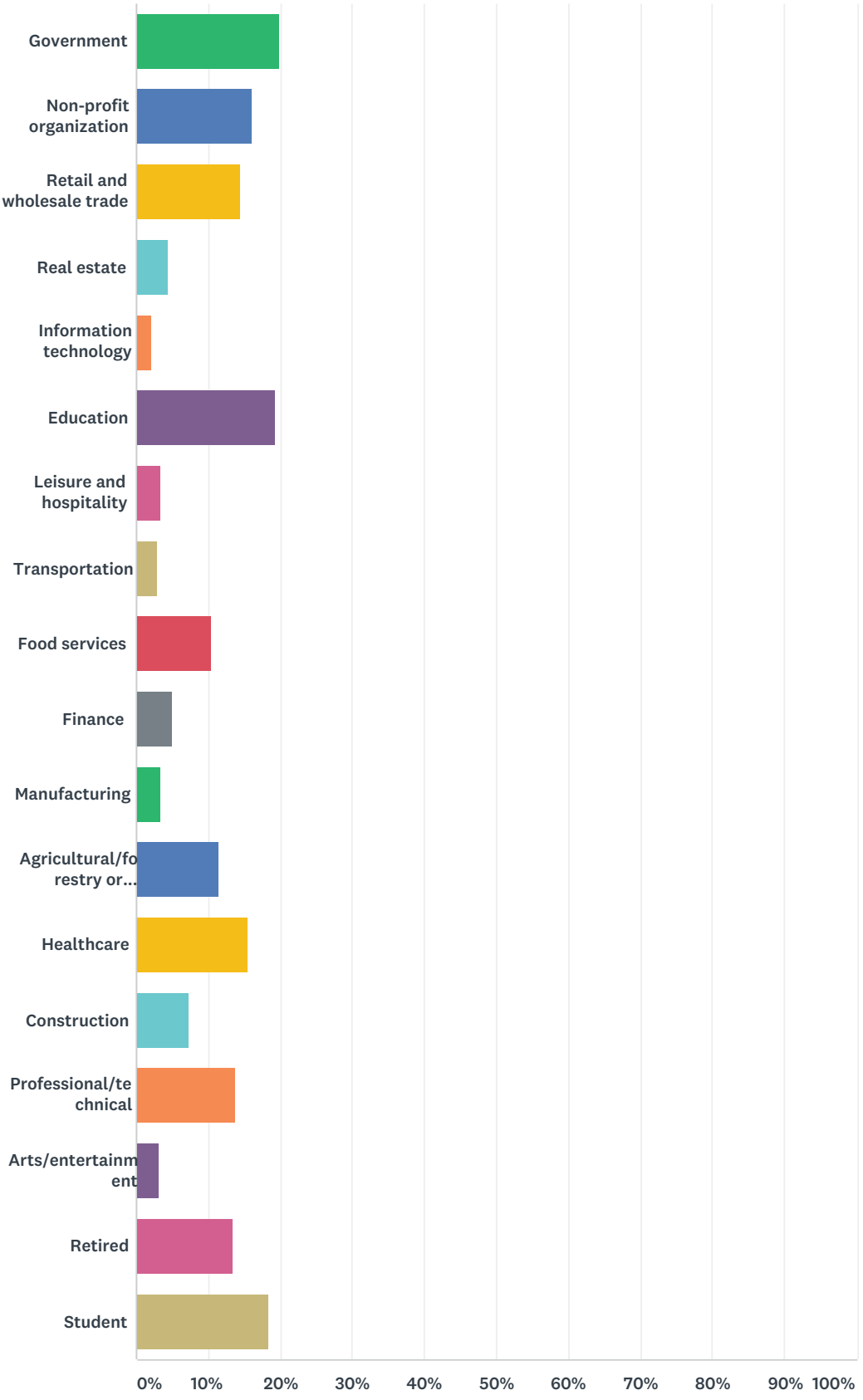
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ANSWER CHOICES	RESPONSES	
Less than $500	7.63%	29
$500 - $999	24.74%	94
$1,000 - $1,499	36.84%	140
$1,500 - $2,149	21.58%	82
$2,150 - $3,000	8.42%	32
Greater than $3,000	0.79%	3
TOTAL		380

Q8 In which of the following sectors are members of your household employed? Please mark all that apply.

Answered: 381 Skipped: 3

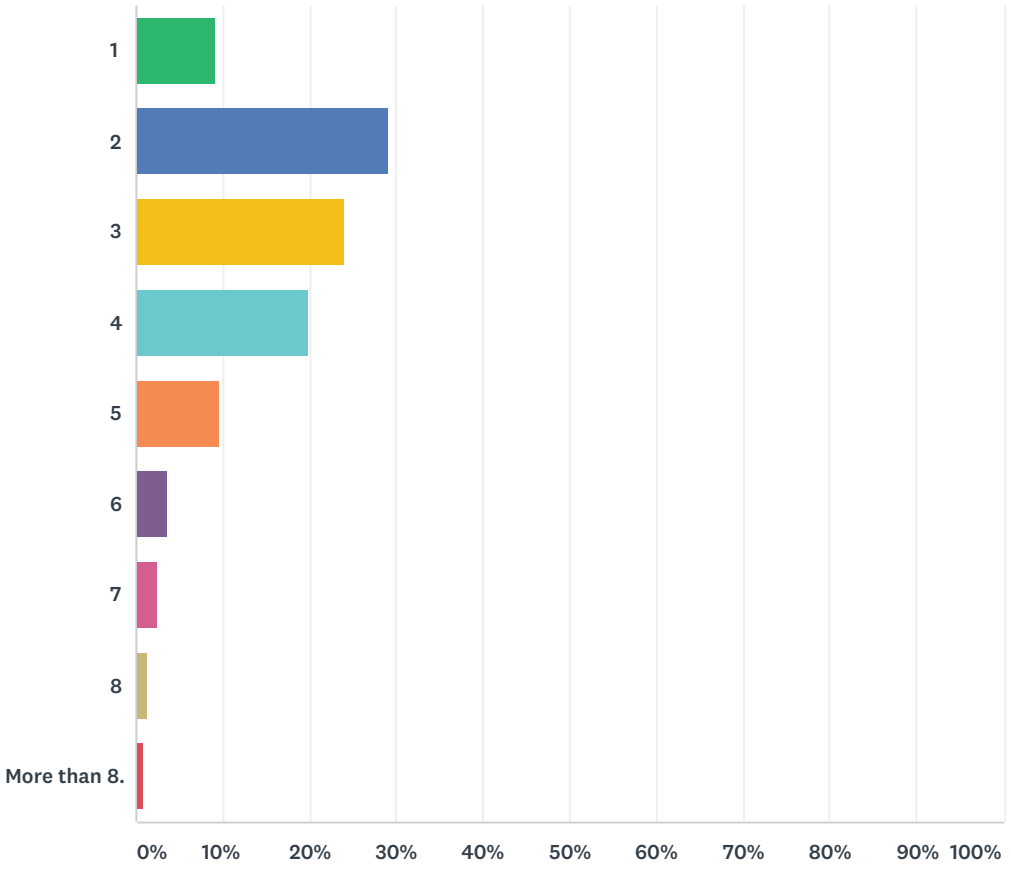


ANSWER CHOICES	RESPONSES	
Government	19.95%	76

Non-profit organization	16.01%	61
Retail and wholesale trade	14.44%	55
Real estate	4.46%	17
Information technology	2.10%	8
Education	19.16%	73
Leisure and hospitality	3.41%	13
Transportation	2.89%	11
Food services	10.50%	40
Finance	4.99%	19
Manufacturing	3.41%	13
Agricultural/forestry or natural resources	11.55%	44
Healthcare	15.49%	59
Construction	7.35%	28
Professional/technical	13.91%	53
Arts/entertainment	3.15%	12
Retired	13.39%	51
Student	18.37%	70
Total Respondents: 381		

Q9 How many people are in your household?

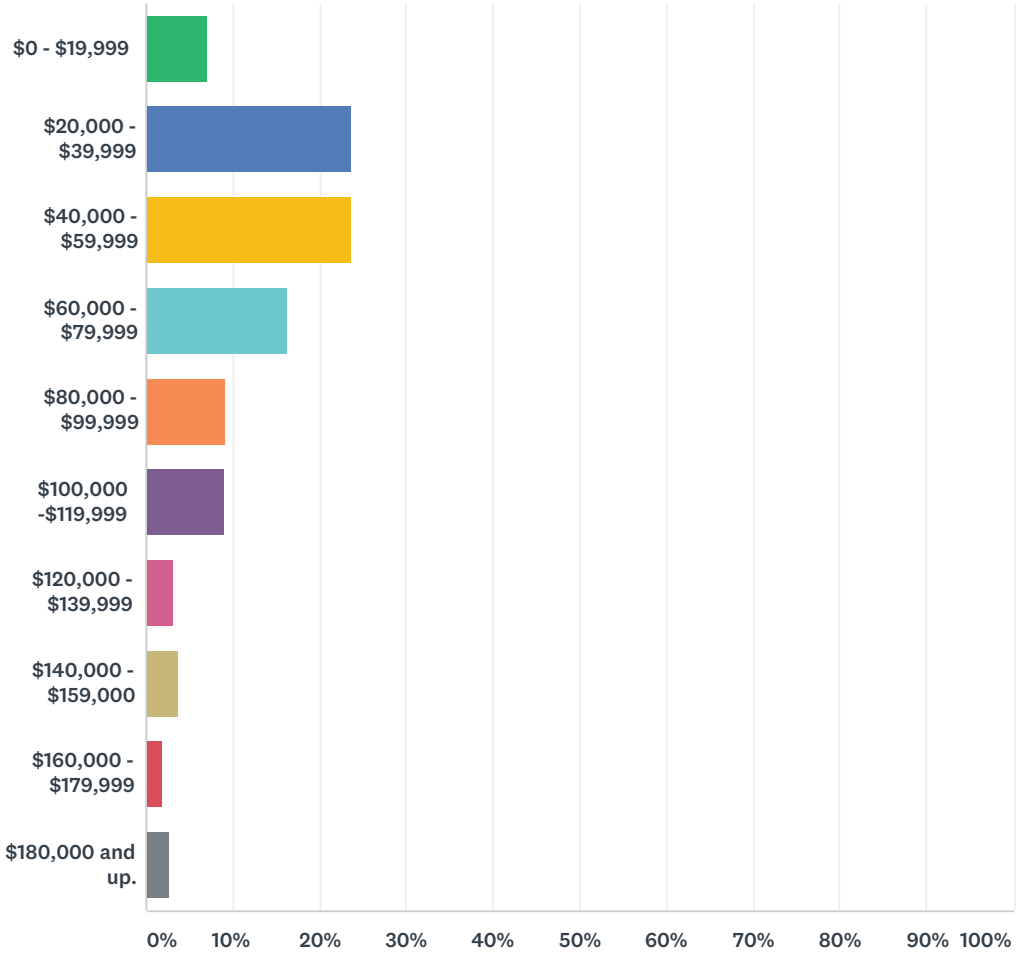
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ANSWER CHOICES	RESPONSES	
1	9.11%	35
2	29.17%	112
3	23.96%	92
4	19.79%	76
5	9.64%	37
6	3.65%	14
7	2.60%	10
8	1.30%	5
More than 8.	0.78%	3
TOTAL		384

Q10 What is your household's approximate annual income before taxes?

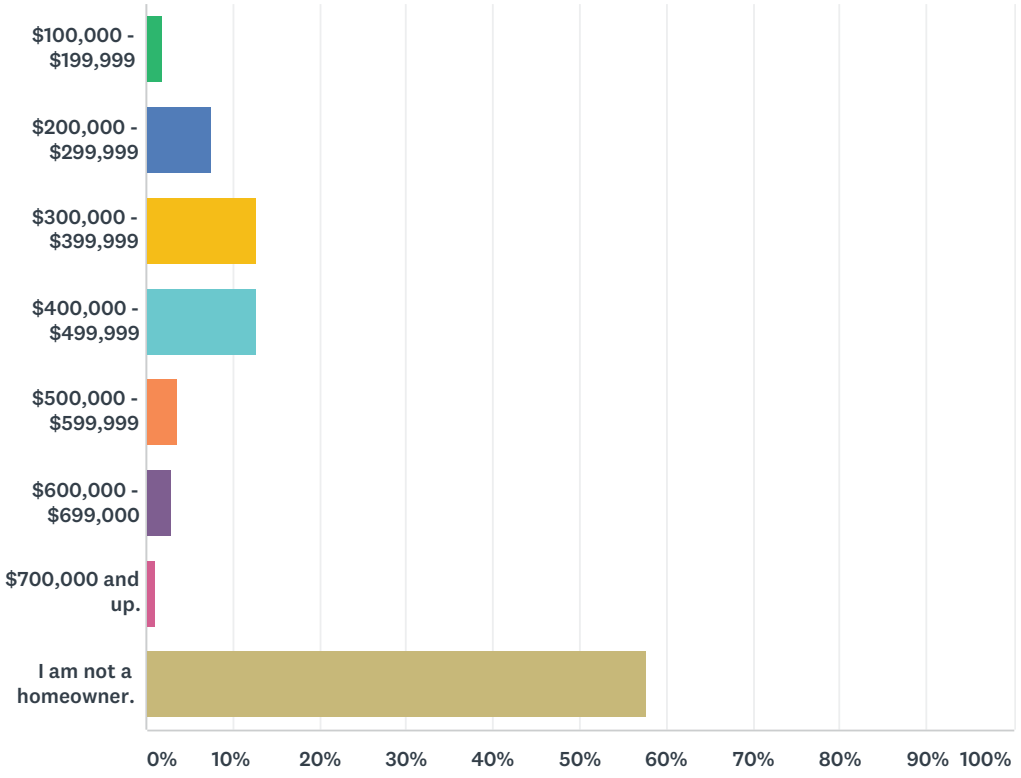
Answered: 381 Skipped: 3



ANSWER CHOICES	RESPONSES	
$0 - $19,999	7.09%	27
$20,000 - $39,999	23.62%	90
$40,000 - $59,999	23.62%	90
$60,000 - $79,999	16.27%	62
$80,000 - $99,999	9.19%	35
$100,000 -$119,999	8.92%	34
$120,000 - $139,999	3.15%	12
$140,000 - $159,000	3.67%	14
$160,000 - $179,999	1.84%	7
$180,000 and up.	2.62%	10
TOTAL		381

Q11 If you are a homeowner, what price do you think your house would sell for?

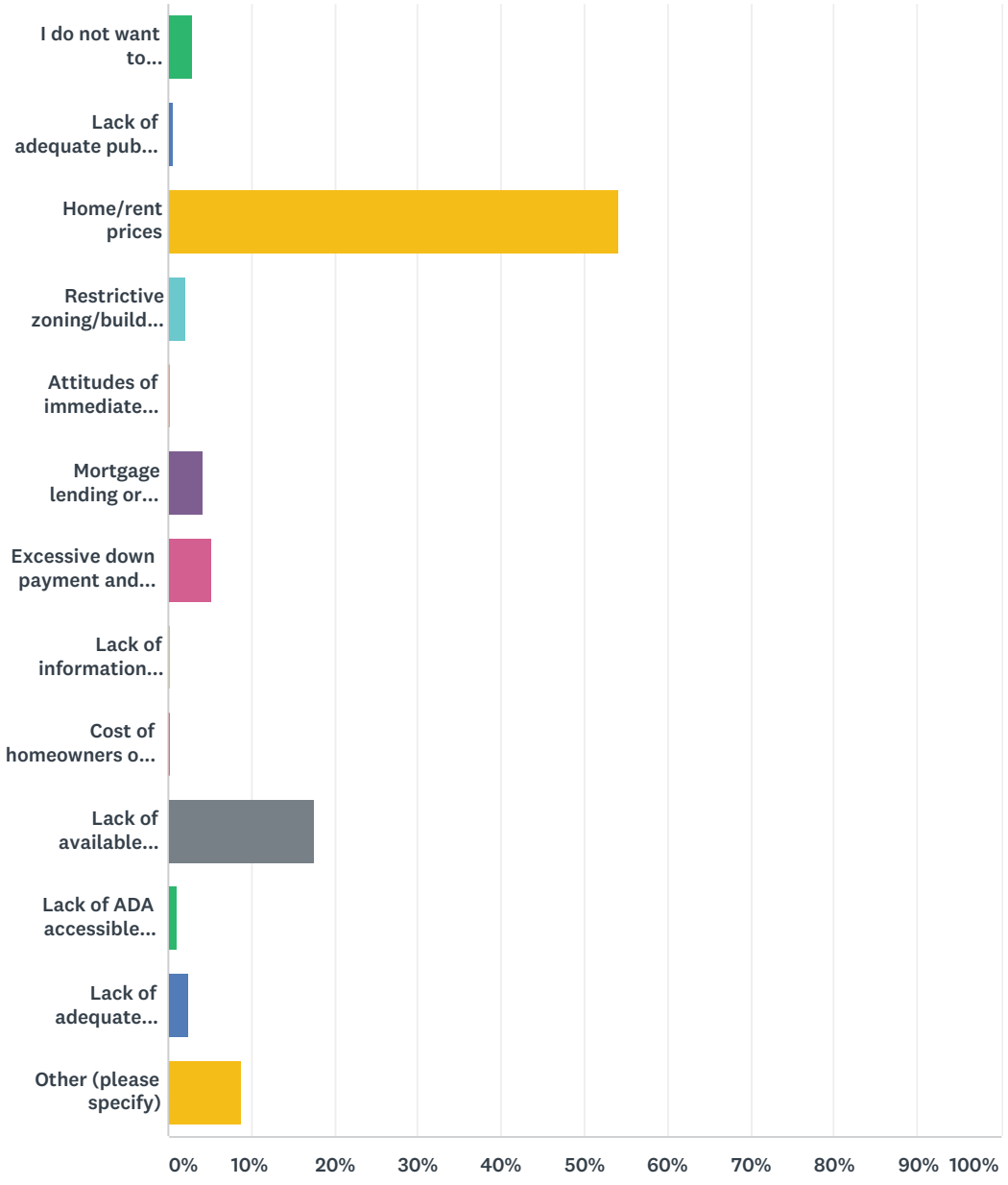
Answered: 371 Skipped: 13



ANSWER CHOICES	RESPONSES	
$100,000 - $199,999	1.89%	7
$200,000 - $299,999	7.55%	28
$300,000 - $399,999	12.67%	47
$400,000 - $499,999	12.67%	47
$500,000 - $599,999	3.50%	13
$600,000 - $699,000	2.96%	11
$700,000 and up.	1.08%	4
I am not a homeowner.	57.68%	214
TOTAL		371

Q12 What is the #1 issue or barrier with obtaining suitable housing for your household?

Answered: 365 Skipped: 19



ANSWER CHOICES	RESPONSES	
I do not want to purchase/rent a home in Ukiah.	3.01%	11
Lack of adequate public transportation	0.55%	2
Home/rent prices	54.25%	198
Restrictive zoning/building codes	2.19%	8
Attitudes of immediate neighbors	0.27%	1

Mortgage lending or rental application requirements	4.11%	15
Excessive down payment and upfront costs	5.21%	19
Lack of information about homeowner/renter responsibilities	0.27%	1
Cost of homeowners or renters insurance	0.27%	1
Lack of available housing inventory	17.53%	64
Lack of ADA accessible housing	1.10%	4
Lack of adequate employment	2.47%	9
Other (please specify)	8.77%	32
TOTAL		365

APPENDIX C
LIST OF QUALIFIED ENTITIES FOR PRESERVING AT-RISK UNITS

County	Organization	Address	City	State	Zip	Phone	Contact Person	Email Address
ALL COUNTIES	Catalyst Housing Group, LLC	21 Ward Street, Suite 2	Larkspur	CA	94939	(415) 205-4702	Jordan Moss	Jordan@CatalystHousing.com
LOS ANGELES	Los Angeles County Development Authority	700 W. Main Street	Alhambra	CA	91801	(626) 586-1816	KeAndra Cylear-Dodds	Keandra.cyleardodds@lacda.org
ALL COUNTIES	Veritas Urban Properties LLC	2050 Hancock Street, Suite B	San Diego	CA	92210	(619) 746-5191	Gilman Bishop	gbishop@bishopventures.com
LOS ANGELES	Santa Fe Art Colony Tenants Association	2415 S. Sante Fe Avenue, Unit 2	Los Angeles	CA	90058	(310) 663-6665	Sylvia Tidwell	sylvia@sylviatidwell.net

APPENDIX D
2017 CITY OF UKIAH HOUSING STRATEGY

CITY OF UKIAH HOUSING STRATEGY
OVERVIEW

The City of Ukiah will develop programs and tools designed to stimulate the Ukiah housing market. Through a two-part strategy, the City will deploy new funding, analyze zoning policy for regulatory relief, and continue the utilization of successful incentives to encourage additional housing production for affordable ("low- and moderate-income") and middle-income households. Key components of this strategy are presented below.

1. Affordable Housing Strategy

Ukiah's affordable housing strategy is targeted at households with incomes of no more than 80% of Area Median Income. Central to this strategy is the creation of a housing trust and revolving loan fund- the Ukiah Housing Trust Fund.



Picture of Sun House Senior Apartments – PEP Housing, October 2017

A. Ukiah Housing Trust Fund (UHTF)

The UHTF will serve as the umbrella for all affordable housing activities, including new and existing housing grants and programs. This provides a centralized and recognizable resource for participating households and affordable housing developers.

Principal funding for the UHTF and its corresponding revolving loan fund is derived from former Redevelopment Agency housing bond proceeds. A majority of this funding is expected to be awarded to affordable housing developers in the form of below market interest rate loans and grants towards the production of housing units. Federal and state programs operated through the UHTF will largely focus on individual households.

B. Activities Funded by the UHTF

Activities funded are expected to include, but may not be limited to, the following:

1. Creation of new affordable units;

2. Purchase of vacant and underutilized land (land assembly) for the purpose of facilitating future affordable housing production
3. Assistance with multi-family housing rehabilitation projects;
4. Conversion of market rate units to affordable housing units;
5. Preservation of existing affordable housing;
6. Construction of accessory dwelling units;
7. First time homebuyer loans;
8. Single-family housing rehabilitation loans; and
9. Predevelopment assistance to non-profit and for-profit developers with project feasibility and preliminary design studies for potential affordable housing projects.

C. UHTF Guidelines and Deployment Allocations
Prior to the launching of the new Housing Trust Fund, Staff will develop UHTF guidelines for City Council review and approval. Included will be recommended deployment allocations for each of the major activities of the UHTF.

D. Marketing and Engagement
Housing Division Staff will design a marketing and engagement approach aligned with existing *Visit Ukiah* and other City of Ukiah marketing strategies. The approach is expected to include the development of marketing materials like informational flyers and handouts and the creation of a new Housing Division webpage. It is anticipated that existing Community Development and Planning Department webpages will be updated during the drafting of the new Housing Division webpage so that Department programs and resources are more synergized.

Included in the marketing and engagement strategy will be a highlight of existing incentives and tools such as the Fee Deferral Program, Title 24 Rebate Program and other energy rebates available to developers.

2. Middle-Income Housing Strategy
Ukiah's Middle-Income Strategy seeks to remove impediments to housing development through regulatory relief and innovative zoning practices.

A. Regulatory Relief Analysis
Staff will investigate zoning ordinances and Ukiah City Code for possible relief and present a report with recommendations to Council. Specific areas of analysis will include the following:
- By-right residential uses in other zoning districts
- Reduction of parking and setback requirements
- Development of an offsite mitigation bank for Low Impact Development (LID)

B. Community Benefit Zoning
This is perhaps the most experimental approach in the City's Housing Strategy. Staff will research possible regulations and policies to establish incentive-based zoning towards encouraging additional housing opportunities affordable to middle income households. A report of findings, with recommendations, will be presented to the Planning Commission for input prior to being presented to City Council. Included will be a short feasibility analysis into utilization of a Neighborhood Pilot Program and Middle Income Citizen Advisory Board.

APPENDIX E
VACANT AND UNDERUTILIZED INVENTORY AND MAPS

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
Very-Low/Low Vacant Parcels												
1	00230155	763 S Oak St	Vacant	C1	C	0.88	38,332	31	77	Very-Low/Low	C	Undeveloped but approved for an entitlement for Ukiah Senior Apartments (31 units) project in Feb 2018. Expected to be developed within 1-2 years.
2	00237027	None Assigned. Corner of Clara & N Orchard	Vacant	C1	C	0.67	29,185	15	37	Very-Low/Low	None	Undeveloped. Realistic development capacity- 22,806 sf available to build up to15 multi-family units. Due to need for housing and citywide build-out, expected to be developed within planning period.
3	17903025	700 E Perkins St	Vacant	C1	C	1.24	54,014	25	62	Very-Low/Low	None	Undeveloped. Realistic development capacity- 37,800 sf available for up to 25 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
4	17903028	730 E Perkins St	Vacant	C1	C	0.58	25,264	16	40	Very-Low/Low	None	Undeveloped. Realistic development capacity- up to 16 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
5	17906104**	705 E Perkins St	Vacant	C1	C	0.52	22,651	14	35	Very-Low/Low	None	Minor improvements including parking lot. Realistic development capacity for up to 14 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
Very-Low/Low Vacant Parcels Subtotal						***3.89***	***169,446***	***101***	***251***			
Moderate/Above-Moderate Vacant Parcels												
6	00111126	None Assigned. Corner of Dora & N Spring	Vacant	R1	LDR	0.16	6,969	2	5	Mod/Above-Mod	None	Undeveloped and surrounded by single family dwellings (SFDs). Realistic development capacity- based on lot restrictions site could be developed with up to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
7	00114239*	179 Park Pl	Vacant	R1	LDR	0.41	17,859	2	5	Mod/Above-Mod	None	Mostly undeveloped but some topographical lot restrictions. Surrounded by SFDs. Realistic development capacity of up to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
8	00114244	169 Park Pl	Vacant	R1	LDR	0.27	11,761	2	5	Mod/Above-Mod	None	Undeveloped. Surrounded by SFDs. Could build up to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
9	00114245	169 Park Pl	Vacant	R1	LDR	0.24	10,454	2	5	Mod/Above-Mod	None	Undeveloped. Some lot restrictions including road access. Realistically could build 2 units- SFD and accessory dwelling unit (ADU). Due to need for housing and citywide build-out, expected to be developed within planning period.
10	00121404	None Assigned. Near S Barnes St & W Clay St	Vacant	R1	LDR	0.54	23,522	3	7	Mod/Above-Mod	D; None	Undeveloped. Lot restrictions and zoning restrict number of units that can be realistically developed to 3. Could increase density if merging with parcel 00121409. Due to need for housing and citywide build-out, expected to be developed within planning period.
11	00125323	None Assigned. Oak Park Ave Between W Clay St & Jones St	Vacant	R1	LDR	0.47	20,473	3	7	Mod/Above-Mod	D; None	Undeveloped and surrounded by SFDs. Realistic development capacity for up to 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
12	00142036	271 Mendo-cino Pl	Vacant	R1	LDR	0.46	20,037	2	5	Mod/Above-Mod	D; Slope	Undeveloped. Although larger lot, topographical restrictions limit to realistic maximum of 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
13	00211480	None Assigned. Behind existing homes on Oak St.	Vacant	R1	LDR	0.15	8,464	2	5	Mod/Above-Mod	None	Undeveloped. Needs road access but realistically could develop 2 units- an SFD and ADU. Due to need for housing and citywide build-out, expected to be developed within planning period.
14	00301059	1010 Helen Ave	Vacant	R1	LDR	0.15	6,534	2	5	Mod/Above-Mod	D; None	Undeveloped; surrounded by SFDs. Due to lot restrictions, maximum development capacity of 1 SFD and 1 ADU. Due to need for housing and citywide build-out, expected to be developed within planning period.
15	00302124	None Assigned. Cochrane Ave Between 410 & 420	Vacant	R1	LDR	0.14	6,098	1	2	Mod/Above-Mod	D; None	Undeveloped. Due to setback limitations realistic development capacity is 1 unit. Due to need for housing and citywide build-out, expected to be developed within planning period.
16	00311056	None Assigned.	Vacant	R1	LDR	0.29	12,632	2	5	Mod/Above-Mod	D; Slope	Undeveloped. Existing slope constraints allow a realistic

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
		At the terminus of Redwood Ave										development maximum of 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
17	00311079	1080 Helen Ave	Vacant	R1	LDR	0.50	21, 780	3	7	Mod/Above-Mod	D; None	Undeveloped flag lot; surrounded by SFDs. Due to lot limitations realistic development capacity is 3 units maximum. Due to need for housing and citywide build-out, expected to be developed within planning period.
18	00352055	None Assigned. Off of S Dora St Near Washington behind homes	Vacant	R1	LDR	0.16	6.969	2	5	Mod/Above-Mod	D; None	Undeveloped; surrounded by SFDs. Due to lot size, setbacks, and access limitations, realistic development capacity is up to 2 units. Expected to be developed within the planning period.
19	00352056	None Assigned. Off of S Dora St near Washington behind homes	Vacant	R1	LDR	0.15	6,534	2	2	Mod/Above-Mod	D; None	Undeveloped; similar to parcel 00352055 and same owner. Due to lot size, setbacks, and access limitations, realistic development capacity is up to 2 units. Expected to be developed within the planning period.
20	00354065	None Assigned. On Cresta near Wabash. Adjacent To 191 Cresta Dr	Vacant	R1	LDR	0.21	9,147	2	5	Mod/Above-Mod	D Slope	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
21	00354066	191 Cresta Dr	Vacant	R1	LDR	0.20	8,712	2	5	Mod/Above-Mod	None	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
22	00357217	None Assigned. Cooper Ln near Betty St	Vacant	R1	LDR	0.19	8,276	2	5	Mod/Above-Mod	C	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
23	00357218	None Assigned. Cooper Ln near Betty St	Vacant	R1	LDR	0.21	9,221	2	5	Mod/Above-Mod	None	Undeveloped. Lot size limitations and setbacks set realistic development capacity at not more than 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
24	00309045	21 Betty St	Vacant	R2	MDR	0.13	5,662	1	2	Mod/Above-Mod	C; Limited access	Undeveloped. Parcel has some access and lot size limitations and

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
												realistically could accommodate one SFD. Due to need for housing and citywide build-out, expected to be developed within planning period.
25	00211432	670 N State St	Vacant	C1	C	0.31	13,503	9	22	Mod/Above-Mod	None	Undeveloped, surrounded by residential development. Realistically could accommodate up to 9 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
26	00214611	528 N State St	Vacant	C1	C	0.31	13,815	9	22	Mod/Above-Mod	None	Undeveloped, surrounded by residential development. Realistically could accommodate up to 9 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
27	00230153	638 S State St	Vacant	C1	C	0.26	11,325	3	7	Mod/Above-Mod	C	Undeveloped but given lot limitations and setbacks only 4,550 sf could be realistically developed, setting maximum capacity at 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
28	00204047	None Assigned. On Low Gap Rd in between N State St & Mazzoni St	Vacant	C2	C	0.21	9,147	6	15	Mod/Above-Mod	None	Undeveloped, narrow lot sets realistic development capacity at up to 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
29	00228110*	190 Cleveland Ln	Vacant	C2	C	0.19	8,403	6	15	Mod/Above-Mod	None	Undeveloped. Existing lot limitations sets realistic development capacity at not more than 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
30	00313065	1137 S Dora St	Vacant	CN	C	0.41	17,859	6	15	Mod/Above-Mod	D; None	Undeveloped; but existing lot size limitations and setbacks removes 300 sf and zoning limits density. Realistic development capacity is not more than 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
31	00226307	None Assigned. Corner of W Clay St & S Oak St	Vacant	GU	C	0.10	3,257	2	5	Mod/Above-Mod	C	Undeveloped; surrounded by commercial development. Zoning allows up to 28 du/acre but lot and setback limitations limit realistic development capacity to 2 units. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
32	00350014	None Assigned. Access from Helen Ave and Foothill Ct	Vacant	R1	LDR	7.56	329,313	12	30	Mod/Above-Mod	Slope	Existing slope constraints allow for 299,000 sf (6 ac) of lot to be developed. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre setting realistic development capacity at 12 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
33	00104002***	None Assigned. Access off of W Stanley St	Vacant	R1H	LDR	36.97	1,610,413	2	5	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with a 5 acre lot; 2 units are possible on this parcel and are expected to be developed within the planning period given need for housing and citywide build-out.
34	00104065***	500 Lookout Drive	Vacant	R1H	LDR	6.29	273,992	2	5	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 2 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
35	00104082***	360 S Highland Ave	Vacant	R1H	LDR	29.63	1,290,682	12	30	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 12 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
36	00104084***	None Assigned.	Vacant	R1H	LDR	10.08	439,084	4	10	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
		Access from Highland Ave										Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 4 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
37	00104088***	None Assigned. Access from Highland Ave	Vacant	R1H	LDR	8.45	368,081	4	10	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 4 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
38	00104092	335 Janix Dr	Vacant	R1H	LDR	4.77	207,781	8	20	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre; a maximum of 8 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
39	00104093***	335 Janix Dr	Vacant	R1H	LDR	4.86	211,701	2	5	Mod/Above-Mod	Slope; infrastructure	Undeveloped but constrained by steep slopes. Although General Plan allows up to 6 units per acre, given other residential development in this district, as well as existing lot limitations and constraints, realistic development capacity has been calculated at roughly 2 du/acre with 5 acre lots; a maximum of 2 units is possible on this parcel and is expected to be developed within the planning period given need for housing and citywide build-out.
Moderate/Above-Moderate Vacant Parcels Subtotal						***115.43***	***5,000,718***	***124***	***308***			
Very-Low/Low Underutilized Parcels												

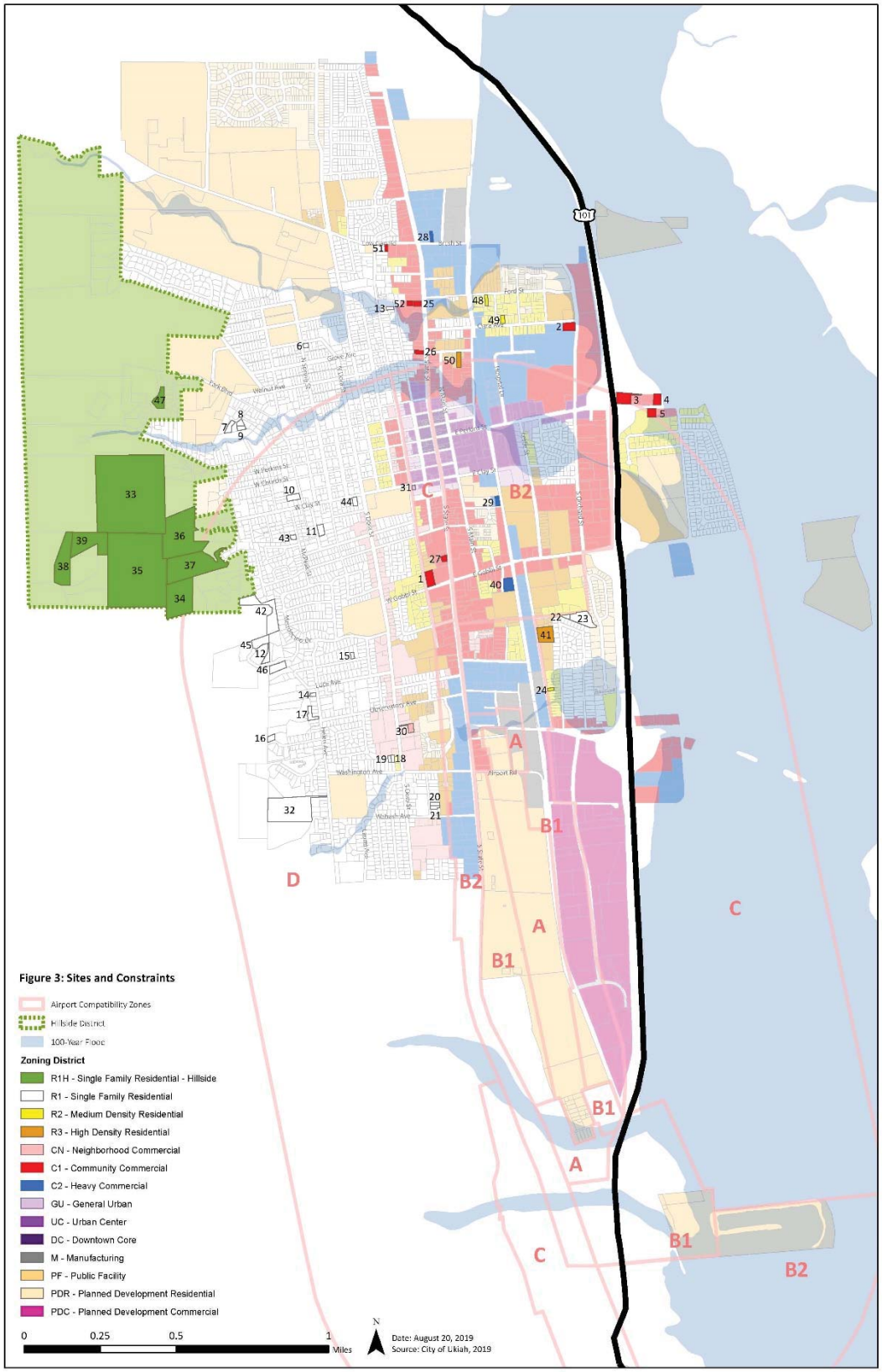
Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
40	00304079; 00304077*; 00304078*;	210 E Gobbi St	Underutilized	C1;C2	C	2.4	22,098	36	90	Very-Low/Low	B2	Underutilized; existing community garden on-site. Application for $500,000 in Ukiah Housing Trust Fund received in 2018 for 40 low income housing units but due to airport constraints, realistic development potential is 36 units. This site consists of three parcels suitable for development. Two of the parcels, 00304077 and 00304078, were listed in the prior planning period. The third parcel, 00304079, was not listed. However, realistically all three parcels will be developed at one time and this will also maximize development potential on the site. Program 2h to allow by right housing development on these parcels has been added. Due to need for housing and citywide build-out, expected to be developed within planning period.
41	00357407**	817 Waugh Ln	Underutilized	R3	HDR	1.66	72,309	24	60	Very-Low/Low	C	Underutilized with existing SFD and minor outbuildings. Existing topographical and lot limitations, plus airport constraints, set realistic development capacity at up to 24 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
Very-Low/Low Underutilized Parcels Subtotal						***4.06***	***94,407***	***60***	***150***			
Mod/Above-Mod Underutilized Parcels												
42	00104061	None Assigned. Parcel off of Hillview Ave	Underutilized	R1	LDR	3.23	140, 698	14	35	Mod/Above-Mod	D; None	Partially developed with residential and/or commercial. Due to existing lot limitations, approximately 30% of the lot has been removed for potential development capacity. Lot area for development is expected to be 87,000 sf and would accommodate up to 14 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
43	00125129	438 Mcpeak St	Underutilized	R1	LDR	0.18	7,840	1	2	Mod/Above-Mod	D; None	Partially developed with residential and/or commercial. Existing lot limitations and development set future realistic development capacity at 1 unit. Due to need for housing and citywide build-out, expected to be developed within planning period.

Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
44	00126618	611 W Clay St	Underutilized	R1	LDR	0.29	12,632	2	5	Mod/Above-Mod	D; None	Partially developed with residential and/or commercial. Given existing development on site, realistic development capacity is 1 SFD and 1 ADU (2 units). Due to need for housing and citywide build-out, expected to be developed within planning period.
45	00142034	275 Mendocino Pl	Underutilized	R1	LDR	0.98	42,688	6	15	Mod/Above-Mod	D; Slope	Partially developed with residential and/or commercial. Given existing topographical, development, and lot limitations including slope constraints, realistic development capacity anticipated at no more than 6 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
46	00142041	145 Mendocino Pl	Underutilized	R1	LDR	0.84	36,590	5	12	Mod/Above-Mod	D; Slope	Partially developed with residential and/or commercial. Given existing topographical, development, and lot limitations including slope constraints, realistic development capacity anticipated at no more than 5 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
47	00113052	1217 W Standley Ave	Underutilized	R1H	LDR	1.18	51,400	1	2.5	Mod/Above-Mod	Slope	Partially developed with residential and/or commercial. Given existing development on site plus slope limitations, realistic development capacity is 1 SFD and 1 ADU (2 units). Due to need for housing and citywide build-out, expected to be developed within planning period.
48	00212404	217 Ford St	Underutilized	R2	MDR	0.22	9,583	3	7	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus topographical limitations, realistic development capacity is no more than 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.
49	00213309	308 Clara Ave	Underutilized	R2	MDR	0.22	9,582	3	7	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus topographical limitations, realistic development capacity is no more than 3 units. Due to need for housing and citywide build-out, expected to be developed within planning period.

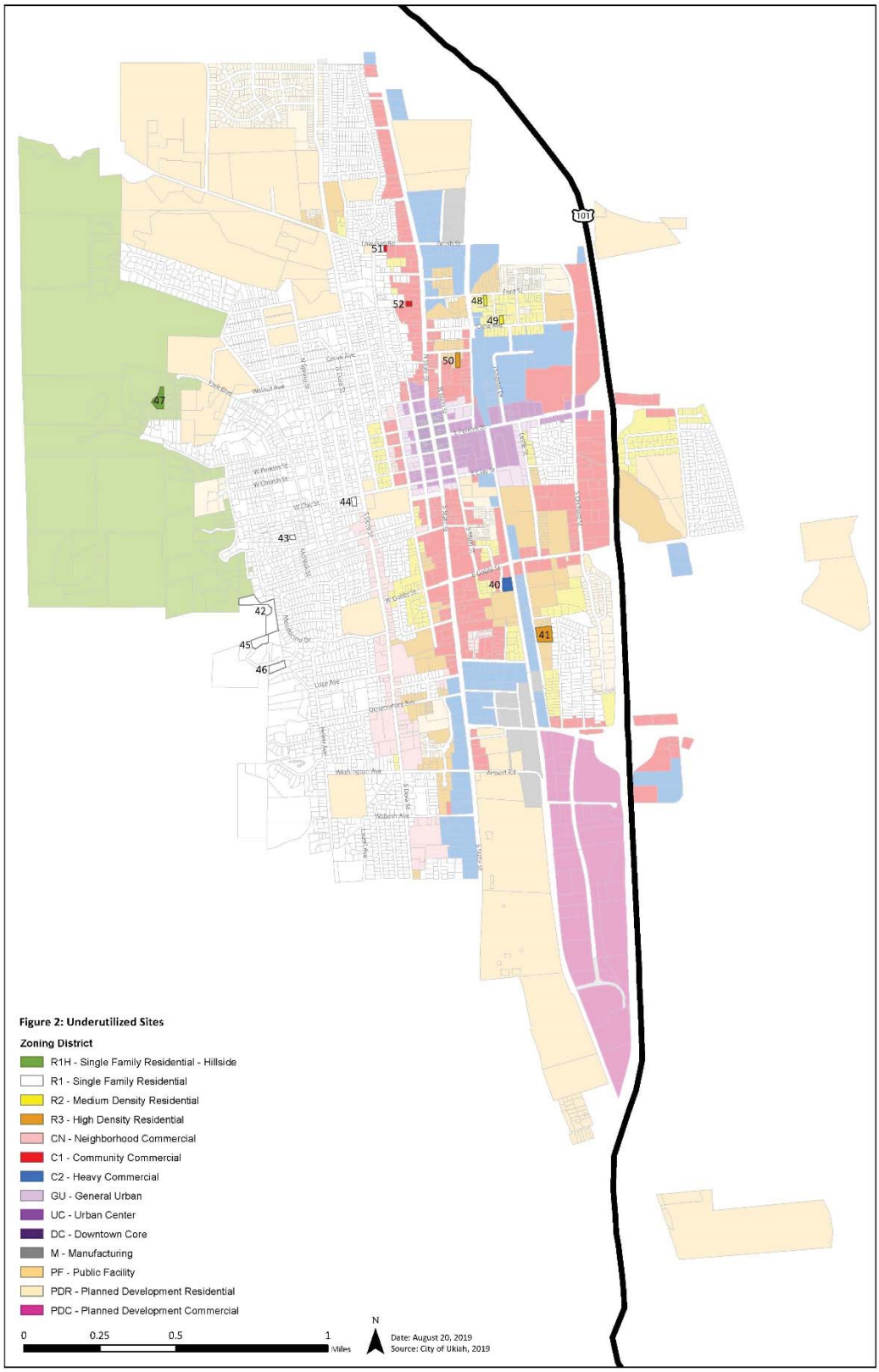
Map ID	APN	Location	Existing Use	Zoning	General Plan	Acres	Square feet	Realistic Development Potential (units)	Population	Income Group	Constraints	Notes
50	00215305	221 Norton St	Underutilized	R3	HDR	0.46	20,037	2	5	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus slope limitations, realistic development capacity is 1 SFD and 1 ADU (2 units). Due to need for housing and citywide build-out, expected to be developed within planning period.
51	00208004	170 Low Gap Rd	Underutilized	C1	C	0.17	7,405	4	10	Mod/Above-Mod	None	Partially developed with residential and/or commercial but parcel is largely undeveloped/vacant. Realistic development capacity is up to 4 units and expected to be developed within the planning period.
52	00211436	678 N State St	Underutilized	C1	C	0.22	9,583	1	2	Mod/Above-Mod	None	Partially developed with residential and/or commercial. Given existing development on site plus lot limitations, realistic development capacity is 1 unit. Due to need for housing and citywide build-out, expected to be developed within planning period.
Moderate/Above-Moderate Underutilized Parcels Subtotal						***7.77***	***197,757***	***41***	***100.5***			
Very-Low/Low Vacant Parcels Subtotal						**3.89**	**169,446**	**101**	**251**			
Moderate/Above-Moderate Vacant Parcels Subtotal						**115.43**	**5,000,718**	**124**	**308**			
Very-Low/Low Underutilized Parcels Subtotal						**4.06**	**94,407**	**60**	**150**			
Moderate/Above-Moderate Underutilized Parcels Subtotal						**7.77**	**197757**	**41**	**100.5**			
Totals Very-Low/Low Vacant + Underutilized Parcels						**7.95**	**263,853**	**161**	**401**			
Totals Moderate/Above-Moderate Vacant + Underutilized Parcels						**123.2**	**5,19,8475**	**165**	**408.5**			

LEGEND:
Zoning: R1- Single Family Residential; R1h-Single Family Residential, Hillside Combining District; R-2- Medium Family Residential; R-3- High Density Residential; C1- Community Commercial; CN-Neighborhood Commercial; C2-Heavy Commercial; GU-General Urban; DC- Downtown Core; UC-Urban Center.
General Plan: LDR- Low Density Residential; MDR- Medium Density Residential; HDR- High Density Residential; C-Commercial.
Constraints (Airport Influence Zones): B2-Extended Approach/Departure Zone; C-Common Traffic Pattern; D-Other Airport Environs.
*= Identified in both 2009-2014 and 2014-2019 HE cycles
** = Neither of these sites were identified in the prior planning period.
***= R1H regulations require a 5 acre lot for parcels with 30-50% slopes.
NOTE: All parcels have access to infrastructure and utilities unless otherwise noted

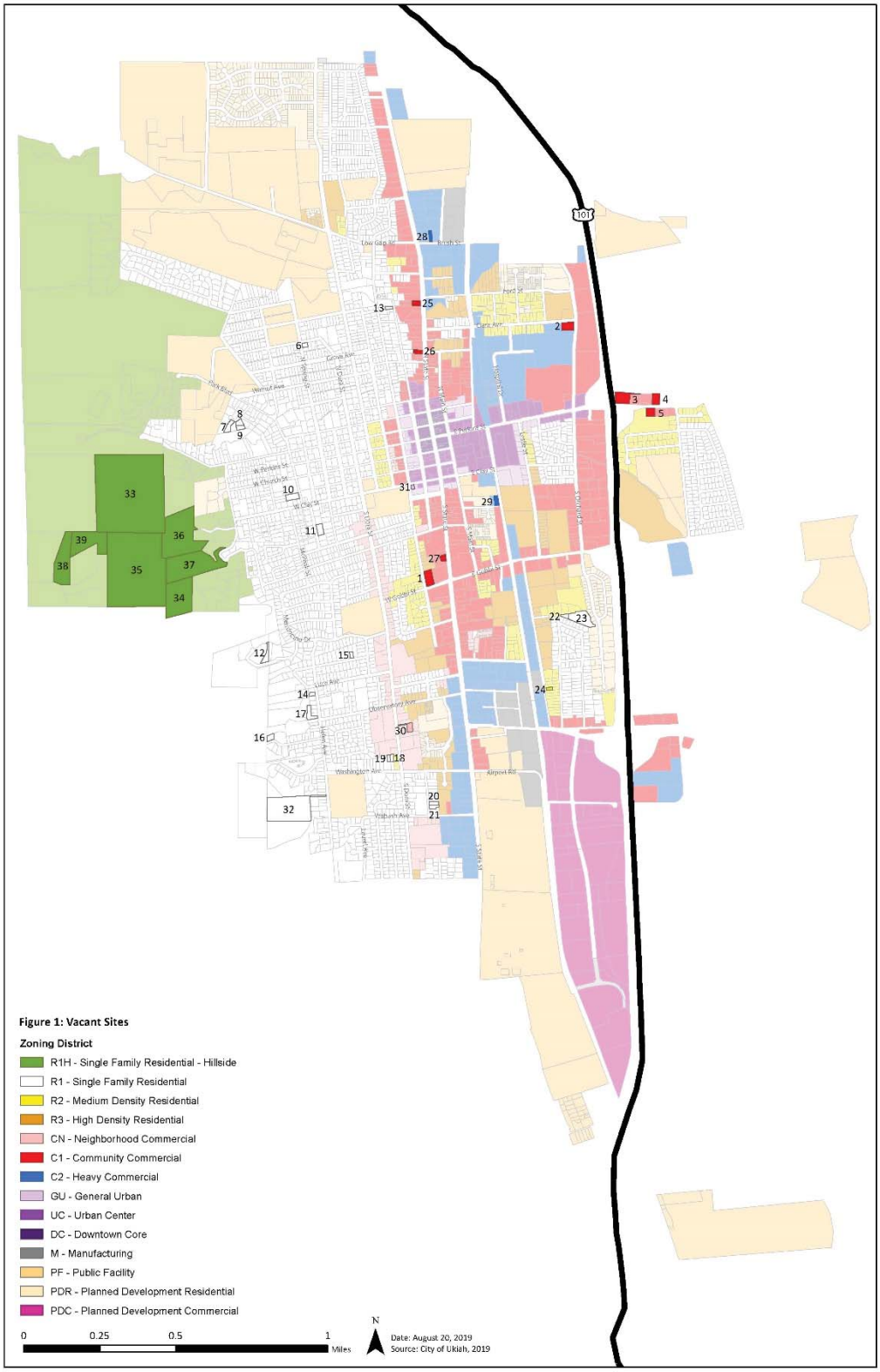
VACANT AND UNDERUTILIZED SITES AND CONSTRAINTS



VACANT SITES



UNDERUTILIZED SITES



APPENDIX F
SAFE NEIGHBORHOODS BY DESIGN STANDARDS



Safe Neighborhoods by Design

Crime Prevention Through Environmental Design Assessment Tools

Crime Prevention Through Environmental Design (CPTED)
is a proactive technique in which the proper design and effective use of the built environment can lead to a reduction in the fear of and incidents of crime and an improvement in the quality of life.

CPTED Principal	What to look for?
Natural Surveillance Seeing into and out of a place is fundamental to safety. Natural surveillance allows site users the ability to see and be seen. The ability to see well should be a feature of the normal, everyday use of a space.	• Is the front entrance visible from the street and driveway? • Are there windows on all sides of the building to allow for full view of the property? • Is landscaping maintained to allow for visibility to the street? • Are there blind corners or recessed areas with limited visibility? • Is there natural surveillance of gathering areas and youth hang out spaces? • Do fence and gate design allow for visibility? • Are indoor activity and congregation areas oriented to allow for visibility to the outdoors? • Are there clear views of street parking, driveways, and garages?
Natural Access Control Strategies that guide people to and through a site and clarify which parts of the site they are encouraged to use. Access control must match the designation for the space. For example, a park will have less access control than a private residence.	• Do walkways, porches, and other features direct visitors to entrances and away from private areas? • Do trees, trashcans, and other features allow for easy access to the 2nd story via windows or balconies? If so, what changes can be made to prevent access? • Do entrances have at least at 180 view, including through the peep hole? • Are door locks located a minimum of 40 inches from adjacent windows? • Do all doors, windows, and garages have appropriate locks?
Territorial Reinforcement A site should clearly announce what it is designed to do. Defining a space through recognizable patterns and features that reflect the encouraged use helps to reveal unwanted or abnormal activity.	• Are property boundaries clearly marked with hedges, low or see-through gates or fences, and/or signage? • Are transitional zones between public, semi-public, and private areas clearly defined? • Are there conflicting uses of the space? • Is the property address visible from the street, non-reflective material, and clearly lit at night? • Is the mailbox or delivery area clearly marked and as close as possible to the front of the building and visible from adjacent buildings?

Crime Prevention Through Environmental Design Assessment Tools

CPTED Principal	What to look for?
Maintenance and Management Once the proper image is created, it must be kept up in order to show pride of ownership. The more pride of ownership that is projected, the less likely the area is to attract criminal activities and vandalism. If not kept up, those activities appear to be acceptable there.	• Are buildings painted and in good condition? • Is there evidence of graffiti or vandalism and in what locations? • Is there visible litter or dumping around? Are there signs indicating who to report this to? • Is landscaping maintained to no higher than 3 ft. in height and tree canopies no lower than 7 ft.? • Are there old and non-working automobiles, boats, trailers, or other vehicles on the street or in the front yard? • Are landscaping species appropriate for the site? • Does the site feel cared for? Does it convey a sense of active ownership?
Lighting Lighting is an important element in any place. Good lighting will help people feel more comfortable with their surroundings. It should provide clear paths for movement and highlight entryways without creating harsh effects or shadowy hiding places.	• Is lighting on only when it is needed? • Are lighting fixtures appropriately designed, placed, and oriented towards vulnerable areas and activity spaces? • Are lighting fixtures shielded and directed downwards? • Is lighting uniform, does it evenly illuminate the desired area without causing glare? • Is there light pollution, is there too much light for the given space or purpose of the site? • Are lighting fixtures protected from vandalism? • Are there any broken lights and are there signs indicating who to report them to? • Do trees or signage block lighting? • Are pedestrian areas illuminated? • Are you able to accurately identify an approaching individual? • Does lighting illuminate signage, address markings, and gathering areas?
Incompatible Uses Land and site use types, diversity, and adjacencies have the ability to influence opportunities for crime. Incompatible land uses should be identified and efforts should be taken to mitigate any negative impacts when possible.	• Are there incompatible activities located next to one another? • Are there signs of competing uses and users and signs conflict between them? For example, a common incompatible land use example is the presence of liquor stores in residential neighborhoods or near schools. • Is street furniture- trashcans, benches, bike parking, newsstands, lighting-appropriately placed so as not to block pedestrian access?
Movement Predictors Many elements or design features in our communities influence the direction or route that pedestrians and cyclists commonly use when traveling. In some cases, such as an alley or pedestrian tunnel, these routes physically define the path and do not provide alternative routes. In other cases, the direction is defined more loosely using signage or other wayfinding elements.	• Does the area feel isolated? • How far away is the nearest person to ask for help? • Is it easy to predict when people will be around and where they will come from? • Is it easy to predict the intended pedestrian route? • Are there signs of makeshift or informal routes? • How easy is it to exit the area undetected? • Can you predict what is at the end of the route, walkway, path? • Do you feel safe waiting in the area for public transportation or other activities?

Crime Prevention Through Environmental Design Assessment Tools

CPTED Principal	What to look for?
Capacity All neighborhoods and communities have a threshold for supporting particular uses or activities. Once a use exceeds that threshold, it can result in negative activities. For example, a single bar or liquor store may function within a neighborhood without any issues. But several bars or liquor stores may begin to have negative impact.	• Is there a mix of land uses? • Who are the current users of the site? • Are there signs of conflicting activities? • Are activities appropriately distributed throughout the site? • Are spaces and sites appropriately sized for encouraged activities? • What are the main and dominant uses of the site? Are they intended uses? • Is there spillover of activities from one space to another and what is the result?
Activity Support It takes an active and engaged community to achieve safe places. Connecting people to each other, to the place, and developing positive norms helps to increase safety. Underutilized locations can be inviting to negative activity.	• How much and what type of activity is in the area, during the day and night? • Do activity levels provide for passive surveillance? Especially of vulnerable users or areas such as children and tot lots? • Are land uses and activities reflective of community needs and priorities? • Are there new and creative opportunities to engage community members and encourage pedestrian activity?
Social Cohesion Supportive relationships and interactions between all users of a place will maintain a sense of community and safety. Urban design can enhance the opportunity for positive social cohesion by providing well-designed and carefully located spaces where this can occur such as comfortable and inviting streets, community gardens, bus stops and community centers.	• How do users of the site interact? Does this convey a sense of safety? • Are there natural opportunities for positive social interaction? • Are there well-designed and carefully located spaces for social interaction-benches, gazebos, walking paths, community spaces? • Are there formal and informal social programs and is the community aware of them? • Are there community gathering spaces such as parks, plazas, parklets, walking paths, multi-use buildings and areas, and cultural, music, art, and sporting event spaces designed to bring community members together?
Community Connectivity Neighborhoods and corridors should be both socially and physically connected to the greater community. Any given place should not exist in isolation from its surroundings but should instead mesh with the rest of the city.	• Are there places in the community you want to access but cannot access by walking, biking, or transit? • Are there opportunities for physical connections between land uses, neighborhoods, and buildings through roadways, pedestrian bridges and paths, bike facilities, and other infrastructure? • How might these physical connections impact safety and crime? • Are adjacent land uses connected or do they exist in isolation, for example a school community with residential area? • Are there opportunities for share-use spaces and programs?
Community Culture The cultural expression of a place instills a sense of pride and ownership in the community. This may include the arts, music, sports or other local cultural events designed to bring people together and enhance social cohesion.	• Are there safe and accessible community gathering spaces, i.e. multi-purpose spaces, sports facilities, art and music spaces, memorials, murals, parks, plazas, parklets? • How are they being used? Do activities represent the community? • Do physical features express a “sense of place”? • Is there a clear branding theme throughout the site through colors, physical features, lighting, landscaping? • Do community memorials, public murals, posters, colors, and the design of buildings, signage, street furniture, and lighting work together to convene a community identity and culture?

APPENDIX G
REVIEW OF 2014-2019 HOUSING ELEMENT ACCOMPLISHMENTS

Review of 2014-2019 Housing Element Accomplishments

The table below summarizes the City's progress in implementing the housing programs outlined in the 2014-2019 Housing Element. This includes reviewing progress made in implementing programs included in the adopted element, and evaluating their effectiveness and continued appropriateness for the City.

Program	Objective	Progress and Continued Appropriateness
H-1.a- Develop and implement a residential rehabilitation program with an emphasis on improving safety, comfort and energy efficiency.	Promote rehabilitation.	The City had started a residential rehabilitation program with CDBG PI funds, but due to the City having an open economic development grant and current CDBG PI expenditure requirements, all the PI was spent on open grant activities. The City may pursue funding for a rehabilitation program in 2020. ***Continued Appropriateness:*** Given the City's age of housing stock, it is important to continue rehabilitation efforts. Pursuit of funding through CDBG and HOME for rehabilitation is listed as a program in the 2019-2027 Housing Element.
H-1.b Work with the City Public Utility Department to potentially expand the City's Energy Efficiency Public Benefits Fund.	Energy efficiency improvements.	Completed. ***Continued Appropriateness:*** Energy efficiency improvements continue to be important, especially in lower income households. This program will continue as a part of the 2019-2027 Housing Element.
H-1.c Provide informational materials to the public regarding sustainable and green building materials.	Educate public on sustainability and green building.	Completed, through creation of the Green Building Information Center at the Ukiah Civic Center. ***Continued Appropriateness:*** This program was completed, but a modified version will be retained in the updated Housing Element to keep the materials updated and relevant.
H-1.d Consider measures that would preserve/conserve existing mobile home parks, such as a mobile home rehabilitation program, conversion to ownership program, infrastructure improvement incentives, rent stabilization, etc.	Preserve mobile home parks.	A rent stabilization ordinance was adopted by the City Council in 2011. ***Continued Appropriateness:*** Preservation of existing mobile homes continues to be a priority for the City. This program has been revised for the 2019-2027 Housing Element to focus only on mobile home park preservation efforts.

Program	Objective	Progress and Continued Appropriateness
H-1.e Develop an At-Risk Units Program.	Maintain existing affordable housing stock.	Not completed due to lack of funding for preservation efforts. ***Continued Appropriateness:*** In 2017, new funding was made available by the City through creation of the Ukiah Housing Trust Fund (UHTF). The UHTF may be a funding mechanism for preservation efforts related to at-risk units. This has been continued as a program in the 2019-2027 Housing Element.
H-1.f Work closely with the Ukiah Police Department and local apartment complex managers to keep housing safe. Consider funding mechanisms for increasing public safety.	Encourage safe housing.	Completed. The Ukiah Police Department (UPD) reviews and makes recommendations on projects through the Crime Prevention through Environmental Design (CPTED) standards. ***Continued Appropriateness:*** CPTED standards are regularly reviewed and updated by the UPD. This program will be continued in the 2019-2027 Housing Element.
H-1.g Refer all proposed General Plan amendments to the appropriate military offices for review and comment. Revise the planning permit application form to include this step of referral.	Improve project referral process.	This program was not completed. ***Continued Appropriateness:*** This program will continue to be important and has been prioritized in the 2019-2027 Housing Element.
H-2.a Provide copies of the inventory of vacant and underdeveloped land for public distribution.	Educate the public.	Completed. ***Continued Appropriateness:*** Copies of the annually updated inventory will be made available on the City's website and at the public counter. This will be retained as a program for 2019-2027.
H-2.b Work with public transit providers and developers to encourage housing development located close to public transit facilities.	Provide education on benefits of locating housing near public transit facilities.	Educational materials not completed. ***Continued Appropriateness:*** Given the focus of the City's General Plan on infill residential development and the location of existing vacant and underutilized parcels, housing development typically occurs within a half mile of public transit. This program has been removed for the 2019-2027 Housing Element.

Program	Objective	Progress and Continued Appropriateness
H-2.c Provide reduced planning permit application fees for residential second dwelling units.	Encourage the development of second dwelling units.	Completed. ***Continued Appropriateness:*** In 2017, the City Council adopted an accessory dwelling unit (ADU) ordinance, making development of ADUs a ministerial by-right process in residential zoning districts. As this is an ordinance and part of the City's code, it has been removed for the 2019-2027 Housing Element. 8 ADUs were issued building permits in 2018.
H-2.d Review the zoning code and determine if any constraints to condominium developments and cooperative living projects exist, and if so, work to eliminate the constraints.	Encourage the development of condominium and cooperative living projects.	Community Development staff performed reviews in 2017 and 2018. One of the primary constraints is the lack of larger parcels to accommodate multi-unit housing projects. ***Continued Appropriateness:*** The City has added programs related to possible removal of constraints present in the zoning code, which is expected to address the issue. This has been removed as a program in the 2019-2027 Housing Element.
H-2.e As staff and resources permit, assist the Ukiah Homeless Services Planning Group in all ways possible.	Address and identify solutions to potential incompatibility issues.	Various City staff have assigned with this Planning Group, and the City now partners with and actively participates with the Mendocino County Continuum of Care. ***Continued Appropriateness:*** A revised version of this program will be in the 2019-2027 Housing Element, under Goal H-2.
H-2.f The zoning code shall be amended to allow homeless facilities without the requirement for a Use Permit in the Homeless Shelter Overlay Zone. The zoning code shall require a Site Development Permit and facility management plan, and reasonable site development standards for homeless facilities.	Support an adequate number or type of homeless facilities to support the homeless population.	Completed. The City adopted a Homeless Shelter Overlay Zone in 2015. In 2017, the City approved a Major Use Permit for a permanent homeless day resource center and temporary winter shelter, and in 2018 the winter shelter opened. To resolve any neighborhood compatibility issues with future homeless facilities, Community Development staff is currently working on an update to the Homeless Facilities definition in the zoning code. This is expected to be developed, with recommendations presented to Planning Commission and the City Council, in 2019-2020. ***Continued Appropriateness:*** This program has been revised to expand on the homeless facilities use and to be in line with transitional housing and emergency shelter legislation such as SB 2. The revised program is now in Goal H-2 of the Updated Housing Element.

Program	Objective	Progress and Continued Appropriateness
H-2.g Do not permit the conversion of rental units to condominium units unless the City's amount of rental units is sufficiently adequate.	Retain the rental housing stock.	There have been no rental unit-to-condominium conversions proposed in the last six years. The rental vacancy rate has been between 1 and 2 percent for the same period. ***Continued Appropriateness:*** There does not seem to be a historical likelihood of rental unit to condominium conversions. However, there may be a growing likelihood of conversion of primary residences to short-term rentals. A program has been added to monitor this in Goal H-2.
H-2.h Do not permit the conversion of single family residential homes to professional offices unless the City's amount of residential units is sufficiently adequate.	Retain total housing stock.	No conversions of single family homes to professional offices were approved in 2014-2018. Additionally, two offices were approved to be converted into two residential units in 2014-15. ***Continued Appropriateness:*** Until the amount of single family homes reaches an adequate level, this program could still be viable. However, it has been revised in Goal H-2 to monitor the conversion occurrence and define “sufficiently adequate.”
H-2.i Adopt an Inclusionary Housing Ordinance by 2013 that requires below-market rate housing to be included as part of residential projects.	Increase the supply of affordable housing.	At the start of the 2014-2019 Housing Element planning cycle, there had been very few housing starts overall in the City of Ukiah for the past several years. This was especially the case for market-rate housing, which in Ukiah tends to be units with rents affordable to households in the "moderate" or "above moderate" income group. Studies have shown that when a lack of developer demand exists for housing development, adopting ordinances such as an inclusionary housing ordinance can have the unintended consequence of further restricting housing development. Noting this trend, the City instead has sought ways to incentivize the development of housing for all economic segments of the community. Through a proactive approach with local and regionally-based housing developers, staff in both the City Manager's Office and Community Development Department met with and engaged developers in pursuing housing development projects. In 2017, the City's Community Development Department shifted to a priority of the delivery of exceptional customer service, streamlining the building and planning permit process and improving responsiveness on building inspections.

Program	Objective	Progress and Continued Appropriateness
		Also in 2017, the City Council adopted a two-part housing strategy to address the need for housing in the community. The City's first Housing Trust Fund was created as a part of this strategy, and a NOFA was released in 2018. The initial funding allocation of $500,000 was over-subscribed with three applications submitted for the maximum funding amount. As reported in the 2018 APR, the City's incentive-based programs appear to be working. 37 housing units affordable to households in the "very low-income" category were permitted in 2018, the most affordable units permitted in any single year within the past 10 years. ***Continued Appropriateness:*** Because of the City's success in utilizing innovative incentive-based approaches to produce affordable and market-rate housing, plus other tools available through recent legislation like SB 35 streamlining provisions, creation of an inclusionary housing ordinance has been removed as a program for the 2019-2027 Housing Element.
H-2.j Adopt minimum standards for inclusionary housing units.	Increase the supply of affordable housing.	See H-2.i above. ***Continued Appropriateness***: Due to the reasons stated in H-2i above, this will removed as a program for the 2019-2027 Housing Element.
H-2.k Prepare a Nexus Study by 2014 to determine if a nexus can be established requiring the developers of large residential and commercial projects to construct needed affordable housing units on site or in another appropriately zoned location near the place of employment/pay impact fee.	Generate local source of affordable housing funds.	The study was not completed but affordable housing funds were generated through the re-use of former redevelopment agency housing successor funds to create the Ukiah Housing Trust Fund. Through funding for housing trust funds in recent legislation, additional funds may be raised in the future. ***Continued Appropriateness:*** A program has been added for the City to pursue additional affordable housing funding to augment the Ukiah Housing Trust Fund and create a permanent local source of funding for affordable housing. H-2k has been removed as a program for the 2019-2027 Housing Element.

Program	Objective	Progress and Continued Appropriateness
H-2.l Identify and meet with non-profit builders who specialize in building housing for extremely low-income households.	Develop partnerships with affordable housing developers.	Completed, and ongoing. The City has been proactive in identifying and meeting with nonprofit developers specializing in building housing for extremely low-income households. ***Continued Appropriateness:*** This program will continue to be important and relevant and has been retained in the 2019-2027 Housing Element.
H-2.m Work in conjunction with other agencies to jointly develop and implement a program that is designed to address the needs of the extremely low income households in the City.	Increase the supply of affordable housing.	The City created a Housing Division in the Community Development Department as a part of its 2017 Housing Strategy. This Division has principally been tasked with developing and implementing programs for lower-income residents. The Division administers the Ukiah Housing Trust Fund and related programs. ***Continued Appropriateness:*** Designing a program for extremely low income households has been consolidated into a program in the 2019-2027 Housing Element that will seek out funding for the development of housing programs and projects to address the needs of extremely low- and very low-income households.
H-2.n Amend the zoning ordinance to be consistent with Senate Bill 2.	Streamline transitional housing projects.	Completed. In 2015, the City adopted a Homeless Shelter Overlay Zone through Ordinance 1161. ***Continued Appropriateness:*** This program has been completed and will be removed for the 2019-2027 Housing Element. However, because no transitional housing projects have located inside this Zone, a program has been added to seek additional improvements towards the streamlining of transitional and supportive housing projects and to more fully define emergency shelters (see Goal H-2).
H-2.o Post sites inventory map and housing development in commercial zones on website and provide hard copies at the counter.	Provide education.	Completed. ***Continued Appropriateness:*** This program is a duplicate of Program H-2a (which is being retained as a program) and will be removed for the 2019-2027 Housing Element.

Program	Objective	Progress and Continued Appropriateness
H-2.p Conduct a roundtable meeting with non-profit housing sponsors and developers.	Provide opportunities for the creation of more affordable housing.	The City did not host a roundtable meeting, but City staff did meet with multiple housing stakeholders, both for-profit and non-profit, to solicit input towards the development of its 2017 Housing Strategy. Additionally, as stated elsewhere in this report, the City has been proactive in engaging with housing sponsors and developers in discussions regarding creation of additional housing units. ***Continued Appropriateness:*** A program to continually engage with non-profit housing sponsors and developers has been retained for the 2019-2027 Housing Element. This program will be removed.
H-2.q Update inventory of vacant and underutilized parcels.	Provide education to the public and potential developers.	The inventory was updated in 2012, 2013, 2016-17, and 2019. ***Continued Appropriateness:*** Maintaining an updated inventory of vacant and underutilized parcels will be important for ensuring developers have the most recent information. This has been retained as a program for the 2019-2027 Housing Element.
H-2.r Facilitate the consolidation of smaller multi-family parcels.	Provide opportunities for the creation of more affordable housing.	The City publicized the inventory of underutilized sites and provided technical assistance to property owners and developers in support of lot consolidation. The City Council also adopted a residential density calculation ordinance for medium density residential (R-2) and mixed use parcels. ***Continued Appropriateness:*** The City has not yet explored creation of incentives for lot consolidations and will retain this portion of the program for the 2019-2027 Housing Element.
H-2.s Pursue annexation of land that can accommodate single-family residential development.	Provide opportunities for the creation of more housing.	The City is undertaking the update of its General Plan in 2019. Annexation efforts will be pursued in coordination with the updating of the Land Use Element. ***Continued Appropriateness:*** Because the City is mostly built-out, pursuit of annexation of land that is already zoned for residential will be important for continuing to accommodate the demand for housing citywide. This program has been consolidated into other programs that reflect this larger priority.

Program	Objective	Progress and Continued Appropriateness
H-3.a Special Needs Rental Housing: Support applications to State and federal agencies such as HCD, State Treasurer's Office, HUD and USDA for affordable rental housing financing to provide shelter for very low-income families and special needs households.	Support funding applications for special needs housing projects.	A project with 37 units of special needs rental housing was issued a building permit in 2018. ***Continued Appropriateness:*** Support of funding applications will continue to be appropriate and has been retained as a program for the 2019-2027 Housing Element.
H-3.b Increase housing opportunities for persons with disabilities consistent with the fair housing and disability laws, and encourage physical access to and within residential units and areas during the development review process.	Increase housing opportunities for persons with disabilities.	The City continues to be supportive of increasing housing opportunities for persons with disabilities. The City's Building Division provides comments on ensuring housing developments are designed to include physical accessibility features. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element.
H-3.c Review zoning code to remove regulatory constraints to special needs housing projects.	Eliminate regulatory constraints to special needs housing.	Preliminary work completed in 2011. No constraints have been identified. A project with 37 units of special needs rental housing was issued a building permit in 2018 (noted in Table A2). ***Continued Appropriateness:*** No known constraints exist. This program has been consolidated into a new program to remove constraints for special needs and lower-income housing projects (see Goal H-2).
H-3.d Continue to assist farmworker housing stakeholders through technical assistance.	Increase supply of farmworker housing.	City Housing and Planning Services Staff continued to actively participate in the Mendocino County Housing Action Team in 2018. Staff also continued to collaborate with farmworker housing stakeholders towards potential housing solutions. ***Continued Appropriateness:*** Because of the flexibility inherent throughout the City's zoning code related to housing for farmworkers and the relatively small size of the City's farmworker population, the housing needs of this group are addressed through its standard affordable housing strategies.
H-3.e Amend the zoning code to define and allow Single Room Occupancy (SRO) developments in the Medium Density (R-2) and High Density (R-3) zoning districts.	Remove constraints to SRO housing.	This program was not completed in 2014-2019. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element and has been

		prioritized to be accomplished within the first two years (see Goal H-2).
H-4.a Refer housing discrimination complaints to appropriate State and local agencies.	Promote fair housing practices.	No complaints received in 2014-2019. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element (see Goal H-4).
H-4.b Develop and make available housing discrimination public information.	Promote fair housing practices.	Completed- Fair Housing literature is available at the City's public counter and website. Fair Housing logos are placed on the Housing Division's programs' flyers. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element (see Goal H-4).
H-5.a Apply the CEQA infill exemption and perform expedited review for affordable housing projects.	Provide education.	The City utilized the CEQA infill exemption for a 35-unit moderate-income housing development and a 31-unit low-income senior housing project. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element (see Goal H-3).
H-5.c Prepare and present green building/sustainable development incentive tool.	Provide opportunities for education and sustainable development.	Through incentive programs provided by the City's Electric Utility, design standards inherent in the City's Downtown Zoning Code and design guidelines, and updates to the CA building code, green building and sustainable development tools continue to be supported citywide. The City also currently provides density bonuses and adopted a residential density calculation ordinance. ***Continued Appropriateness:*** A modified version of this program will be retained for the 2019-2027 Housing Element, to explore flexible parking standards (see Goal H-1).
H-5.d Analyze zoning and building codes for removing impediments to green building.	Provide education and encourage green building.	Due to changes in the CA building code, many impediments to green building have been removed. The City completed further revisions to its handouts at the public counter in 2018. ***Continued Appropriateness:*** This program has been completed and will be removed for the updated Element.

Program	Objective	Progress and Continued Appropriateness
H-5.e Continue to administer solar and energy efficiency rebate programs.	Provide opportunities for energy efficient housing development and education.	This program is currently in operation and available as funds are accessible. Additionally, the City has developed a rebate program for those affordable housing developers that achieve energy efficiency savings above Title 24 standards. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element (see Goal H-1).
H-5.f Assist developers in incorporating green building practices.	Provide education and opportunities to increase green building practices.	The Green Building Information Center was completed in Ukiah Civic Center. ***Continued Appropriateness:*** This program, which is very similar to H-1.c and H-5.g, has been completed and will be removed for the updated Element. However, Goal H-1 contains policies and programs supporting green building practices.
H-5.g Promote energy and water conservation education programs that address steps to energy and water efficiency, benefits of weatherization and weatherization assistance programs, and information of onsite renewable energy generation technologies.	Provide education about stormwater management for affordable housing developers.	The Green Building Information Center was completed in the Ukiah Civic Center. ***Continued Appropriateness:*** This program, which is very similar to H-1.c and H-5.f, has been completed. However, Goal H-1 contains policies and programs supporting ongoing green building practices.
H-5.h Stormwater management for multi-family housing development.	Provide education about stormwater management for affordable housing developers.	The City adopted Low Impact Development (LID) standards to filter and slow stormwater runoff. ***Continued Appropriateness:*** This program has been revised to explore an offsite mitigation bank or other relief measure to ensure stormwater management is achieved without the loss of potential housing units (see Implementing Program 3c).
H-5.i Promote use of renewable energy technologies in residential and mixed-use projects.	Develop housing that incorporates renewable energy and energy efficient design; and provide education to the public.	The City has adopted the Cal-Green Building Code (Tier 1), which requires buildings to attain a higher level of efficiency. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element (see Goal H-1).

Program	Objective	Progress and Continued Appropriateness
H-5.j Assist in creating residential neighborhoods with mixed housing densities, types and affordability.	Provide education to the community.	No opportunities have surfaced. Poised to implement. ***Continued Appropriateness:*** This program is ongoing and still appropriate. It remains in the updated Element (see Goal H-3).
H-6.b Develop a housing resources webpage that may be used to facilitate the development and improvement of affordable housing.	Provide education to the community.	Completed. The City created a Housing Division in 2017, and a webpage for the Housing Division was established in 2018. ***Continued Appropriateness:*** This program has been modified to maintaining the webpage in the updated Element (see Goal H-5).
H-6.c Conduct periodic meetings with developers, non-profit housing development agencies, the Ukiah Police Department, and others to identify constraints to development of affordable housing and use the information gained to consider zoning code amendments.	Provide education.	This program is similar to other programs in the Housing Element and was completed in 2014-2019. ***Continued Appropriateness:*** This program has been consolidated into other similar programs and removed as a program for the 2019-2027 Housing Element.

APPENDIX H
2019-2027 HOUSING ELEMENT GOALS, POLICIES, AND IMPLEMENTING PROGRAMS

City of Ukiah 2019-2027 Housing Element Goals, Policies and Implementing Programs

Goal H-1	**Conserve, rehabilitate, and improve the existing housing stock to provide adequate, safe, sustainable, and decent housing for all Ukiah residents.**			
Supporting Policies	**Policy 1-1**: Encourage the rehabilitation of existing residential units.			
	Policy 1-2: Promote the use of sustainable and/or renewable materials and energy technologies (such as solar and wind) in rehabilitated housing and new housing construction; and reduce greenhouse gas emissions.			
	Policy 1-3: Preserve at-risk housing units.			
	Policy 1-4: Promote increased awareness among property owners and residents of the importance of property maintenance to long-term housing quality.			
	Policy 1-5: Continue to implement effective crime prevention activities.			
Implementing Programs	**Program**	**Responsibility**	**Funding**	**Schedule**
	1a: Implement a residential rehabilitation program.	Community Development Department, Housing Services Division	CDBG, HOME, and/or other local, state or federal sources	Ongoing
	1b: Continue the City's Energy Efficiency Public Benefits Fund and renewable energy and energy efficiency rebate programs.	Electric Utility Department	Energy efficiency and renewable energy rebate program funds.	Ongoing
	1c: Support funding or other applications that would preserve/conserve existing mobile home parks.	Community Development Department, Housing Services Division	N/A	Ongoing
	1d: Continue providing informational materials to the public through the Green Building Information Center and at the public counter.	Community Development Department, Building Services Division	Departmental budget	Ongoing

Implementing Programs	Program	Responsibility	Funding	Schedule
	1e: Develop standards and design guidelines for residential development in the Medium Density Residential (R-2), High Density Residential (R-3), Community Commercial (C-1) and Heavy Commercial (C-2) zoning districts.	Community Development Department, Planning Services Division	General Funds and/or other funding if available	Establish guidelines by December 2020.
	1f: Develop an At-Risk Units Program.	Community Development Department, Housing Services Division	Ukiah Housing Trust Fund, CDBG, HOME, and/or other funding sources as available and as needed	Develop program by December 2020
	1g: Tenant education and assistance for tenants of at-risk projects.	Community Development Department, Housing Services Division	Departmental budget	Education and notification procedures by 6/30/20; implementation ongoing through 2027.

Goal H-2	Expand housing opportunities for all economic segments of the community, including special needs populations.			
Supporting Policies	**Policy 2-1**: Continue to allow placement of manufactured housing units on permanent foundations in residential zoning districts.			
	Policy 2-2: Encourage the development of a variety of different types of housing.			
	Policy 2-3: Ensure that adequate residentially designated land is available to accommodate the City's share of the Regional Housing Need. In order to mitigate the loss of affordable housing units, require new housing developments to replace all affordable housing units lost due to new development.			
	Policy 2-4: Pursue State and Federal funding for very low, low, and moderate income housing developments.			
	Policy 2-5: Facilitate the production of housing for all segments of the Ukiah population, including those with special needs.			
	Policy 2-6: Expand affordable housing opportunities for first time homebuyers.			
Implementing Programs	**Program**	**Responsibility**	**Funding**	**Schedule**
	2a: Update the inventory of vacant and underutilized parcels.	Community Development Department, Planning Services Division	Departmental budget	Updated annually, by June 30 of each year
	2b: Monitor the rate of conversion of primary residences to short-term rental units.	Community Development Department, Planning Services Division; City Council	General Funds	• Develop monitoring program by June 30, 2020. • Track conversion rate annually. • Report to Council annually. • Draft ordinance due June 30, 2025.
	2c: Monitor the conversion of single family residential homes to commercial uses.	Community Development Department, Planning Services Division	Departmental budget	Report to City Council by June 30, 2021.

Implementing Programs	Program	Responsibility	Funding	Schedule
	2d: Pursue additional funding sources to augment the Ukiah Housing Trust Fund, creating a permanent source of funding for affordable housing.	Community Development Department, Housing Services Division	Low and Moderate Income Housing Asset Fund; other funds as they become available	Ongoing
	2e: Continually engage with a variety of housing developers who specialize in providing housing to each economic segment of the community.	Community Development Department, Housing Services Division; City Manager's Office-Economic Development Section	Departmental budget	Ongoing outreach, occurring at least on a quarterly basis throughout 2027.

Implementing Programs	Program	Responsibility	Funding	Schedule
	2f: Amend the zoning code as follows: • Emergency Shelters. Amend the Zoning Code to redefine homeless facilities as emergency shelters, according to State Government Code. • Transitional/Supportive Housing. Pursuant to SB 2, the City must explicitly allow both supportive and transitional housing in all zones that allow residential uses and supportive and transitional housing is to be only subject to those restrictions applicable to other residential dwellings of the same type in the same zone (note: this is not limited to residential zones). The City will amend the Zoning Code to specifically define transitional/supportive housing as defined in Government Code. • Single-Room Occupancy Housing- The City will amend the Zoning Code to allow Single-Room Occupancy (SRO) units in the medium density residential (R-2) and high density residential (R-3) zoning districts for the purpose of increasing the number of units affordable to extremely low, very low, and low-income persons. • Manufactured/Factory-built homes. The City will amend the Zoning Code to define and allow manufactured and factory-built homes in the same manner and use as all other types of residential dwellings in all zoning districts.	Community Development Department, Planning Services Division	Departmental budget	• Draft Zoning Code amendments by December 30, 2020. • Secure adoption by June 30, 2021.

Implementing Programs	Program	Responsibility	Funding	Schedule
	2g: Facilitate the consolidation of smaller, multi-family parcels by providing technical assistance to property owners and developers in support of lot consolidation.	Community Development Department, Planning Services Division	Departmental budget	Present to Planning Commission and City Council, with recommendations, by June 30, 2026.
	2h: Ensure capacity of adequate sites for meeting RHNA by amending the Zoning Code as follows: - Update C1 and C2 Zones to allow by-right housing development, with objective design and development standards; - Update the R2 Zone to allow up to 15 dwelling units/acre - Update the CN Zone to increase residential density and allow similar housing types as those allowed in R2. - By-right housing program for select parcels. Specific to APNs 00304077, 00304078, and 00304079, rezone these parcels at the default density of 15 du/ac. Also rezone these parcels to allow residential use by-right for developments with at least 20% of the units affordable to lower income households.	Community Development Department, Planning Services Division; Planning Commission; City Council.	Departmental budget	Develop objective design and development standards per schedule in Program 1e; pursue amendments to Zoning Code by June 30, 2021.

	2i: Proactively monitor residential capacity (no net loss).	Community Development Department, Planning Services Division	Departmental budget	Ongoing, with annual reports to HCD and City Council; develop and implement a project evaluation procedure pursuant to Government Code 65863 by June 30, 2021
	2j: First Time Homebuyer Assistance	Community Development Department, Housing Services Division	• CDBG • HOME • Low and Moderate Income Housing Assets Funds • CalHome • Other funding sources as available.	Ongoing
	2k: Collaborate with local service providers on addressing homelessness.	City Manager's Office	N/A	Ongoing
	2l: Review existing City processes for compliance with AB 2162.	Community Development Department, Planning Services Division	Departmental budget	Complete review of City processes by June 30, 2020; revise zoning codes/processes by December 31, 2020.
	2m: Housing Units Replacement Program.	Community Development Department, Planning Services Division	Departmental budget	Implemented immediately and applied as applications on identified sites are received and processed.
	2n: Homeless Shelter Overlay District Evaluation.	Community Development Department, Planning Services Division	Departmental budget	Evaluation completed on bi-annual basis, with first report due to Planning Commission by 6/30/20. Recommendations may require future amendments to district.

Goal H-3	Remove governmental constraints to infill housing development.			
Supporting Policies	**Policy 3-1**: Improve building and planning permit processing for residential construction.			
	Policy 3-2: Encourage the use of density bonuses and provide other regulatory concessions to facilitate housing development.			
	Policy 3-3: Encourage the development of mixed residential and commercial uses in the commercial zoning districts where the viability of the commercial activities would not be adversely affected.			
Implementing Programs	**Program**	**Responsibility**	**Funding**	**Schedule**
	3a. Research, review and amend development standards in the zoning code for opportunities to maximize housing development.	Community Development Department, Planning Services Division; Planning Commission; City Council	Departmental budget	• Zoning Code amendments by June 30, 2020 • Adoption by December 31, 2020
	3b: Develop flexible parking policies for new residential development.	Community Development Department, Planning Services Division; Planning Commission; City Council	Departmental budget and other funding sources as available	Complete draft policy by June 30, 2020.
	3c: Explore other policies and regulations that facilitate new infill housing development.	Community Development Department, Planning Services Division; Planning Commission; City Council	Departmental budget	Complete draft report by June 30, 2026.
	3d: Facilitate improvements to permit processing to streamline housing development.	Community Development Department, Planning Services Division, Building Services Division	Departmental budget	Pre-application conferences ongoing; City processing procedures brochure developed by June 30, 2021.

Implementing Programs	Program	Responsibility	Funding	Schedule
	3e: Continue to apply the CEQA infill exemption to streamline environmental review.	Community Development Department, Planning Services Division	Departmental budget	Ongoing
	3f: Review Site Development Permit and Use Permit Processes.	Community Development Department, Planning Services Division	Departmental budget	Report due to City Council by 12/31/20; process and/or code improvements to be implemented immediately thereafter.

Goal H-4	**Promote well-planned and designed housing opportunities and projects for all persons, regardless of race, gender, age, sexual orientation, marital status, or national origin.**			
Supporting Policies	**Policy 4-1**: Promote fair housing practices in the sale or rental of housing with regard to race, color, national origin, ancestry, religion, disability/medical conditions, sex, age, marital status, familial status, source of income, sexual orientation/gender identify, or any other arbitrary factors.			
	Policy 4-2: Promote and facilitate community awareness of the City of Ukiah's goals, tools, available resources and programs for lower income households.			
Implementing Programs	**Program**	**Responsibility**	**Funding**	**Schedule**
	4a: Continue to collaborate with the Ukiah Police Department and property owners and managers to keep housing safe.	Community Development Department, Planning Services Division, Building Services Division; and Ukiah Police Department	General funds	Ongoing
	4b: Continue to refer housing discrimination complaints to Legal Services of Northern California, State Fair Employment and Housing Commission, and the U.S. Department of Housing and Urban Development (HUD).	Community Development Department, Housing Services Division	Departmental budget	Ongoing
	4c: Develop project referral procedural for referral of all proposed General Plan amendments to the appropriate military office for review and comment.	Community Development Department, Planning Services Division	Departmental budget	Ongoing

Goal H-5	Provide support for future housing needs.			
Supporting Policies	**Policy 5-1**: Pursue annexation efforts that lead to an orderly expansion of growth, where services are adequate for future residential development.			
	Policy 5-2: Continue to encourage and facilitate public participation in the formulation and review of the City's housing and development policies.			
	Policy 5-3: Assume a leadership role in the development of all types of housing in the community.			
Implementing Programs	**Program**	**Responsibility**	**Funding**	**Schedule**
	5a: Maintain a housing resources webpage.	Community Development Department, Housing Services Division	Departmental budget	Ongoing
	5b: Complete the update of the 2020 Sphere of Influence, Municipal Service Review, and Ukiah 2040 General Plan.	Community Development Department, Planning Services Division	Departmental budget, other funding as available	• 2020- Sphere of Influence and Municipal Service Review • 2021 Ukiah 2040 General Plan.
	5c: Work collaboratively with stakeholder jurisdictions to lessen or remove development constraints, and update the housing plan accordingly.	Community Development Department, in conjunction with stakeholder jurisdictions.	Departmental budget, other funding as available	Ongoing, at least on an annual basis.

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF HOUSING POLICY DEVELOPMENT
2020 W. El Camino Avenue, Suite 500
Sacramento, CA 95833
(916) 263-2911 / FAX (916) 263-7453
www.hcd.ca.gov

December 5, 2019

Sage Sangiacomo, City Manager
City of Ukiah
300 Seminary Avenue
Ukiah, CA 95482

Dear Sage Sangiacomo:

RE: City of Ukiah's 6th Cycle (2019-2027) Adopted Housing Element

Thank you for submitting Ukiah's Housing Element adopted October 23, 2019 and received for review on October 28, 2019. Pursuant to Government Code section 65585, subdivision (h), the California Department of Housing and Community Development (HCD) is reporting the results of its review.

HCD is pleased to find the adopted Housing Element in full compliance with state Housing Element law (Article 10.6 of the Government Code). The adopted element was found to be substantially the same as the revised draft Housing Element that HCD's June 22, 2019 review determined met statutory requirements.

For your information, some General Plan element updates are triggered by Housing Element adoption. HCD reminds the City of Ukiah to consider timing provisions and welcomes the opportunity to provide assistance. For information, please see the Technical Advisories issued by the Governor's Office of Planning and Research at: http://opr.ca.gov/docs/OPR_Appendix_C_final.pdf and http://opr.ca.gov/docs/Final_6.26.15.pdf.

Several federal, state, and regional funding programs consider Housing Element compliance as an eligibility or ranking criteria. For example, CalTrans Senate Bill (SB) 1 Sustainable Communities grants; the Strategic Growth Council and HCD's Affordable Housing and Sustainable Communities program; and the SB 2 Planning Grants as well as ongoing SB 2 funding consider Housing Element compliance and/or annual reporting requirements pursuant to Gov. Code section 65400. With Housing Element compliance, City of Ukiah meets the Housing Element requirements for these funding sources.

HCD appreciates the hard work and dedication Craig Schlatter, Community Development Director, provided throughout the course of the Housing Element review. HCD wishes the City of Ukiah success in implementing its Housing Element and looks forward to following its progress through the General Plan annual progress reports pursuant to Gov. Code section 65400. If HCD can provide assistance in implementing the Housing Element, please contact Sohab Mehmood, of our staff, at (916) 263-1968.

Sincerely,



Shannan West
Land Use & Planning Manager

Appendix J: 2019 Consumer Confidence Report (Water Quality Report)

City of Ukiah 2020 Urban Water Management Plan

ANNUAL WATER QUALITY REPORT

REPORTING YEAR 2019



Presented By
City of Ukiah

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

PWS ID#: CA2310003

2019 Executive Summary

The City of Ukiah's Water Resources Department is responsible for providing drinking water to over 5,000 connections. The water that we produce continues to consistently meet and exceed both State and Federal Standards for drinking water. Our ability to achieve this high standard is made possible by a combination of well-trained staff, an excellent water system, and outstanding sources of water.



In 2019, the City began operation of its recycled water system. This system offsets approximately 1,000 acre-feet of demand from the City's surface water sources. This savings will greatly improve our drought resiliency. The City also made a number of improvements to our system to improve reliability during power outages.

In 2020, we will be replacing almost a mile of distribution line as part of the Streetscape Project. We will also be replacing one of our storage tanks above the golf course. Our Department could not perform the job that we do without the hard work and support of our Distribution Crew, and their continual dedication is greatly appreciated. The combined efforts of the Distribution and Water Resources Departments ensure that exceptional drinking water is delivered throughout our entire system.

Where Does My Water Come From?

The City of Ukiah supplies its customers with water that is considered underflow from the Russian River, as well as five groundwater sources. The amounts of water delivered from each source, and when they are used, is dependent on both the demand on the system and the time of year. There are times of emergency when the City may have to purchase water from our neighboring water systems. These systems would be Millview County Water District and Willow County Water District.

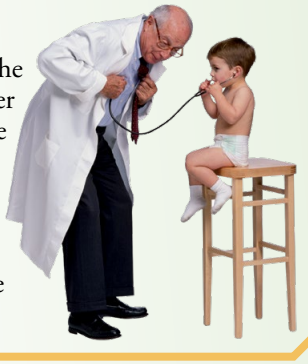
Community Participation

Regularly scheduled Ukiah City Council meetings convene on the first and third Wednesdays of each month at 6 p.m. at the Ukiah Civic Center, 300 Seminary Avenue, Ukiah, CA. These meetings provide citizens with the opportunity to express concerns regarding the City's drinking water.



Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or http://water.epa.gov/drink/hotline.



Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water, but we cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. (If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants.) If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at (800) 426-4791 or at www.epa.gov/safewater/lead.



Substances That Could Be in Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

> We remain vigilant in delivering the best-quality drinking water

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (U.S. EPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.

Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

Inorganic Contaminants, such as salts and metals, that can be naturally occurring or can result from urban storm-water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

Pesticides and Herbicides, that may come from a variety of sources such as agriculture, urban storm-water runoff, and residential uses;

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and which can also come from gas stations, urban storm-water runoff, agricultural applications, and septic systems;

Radioactive Contaminants, that can be naturally occurring or can be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Source Water Assessment

In June of 2016, the City of Ukiah completed a Source Water Assessment. This study considered the topography, type of vegetative cover, soil type, type of animal life, and climate conditions of our watershed. Combined with human-related recreation, industry, and life style, several areas were considered to have influence on our raw waters. The influence was considered to be minimal, and several areas of concern have been mitigated. These include the closing of the landfill, the replacement of leaking underground storage tanks, and bulk fuel containment. The City of Ukiah is continually upgrading its system and monitors for a variety of possible hazards. The City of Ukiah's water is still considered safe and reliable. The summary from that report is as follows.

Vulnerability Summary

According to the results of the vulnerability analysis, the surface water source is considered most vulnerable (vulnerability score* of 15) to the following activities not associated with any detected contaminants:

- Gas stations
- Plastic synthetic producers
- Historic gas stations
- Historic waste dumps/landfills
- Historic mining operations
- Confirmed leaking tanks
- Wastewater treatment and disposal facilities
- Managed forests
- Septic systems -- high



QUESTIONS?

For more information about this report, or for any questions related to your drinking water, please contact Shelly Wagenet, Water Treatment Plant Supervisor, at (707) 467-2842.

Test Results

During the past year, the City of Ukiah has taken hundreds of water samples to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The tables show only those contaminants that were detected in the water.

The State recommends monitoring for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

We participated in the 4th stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR4) program by performing additional tests on our drinking water. UCMR4 sampling benefits the environment and public health by providing the U.S. EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if U.S. EPA needs to introduce new regulatory standards to improve drinking water quality. Unregulated contaminant monitoring data are available to the public, so please feel free to contact us if you are interested in obtaining that information. If you would like more information on the U.S. EPA's Unregulated Contaminants Monitoring Rule, please call the Safe Drinking Water Hotline at (800) 426-4791.

REGULATED SUBSTANCES

				Distribution System[1]		Surface Water		Groundwater[2]			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	PHG (MCLG) [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2019	1	2	100	NA	ND[2]	NA[2]	0.042[1,2]	ND–0.11[1,2]	No	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
Chlorine (ppm)	2019	[4.0 (as Cl2)]	[4 (as Cl2)]	0.87	0.41–1.54	NA	NA	NA	NA	No	Drinking water disinfectant added for treatment
Fluoride (ppm)	2019	2.0	1	NA	NA	0.17	NA	0.05	ND–0.12	No	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate [as nitrate] (ppm)	2019	45	45	0.46	NA	0.41[2]	NA[2]	1.7[2]	0.88–2.6[2]	No	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Turbidity[3] (NTU)	2019	TT	NA	NA	NA	0.200	0.011–0.200	NA	NA	No	Soil runoff
Turbidity (lowest monthly percent of samples meeting limit)	2019	TT = 95% of samples meet the limit	NA	NA	NA	100	NA	NA	NA	No	Soil runoff

Tap Water Samples Collected for Copper and Lead Analyses from Sample Sites throughout the Community

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	PHG (MCLG)	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2019	1.3	0.3	0.470	0/32	No	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (ppb)	2019	15	0.2	ND	0/32	No	Internal corrosion of household water plumbing systems; discharge from industrial manufacturers; erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	PHG (MCLG)	Distribution System AMOUNT DETECTED	Distribution System RANGE LOW-HIGH	Surface Water AMOUNT DETECTED	Surface Water RANGE LOW-HIGH	Groundwater AMOUNT DETECTED	Groundwater RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2019	500	NS	6.2	NA	4.6	NA	8.8	7.1–13	No	Runoff/leaching from natural deposits; seawater influence
Corrosivity (Units)	2019	Non-corrosive	NS	11	NA	10.49	NA	11.4	10.5–11.7	No	Natural or industrially influenced balance of hydrogen, carbon, and oxygen in the water; affected by temperature and other factors
Specific Conductance (µmho/cm)	2019	1,600	NS	NA	NA	190	NA	302	210–350	No	Substances that form ions when in water; seawater influence
Sulfate (ppm)	2019	500	NS	10.0	NA	9.9	NA	15	12–19	No	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids (ppm)	2019	1,000	NS	140	NA	110	NA	212	200–220	No	Runoff/leaching from natural deposits
Turbidity (NTU)	2019	5	NS	0.131	0.064–0.281	NA	NA	0.040	0.003–0.700	No	Soil runoff

UNREGULATED AND OTHER SUBSTANCES [4]

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	Distribution System AMOUNT DETECTED	Distribution System RANGE LOW-HIGH	Surface Water AMOUNT DETECTED	Surface Water RANGE LOW-HIGH	Groundwater AMOUNT DETECTED	Groundwater RANGE LOW-HIGH
1-Butanol (ppb)	2019	NA	NA	0.5	ND-3.2	ND	NA
Bicarbonate (ppm)	2019	110	NA	100[2]	NA[2]	176	130-210
Bromochloroacetic acid (ppb)	2019	1.5	ND-3.7	NA	NA	29[2]	21–33[2]
Bromide (ppb)	2019	NA	NA	36	20-52	NA	NA
Bromodichloroacetic acid (ppb)	2019	1.6	ND-3.8	NA	NA	NA	NA
Calcium (ppm)	2019	18	NA	17[2]	NA	29	21-33
Chlorodibromoacetic acid (ppb)	2019	0.5	ND-0.96	NA	NA	NA	NA
Dibromoacetic acid (ppb)	2019	0.4	ND-0.91	NA	NA	NA	NA
Dichloroacetic acid (ppb)	2019	3.7	0.34-8.5	NA	NA	NA	NA
Magnesium (ppm)	2019	9.5	NA	9.7	NA	19	17-20
Manganese Total ICAP/MS (ppb)	2019	NA	NA	0.2	ND-1.2	1.7	0.72-2.6
Sodium (ppm)	2017	16	NA	9.1[2]	NA[2]	16[2]	11–20[2]
Total Alkalinity (ppm)	2019	89	NA	83[2]	NA[2]	146	110-170
Total HAA5 (ppb)	2019	8.3	0.34-18	NA	NA	NA	NA
Total HAA6Br (ppb)	2019	4.0	ND-9.4	NA	NA	NA	NA
Total HAA9 (ppb)	2019	10.5	ND-27	NA	NA	NA	NA
Total Hardness (ppm)	2019	83	NA	83[2]	NA[2]	148	128-163
Total Organic Carbon (ppm)	2019	NA	NA	0.5	ND-0.93	NA	NA
Trichloroacetic acid (ppb)	2019	4.0	ND-8.9	NA	NA	NA	NA

Definitions

90th %ile: The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

AL (Regulatory Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste and appearance of drinking water.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. EPA.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable.

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

NS: No standard.

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

PDWS (Primary Drinking Water Standard): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

PHG (Public Health Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

µmho/cm (micromhos per centimeter): A unit expressing the amount of electrical conductivity of a solution.

DISTRIBUTION SYSTEM DISINFECTION BY-PRODUCTS

		2018				2019					
Total Trihalomethanes (ppb)	**MCL**	**2ND QUARTER**	**3RD QUARTER**	**4TH QUARTER**	**LRAA**	**1ST QUARTER**	**2ND QUARTER**	**3RD QUARTER**	**4TH QUARTER**	**LRAA**	**SOURCE**
Site #1	80	0.0	15.3	0.0	3.8	7.2	0.0	16.6	19.8	10.9	By-product of drinking water disinfection.
Site #2	80	0.0	9.4	17.4	6.7	0.0	0.0	1.0	14.2	3.8	
Site #3	80	4.8	23.5	25.1	14.8	8.2	2.8	14.1	19.9	11.3	
Site #4	80	7.3	17.0	31.6	15.8	11.3	2.5	18.4	20.9	13.3	
Total Haloacetic Acids (ppb)	**MCL**	**2ND QUARTER**	**3RD QUARTER**	**4TH QUARTER**	**LRAA**	**1ST QUARTER**	**2ND QUARTER**	**3RD QUARTER**	**4TH QUARTER**	**LRAA**	**SOURCE**
Site #1	60	0.0	10.8	18.9	7.4	5.6	0.0	8.4	10.2	6.1	By-product of drinking water disinfection.
Site #2	60	0.0	6.9	17.0	6.0	0.0	0.0	1.0	9.1	2.5	
Site #3	60	1.5	16.4	23.1	11.1	7.8	0.0	7.5	12.0	6.8	
Site #4	60	3.5	12.5	29.1	12.6	9.2	4.2	9.4	15.1	9.5	

[1] Sampled in 2017.
[2] Two groundwater sources sampled in 2018.
[3] Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.
[4] Unregulated contaminant monitoring helps U.S. EPA and the State Water Resources Control Board to determine where certain contaminants occur and whether the contaminants need to be regulated.

Appendix K: UWMP Notices: 60-Day, 2-Week, & 1-Week

City of Ukiah 2020 Urban Water Management Plan

March 22, 2021

Grant Davis
General Manager
Sonoma Water
404 Aviation Bvd.
Santa Rosa, CA 95403

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Davis:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Notices confirming the exact date and time of the public hearing will be issued two weeks and one week prior (a total of two notices) to the actual public hearing date. Please feel free to contact me via email (jthiele@cityofukiah.com) if you have any questions.

Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Ignacio Gonzalez
Interim Director
Mendocino County Planning and Building Services
860 North Bush St.
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Gonzalez:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Uma Hinman
Executive Officer
Mendocino Local Agency Formation Commission
200 S. School St.
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Ms. Hinman:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Alicia Bales
Program Director
Mendocino Environmental Center
106 W. Standley St.
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Ms. Bales:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

March 22, 2021

Greater Ukiah Chamber of Commerce
200 S. School St.
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Greetings:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Rogina Water Company
1850 Talmage Rd
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Greetings:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Steve Bogart
President
Calpella County Water District
151 Laws Ave
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Bogart:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

March 22, 2021

Sage Sangiacomo
City Manager
City of Ukiah
300 Seminary Ave
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Sangiacomo:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Jared Walker
General Manager
Willow County Water District
151 Laws Ave
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Walker:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Ernie Wipf
Chair of Board of Directors
Ukiah Valley Sanitation District
151 Laws Ave., Suite B
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Wipf:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Tom Schoeneman
President
Redwood Valley County Water District
151 Laws Ave
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Schoeneman:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

March 22, 2021

Elizabeth Salomone
General Manager
Russian River Flood Control
And Water Conservation Improvement District
151 Laws Ave., Suite D
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Ms. Salomone:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Kenneth Budrow
Board President
Millview County Water District
151 Laws Ave.
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Mr. Budrow:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Carmel J. Angelo
Chief Executive Officer
Mendocino County
501 Low Gap Road, Room 1010
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Ms. Angelo:

The City of Ukiah (City) is currently in the process of updating its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act, Water Code Section 10610 et seq., requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

March 22, 2021

Carmel J. Angelo
General Manager
Mendocino County Water Agency
501 Low Gap Rd. Room 1010
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

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Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

CITY OF UKIAH, CA

Notice of Public Hearing
For 2020 Urban Water Management Plan and
Availability of Draft Plan for Review

The City of Ukiah hereby releases its Draft 2020 Urban Water Management Plan (UWMP) for public review. The UWMP will be available through June 2nd at City Hall located at 300 Seminary Avenue, Ukiah CA 95482. An electronic (PDF) copy can also be obtained by contacting the City and requesting a PDF copy.

A Public Hearing will be held as an agenda item of the City's regularly scheduled Council Meeting on Wednesday, June 2nd 2021 to consider comments on the Draft 2020 UWMP and to formally adopt the UWMP by resolution. The Council Meetings are typically held at the City's Council Chambers. However, COVID-19 restrictions have moved the meeting to an online format. The time of the Public Hearing will be posted on the Council Agenda which will be released a few days prior to the June 2nd Council meeting. A web link will also be provided in order to access the meeting.

The City encourages the active involvement of its citizens. If you have any questions concerning the 2020 UWMP, please contact: Jarod Thiele, Management Analyst by email at jthiele@cityofukiah.com.

-Newspaper Ad-
Notice of Public Hearing
For 2020 Urban Water Management Plan and Availability of Draft Plan for Review

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The City encourages the active involvement of its citizens. If you have any questions concerning the 2020 UWMP, please contact: Jarod Thiele, Management Analyst by email at jthiele@cityofukiah.com.

Appendix L: Characterization of the Ukiah Valley Groundwater Basin

City of Ukiah 2020 Urban Water Management Plan



University of California, Davis
Water Management Lab



Characterization of the Ukiah Valley Groundwater Basin

Final Report

Prepared for:
City of Ukiah

By:
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Executive Summary

This report provides a hydrologic characterization of the Ukiah Valley Groundwater Basin to provide a science based foundation of information and knowledge for groundwater management purposes. The hydrologic characterization is completed through the development of a water budget, which is the accounting of the water within an area by estimating the water inflows, outflows, and storage. The water budget was developed on a monthly time step from 1991 to 2015 in collaboration with local stakeholders and scientists. The method for estimating a water budget consists of four main components: (1) performing agricultural water use calculations, (2) constructing a surface water mass balance, (3) estimating aquifer storage, and (4) constructing a groundwater mass balance.

Results suggest that the Ukiah Valley Groundwater Basin is not in groundwater overdraft, overall the groundwater storage is stable (no chronic decline) with time. The conclusion that the groundwater storage is stable is also supported by long term monitoring wells within the basin that do not show a decline in the water levels. This is also supported by the small dependence on groundwater sources, only 19 % of the water use comes from groundwater, mostly for agriculture. Furthermore, the amount of recharge in the Ukiah Valley Groundwater Basin exceeds groundwater extractions, on average (Table 1).

Table 1. Average groundwater recharge and extractions observed in the Ukiah Valley Groundwater Basin.

	(AF/year)
Precipitation & Irrigation Recharge	23,011
Percolation Pond Recharge, City of Ukiah	2,264
Percolation Pond Recharge, Calpella County WD	42
Average Aquifer Recharge	***25,317***
Ag Water Pumping	2,468
Municipal GW Use	943
Average Aquifer Extractions	***3,411***

The Ukiah Valley Groundwater Basin has surface water – groundwater interactions.

In general, the Russian River mainstem, from the confluence of the East and West fork to Hopland, is a gaining river from November to June, gaining approximately 18,952 AF/y, on average. Surface water gains mostly are from groundwater discharge into the river mainstem when the groundwater table is higher than the surface of the Russian River, and tributary runoff from creeks in the upper watershed and foothills feeding into the Russian River. In contrast, the Russian River has net surface water losses, approximately 393 AF/y, from July to October. Surface water losses occur when the groundwater table is lower than the free surface of the Russian River, and recharge from surface water to the aquifer occurs. From July to October, water in the mainstem mostly comes from Lake Mendocino releases, which in turn is filled with imported water from the Eel River through the Potter Valley Hydropower Project. These results suggest that releases from Lake Mendocino are recharging the Ukiah Valley Groundwater Basin and it is likely that a portion of Lake Mendocino releases come from the water transfers from the

Eel River through PVHP and may end up recharging the Ukiah Valley Groundwater Basin during parts of the year. In general, surface water gains are more frequent and greater in magnitude than surface water losses. Of the surface water gains, 88% comes from tributaries and 12% comes from groundwater influence.

Furthermore, there is lateral groundwater movement in the Ukiah Valley Groundwater Basin. The magnitude and occurrence of the lateral groundwater inflows are about equal to the magnitude and occurrence of the lateral groundwater outflows. The lateral groundwater gains observed come from tributary streamflow that recharges the Ukiah Valley Groundwater Basin. In contrast, lateral groundwater losses are occurring from downgradient groundwater flow from the Ukiah Valley Groundwater Basin towards the Russian River and into the Sanel Valley Groundwater Basin (also known as the Hopland Valley Groundwater Basin).

This report is divided in two sections. The first part describes the main hydrologic characteristics of the Ukiah Valley Groundwater Basin as well as the methods and results associated to creating the water budget for the Ukiah Valley Groundwater Basin. The calculations of the water budget have been stored in a geodatabase. The second part of the report describes the construction and architecture of the geodatabase of the Ukiah Valley Groundwater Basin. The geodatabase contains the information used to construct the water budget and the results estimated from the water budget. Information regarding the geodatabase is found at the end of the report.



Panoramic View of the Ukiah Groundwater Basin

University of California, Davis
Water Management Lab

Characterization of the Ukiah Valley Groundwater Basin

Part 1- Water Budget

Abstract

The Sustainable Groundwater Management Act (SGMA) is the first legislative effort of its form in California geared towards reforming groundwater management throughout the state after years of uncoordinated and voluntary management of groundwater. SGMA will enforce the management and monitoring of groundwater resources at a local scale by requiring medium and high priority groundwater basins to form a Groundwater Sustainability Agency (GSA). GSAs are required to submit a Groundwater Sustainability Plan (GSP) addressing how their groundwater resources will be managed to achieve groundwater sustainability by the year 2040 by avoiding the six undesirable results listed by the California Department of Water Resources (DWR). The objective of this part 1 of the study is to (a) describe the implementation of SGMA in California, (b) describe a method for estimating a water budget, and (c) present the implementation of this method for the Ukiah Valley Groundwater Basin. To characterize the Ukiah Valley Groundwater Basin, a water budget was developed on a monthly time step from 1991 to 2015 in collaboration with local stakeholders and scientists. Results suggest that the Ukiah Valley Groundwater Basin is not in groundwater overdraft, and that a portion of the Russian River is a gaining river approximately 18,952 AF/y from November to June, and a losing river approximately 393 AF/y from July to October. Furthermore, groundwater connectivity is observed to occur between the Ukiah Valley Groundwater Basin and the Sanel Valley Groundwater Basin through lateral groundwater movement. Local groundwater managers and users will use this information to inform proposed action plans and monitoring protocols that will allow them to achieve and maintain groundwater sustainability by the year 2040 and onward.

1. Introduction

In California, groundwater is not merely part of the hydrologic cycle, but a key component that supports the state's economy, contributes towards environmental stewardship, and supports communities that may range from being partially dependent to solely dependent on groundwater. Groundwater in California has supported urban development, irrigation for intensive agriculture, and has functioned as an alternative water source during periods of drought. Given the importance of groundwater in the state, California pumps more groundwater than any other state in the nation, roughly 16% of all the groundwater pumped by the United States (DWR 2015). Despite the importance of groundwater, California has forgone establishing a comprehensive plan for managing its groundwater resources. As a result, some groundwater basins have been deemed unsustainable because they have experienced one or more of the following conditions: chronic lowering of the water table, a reduction in groundwater storage, saline intrusion, a degradation of water quality, land subsidence, and depletion in groundwater-surface water interactions. In 2014, the Sustainable Groundwater Management Act (SGMA) was introduced in California to encourage groundwater management and monitoring at a local scale through the formation of Groundwater Sustainability Agencies (GSAs). With the goal of obtaining groundwater sustainability the year 2040, GSA formations were formed in areas where the groundwater basins were identified as medium and high priority by the California Department of Water Resources (DWR). Given the challenges that some groundwater basins are experiencing, there is a critical need to hydrologically analyze them to begin managing them and make them sustainable.

1.1 Research Objectives

The objectives of this research study are: (1) describe the implementation of SGMA in California, (2) describe the method and framework used for estimating a water budget, and (3) describe the implementation of SGMA and the construction of a water budget for the Ukiah Valley Groundwater Basin. The development of this water budget will provide a characterization of the Ukiah Valley Groundwater Basin for the formed GSA which will contribute towards the efforts of developing a Groundwater Sustainability Plan (GSP). The development of this water budget also will be the starting point for more detailed water management projects for this region.

SGMA provides a mandate to make all groundwater basins in California sustainable. Analysis of groundwater basins in critical condition begins with constructing a water budget. A well-constructed water budget can inform in the decision making process when it comes time to design water management strategies for an area that needs improvement. The water budget will provide a historical and a current summary of the groundwater basin that was otherwise unknown or controversial.

This study presents a method for estimating a water budget for a groundwater basin identified to be of concern by DWR. The method consists of developing a water mass balance for the project area. The framework consist of four main components that included (1) performing agricultural water use calculations, (2) constructing a surface water mass balance, (3) estimating aquifer storage, and (4) constructing a groundwater mass balance. The presented framework considers the historical association between the water sources, water supplies, and water uses for the groundwater basin of interest.

Background in California's groundwater management and SGMA are covered in Chapter 2. In Chapter 3, the Case Study on the Ukiah Valley Groundwater Basin is presented. Chapter 4 describes the development of the water budget for the Ukiah Valley Groundwater Basin. Chapter 5 presents the results and Chapter 6 is a discussion on the results. Chapter 7 concludes with closing comments, an overall summary of what was accomplished through this study, and a brief outline of some of the limitations encountered in this study.

2. Background

2.1 Groundwater in California

The state of California relies on groundwater from either alluvial or fractured rock aquifers. The alluvial aquifers have fine grained sediments, sand and/or gravel that contains water stored within its pore spaces (DWR 2015). Fractured rock aquifers store much less water and are made of impermeable granitic, metamorphic, volcanic, or sedimentary rocks that hold groundwater within the fractures or void spaces. Typically, fractured rock aquifers are in mountainous and foothill areas (DWR 2015).

In California, 515 alluvial groundwater basins and subbasins exist that cover 42% of the state (DWR 2015). From the groundwater basins it is estimated that 16.5 MAF or 20,352 Mm^3 of groundwater are extracted annually, which accounts for 38% of the water supply in the state (DWR 2015). Despite the number of basins in the state, each basin is somewhat unique but, have been regionalized into the Central Valley aquifer system, the coastal aquifers, the Northern California basin-fill aquifers, and the eastern Sierra Nevada and the California Desert aquifers (DWR 2015). In Figure 1, the location of the groundwater basins and subbasins in California have been identified as the areas shaded in green.



Figure 1. Areas shaded in green are the groundwater basins and subbasins found in California (DWR 2015).

Of the 16.5 MAF of groundwater pumped annually in the state of California, 39% is used for agriculture, 41% in the urban areas, and 18% used for the state's wetlands (DWR 2015). The Central Valley alone uses 74% of all extracted groundwater, where the Tulare Lake Hydrologic Region is the greatest groundwater user (DWR 2015). Topography, precipitation, and hydrologic conditions vary throughout the state. Some areas lack access to enough water to meet water demands, so state and federal water projects offer help with imported water. When the amount of surface water from the state and federal water projects does not fully meet local water demands,

water users typically rely on groundwater to cover the deficit. The total amount of water used in each hydrologic region is found in Figure 2, along with the amount of groundwater used by each region. The Tulare Lake Hydrologic Region is by far the greatest groundwater consumer. The North Lahontan Hydrologic Region is the smallest groundwater consumer in California.

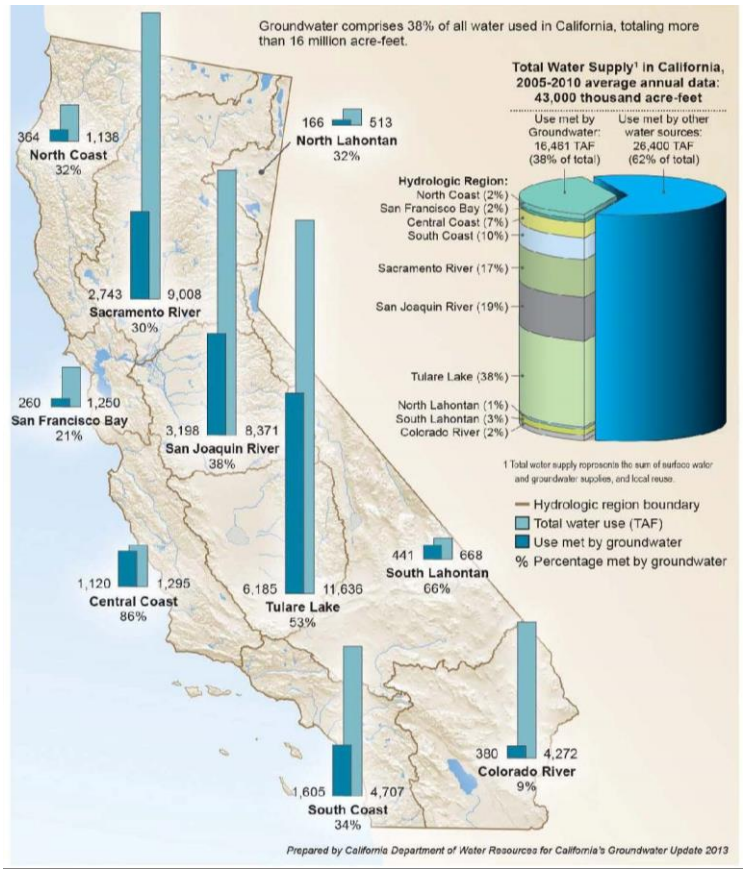


Figure 2. Total water supply and the percent of groundwater supply for each hydrologic region for the years 2005-2010 (DWR 2015).

2.2 Concerns Regarding California Groundwater Resources

California has long forgone establishing a comprehensive plan for managing its groundwater resources. The lack of groundwater oversight has introduced concerns that need to be mitigated and better addressed. Some groundwater basins throughout the state are not

sustainable due to overdraft, reduced stream flows, potential to lose ecosystems, depletion in groundwater quality, land subsidence, or salt water intrusion.

Conjunctive use seeks to manage both groundwater and surface water simultaneously. California's Water Plan Update 2013, defines conjunctive use as "a coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region to meet various management objectives" (DWR 2013). Through conjunctive use, groundwater is essentially stored and used for future needs mostly during drought periods. Through this management scheme users can rely on stored groundwater during dry periods, and surface water during wet periods.

Many areas in California lack an integrated water resources management system that integrates surface water and groundwater management. Groundwater overdraft is an example of the many groundwater issues that have resulted from the unregulated groundwater use, water demand increase, change in cropping patterns, an increase in population, and or change in irrigation systems. Groundwater overdraft is the point at which the quantity of groundwater extracted from the aquifer exceeds the amount of groundwater recharging the aquifer (Moran et al. 2014). Groundwater overdraft is a prominent problem in the Central Valley where several communities rely on groundwater resources to meet agricultural and municipal water demands. Coastal basins and some basins in the southern portion of the state have also been known to be susceptible to groundwater overdraft (Lund and Harter 2013). It is estimated that 500,000 AF to 1.5 million AF of overdraft occur throughout the state (Lund and Harter 2013). The Tulare Lake Basin is the highest groundwater consumer as a result of intensive agriculture, making this area, particularly susceptible to 0.7 to 1.5 million AF/y of groundwater overdraft (Lund and Harter 2013). In general, groundwater overdraft leads to decreasing groundwater storage and chronic

lowering of the groundwater table as a function of time. This in turn, threatens water security in communities and leads to more expensive pumping and drilling costs to access groundwater in areas that lack reliable sources of surface water.

With the depletion of groundwater resources and lowering of the water table, surface water and groundwater interactions may also be lost. In most cases, the surface water and groundwater systems are connected. Through the streambed, groundwater may flow into the surface water, providing surface water gains or surface water may flow through the streambed to recharge the groundwater system (Vandas et al. 2002). For surface water to recharge groundwater, the groundwater water table must be lower than the free surface of the surface water (Vandas et al. 2002). For surface water to gain groundwater, the water table must be higher than the free surface of the surface water (Vandas et al. 2002). Since both systems are hydrologically connected it is important to try to maintain them connected by monitoring the amount of groundwater pumped. Maintaining these surface water and groundwater interactions assures that there is chemical and thermal buffering, the formation and maintenance of habitat, refuge areas for aquatic species that are endangered, and assures base flows in rivers during times in which there is no snowmelt or rain (Gardner 1999).

Many groundwater basins have experienced degradation of groundwater quality. In California, some regions have water quality concerns regarding nitrates and salinity that stem from agricultural irrigation practices mainly. Excess surface water used for irrigation, transports nitrates and salts to the groundwater, polluting local water supplies. The Tulare and Salinas Basins are examples of sites that have been affected from nitrate contamination (Lund and Harter 2013). Their groundwater sources have become impacted from crop fertilizer, nitrates from dairies, and nitrates from septic tanks (Lund and Harter 2013). The Tulare Lake Basin and the

San Juaquin Basin are also susceptible to salinity problems (Lund and Harter 2013). High concentrations of salts have been found in their groundwater supplies which stem from the soils and aquifers, irrigation water, animal farming, and waste from industry and communities (Lund and Harter 2013). The high presence of nitrates and salinity has led to the closure of several wells within these groundwater basins.

With an unmanaged groundwater system, land subsidence has also been a problem in some regions. Land subsidence is the gradual sinking of the Earth's surface (USGS 2016). Areas of concern include the Tulare Lake Basin and the San Juaquin basin, with land subsidence of up to 30ft due to groundwater overdraft (Lund and Harter 2013). Land subsidence can be a threat locally because of the damage it can cause to infrastructure, canals, bridges, and sewers. Figure 3 demonstrates how dire the results may be from land subsidence. Figure 3 is an image demonstrating how much land subsidence has occurred in the Central Valley, near the area of Mendota California. In the image it can be seen how the land has significantly dropped with time as a result of the large amounts of groundwater that have been withdrawn from the aquifer.

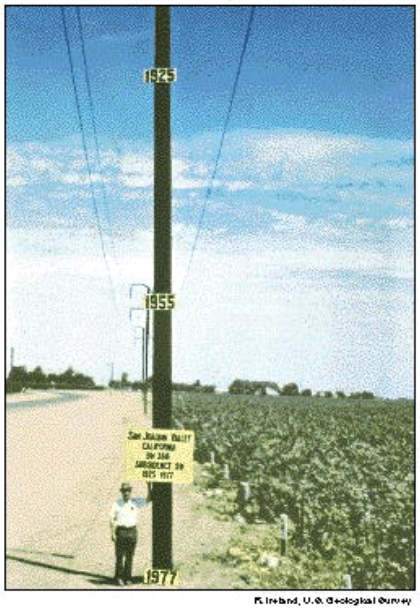


Figure 3. Historical land subsidence observed in the Central Valley near Mendota, California (USGS 2000).

Lastly, sea water intrusion has also been a concern for some groundwater basins. During sea water intrusion, sea water will flow into fresh water aquifers which may contaminate the drinking water supply. This can occur from excessive groundwater pumping or naturally, a physical process that is seen commonly in the coastal aquifers. For sea water intrusion to occur, the groundwater levels must be lower that the sea level. The amount of sea water intrusion will vary depending on the rate at which groundwater is extracted and the amount of fresh water that is being recharged into the groundwater basin (Barlow and Reichard 2010). Other factors affecting sea water intrusion may include the distance that exists between the groundwater wells and the source of saltwater, the geologic structure of the aquifer, and the presence of confining units that may prevent the movement of saltwater into the aquifer (Barlow and Reichard 2010). In coastal Los Angeles, sea water intrusion has been a problem as a result of excessive groundwater development that began in the middle of the 19th century (Nishikawa et al. 2009). With time, the amount of groundwater pumping increased as the population grew. The use of turbine pumps eventually decreased the water level lower than that of sea level which lead to seawater intrusion, since then sea water intrusion problems have continued to be addressed (Nishikawa et al. 2009). The Salinas and Pajaro Valleys have also been areas that have been recognized to experience occasional seawater intrusion as a result of agriculture development (Garza Diaz 2016).

2.3 Prior the Sustainable Groundwater Management Act (SGMA)

Up to 2014, there had been little coordinated effort on managing groundwater in California. This widely used water resource lacked detailed groundwater law or policies governing its use. Indirectly, money regulated groundwater use. Groundwater hydrologic

characteristics and the costs of pumping and drilling drove how much groundwater was used. However, the most common groundwater management practices involved water districts with groundwater management programs or having adjudicated groundwater basins. The groundwater rights in the state have been correlative rights, appropriative rights, mutual prescription, and notions of equitable appointment (Weatherford et al. 1982).

Through correlative rights, overlying users are limited to a feasible amount of groundwater that will not cause detrimental impacts to other users depending on the aquifer. The doctrine of correlative rights is formed from the idea that the overlying owners have equal rights per acre to reasonably pump groundwater from a common source (Cox 1982). In addition, overlying users have greater priority than non-overlying users. Non-overlying users may only have access to the water not needed by the overlying users (Weatherford et al. 1982).

The rights of overlying and non-overlying users were redefined by the 1949 court case of the City of Pasadena vs. City of Alhambra (Weatherford et al. 1982). This Supreme Court case established the doctrine of mutual prescription. Under the doctrine of mutual prescription "groundwater withdrawals could be judicially limited to safe yield by proportionally reducing the pumping of all parties, using five-year periods of highest continuous use following the beginning of overdraft as the measure for the amount of water to which the reduction would apply" (Weatherford et al. 1982). When groundwater overdraft was experienced, private pumpers would "acquire rights against one another by the continued act of pumping, without regard to seniority or the location of use" (Weatherford et al. 1982). However, this doctrine raised several questions and problems. A problem that arose involved public entities being able to acquire prescriptive rights from private users, but private users would not be able to acquire prescriptive rights from public entities such as cities and water districts. Another problem that arose was that unnecessary

groundwater pumping was encouraged (Weatherford et al. 1982). It was not until the case of the City of Los Angeles vs. City of San Fernando, that the doctrine of mutual prescription was limited. This case excluded municipalities from prescription and required owners to be put on notice of the adversity caused by the commencement of the overdraft (Getches et al. 2015). This court case also defined overdraft as "the condition when withdrawals exceed both safe yield and temporary surplus," but more importantly, it declared that equitable appointment was more important than mutual prescription (Weatherford et al. 1982). In other words, all water rights "must be subject to reasonable conditions and priorities" (Weatherford et al. 1982).

California groundwater law has been diverse. Aside from groundwater laws, the concept of adjudicated basins has been a way to manage groundwater. In adjudicated basins, the court has jurisdiction, watermasters are appointed, local management districts exist, and it is the economics of groundwater pumping that determines the behavior of groundwater users (DWR 2015). Adjudicated basins can form when people or cities go to court to address groundwater issues. In this process the court appoints a watermaster or a group responsible to purchase water and manage water storage (Weatherford et al. 1982). The objective of groundwater adjudications has been to provide an equal share of available groundwater available to the users while simultaneously not causing detrimental effects on groundwater supplies as groundwater is pumped to meet water demands. Since the publication of *California's Groundwater Update 2013,* there have been a total of 24 adjudicated groundwater basins located mainly in southern California (DWR 2015). For many of the adjudicated basins, extraction limits and management actions are imposed when groundwater levels and water quality levels are declining.

To address emerging groundwater concerns, some innovative solutions have occasionally resulted. Groundwater overdraft eventually led to the creation of the Central Valley and the State

Water Project, and in 1975 interests in groundwater management peaked and encouraged conjunctive use along with better management practices (Weatherford et al. 1982). In 1980, special legislation, SB 1391, was passed to address groundwater overdraft (Weatherford et al. 1982). The Sierra Valley and Long Valley Groundwater Basin Act allowed several counties to form groundwater management districts by joint powers agreements and to "require the registration of groundwater extraction, to purchase, condemn, import, store, reclaim, and/or exchange water; to enjoin well inference; to require permits before groundwater can be exported; and to levy extraction and management charges" (Weatherford et al. 1982).

In 1992, the state increased support for groundwater management through passage of the Groundwater Management Act, AB 3030, which has since then been modified. Through this legislation groundwater management was adopted as "the planned and coordinated monitoring, operation, and administration of a groundwater basin, or portion of a basin, with the goal of long term groundwater resource sustainability" (DWR 2015). This act encouraged local water entities to work together in managing their groundwater resources and to develop groundwater management plans. In 2002 The Groundwater Management Act was modified so public agencies seeking funds from the state to finance groundwater management projects must provide groundwater management plans. In 2011, the Assembly Bill 359 modified the Groundwater Management Act again to require local agencies to provide a copy of their groundwater management plan to the DWR (DWR 2015).

Groundwater resources management has been attempted through the State Water Code and Government Code. If a city or county sought financial support for groundwater management, a water management plan must be constructed as mandated by the codes (Green 2014). However, these groundwater management plans failed to limit groundwater use. To better monitor

groundwater conditions, the state created the California Statewide Groundwater Elevation Monitoring Program (CASGEM).

The goal of CASGEM in 2009 was to improve the monitoring of groundwater conditions by allowing local management agencies the responsibility to monitor and report groundwater levels. CASGEM was put into effect as a result of legislation enacted in California's 2009 Comprehensive Water Package (DWR 2014). In essence, CASGEM established collaboration between local monitoring parties and DWR to monitor groundwater levels statewide. In efforts to shed light on the need to reform groundwater management, California Water Code 10933 and 12924 required the DWR to prioritize all 515 alluvial groundwater basins and subbasins and do groundwater basin assessments which became known as the CASGEM Groundwater Basin Prioritization Process (DWR 2014). This effort ranked groundwater basins as high, medium, low, or very low priority.

2.3.1 CASGEM Groundwater Basin Prioritization

The 515 alluvial groundwater basins and subbasins were classified as high, medium, low, or very low priority by considering the following variables (DWR 2014): (a) the population overlying the basin, an area with underlying permeable material that can store water; (b) the rate of current and projected growth of the population overlying the basin; (c) the number of public supply wells that draw from the basin; (d) the total number of wells that draw from the basin; (e) the irrigated acreage overlying the basin; (f) the degree to which persons overlying the basin rely on groundwater as their primary source of water; (g) any documented impacts on the groundwater, which may include groundwater overdraft, land subsidence, saline intrusion, and water quality degradation; and (h) any other information determined to be relevant by the DWR.

In classifying each groundwater basin and subbasin a score from 0-5 was assigned to each variable listed above. To determine the score, the information in Figure 4 was referenced. After each variable had an assigned score, the total wells data was reduced by 25 % as a result of data confidence (DWR 2014). The resulting scores for each variable were then input into Equation [1] to obtain a rank value for each groundwater basin.

Ranking	Ranking Value	Data Components and Ranking Ranges						
		Population		PSW Density	Total Well Density	Irrigated Acreage	Groundwater Reliance	
		Density	Projected Growth				GW Use	% of Total Supply [1]
		per sq.-mi	%	per sq.-mi	per sq. mi	ac/sq.-mi	ac-ft/acre	%
Very Low	0	x < 7	x < 0	x = 0	x = 0	x < 1	x < 0.03	x < 0.1
Low	1	7 ≥ x < 250	0 ≥ x < 6	0 > x < 0.1	0 > x < 2	1 ≥ x < 25	0.03 ≥ x < 0.1	0.1 ≥ x < 20
Moderately Low	2	250 ≥ x < 1000	6 ≥ x < 15	0.1 ≥ x < 0.25	2 ≥ x < 5	25 ≥ x < 100	0.1 ≥ x < 0.25	20 ≥ x < 40
Medium	3	1000 ≥ x < 2500	15 ≥ x < 25	0.25 ≥ x < 0.5	5 ≥ x < 10	100 ≥ x < 200	0.25 ≥ x < 0.5	40 ≥ x < 60
Moderately High	4	2500 ≥ x < 4000	25 ≥ x < 40	0.5 ≥ x < 1.0	10 ≥ x < 20	200 ≥ x < 350	0.5 ≥ x < 0.75	60 ≥ x < 80
High	5	x ≥ 4000	x ≥ 40%	x ≥ 1.0	x ≥ 20	x ≥ 350	x ≥ 0.75	x ≥ 80%

Note:
Population growth is percent growth from 2010 to 2030.
[1] Percent of total water supply (groundwater and surface water) that is provided by groundwater.
x = component data value

Figure 4. CASGEM Groundwater Basin Prioritization Process score assignment table (DWR 2014).

$$Overall\ Basin\ Ranking = Population + Population\ Growth + Public\ Supply\ Wells + (Total\ Wells\ x\ .75) + Irrigated\ Acreage + [(Groundwater\ Use + \%\ of\ Total\ Supply)/2] + Impacts + Other\ information \quad [1]$$

After each basin obtained a rank value, the basin rankings were divided into four ranges to identify the threshold under which a basin would be identified as very low, low, medium, or high priority. The resulting thresholds (Figure 5) were used to classify each basin into very low, low, medium, or high priority.

Very Low Priority Ranking Range	Low Priority Ranking Range	Medium Priority Ranking Range	High Priority Ranking Range
x < 5.75	5.75 ≥ x < 13.42	13.42 ≥ x < 21.08	x ≥ 21.08
Note: x = Overall Basin Ranking Score			

Figure 5. Table used to classify each groundwater basin and subbasin as high, medium, low or very low priority (DWR 2014).

From the CASGEM Groundwater Basin Prioritization Process 43 groundwater basins were classified as high priority, 84 basins as medium priority, 27 basins as low priority, and the remaining basins from the 515 as low priority as of May 2014 (DWR 2014). Of the basins classified as high and medium priority, they are responsible for 96% of the annual groundwater pumping in California and provide water supply to 88% of the people residing over those groundwater basins (DWR 2014). The results from the CASGEM groundwater basin prioritization helped DWR identify areas that need implementation of sustainable groundwater management practices throughout the state. Figure 6 demonstrates the basins and subbasins in the state classified as high, medium, low, or very low priority through the CASGEM Groundwater Basin Prioritization Process. Areas of great concern are in the Central Valley, where much of the water demands are met through groundwater.

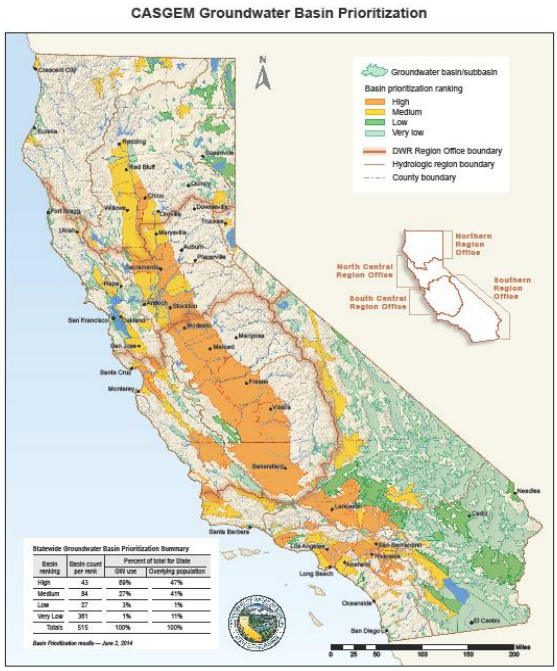


Figure 6. Basins and subbasins classified as high, medium, low, or very low priority (DWR 2014).

2.4 Introduction of the Sustainable Groundwater Management Act (SGMA)

The goal of the Sustainable Groundwater Management Act (SGMA) is for the groundwater basins in California to meet sustainable yield by the year 2040. California's Governor Jerry Brown signed the legislation into law in September of 2014 as an attempt to manage California's groundwater for the first time in history. Through this legislation, the State Water Resources Control Board (SWRCB) and the DWR have established a timeline with deadlines to comply with SGMA. By June of 2017, groundwater sustainability agencies (GSAs) will need to form and provide groundwater sustainability plans (GSP) by the year 2020 or 2022 for groundwater basins classified as medium or high priority respectively (Christian-Smith and Abhold 2015). Once the GSP has been approved, the GSA implement it to maintain or achieve groundwater sustainability by the year 2040 or 2042 (Christian-Smith and Abhold 2015). A groundwater basin will have reached sustainability if it has avoided six undesirable results listed by DWR. A sustainable groundwater basin will: (1) not have chronic lowering of the groundwater table, (2) not have a reduction in groundwater storage, (3) not experience seawater intrusion, (4) not experience degradation of water quality, (5) not experience land subsidence, and (6) not have depletion in groundwater/surface water interactions (DWR 2017).

The GSPs to be submitted will be more thorough and stringent than past groundwater management plans submitted to the state. Previous groundwater management plans were voluntary and unenforceable, which caused some to not improve the conditions of the groundwater basins. For some regions, groundwater users pumped as much as they wanted without regard to how stressed the aquifers were or how they would impact other groundwater users because local water agencies did not have the authority to regulate groundwater pumping. To avoid detrimental conditions, SGMA requires the GSPs to set measurable objectives aimed at

reaching groundwater sustainability, including descriptions of how the objectives will be met, a physical description of the basin, monitoring and management provisions, paperwork about how the plan will include other county/city plans, as well as documentation of how the planning will encourage the involvement of various interest groups (Christian-Smith and Abhold 2015).

After the GSPs have been submitted for groundwater basins of medium or high priority, the GSPs will be reviewed within 2 years and corrections may be suggested by DWR. However, if DWR and the SWRCB see that a water plan will be insufficient or discover that the GSP is not being followed, intervention by the state may result (Christian-Smith and Abhold 2015).

2.5 Water Budgets

Water budgets are helpful for evaluating water resources management and environmental planning. A water budget utilizes the conservation of mass equation to account for all water inflows, outflows and changes in storage in a control volume. Through this process all groundwater and surface water entering and leaving the system is accounted for and ultimately leads to accounting for the change in water storage as a function of time (Joseph et al. 2016). By using a water budget, the availability and sustainability of water supplies also can be evaluated in the area of interest (Healy et al. 2007).

A water budget was used in the Beaverdam Creek Basin in Maryland to determine the proportion of rain distributed between the recharge, runoff, groundwater evapotranspiration, and groundwater storage (Healy et al. 2007). To complete the water budget, data was collected extensively for 2 years. Within this time span the water table was measured weekly, stream discharge was monitored with a sharp crested weir, the change in water storage of the ponds found in the watershed were calculated based off stage readings, precipitation data was collected

from precipitation gauges, pan evaporation was measured, and soil moisture content was determined weekly by electrical resistance (Healy et al. 2007). With the abundance of data, a detailed water budget was developed in which the apportionment of precipitation was estimated. From the detailed accounting it was found that 60% of the rainfall became evapotranspiration, 37% of the rainfall left the watershed as streamflow, and only 3% of rainfall increased the surface and subsurface storage (Healy et al. 2007). Furthermore, the resulting recharge in the watershed was estimated by using the water table data collected from the monitoring wells. It was determined that in the time span of 2 years, 42.5 inches of recharge occurred, where 21.5 inches contributed to base flow, 1.7 inches increased the groundwater storage, and 19.5 inches became evapotranspiration of groundwater (Healy et al. 2007). A water budget done on a small scale basin can provide a lot of insight on where water is coming from and where it ends up.

With respect to water management, a water budget has been constructed in the past for the Arroyo Seco Watershed to evaluate water use in the area and to determine ways that water management can be improved upon. The Arroyo Seco Watershed is located in Southern California in which its water sources come from precipitation, imported water (the Eastern Sierra Nevada, the Colorado River, and the Sacramento River), and the Raymond Basin (Brick 2003). The water budget created for the Arroyo Seco Watershed was developed using a spreadsheet model that included data available for precipitation, infiltration, runoff, and water supply studies and plans for the region from agencies such as the U.S. Geological Survey and the Los Angeles Department of Water and Power (Brick 2003). For the water budget, the water inflows considered included imported water supplies, septic tank recharge, recharge from applied water, and precipitation. For the water outflows, the items considered included surface water diversions, outflow to the Los Angeles River, water production and sales, subsurface flow, and

evapotranspiration. By quantifying all water inflows and outflows of the Arroyo Seco Watershed the interaction between the water sources and water demands could be evaluated to generate a preliminary understanding of the area. The creation of the water budget can help create awareness in the community of each component of the hydrologic cycle while simultaneously providing a characterization of the watershed that supports strategic water management plans. As a result of the water budget study, items were recommended that included expanding on the water conservation and water recycling programs as well as promoting conjunctive use in the region.

With respect to SGMA, developing a water budget will provide understanding on how the water supply, water demand, hydrology, climate, land use, and population of the groundwater basin relate to the six sustainability objectives (Joseph et al. 2016). Its main purpose will be to evaluate the conditions of the groundwater basin, identify undesirable results, help set sustainability criteria, guide in creating monitoring networks, and suggest future projects for improving water management to maintain and achieve groundwater sustainability when drafting the GSP (Joseph et al. 2016).

3. Case of Study: Ukiah Valley Groundwater Basin

The Ukiah Valley Groundwater Basin is in Mendocino County, in the Russian River Watershed (Figure 7). This groundwater basin is approximately 37,531 acres, overlies the Redwood and Ukiah Valley, and is the largest groundwater basin on the Russian River (DWR 2004).

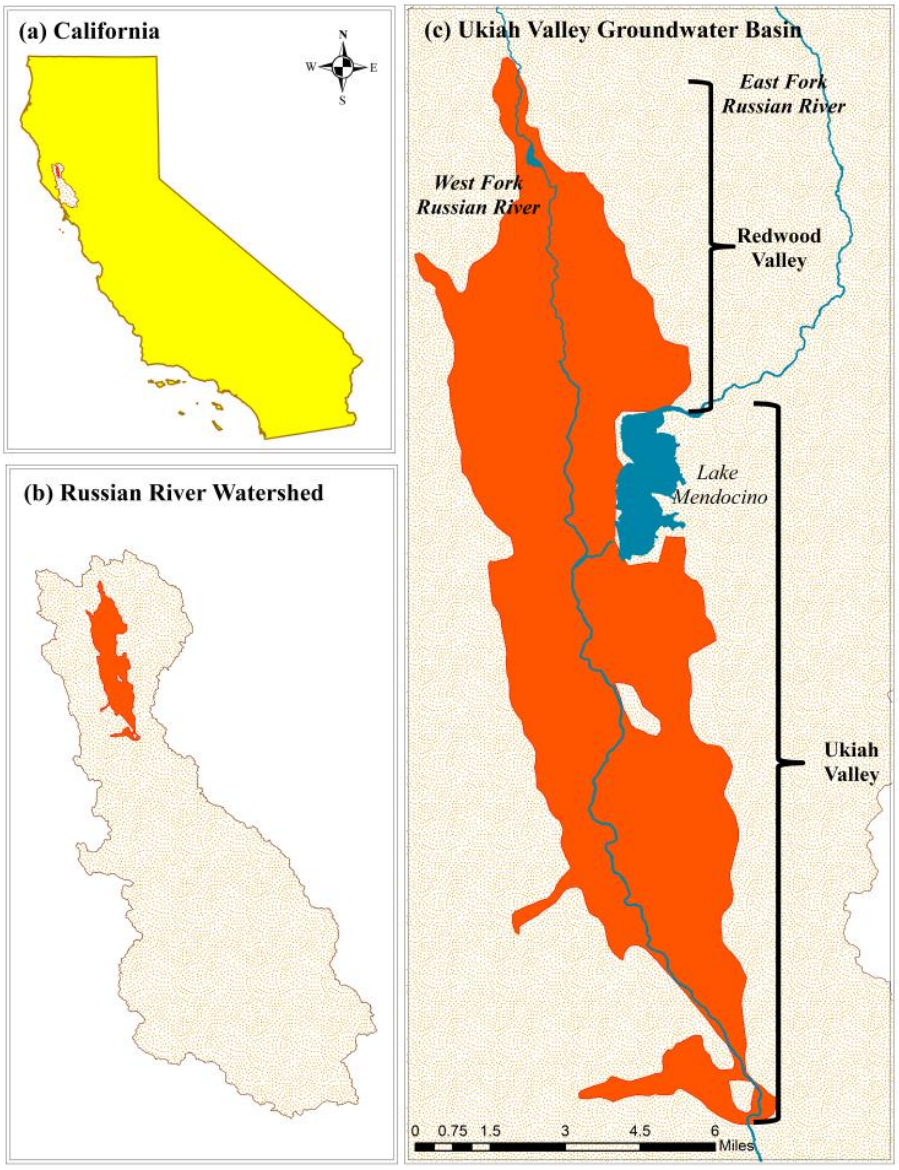


Figure 7. The Ukiah Valley Groundwater Basin (c) located in (a) California and (b) within the Russian River Watershed.

From the CASGEM groundwater basin prioritization process, the Ukiah Valley Groundwater Basin was classified as medium priority. The classification as a medium priority basin resulted because a ranking of 15.8 was obtained from the scores that the groundwater basin received when it was evaluated based on the variables listed in section 2.3.1 (Figure 8).

DATA COMPONENT RANKING VALUE TABLE

Data Component		Ranking Range (x)	Units	Ranking Value	Confidence Adjustment	Average of Components	Adjusted Ranking Values
1. Population		250 ≤ x < 1000	persons/sq-mi	2			2
2. Population Growth		0 ≤ x < 6	percent	1			1
3. Public Supply Wells		0.25 ≤ x < 0.5	wells/sq-mi	3			3
4. Total Wells		x ≥ 20	wells/sq-mi	5	3.75		3.75
5. Irrigated Acreage		100 ≤ x < 200	acres/sq-mi	3			3
6. GW Reliance	GW Use	0.1 ≤ x < 0.25	acre-foot/acre	2		2	2
	% of Total Supply	20 ≤ x < 40	percent	2			
7. Impacts*		--	--	0			0
8. Other Information**		--	--	1			1
Overall Basin Ranking Score		**13.42 ≤ x <**	**--**				**15.8**

Figure 8. Summary of the results obtained for the Ukiah Valley Groundwater Basin as a result of the CASGEM Groundwater Basin Prioritization Process (DWR 2014).

Since the Ukiah Valley Groundwater Basin was classified as medium priority, it must comply with implementing SGMA. Consequently, a GSA structure has been proposed in which it will consist of 6 members representing different stakeholder groups and agencies (Figure 9). It will also have a technical advisory committee. This GSA will consist of the Upper Russian River Water Agency, the Russian River Flood Control and Water Conservation Improvement District, the City of Ukiah, the County of Mendocino, an agricultural seat, and a Tribal seat. The technical advisory committee will consist of Sonoma County Water Agency, the Mendocino County Resource Conservation District, and representatives from each stakeholder and agency making up the GSA. Following the formation of the GSA, the next step is to create a GSP, but before the GSP can be constructed it is necessary to characterize the groundwater basin by estimating a

water budget. Ultimately, the water budget will provide insight on the historical and current groundwater trends, in addition to identifying the degree to which the groundwater basin may or may not be in balance. The results from this water budget will provide the foundation for future water management projects, while also providing an initial direction on how the GSA will advance in developing monitoring protocols and integrated water resources management strategies to achieve and maintain groundwater sustainability. The following describes the water resources of the region and the major water entities that supply water for municipal and agricultural water demands.

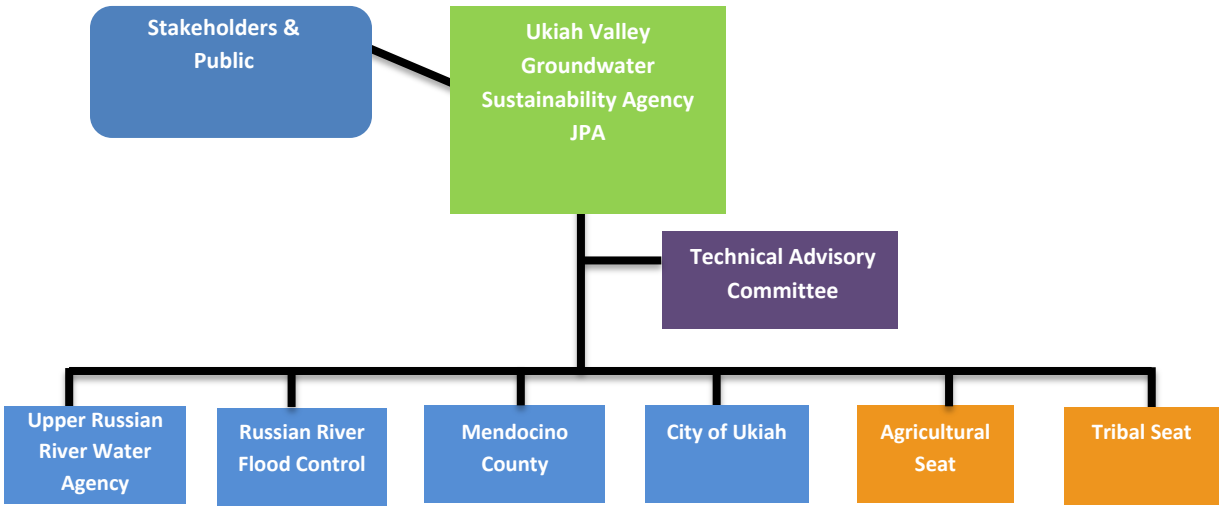


Figure 9. GSA structure for the Ukiah Valley Groundwater Basin.

3.1 Water Sources

3.1.1 Precipitation

Most of the precipitation in the Ukiah Valley Groundwater Basin falls from November to April. The climate is Mediterranean, where the summers are hot and the winters are cold and wet.

3.1.2 Surface Water

The surface water supply is from the Russian River, surface water stored in Lake Mendocino, and from water imported from the Eel River through the Potter Valley Hydroelectric Project (PVHP). The Russian River flows over the groundwater basin where the East Fork and the West Fork of the Russian River converge near the City of Ukiah. As the Russian River flows over the groundwater basin, several tributaries feed into it. As a result of the PVHP, diversions from the Eel River to the East Fork of the Russian River occur through a tunnel. Diversions began in 1908, and since then this water has flowed into Lake Mendocino (Cardwell 1548). Lake Mendocino and Coyote Valley Dam are located on the East Fork of the Russian River and they provide flood control, water supplies, recreation, water storage, and power generation, but ultimately Coyote Valley Dam regulates the flow of the East Fork of the Russian River (MCWA 2010).

3.1.3 Groundwater

The groundwater supply comes from the Ukiah Valley Groundwater Basin. Communities in Ukiah Valley are groundwater dependent, whereas the communities in Redwood Valley depend on surface water. The controversial aspect is whether the groundwater is classified as underflow from the Russian River (DWR 2014).

Overall, the Ukiah Valley Groundwater Basin has a reported storage capacity of 324,000 AF, with 90,000 AF of available storage recharged each year primarily from precipitation (MCWA 2010). From historical groundwater elevation measurements, the groundwater basin has been relatively stable since the 1960's (MCWA 2010). Seasonally, fluctuations have been

observed in which the water table will be at its highest in March or April and at its lowest during October (MCWA 2010).

3.2 Water Entities

The Ukiah Valley Groundwater Basin is comprised of seven water entities that supply water to the region (Figure 10). The following is a description of each water entity.

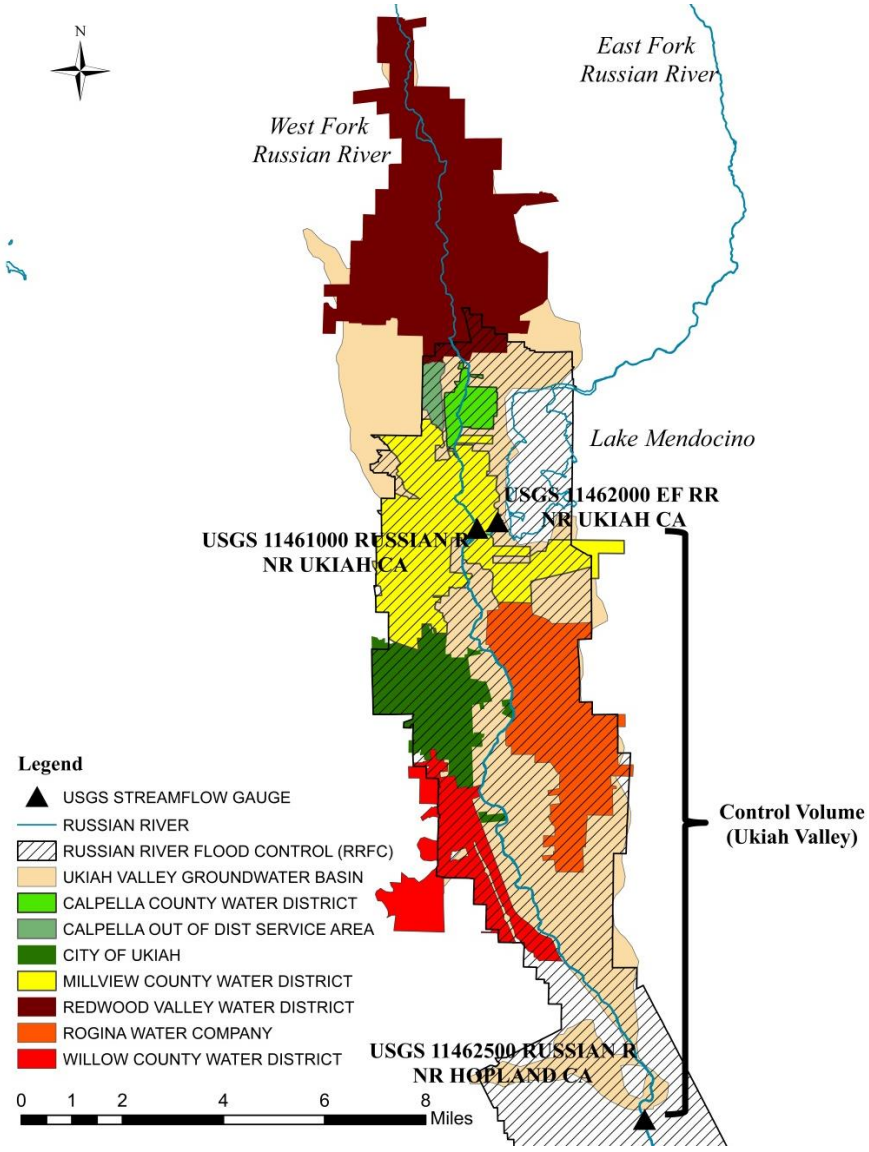


Figure 10.Water entities and USGS streamflow gauges located in the Ukiah Valley Groundwater Basin.

3.2.1 Calpella County Water District

Calpella County Water District is the smallest water district in the area that serves about 140 residential and 25 commercial connections (MCWA 2010). The water supplied to the community of Calpella and the surrounding areas comes from a groundwater well with a capacity of 25 gallons per minute, whereas the remaining water supplies are from a Russian River Flood Control and Water Conservation Improvement District (RRFC) contract to purchase 51 AF/y of surface water (MCWA 2010). Millview County Water District will obtain the surface water from RRFC and transfer it to Calpella County Water District.

3.2.2 City of Ukiah

The City of Ukiah is a public water service provider to approximately 5,800 connections (MCWA 2010). Its water is from groundwater and surface water. For groundwater, the city currently has 4 active wells (WYA 2016). For surface water, 800 AF/y of surface water can be purchased from RRFC under a contract and the remaining surface water supplies are obtained through the City's water right (MCWA 2010). In some cases, the City of Ukiah may obtain emergency water supplies from the Millview and Willow interties (MCWA 2010). The City's water right is to divert 14,480 AF/year from the Russian River between January 1 to December 31 at a maximum diversion rate of 20 cfs (MCWA 2010).

3.2.3 Millview County Water District

Millview County Water District serves to about 1,300 residential connections and 210 commercial connections (MCWA 2010). In addition, it wheels RRFC surface water to Calpella County Water District (MCWA 2010). The water supply for Millview County Water District

comes from RRFC or from water rights. From the water rights, approximately 1,522 AF/y of surface water and underflow can be obtained (LAFCO 2016). These are junior water rights, so during drought Millview County Water District may lack water due to low flow in the Russian River. From RRFC Millview County Water District can purchase up to 1,520 AF/y of surface water (MCWA 2010).

3.2.4 Redwood Valley County Water District

Redwood Valley County Water District provides water for residential, commercial and agricultural uses. About a third of all water use is for municipal and commercial water demands. Redwood Valley County Water District supplies surface water from diversions from Lake Mendocino or from surplus water sold to them from the Russian River Flood Control and Water Conservations Improvement District (MCWA 2010). Redwood Valley County Water District has also obtained water from other sources. From 2005 to 2010 surface water was obtained through a contract with Sonoma County Water Agency and in 2015 to meet domestic water demands, groundwater from well 6, near Millview County Water District, was obtained. Through their own water right, up to 4,900 AF/y of surface water may be diverted from Lake Mendocino from November 1 to April 30 when the flow at the confluence of the East Fork and West Fork of the Russian River is above 150 cfs and the storage in Lake Mendocino is greater than 72,000 AF (MCWA 2010). Essentially, Redwood Valley County Water District has a relatively un-exercisable water right.

3.2.5 Rogina Water Co.

Rogina Water Company is a private water company that provides water to a small service area of about 990 connections (MCWA 2010). The water supply obtained is from a RRFC

contract to purchase 400 AF/y of surface water while the rest of their water supplies comes from their groundwater wells (MCWA 2010). However, the water pumped may actually be underflow from the Russian River.

3.2.6 Russian River Flood Control and Water Conservation Improvement District

The Russian River Flood Control and Water Conservation Improvement District (RRFC) serves a great portion of the Ukiah Valley Groundwater Basin. RRFC along with Sonoma County Water Agency sponsored the development of Coyote Valley Dam and Lake Mendocino (MCWA 2010). As a result of the water right permit 12947B, the RRFC can divert 8,000 AF/y within the RRFC service area to provide water for domestic, municipal, irrigation and recreational use (MCWA 2010). Although, the RRFC has access to 8,000 AF/y of surface water, rarely will it use its full water allocation. RRFC sells raw water to the City of Ukiah, Redwood Valley County Water District, Millview County Water District, Calpella County Water District, Rogina Water Co, Willow County Water District and other contractors for municipal water demands, irrigation, and frost protection.

3.2.7 Willow County Water District

Willow County Water District provides water to a service area of 990 residential connections and 60 commercial connections (MCWA 2010). The water supply comes from a water contract with the RRFC where 515 AF/y of surface water can be purchased, whereas the remaining water supply is from appropriative water rights (MCWA 2010). Under one water right, up to 1,400 AF/y of surface water may be diverted between November 1 and July 1 at a maximum rate of 3 cfs when the stream flow in the Russian River is or exceeds 150 cfs at the point where the diversion occurs (MCWA 2010). Under the second water right, 728 AF/y of

surface water may be diverted from January 1 to December 31 at a maximum rate of 1 cfs (MCWA 2010). In dry years, Willow County Water District may find it difficult to exercise its water rights since they are junior water right holders. During dry years, the Russian River may not have the flow needed for Willow County Water District to divert surface water.

4. Method

4.1 Introduction

A water budget was developed on a monthly time step from 1991 to 2015 for the Ukiah Valley Groundwater Basin. For the purposes of this study the area that lies in the Redwood Valley County Water District is identified as Redwood Valley, whereas the area south is referred to as Ukiah Valley (Figure 7).

The interactions that occur between the water sources and water supplies in the Ukiah Valley Groundwater Basin (Figure 11) are captured in the framework used to develop the water budget (Figure 12). First, calculations associated with the agricultural water use are estimated to obtain the water use and drainage from agricultural water use, and the recharge resulting from precipitation and irrigation. Second, a surface water mass balance is completed using the conservation of mass equation to estimate the surface water gains and losses. Third, the change in groundwater storage is estimated from 1991 to 2015. Fourth, a groundwater mass balance is completed using the conservation of mass equation to obtain the lateral groundwater inflows and outflows. The groundwater mass balance utilizes the already calculated variables of recharge from precipitation and irrigation, surface water gains and losses, and the change of groundwater storage.

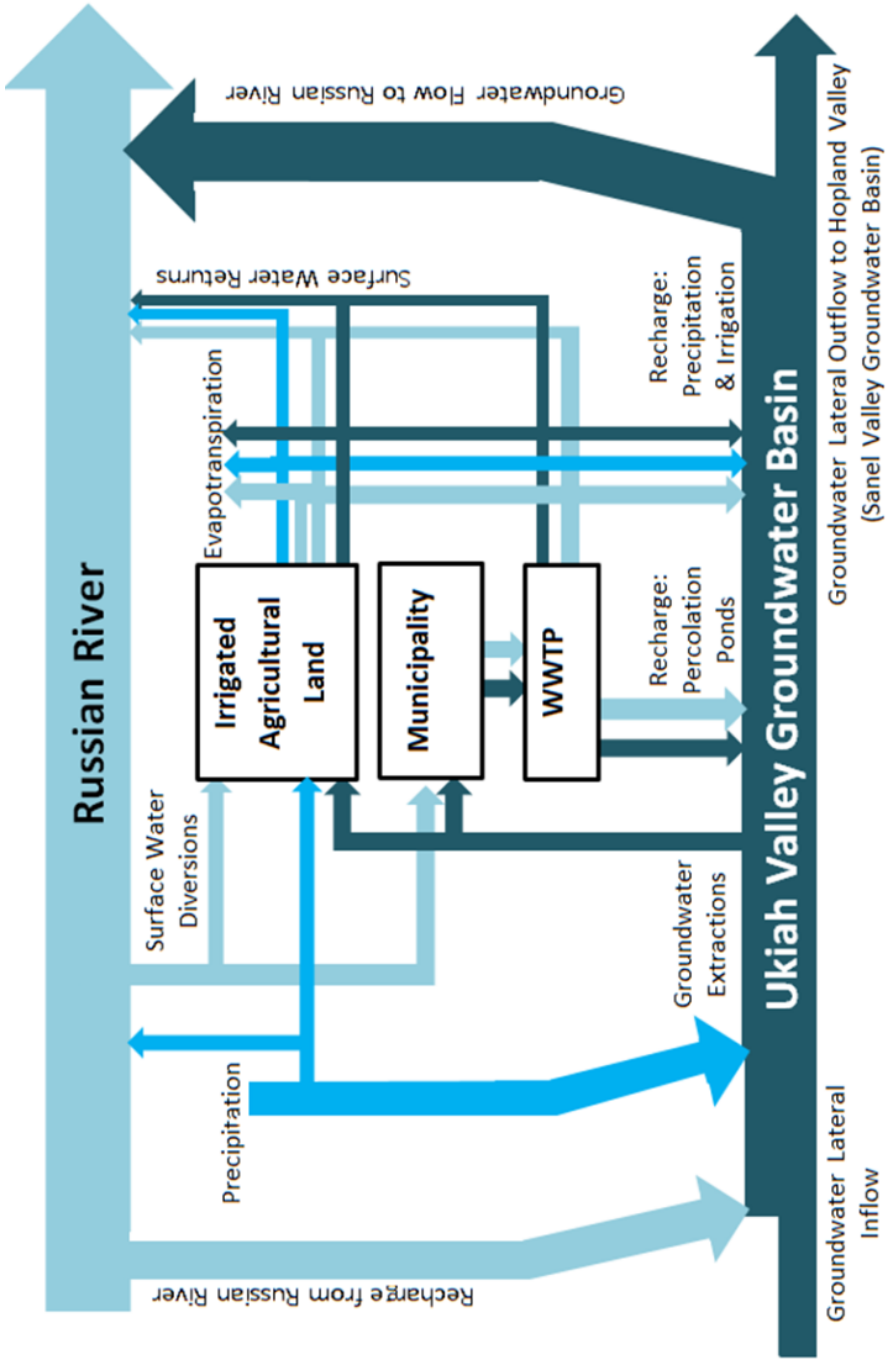


Figure 11.Surface water-groundwater conceptual model for the Ukiah Valley Groundwater Basin.

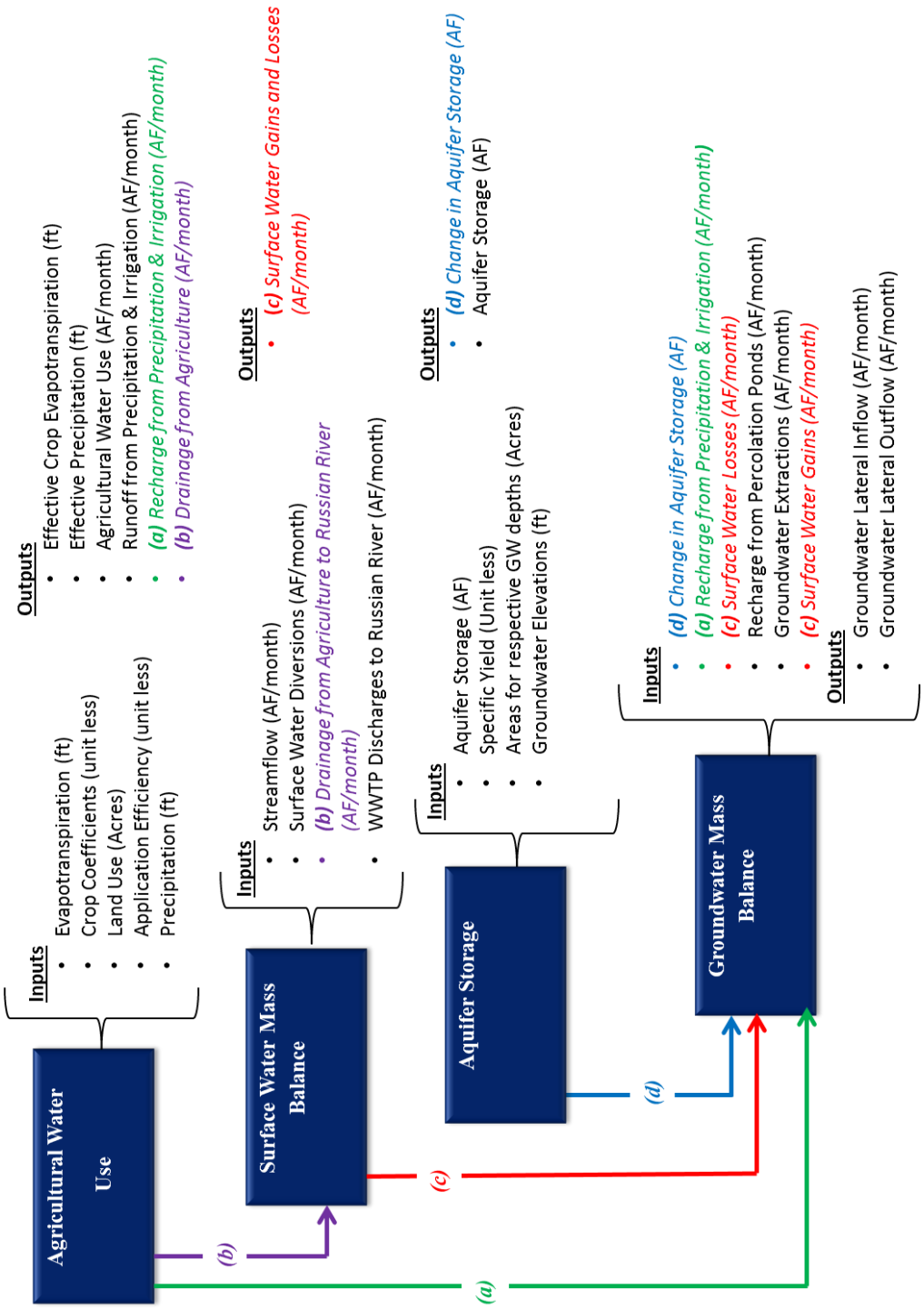


Figure 12. Framework followed for constructing the water budget.

4.2 Agricultural Water Use

4.2.1 Inputs

4.2.1.1 Land Use

The land use overlying the Ukiah Valley Groundwater Basin was obtained from Mendocino County's Agricultural Commissioner and County Sealer of Weights and Measures (Chuck Morse, personal communication, 2016). From annual records, land use data was obtained from 1991-2015 for Redwood Valley and Ukiah Valley. For the year 2001 there was no data available and so the average between the land use values found in the years 2000 and 2002 was taken and used to represent the missing data. In receiving the land use data, two separate datasets were obtained that had slight differences on the number of crop acres reported. One data set contained data from 1990-2012 whereas the second data set contained data from 2006-2015. To address the discrepancy between the reported acres of grapes (red wine and white wine grapes), acres of pears (Bartlett), acres of pears (other), and acres of olives in the Ukiah Valley, the acreage in the 1990-2012 dataset was used for the years 1990 to 2005, whereas the 2006-2015 dataset was used for the years 2006 to 2015. The assumption was that the values reported on the latest dataset contained the updated acreage. For Redwood Valley, the discrepancy between the reported acres of grapes (white wine and red wine grapes) and acres of olives was addressed similarly. Appendix C, D, and E shows the land use data that was used in the study.

4.2.1.2 Crop Coefficients

A crop coefficient is the ratio of the evapotranspiration observed for a crop over the reference evapotranspiration of a well-watered grass maintained under standards conditions (NRMED). For this study crop coefficients were required for apples, cherries, red wine grapes,

white wine grapes, grapes (rootstock), olives, Bartlett Pears, pears (other), pistachios, walnuts, pasture, and raisins. The crop coefficients used for the white wine grapes, red wine grapes, raisins, and grapes (rootstock) were obtained from Glenn McGourty, a University of California Division of Agriculture and Natural Resources Adviser that specializes in Viticulture and Plant Science. For walnuts, pistachios, olives, apples, and pears the crop coefficients used were obtained from Schwankl et al. (2010). For the few cherries present, the crop coefficient values found for stone fruit (Schwankl et al. 2010) were applied. For pasture, the initial crop coefficient value of 0.95 stemmed from the Consumptive Use Program PLUS (CUP+). After contacting John Harper, a Strategic Initiative Leader-Sustainable Natural Ecosystems, Livestock and Natural Resources Adviser for the University of California Cooperative Extension, the time frame under which the crop coefficient was applied was adjusted to be from May to October. After determining the applied water required for each crop (AF/acre), the calculated values for pasture, vineyards, and pear orchards was compared to the published values in Lewis et al. (2008). First, the applied water values that were calculated for vineyards and pear orchards was in agreement with the values published in Lewis et al. (2008), meaning that the crop coefficients from Schwankl et al. (2010) and the crop coefficient values suggested through expert consultation (Glenn McGourty, personal communication, 2016) were adequate to use. Second, to further verify the validity of the chosen crop coefficients, the applied water values estimated for all the crops was compared with Mendocino County values that are reported to the state (DWR 2017). The applied water values estimated agreed with the values reported by the county to the state further suggesting the crop coefficients used were acceptable. For pasture, the applied water estimated was higher than what was published in Lewis et al. (2008) and the values reported by the county to the state. The crop coefficient value of 0.95 for pasture was thus adjusted to 0.8

until the estimates of applied water for pasture were close to the values reported by the county and in Lewis et al. (2008). The crop coefficients used in the study are found in Appendix B.

4.2.1.3 Evapotranspiration

Evapotranspiration is the process that involves transpiration and evaporation of a determined crop to meet its water needs. In transpiration plants lose water to the atmosphere, whereas evaporation is the process by which the land surfaces and bodies of water loose water into the atmosphere. For this study Equation [2] was used to estimate monthly evapotranspiration of the various crops found in the Ukiah Valley Groundwater Basin. In calculating the evapotranspiration, the crop coefficients identified and the reference evapotranspiration of the study area is used.

$$ET_{ijk} = Kc_{jk} \times ETo_{ij} \quad [2]$$

In Equation [2], ET_{ijk} signifies the evapotranspiration in feet for a given crop k in a given month *j* in year *i*. The term Kc_{jk} represents the crop coefficient a dimensionless term for a given crop *k* in a given month *j*. The term ETo_{ij} represents the reference evapotranspiration in feet for a given month *j* in a given year *i*. In using this method, crop growth and the evapotranspiration that stems from salinity stress, crop density, pests, disease, weed infestation or low fertility was not limited (NRMED). The reference evapotranspiration values used for this study were obtained monthly from the California Irrigation Management Information System (CIMIS) Station 106 in Sanel Valley from February 1991 to December 2015. To obtain the January 1991 value, the median of the January values from 1992 to 2015 was taken. The reference evapotranspiration values used can be found in Appendix A.

4.2.1.4 Precipitation

Precipitation can be classified as effective rainfall or net rainfall. Effective rainfall is the amount of rain that can be used by crops to meet their agricultural water demands. If the amount of precipitation from a given storm event is not enough to meet the agricultural water demands, additional water through irrigation must be applied. Net rainfall is defined to be the total amount of water available from a given storm event.

Since precipitation in the Ukiah Valley Groundwater Basin varies from the northern portion of the basin (45 in) to the southern portion of the basin (35 in), the Thiessen polygons method for precipitation was used (DWR 2004). Through the Thiessen polygons method for precipitation and the use of Geographic Information System (GIS) software, the average rainfall found monthly over the Ukiah Valley Groundwater Basin was obtained.

For the Thiessen polygon method, monthly precipitation data from 1991 to 2015 was obtained from the CIMIS Sanel Valley Station 106, the California Data Exchange Center (CDEC) weather station found near Lake Mendocino (COY), and from the CDEC weather station located near the City of Ukiah (UKH). Data from these weather stations was obtained because they had complete data sets from 1991 to 2015 and because they are all found in the valley at an elevation lower than 1000 ft. Data from weather stations at higher elevations was not considered since it could skew the generated precipitation results and thus not provide an accurate representation of the average rainfall over the valley. The resulting precipitation data used in the study can be found in Appendix F. Although the average rainfall over the Ukiah Valley Groundwater Basin was estimated, it should be noted that the values estimated are averages and may not truly represent the actual rainfall trends throughout the whole groundwater basin. It is assumed that the estimated rainfall occurs throughout the whole groundwater basin

when there is a possibility that some areas may not have received as much rain for a given time period.

4.2.1.5 Application Efficiency

Application efficiency is the ratio of the average water depth to the water depth targeted during an irrigation event (Sandoval-Solis et al. 2013). The application efficiency values used for this study were based off Lewis et al. (2008). From Lewis et al. (2008), system uniformity values for grape vineyards and pear orchards are provided (Table 1). The average value provided for grape vineyards, 88.8%, was used to describe the application efficiency for vineyards occurring in 1991. This value was interpolated linearly and annually until a value of 92% was obtained for the year 2015. This was done since the irrigation systems used are expected to become more efficient with time. For the past three decades, farmers have significantly conserved water in the Mendocino County portion of the Russian River Watershed where the Ukiah Valley Groundwater Basin is nestled. This has been the case because they have relied on more efficient irrigation systems that include drip irrigation for vineyards and under canopy sprinkler systems for pear orchards (Lewis et al. 2008). Given the efficient irrigation practices in the area, the application efficiency for pear orchards was estimated similarly. The average value provided for the pear orchards, 88.4% (Table 1), was used to describe the application efficiency for pear orchards in 1991. This value was interpolated linearly and annually until a value of 90% was obtained for the year 2015. The application efficiency values for pasture were also estimated given that gravity type underground pipe and valve sprinkler delivery systems are used to irrigate pasture (Lewis et al. 2008). Sandoval-Solis et al. (2013), estimated application efficiency values for various crops in different counties by using the 2001 and 2010 irrigation surveys. Using the data provided for Mendocino County (Table 2) the average value of 69.3% from the 2010

irrigation survey was used to describe the application efficiency for pasture in the year 1991. This value was interpolated linearly and annually until the maximum application efficiency value of 78 % (Table 2) was obtained for the year 2015.

Once a set of annual application efficiency values was obtained for grape vineyards, those values were applied to the white wine grapes, red wine grapes, grapes (rootstock), and grapes for raisins to describe their irrigation trends. Similarly, the annual application efficiency values found for pear orchards was applied to the few apple, cherry, olive, and pistachio orchards in the area. It was thus assumed that all the grape vineyards in the region have the same application efficiency trends, while all the orchards in the area were assumed to all share the same application efficiency trends. Given the amount of assumptions done to estimate the application efficiency of the crops in the Ukiah Valley Groundwater Basin, the authors from Lewis et al. (2008) were contacted to review and improve upon the original assumptions made to obtain a set of application efficiency values representative of the area. The application efficiency values used for this study can be found in Appendix G.

Table 1. Application efficiency values for grape vineyards and pear orchards (Lewis et al. 2008)

Crop	Mean	Standard Deviation	Minimum	Maximum
Grapes	88.8	7.5	64.3	96.0
Pears	88.4	5.5	81.9	94.3

Table 2. Application efficiency values for pasture obtained for Mendocino County (Sandoval-Solis et al. 2013) .

Year	Crop	Mean AE %	Low AE %	High AE %
2001	Pasture	73	60.6	83
2010	Pasture	69.3	58.4	78

4.2.2 Outputs

4.2.2.1 Effective Crop Evapotranspiration

The effective crop evapotranspiration represents the irrigation water requirement or the depth of water that a crop requires. It is defined as the difference between the crop water requirement, the quantity of water needed to compensate for the losses that result from evapotranspiration, and the effective precipitation (Allen et al. 1998). Using expression [3] the effective crop evapotranspiration is estimated for each crop on a monthly time step for Ukiah Valley and Redwood Valley.

$$ET_{ijk} - p_{ij} \quad [3]$$

ET_{ijk} is the evapotranspiration in feet for a given crop k in a given month *j* in year *i*, whereas the term p_{ij} represents precipitation in feet in a given month *j* and year *i*.

4.2.2.2 Effective Precipitation

The effective precipitation is the amount of precipitation used to meet the crop water requirement. Expression [4] is used to determine the effective precipitation for Ukiah Valley and Redwood Valley. The term p_{ij} represents precipitation in feet in a given month *j* and year *i* and

the term ET_{ijk} represents the evapotranspiration in feet for a given crop k in a given month *j* in year *i*.

$$p_{ij} - ET_{ijk} \quad [4]$$

4.2.2.3 Agricultural Water Use

The agricultural water use was estimated for Ukiah Valley, Redwood Valley, and ultimately for the entire Ukiah Valley Groundwater Basin. By estimating the agricultural water use, the applied water required to meet the agricultural water use is estimated. To estimate the monthly agricultural water use Equation [5] is used, whereas to estimate the annual agricultural water use Equation [6] is used.

$$WD_{ij} = \sum_{k=1}^{K} \left(\frac{ET_{ijk} - p_{ij}}{AE_{ik}} \times A_{ik} \right) \quad [5]$$

$$WD_i = \sum_{j=1}^{J} WD_{ij} \quad [6]$$

For this set of equations, WD_{ij} represents the water use of irrigation in acre feet for a given month *j* and year *i* for every crop *k*. The term WD_i represents the annual water use in acre feet in a year *i* that is representative of the sum of all of the agricultural water use obtained for each crop for a given water year. The term A_{ik} represents the area in acres of a given crop *k* found in year *i*. The term ET_{ijk} is the evapotranspiration in feet for crop *k* in a given month *j* and year *i*, whereas p_{ij} represents the precipitation in feet in a given month *j* and year *i*. Lastly, AE_{ik} represents the application efficiency for crop *k* in a given year *i*. In estimating the agricultural water use, it was assumed that no land use changes occurred for the given year.

In estimating the agricultural water use for the crops found in the Ukiah Valley Groundwater Basin, it was assumed that only 90% of the grapes are irrigated (Lewis et al. 2008). This assumption was confirmed with expert consultation (Glenn McGourty, personal communication, 2016).

Based on personal communication with Rachel Elkins, a University of California Division of Agriculture and Natural Resources Pomology Adviser in Lake and Mendocino County, it was also assumed that the few walnut orchards in the region are dry irrigated.

4.2.2.4 Runoff from Precipitation and Irrigation

To estimate the amount of runoff that results from a storm event in Ukiah Valley and Redwood Valley, Equation [7] is used. The term r'_{ij} represents the runoff that results from precipitation in a given month *j* and year *i.* The term ET_{ijk} represents the evapotranspiration in feet for a given crop k in a given month *j* in year *i*, whereas the term p_{ij} represents precipitation in feet in a given month *j* and year *i*. The term α_{ij} is the runoff factor that occurs in month *j* in year *i.* The runoff factor was assumed to be 3% based on expert consultation (McGourty, personal communication, 2016) and by the amount of runoff that was observed during the extent of the project (Fall 2015 to spring 2017) in the Ukiah Valley Groundwater Basin.

$$r'_{ij} = \left(p_{ij} - ET_{ijk}\right) \times \alpha_{ij} \quad [7]$$

Similarly, runoff that results from irrigation r''_{ij} in acre feet is estimated using Equation [8]. As defined earlier WD_{ijk} is the agricultural water use resulting for a given month *j* and year *i* and crop k, whereas AE_{ik} represents the application efficiency for crop *k* in a given year *i*. Term α_{ij} holds the same definition and value as defined for Equation [7].

$$r''_{ij} = \left[WD_{ijk} \times (1 - AE_{ik})\right] \times \alpha_{ij} \quad [8]$$

4.2.2.5 Recharge from Precipitation and Irrigation

For this study, the soil moisture content is not considered, thus after the crop water requirement has been met and runoff has been generated, the precipitation that is in excess will percolate into the aquifer. Equation [9] describes the recharge that may occur in Redwood Valley and Ukiah Valley as a result of precipitation.

$$RP_{ij} = \left(p_{ij} - ET_{ijk} - r'_{ij}\right) \times A_{ik} \quad [9]$$

The term RP_{ij} represents the recharge that occurs from precipitation in acre feet in a given month *j* and given year *i*. The term p_{ij} represents the amount of precipitation in feet that is present in a given month *j* and given year *i*. The term A_{ik} is representative of the area in acres of a given crop *k* in a given year *i*. The term ET_{ijk} is the evapotranspiration in acre feet for a crop *k* in a month *j* and in year *i*, whereas the term r'_{ij} is the surface runoff that occurs as a result of precipitation for a given month *j* and year *i*.

Similarly, Equation [10] is used to estimate the recharge in Redwood Valley and Ukiah Valley that results from irrigation. The term WD_{ijk} is the water use in acre feet that results for a given crop *k* in a given month *j* and given year *i*, whereas the term AE_{ik} represents the application efficiency of a given crop *k* in a specific year *i*. Lastly, the term r''_{ij} represents the surface runoff that results from irrigation for a given month *j* and given year *i*.

$$RI_{ij} = \sum_{k=1}^{K} \left[WD_{ijk} \times (1 - AE_{ik})\right] - r''_{ij} \quad [10]$$

To estimate total recharge from irrigation and precipitation for a given month *j* and year *i*, Equation [11] is used. To estimate total annual recharge from precipitation and irrigation Equation [12] is used. From the expressions the term R_{ij} is the total recharge that results in acre feet in a given month *j* and year *i*. The term R_i represents the total recharge in acre feet in a given year *i*, whereas the terms RP_{ij} and RI_{ij} are representative of the recharge, in acre feet, respectively from precipitation and irrigation for a given month *j* and year *i*.

$$R_{ij} = RP_{ij} + RI_{ij} \quad [11]$$

$$R_i = \sum_{j=1}^{J} R_{ij} \quad [12]$$

4.2.2.6 Agricultural Drainage

Agricultural drainage is the excess water removed from irrigated agricultural land by surface ditches and/or subsurface permeable pipes (Busman and Sands 2002). For the Ukiah Valley Groundwater Basin it was assumed that 3% of the water that is applied to meet agricultural water use, whether it stems from groundwater or surface water sources, results in agricultural drainage for consistency with runoff from storms and irrigation. In addition, 3% of water applied to meet frost protection, post-harvest applications, and heat protection also became agricultural drainage. The agricultural drainage that results in Ukiah Valley and Redwood Valley is estimated from 1991 to 2015 on a monthly time step.

4.3 Frost Protection, Post Harvest Application, and Heat Protection

In the Ukiah Valley Groundwater Basin, surface water is used for frost protection, post-harvest applications, and heat protection. For orchards and vineyards located at an elevation

lower than 700 ft, water is applied for frost protection during times of radiant frost which usually occurs from March to May (Lewis et al. 2008). To increase the carbohydrate storage and to germinate the cover crop seed bank, post-harvest water applications can be applied to vineyards from September to October (Lewis et al. 2008). In times of extreme heat, usually July and August, water can be applied to vineyards for heat protection (Lewis et al. 2008). Although frost protection, post-harvest application, and heat protection occur in the Ukiah Valley Groundwater Basin, it is unclear how often farmers use water for frost protection, post-harvest application, and heat protection it depends on the irrigation systems and the availability of surface water that farmers have access to (Lewis et al. 2008). For this study the amount of water used for frost protection, post - harvest application, and heat protection was estimated and accounted for in the water budget.

To estimate the quantity of water used for frost protection in Ukiah Valley, Redwood Valley and ultimately in the Ukiah Valley Groundwater Basin, the number of frost events was identified by (Silva-Jordan 2016), who estimated the number of frost events in Redwood Valley and in Hopland from historical meteorological data. Frost events in Hopland were assumed to occur in Ukiah Valley. It was then assumed that 2,155 acres of vineyards required frost protection annually in Ukiah Valley and 548 acres of vineyards in Redwood Valley required frost protection annually since the actual number of acres is unknown from year to year. In addition, the application rate of 50 gallons/min/acre was assumed. These assumptions were obtained from Lewis et al. (2008) for Ukiah Valley and Redwood Valley. Frost protection is also applied to pear orchards so it was assumed that 649 AF/y of water is applied for frost protection in Ukiah Valley and 55 AF/y in Redwood Valley. The 649 AF/y value was divided evenly between the number of frost events occurring in Ukiah Valley and the 55 AF/y value was divided

evenly between the number of frost events seen in Redwood Valley. The frost protection applied to pear orchards was derived from Lewis et al. (2008).

To estimate the annual quantity of water used for post-harvest application, it was assumed that only one post harvest event occurred each year and that the resulting water used in Ukiah Valley and Redwood Valley was 60 AF/y and 149 AF/y, respectively. These assumptions resulted from Lewis et al. (2008). For this study it was assumed that the post-harvest application event always occurred in September of every year.

Finally, to estimate the annual quantity of water used for heat protection, it was assumed that 5 heat events occurred where the total water used was 149 AF/y in Ukiah Valley and 57 AF/y in Redwood Valley. These assumptions resulted from Lewis et al. (2008). For this study it was assumed that the heat events occurred in July of every year with the assumption that July is the warmest month of the year.

Given the assumptions, a time series of how much water may be used annually for frost protection, post-harvest application, and heat protection was estimated for Ukiah Valley and Redwood Valley. After comparing the water use and water supplies in Ukiah Valley, it was seen that the estimates of frost protection, post-harvest application, and heat protection could be covered with the water supplies available. The resulting quantities of frost protection, post harvest application, and heat protection were thus considered in the water budget analysis. For Redwood Valley, there were some years, year 2013 and 2014, that the water supplies was not be enough to cover the frost protection, post-harvest application, and heat protection. For those years, it was assumed that no frost protection, post-harvest application, and heat protection occurred. This assumption can be supported by the fact that there was a drought during that time

frame and it is likely that Redwood Valley County Water District and private water users in Redwood Valley did not have access to as much surface water in those years to meet frost protection, post-harvest application, and heat protection water demands.

The Ukiah Valley Groundwater Basin has limited data available on the quantity of water used annually for frost protection, post-harvest application, and heat protection. To estimate the amount of water used annually, Lewis et al. (2008) was referenced. In this study it was assumed that the quantity of water used for frost protection, post-harvest application, and heat protection in Ukiah Valley and Redwood Valley remained the same from year to year, as well as the time frame under which the water was used each year. In reality, these estimates have an associated uncertainity because they may not represent reality. The amount of water used depends on the micro climate, the crops, water availability, and ultimately the farmers. To gain more knowledge on the amount of water used by each farmer, farmers may be encouraged to report their water use to the GSA.

4.4 Surface Water Mass Balance

A surface water mass balance was done to estimate the groundwater–surface water interactions monthly from 1991-2015 in a control volume. For this study, the *control volume* is the space located between the confluence of the East and West forks of the Russian River near the City of Ukiah [United States Geological Survey (USGS) streamflow gauges for the East Fork and West Fork of the Russian River] and the southern portion of the groundwater basin located near Hopland [USGS stream flow gauge near Hopland] (Figure 10).

For this study, the water budget is only for the Ukiah Valley portion of the Ukiah Valley Groundwater Basin and not for the entire groundwater basin because there is no streamflow

gauge upstream of Redwood Valley. For the control volume proposed for Ukiah Valley, the surface water inflows (streamflow gauges at the East and West forks of the Russian River) and the outflow (USGS streamflow gauge at Russian River at Hopland) are well defined.

Although, this water budget is calculated only in Ukiah Valley, the obtained results from the water budget will still be useful in characterizing the Ukiah Valley Groundwater Basin. The reason for that is because within the specified control volume majority of the groundwater pumping that occurs in the Ukiah Valley Groundwater Basin is captured because Ukiah Valley is groundwater dependent and Redwood Valley is not. In addition, most of the surface water diversions from the Russian River in the Ukiah Valley Groundwater Basin are captured within the defined control volume.

The surface water mass balance was used to estimate the surface water gains and losses using conservation of mass. The surface water storage in a determined control volume varies with surface water inflows and outflows described with Equation [13]. Since Lake Mendocino is outside the control volume, Equation [13] simplifies to Equation [14]. The term Δt in Equation [13] is change in time. The surface water inflows and outflows in the project area are identified with Equation [15] and [16] respectively. The surface water diverters in the in the control volume are defined with Equation [17]. The surface water gains and losses are estimated using Equation [18].

$$\Delta Storage_t{}^{SW} = [Inflow_t{}^{SW} - Outflow_t{}^{SW}]\,\Delta t \quad [13]$$

$$Inflow_t{}^{SW} = Outflow_t{}^{SW} \quad [14]$$

$$Inflow_t{}^{SW} = Q_t{}^{WF} + Q_t{}^{EF} + Return_t{}^{SW} + Return_t{}^{GW} + Gains_t{}^{SW} \quad [15]$$

$$Outflow_t{}^{SW} = Q_t{}^{Hopland} + \sum_{i=1}^{i=1} User_t{}^{SW,i} + Losses_t{}^{SW} \quad [16]$$

$$\sum_{i=1}^{i=1} User_t{}^{SW,i} = CityUkiah_t^{SW} + Willow_t^{SW} + Millview_t^{SW} + Calpella_t^{SW} + Rogina_t^{SW} + RRFC_t^{SW} + PrivateUsers_t^{SW} \quad [17]$$

$$Gains_t{}^{SW} - Losses_t{}^{SW} = \left[Q_t{}^{Hopland} + \sum_{i=1}^{i=I} User_t{}^{SW,i}\right] - \left[Q_t{}^{WF} + Q_t{}^{EF} + Return_t{}^{SW} + Return_t{}^{GW}\right] \quad [18]$$

4.4.1 Surface Water Mass Balance Inflows

4.4.1.1 Streamflow

The flow from the West Fork of the Russian River is a surface water inflow in the surface water mass balance represented with the term $Q_t{}^{WF}$ in AF/month in Equation [15]. Data for the West Fork of the Russian River was obtained monthly from 1991 to 2015 from the stream flow gauge USGS 11461000.

The flow from the East Fork of the Russian River is another surface water inflow represented by the term $Q_t{}^{EF}$ in AF/month in equation [15]. Data for the East Fork of the Russian River was obtained monthly from 1991-2011 from the stream flow gauge USGS 11462000. Since the acquired data only went up to the year 2011, flow records from 2012-2015 were filled with data obtained from CDEC from the station COY located near Lake Mendocino. The reservoir outflow was thus assumed to be representative of the stream flow occurring in the East Fork of the Russian River.

4.4.1.2 Surface Water Returns

A surface water return is water that may have originated from surface water or groundwater sources that ultimately returns into the surface water system, the Russian River. The surface water returns are surface water inflows represented in Equation [15] with the terms $Return_t^{SW}$ and $Return_t^{GW}$. The agricultural drainage described in Section 4.1.2.6 is a surface water return as well as the waste water that is treated and discharged into the Russian River from the City of Ukiah's Waste Water Treatment Facility. The amount of effluent discharged into the Russian River was obtained from a personal communication with Sean White, director of water and sewer for the City of Ukiah. Monthly discharge data was obtained from 2001-2015 and the data from 1991-2000 was estimated using the median value for each month. Since the discharge was estimated from 1991 to 2000, a small degree of uncertainty may be present in the water budget during that time frame.

4.4.1.3 Surface Water Gains

A surface water gain is the combined amount of surface water from tributaries and the groundwater that flows through the streambed into the surface water system. It is an inflow in the surface water mass balance that is represented with the term $Gains_t^{SW}$ in AF/month in Equation [15]. This value is unknown until solved for monthly from 1991-2015 using Equation [18].

4.4.2 Surface Water Mass Balance Outflows

4.4.2.1 Streamflow

The stream flow, flowing out of the southern end of the groundwater basin is a surface water outflow in the surface water mass balance and is represented using the term $Q_t^{Hopland}$ in

AF/month in Equation [16]. Data was obtained monthly from 1991-2015 from the stream flow gauge USGS 11462500.

4.4.2.2 Surface Water Diversions

The surface water diversions in Ukiah Valley were identified as a surface water outflow in the surface water mass balance and described with Equation [17]. The surface water diversions are the City of Ukiah, Willow County Water District, Millview County Water District, Calpella County Water District, Rogina Water Co, RRFC contractors, and surface water users that have their own water right to divert water for municipal and agricultural water demands. The monthly surface water diversions that occur by each surface water diverter i is represented in Equation [16] with the term $User_t^{SW,i}$ in the units of AF/month.

The surface water diverted annually and monthly by the City of Ukiah was obtained from the City of Ukiah (Sean White, personal communication, 2016). The amount of surface water diverted monthly and annually by the water districts was obtained from the personal communication with Bill Koehler, general manager of Millview County Water District and Redwood Valley County Water District.

The amount of surface water diverted by users that have their own water right was obtained from the SWRCB 2010-2013 Average Demand Dataset (SWRCB 2017). In this dataset monthly diversions from 2010-2013 are reported. Data was obtained for Ukiah Valley using a series of hydrologic unit code 12 values (HUC12); the values used were 180101100403, 180101100404, 180101100401, 180101100407, 180101100402, and 180101100405. To avoid double counting, diversions reported by the water districts, water sold by RRFC, and water diverted from RRFC contractors was removed from the SWRCB dataset. A list of the 2010-2013

RRFC contractors was obtained through personal communication with RRFC General Manager Tamara Alaniz to identify surface water diversions that needed to be removed to avoid double counting. Since the data obtained from the HUC12 value of 180101100407 covered regions in Hopland Valley, an area outside of the Ukiah Valley Groundwater Basin, information found online for the surface water diverters was used to determine whether or not they were in Ukiah Valley. If a diversion was found to occur outside of the groundwater basin that particular data set was removed. With a final monthly data set obtained for 2010-2013, the monthly average water use was obtained and used to fill in the missing years from 1991-2009 and 2014-2015. Although Redwood Valley is not considered in the water budget, the surface water diversions occurring from users that have their own water right was still determined. These estimated surface water diversions may have some degree of uncertainty considering that there was not a full data set and the unknown years were estimated off the available records.

As noted in Section 3.2.5, Rogina Water Co. is completely surface water dependent, with water supplies stemming from a RRFC contract to purchase surface water and the rest of the their water supplies stemming from underflow (surface water). Since no data was obtained from Rogina Water Co., monthly surface water diversions were estimated. Information on monthly surface water quantities obtained from RRFC from 1991-2015 was obtained from RRFC records (Tamara Alaniz, personal communication, 2016) and the remaining monthly surface water supplies from underflow was estimated. By using the groundwater production records from the City of Ukiah and Calpella County Water District, a time series of the percentage of groundwater produced monthly for a given year was obtained from 1991-2015 and assumed to represent the amount of underflow used in Rogina Water Co. The urban water use for Rogina Water Co. was estimated from 1991-2015, the annual water production from 2009-2013 was obtained from

(SCWA 2015), and the annual water production from 2000-2009 reported in MCWA (2010). From the monthly RRFC quantities, the annual surface water supply from RRFC is known. By taking the difference between the annual urban water use and the annual RRFC quantities, the difference can be assumed to be the underflow used annually by Rogina Water Co. Similarly, given the annual water production records found from SCWA (2015) and MCWA (2010), the estimated annual use of underflow could be estimated for the years of 2000-2013. For the years in which there were two estimated annual underflow quantities, the average between them was taken and assumed to be the total underflow quantity for that year. With estimated annual underflow values, the time series for the percentage of underflow assumed to be used monthly was applied to estimate the monthly quantity of underflow used by Rogina Water Co. Finally, the total monthly surface water diversions occurring in Rogina Water Co. were estimated by taking the sum of the monthly RRFC values and the estimated monthly underflow values. The estimated surface water use by Rogina Water Co. may have some degree of uncertainty given their water use was estimated off the reports available and the records available from the RRFC. To improve upon this, monthly records from Rogina Water Co. would have to be obtained.

Another major source of surface water diversions that occur in Ukiah Valley results from the contractors that purchase surface water from RRFC. The assumption in this study was that the RRFC water not already used by the water districts, the City of Ukiah, and the Hopland Public Utility District (PUD), would be used in Ukiah Valley to meet the agricultural water use. The total surface water sold annually by RRFC and the monthly water quantities sold to the water districts, City of Ukiah, and Hopland PUD was obtained (Tamara Alaniz, personal communication, 2016) and was used to estimate the water monthly available from RRFC to meet the agricultural water use in Ukiah Valley. The resulting monthly quantities were identified as

RRFC surface water purchased by contractors, diverted and used to meet agricultural water demands in Ukiah Valley. RRFC records prior the year 2000 do not have a clear record of how much water was sold to each contractor. As a result, some uncertainty arises given that the amount of water sold to each contractor was estimated and thus it may have had a slight effect on the amount of water that was actually used for agriculture from RRFC in Ukiah Valley from 1991 to 2000.

4.4.2.3 Surface Water Losses

A surface water loss is surface water that flows through the streambed to recharge the aquifer. They are a surface water outflow in the surface water mass balance represented with the term $Losses_t^{SW}$ in AF/month in Equation [16]. This value is unknown until solved for from 1991-2015 on a monthly time step using Equation [18].

4.5 Aquifer Storage

Using water table elevations derived from monitoring wells, groundwater depth contours were created in GIS by using Inverse Distance Weighted Interpolation (Rodriguez Arellano 2015). The water table elevations were obtained from DWR monitoring wells found in the Ukiah Valley Groundwater Basin (DWR 2017). The data was obtained from DWR's water data library from 1991 to 2015 where most water table measurements were provided at 6 month intervals, with measurements taken in the fall and spring (DWR 2017). The groundwater depths are contours generated in GIS in 20 ft increments, *m,* in an analysis from 1991 to 2015 for the months when water table measurements are available. The resulting groundwater depth contour maps can be found in Appendix H. The aquifer storage underlying the study area was found

using Equation [19]. The S_t term represents the aquifer storage in acre feet for the given time step. The term A_{im} is the resulting area in acres for a given groundwater depth for a given time step. The term Z is a reference datum used to represent the bottom of an idealized one bucket aquifer system; this value was proposed to be 490 ft. For simplification, the one bucket aquifer system was considered to represent the aquifer system of the Ukiah Valley Groundwater Basin (Rodriguez Arellano 2015). The term d_{mi} is the groundwater surface elevation with respect to sea level in feet. The term γ is the specific yield, which was assumed to be 8%, a value obtained from Bulletin 118 for the Ukiah Valley Groundwater Basin.

$$S_t = \sum_{m=20}^{M} [A_{im} \times (d_{mi} - Z)] \times \gamma \qquad [19]$$

To estimate the change in aquifer storage, storage found from a previous time step is subtracted from the storage at the current time step. The initial aquifer storage used to estimate the change in aquifer storage was 324,000 AF, the approximate groundwater storage capacity reported in Bulletin 118 for the Ukiah Valley Groundwater Basin (DWR 2004). Ultimately, the derived values for the change in aquifer storage are fed into the groundwater mass balance (Equation [23]).

4.6 Groundwater Mass Balance

A groundwater mass balance estimates the lateral groundwater inflows and outflows monthly from 1991-2015 in the control volume using the conservation of mass equation. The groundwater storage that occurs as a result of groundwater inflows and outflows is described with Equation [20], where the term Δt represents the change in time. The groundwater inflows

and outflows in the groundwater basin are identified by Equation [21] and Equation [22] respectively. The lateral groundwater gains and losses are estimated using Equation [23].

$$\Delta Storage_t{}^{GW} = [Inflow_t{}^{GW} - Outflow_t{}^{GW}]\Delta t \quad [20]$$

$$Inflow_t{}^{GW} = Recharge_t{}^{Precipitation} + Recharge_t{}^{Irrigation} + Losses_t{}^{SW} + Recharge_t{}^{Percolation\ Ponds} + Recharge_t{}^{Tributary} + Gains_t{}^{GW} \quad [21]$$

$$Outflow_t{}^{GW} = \sum_{i=1}^{i=1} AW_t{}^{GW,crop\ k} + Gains_t{}^{SW} + GE_t{}^{Municipal} + Losses_t{}^{GW} \quad [22]$$

$$Gains_t{}^{GW} - Losses_t{}^{GW} = \Delta Storage_t{}^{GW} - \left[Recharge_t{}^{Precipitation} + Recharge_t{}^{Irrigation} + Losses_t{}^{SW} + Recharge_t{}^{Percolation\ Ponds} + Recharge_t{}^{Tributary}\right] + \left[\sum_{i=1}^{i=1} AW_t{}^{GW,crop\ k} + Gains_t{}^{SW} + GE_t{}^{Municipal}\right] \quad [23]$$

4.6.1 Groundwater Mass Balance Inflows

4.6.1.1 Recharge from Precipitation and Irrigation

The recharge from precipitation and irrigation is described in Section 4.1.2.5 for Ukiah Valley as a groundwater inflow in the groundwater mass balance. The recharge that results from precipitation is represented by the term $Recharge_t{}^{Precipitation}$ in AF/month while the recharge from irrigation is represented by the term $Recharge_t{}^{Irrigation}$ in AF/month in Equation [21].

4.6.1.2 Surface Water Losses

The surface water losses from the surface water mass balance, Section 4.3.2.3, are a groundwater inflow for the groundwater mass balance. In Equation [21] the surface water losses are represented by the term $Losses_t{}^{GW}$ with the units of AF/month.

4.6.1.3 Recharge from Percolation Ponds

The recharge from percolation ponds is a groundwater inflow in the groundwater mass balance defined by the term $Recharge_t^{Percolation\ Ponds}$ in Equation [21] in the units of AF/month. The percolation ponds in Calpella County Water District and in the City of Ukiah are considered in the analysis.

The waste water treatment facility located in the community of Calpella, is located in the south end of the community along the west banks of the Russian River in which it serves the community of Calpella and the surrounding areas (MC 2010). In personal communication with David Redding, General Manager of Willow County Water District, the facility provides secondary treatment with aerated lagoons and all of the generated effluent is discharged into one of three percolation ponds that are 47,900 ft^2 each. The monthly discharge into a percolation pond was obtained from 1991-2015 (David Redding, personal communication, 2016). However, since there is only one reliable meter to measure influent, the values provided were influent values assumed to be the effluent values. To estimate monthly percolation rates, the monthly rain (Section 4.1.1.4) was considered along with the evaporation that may occur on the percolation ponds. Pan evaporation values from the CDEC COY station at Lake Mendocino were obtained and assumed to represent the amount of evaporation from the percolation ponds found in the waste water treatment facility in Calpella. The monthly percolation rate for one percolation pond was found by summing the effluent and the precipitation and subtracting the evaporation. The resulting percolation rates were the values used in this study. To improve upon the estimated monthly percolation rates, a meter should be placed in the waste water treatment facility to measure effluent discharge.

For the rest of Ukiah Valley, the Ukiah Valley Sanitation District and the City of Ukiah provide most sanitary sewer services. The Ukiah Valley Sanitation District and the City of Ukiah have collection systems for sewage taken to the City of Ukiah Waste Water Treatment Facility. Treated effluent is discharged into the Russian River or sent to percolation ponds. Monthly data from 2001-2015 was obtained (Sean White, personal communication 2016) showing the effluent quantities that are discharged monthly into the Russian River and to the percolation ponds. The percolation rates used in this study originated from work done by Carollo Engineers for the City of Ukiah's Waste Water Treatment Facility who estimated monthly percolation rates from 2009-2015 (Carollo Engineers, unpublished excel sheet, 2016). The remaining percolation rates from 1991-2008 were estimated using the median value for each month. Since the percolation rates were estimated from 1991 to 2008, a small degree of uncertainty may be present in the water budget during that time frame.

4.6.1.4 Tributary Recharge

The recharge resulting from tributary influence was represented with the term $Recharge_t^{Tributary}$ in Equation [21] in the units of AF/month. Tributary data was obtained from (Flint et al. 2015) for the reach near Hopland.

4.6.1.5 Lateral Groundwater Gains

The lateral groundwater gains are a groundwater inflow in the groundwater mass balance. This term $Gains_t^{GW}$ in Equation [21] is representative of the amount of water that is flowing latterly into the groundwater basin and is in the units of AF/month. This term is unknown until solved for using Equation [23].

4.6.2 Groundwater Mass Balance Outflows

4.6.2.1 Applied Groundwater for Agricultural Water Use

The groundwater pumped for agricultural water use for a given crop *k*, is represented with the term $AW_t^{GW,crop\ k}$ in AF/month in Equation [22]. This value is estimated as the difference between the monthly agricultural water use in Ukiah Valley (Section 4.1.2.3) and the surface water available monthly for agricultural water use. The surface water available to meet the agricultural water use stems from RRFC or from private water users that have their own water right to divert water. To estimate the amount of water diverted from private users to irrigate, data was obtained from the SWRCB 2010-2013 Average Demand Dataset, as explained before (SWRCB 2017).

4.6.2.2 Surface Water Gains

The surface water gains identified in Section 4.3.1.3 from the surface water mass balance are an outflow in the groundwater mass balance. The surface water gains are represented by the term $Gains_t^{SW}$ in AF/month in Equation [22].

4.6.2.3 Groundwater Extractions for Municipal Water Use

In the Ukiah Valley Groundwater Basin, the City of Ukiah and Calpella County Water District are both partially dependent on groundwater supplies to meet municipal water use. Monthly groundwater production values for the City of Ukiah from 1991 to 2015 were obtained from the City of Ukiah (Sean White, personal communication, 2016). In addition, monthly groundwater production values for Calpella County Water District from 1991-2015 were obtained (Bill Koehler, personal communication, 2016). The groundwater production values are

an outflow in the groundwater mass balance represented by the term $GE^{Municipal}$ in AF/month in Equation [22].

4.6.2.4 Lateral Groundwater Losses

The lateral groundwater losses are an outflow in the groundwater mass balance and are represented by the term $Losses_t^{GW}$ in AF/month in Equation [22]. This term is unknown until solved for monthly from 1991 to 2015 with Equation [23].

5. Results

5.1 Ukiah Valley Groundwater Basin Characterization

An overview of the crops in the Ukiah Valley Groundwater Basin was developed from land use data from Mendocino County (Chuck Morse, personal communication, 2016). In Ukiah Valley (Figure 13) the prominent crops are red wine grapes, white wine grapes, and Bartlett pears. The region also has some cherry orchards, olive orchards, other types of pear orchards, pistachio orchards, walnut orchards, and pasture. Since there are only a few acres of these crops they were classified as other in Figure 13. On average, 6,368 acres of agricultural land exists in Ukiah Valley. In Redwood Valley (Figure 14) the prominent crops are red wine grapes and white wine grapes with a few acres of Bartlett pears, apple orchards, grapes (rootstock), olive orchards, pistachio orchards, pasture, walnut orchards, and raisin grapes. A few crops in Redwood Valley are classified as other in Figure 14. On average, 2,404 acres of agricultural land exists in Redwood Valley. Overall in the Ukiah Valley Groundwater Basin (Figure 15) the major crops are red wine grapes, white wine grapes, and Bartlett Pears, averaging 8,772 acres of agricultural land.

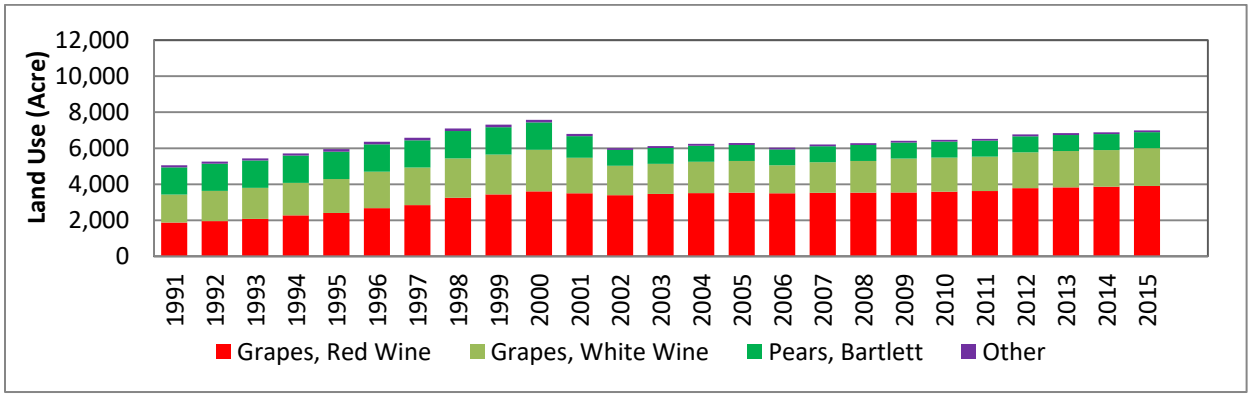


Figure 13.Land use trends for Ukiah Valley.

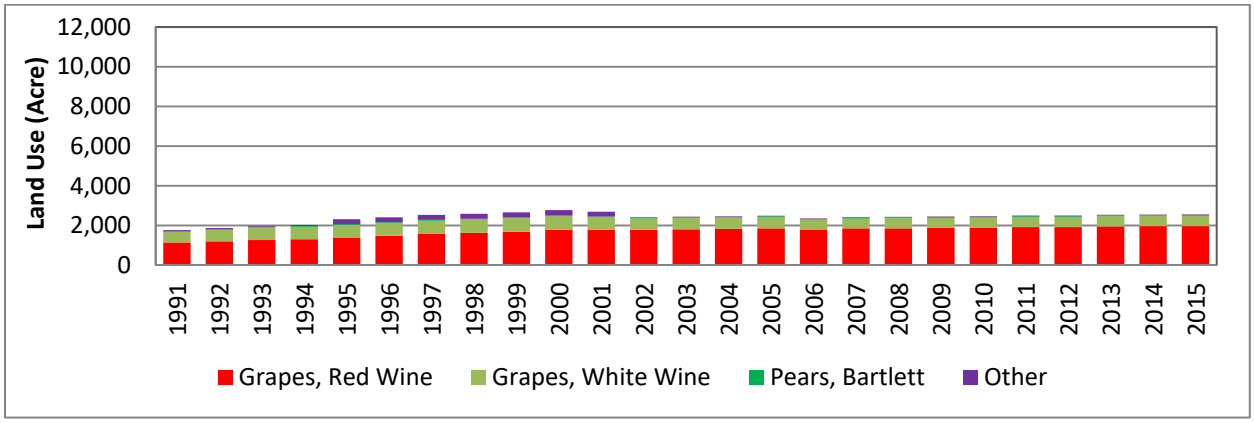


Figure 14. Land use trends for Redwood Valley.

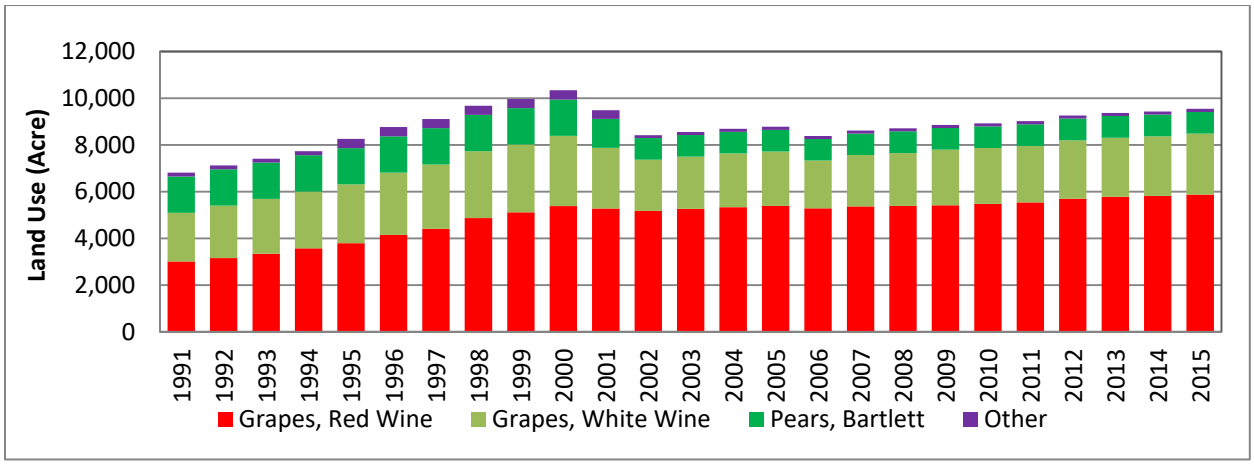


Figure 15. Land use trends for the Ukiah Valley Groundwater Basin.

Given the land use trends in Ukiah Valley, Redwood Valley, and the Ukiah Valley Groundwater Basin, total agricultural water use was estimated. In Ukiah Valley (Figure 16) the average agricultural water use is 7,789 AF/y where 6,635 AF/y stems from the water applied to meet the crop water requirements and the remaining 1,154 AF/y stems from the water applied for frost protection, post-harvest application, and heat protection. In Redwood Valley (Figure 17) the average agricultural water use is 2,393 AF/y, the quantity of water required to meet the crop water requirements is 2,006 AF/y, and the remaining 387 AF/y is representative of the amount of water applied for frost protection, post-harvest application, and heat protection. For the Ukiah

Valley Groundwater Basin (Figure 18) average agricultural water use is 10,181 AF/y. In combing the results obtained from Ukiah Valley and Redwood Valley, average water required to meet the crop water use is 8,641 AF/y, whereas the estimated annual amount of water that may be used in the Ukiah Valley Groundwater Basin for frost protection, post-harvest application, and heat protection averages approximately 1,541 AF/y. These water use estimates were compared with Lewis et al. (2008) and discussed with expert consultation (David Lewis & Glenn McGourty, personal communication, 2016). The resulting agricultural water use in this study agrees with the results published in Lewis et al. (2008) suggesting that the estimated quantities are representative of the Ukiah Valley Groundwater Basin.

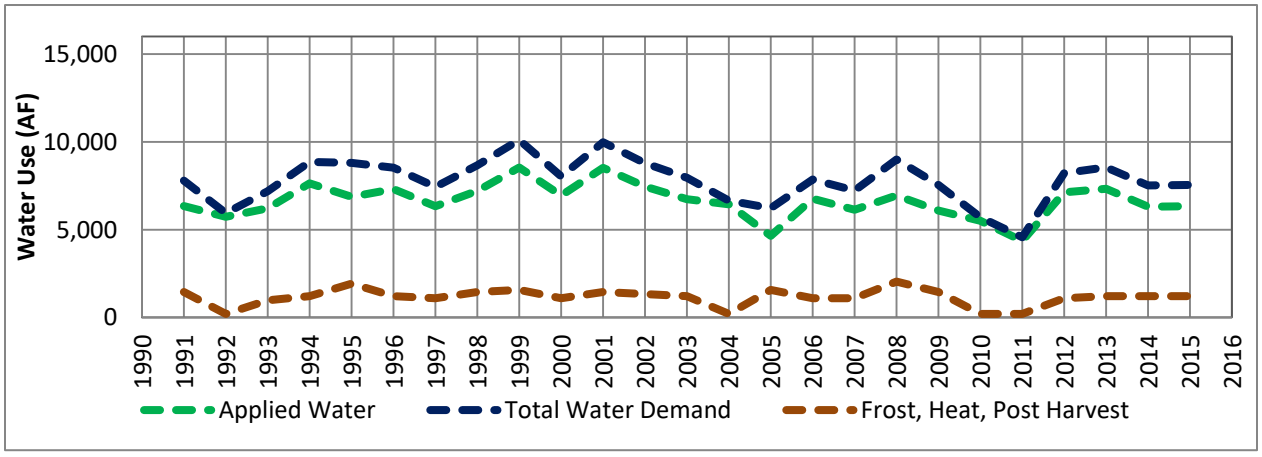


Figure 16. Total agricultural water use in Ukiah Valley.

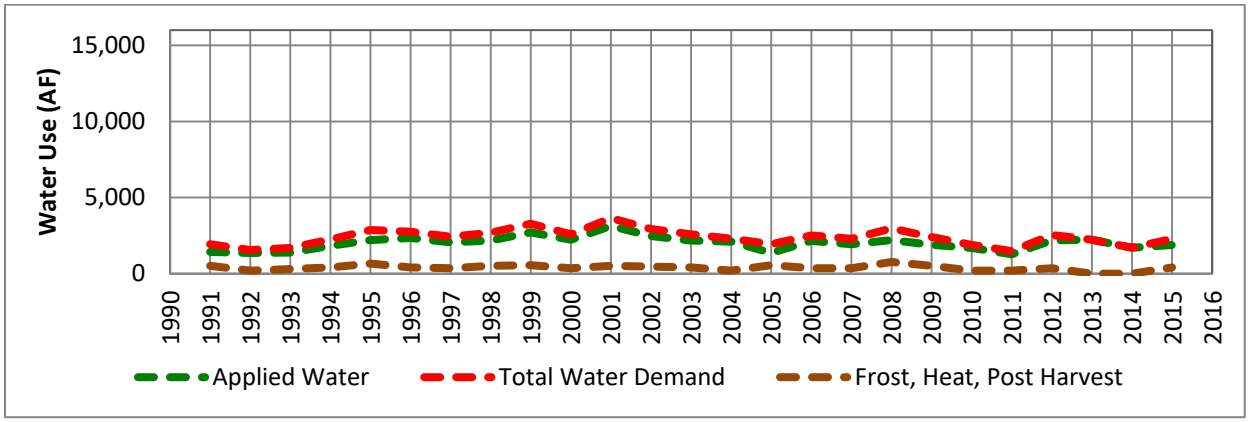


Figure 17. Total agricultural water use in Redwood Valley.

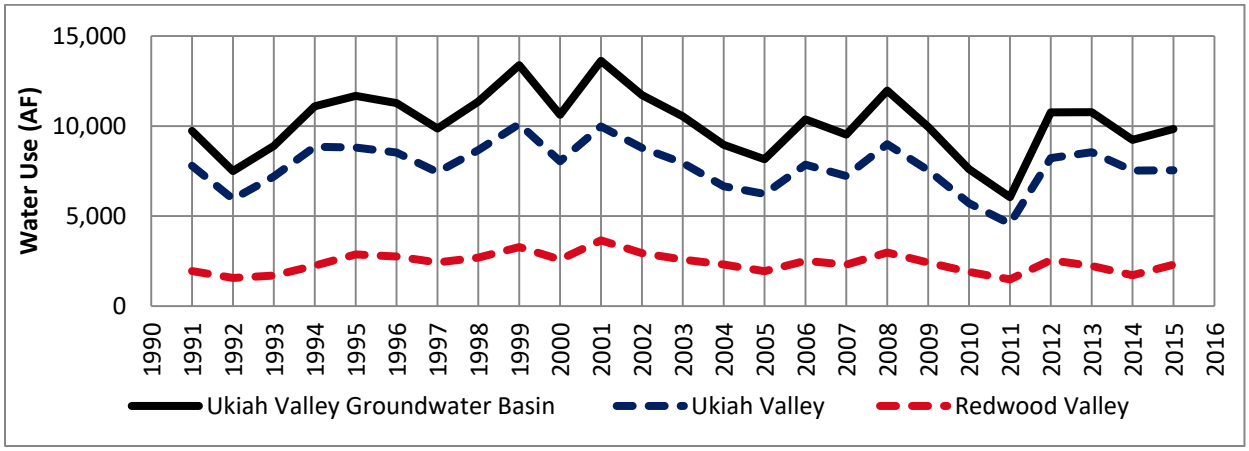


Figure 18.Total agricultural water use in the Ukiah Valley Groundwater Basin.

For Ukiah Valley, Redwood Valley, and the Ukiah Valley Groundwater Basin the recharge from irrigation and precipitation was estimated. The annual recharge from irrigation and precipitation is 23,011 AF/y on average for the Ukiah Valley Groundwater Basin (Figure 19). For Ukiah Valley annual recharge from precipitation and irrigation averages 16,681 AF/y, and in Redwood Valley the annual recharge from precipitation and irrigation on average is 6,330 AF/y.

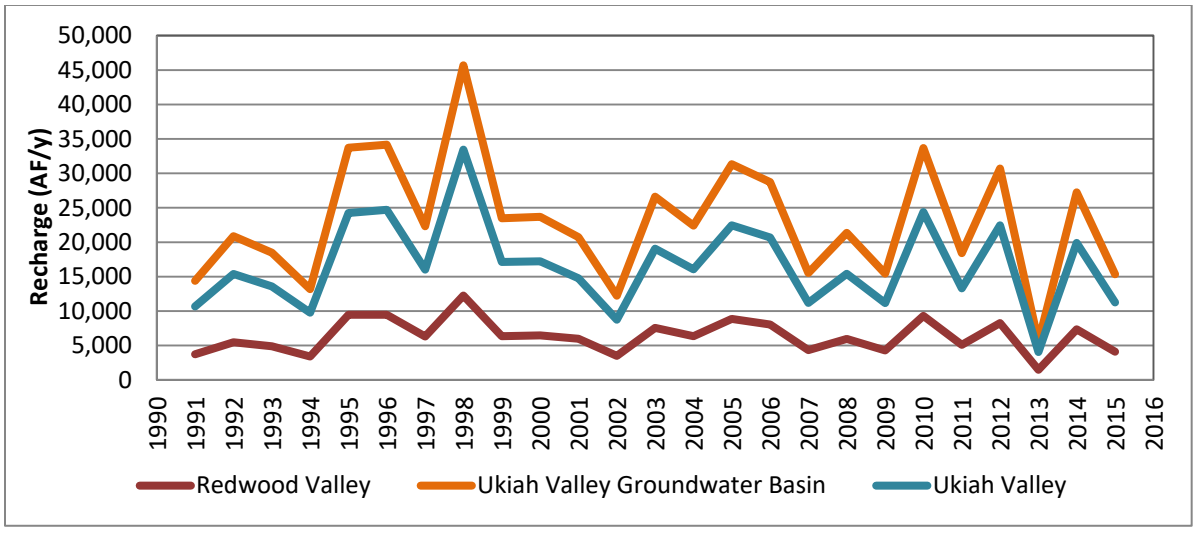


Figure 19. Groundwater recharge in Redwood Valley, Ukiah Valley, and the Ukiah Valley Groundwater Basin occurring from precipitation and irrigation from 1991-2015

All major water supplies and water use in Ukiah Valley were identified for the water budget. The total agricultural water use in Ukiah Valley (Figure 20) is 7,789 AF/y on average and can be divided into categories: (1) the applied water for crop water use and (2) for frost protection, post-harvest application, and heat protection. This agricultural water use is met with surface water and groundwater supplies, on average 2,468 AF/y is supplied from groundwater and 5,321 AF/y is supplied from surface water. For the surface water supplies, on average 2,940 AF/y comes from RRFC contracts and the remaining 2,381 AF/y comes from individual water right holders. Figure 21 shows the quantity of surface water and groundwater used annually to meet the agricultural water use in Ukiah Valley.

Of the estimated agricultural water use in Ukiah Valley, the greatest source of uncertainty stems from the frost, post harvest, and heat protection, as explained in Section 4.3. Although it may have some uncertainty, this quantity only makes up 15% of the total agricultural water use.

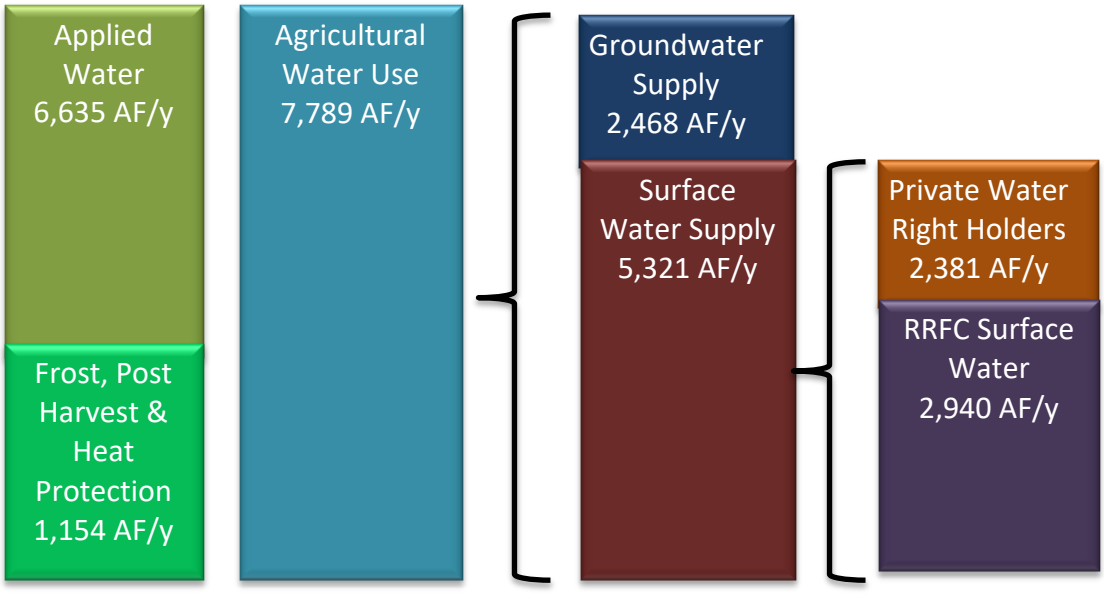


Figure 20.Identification of the average agricultural water use found in Ukiah Valley and the associated water supplies used on average to meet the agricultural water use.

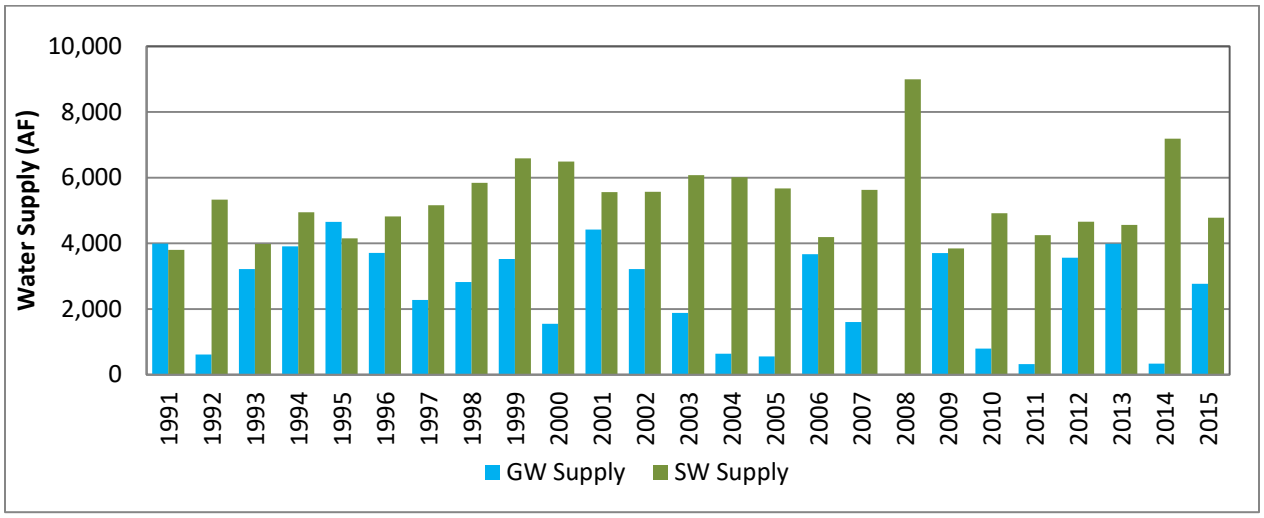


Figure 21. Groundwater and surface water used annually to meet the agricultural water use in Ukiah Valley.

Municipal water use in Ukiah Valley (Figure 22) averages 6,685 AF/y. Supplies include 930 AF/y from groundwater and 5,755 AF/y of surface water. Communities that partially depend on groundwater are the City of Ukiah and Calpella County Water District. On average, the City of Ukiah will use approximately 897 AF/y of groundwater, whereas Calpella County Water District pumps on average about 33 AF/y. For surface water sources to meet the municipal water use, an average of 1,708 AF/y comes from RRFC and 4,047 AF/y from underflow, surface water from a water right held by the City of Ukiah or the water districts, or surface water obtained by a user with a water right to divert water for domestic purposes. Figure 23 shows the annual water use of surface water sources for the City of Ukiah, Millview County Water District, Willow County Water District, Rogina Water Co, and private water right users. Figure 24 shows the annual groundwater production for the City of Ukiah and Calpella County Water District. Unlike the agricultural water use in Ukiah Valley, the municipal water use is less uncertain since most of the water use records were collected directly from the City of Ukiah and the water districts.

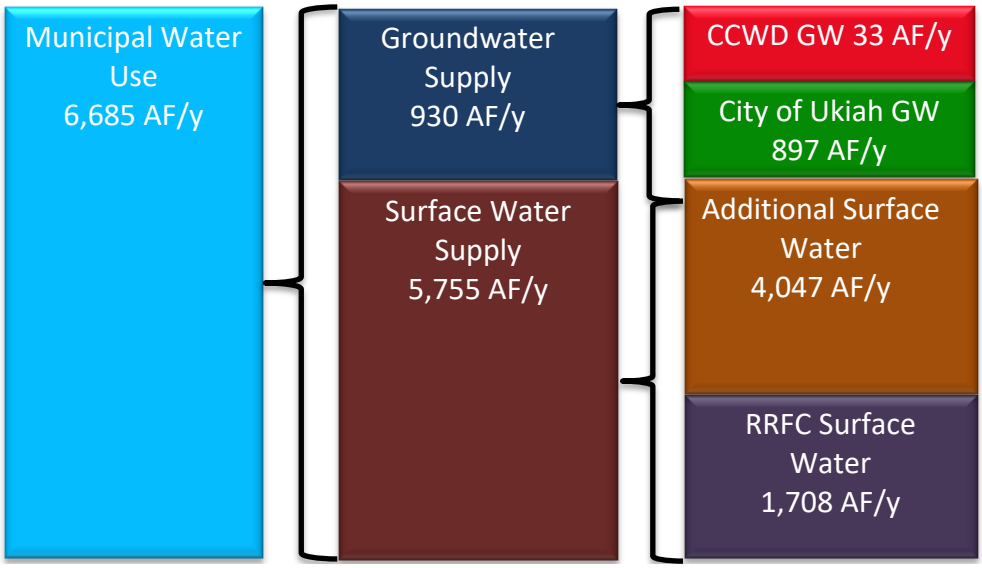


Figure 22. Identification of the average municipal water use found in Ukiah Valley and the associated water supplies used on average to meet the municipal water use.

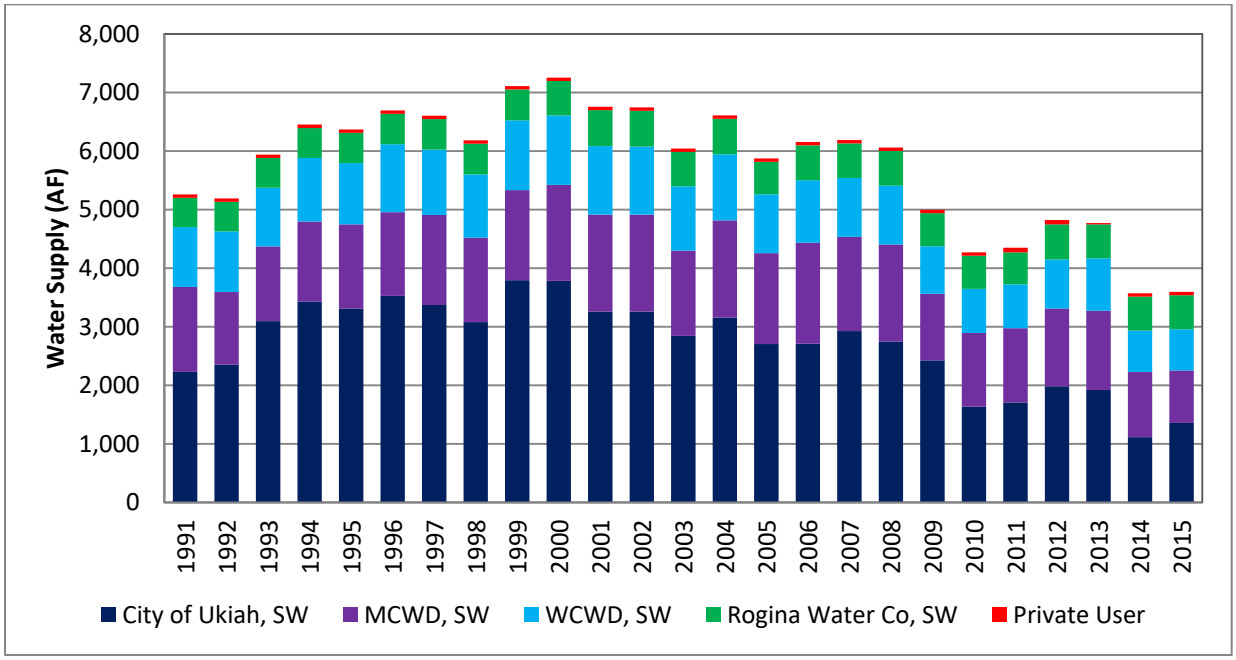


Figure 23.Surface water supplies used annually by each water entity in Ukiah Valley to meet municipal water use. The water quantity shown for Millview County Water District is representative of the surface water Millview County Water District uses, but also the amount of surface water that is purchased by Calpella County Water District from RRFC that is wheeled to them by Millview County Water District.

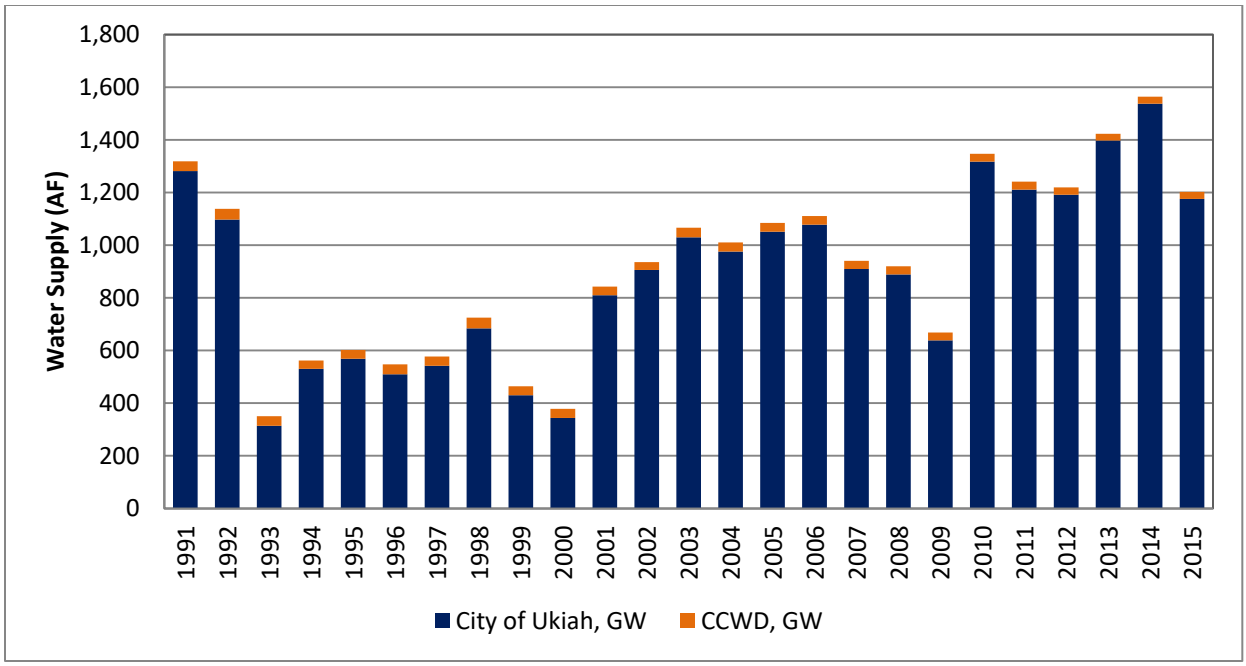


Figure 24.Annual groundwater production by the City of Ukiah and the Calpella County Water District used to meet municipal water use.

Although Redwood Valley was not included in the water budget, the water use and water supplies in the area were still identified (Figure 25). The agricultural water use in the region is about 2,393 AF/y on average and can be divided in two categories: (1) the amount of water required for crops in the region, and (2) the water estimated for frost protection, post-harvest application, and heat protection. On average, the municipal water use is about 415 AF/y. To meet the municipal and agricultural water use 2,795 AF/y of surface water and 13 AF/y of groundwater will be used on average. Redwood Valley is completely surface water dependent and in 2015 groundwater from well 6, an intertie well found near Millview County Water District, was used to help supply domestic water use for that year. The average annual water supply in Figure 25 was obtained by considering all annual water supplies available to Redwood Valley from 1991-2015. From 1991-2015, surface water came from RRFC 1,557 AF/y on average, Redwood Valley County Water District's water right 252 AF/y on average, and Sonoma

County Water Agency (SCWA) 102 AF/y on average when there was a water contract with this agency from 2005-2010. Finally, water supplies in Redwood Valley can come from water diverted by users that have their own water right, 884 AF/y on average. The annual water supply for Redwood Valley is presented in Figure 26. Once more, the greatest source of uncertainty in the amount of water used by Redwood Valley stems from frost, post harvest, and heat protection (Section 4.3). Although it may have some uncertainty, this quantity only makes up 16% of the total agricultural water use.

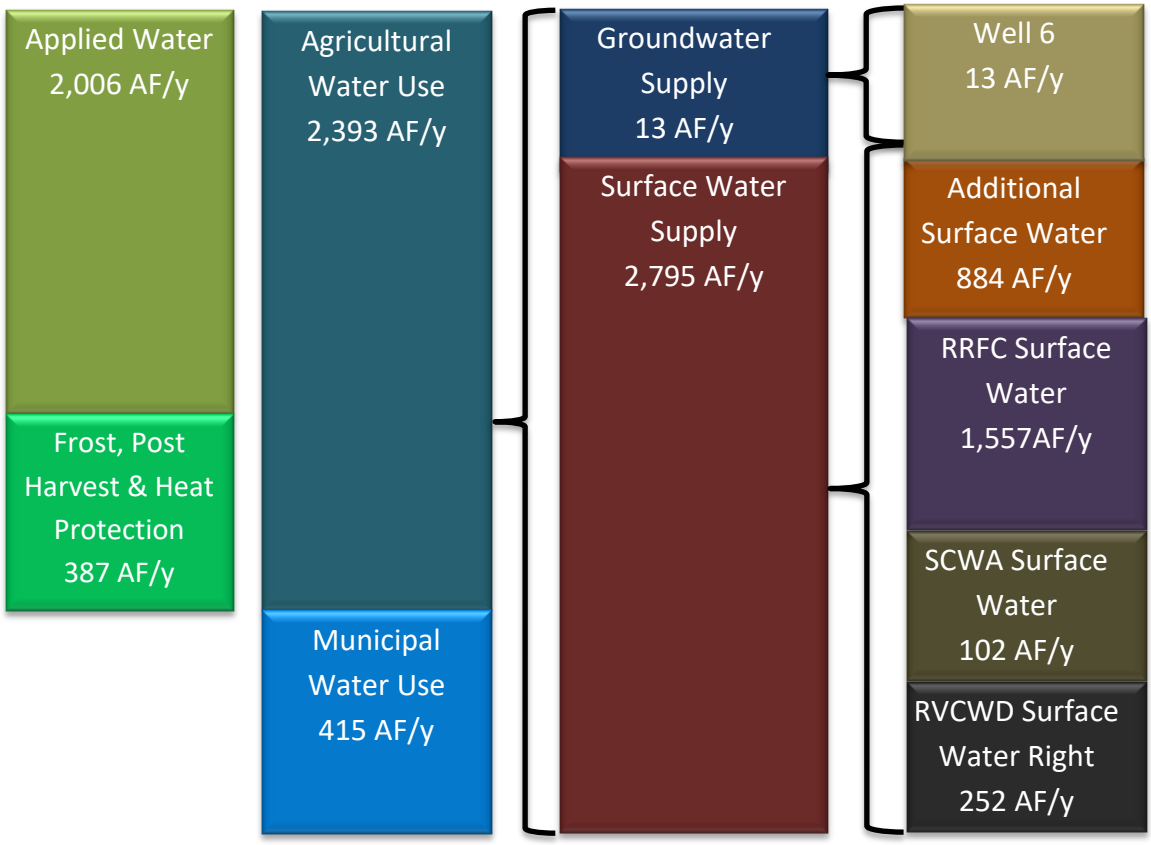


Figure 25.The average agricultural and municipal water use found in Redwood Valley and the water supplies used on average to meet the agricultural and municipal water use.

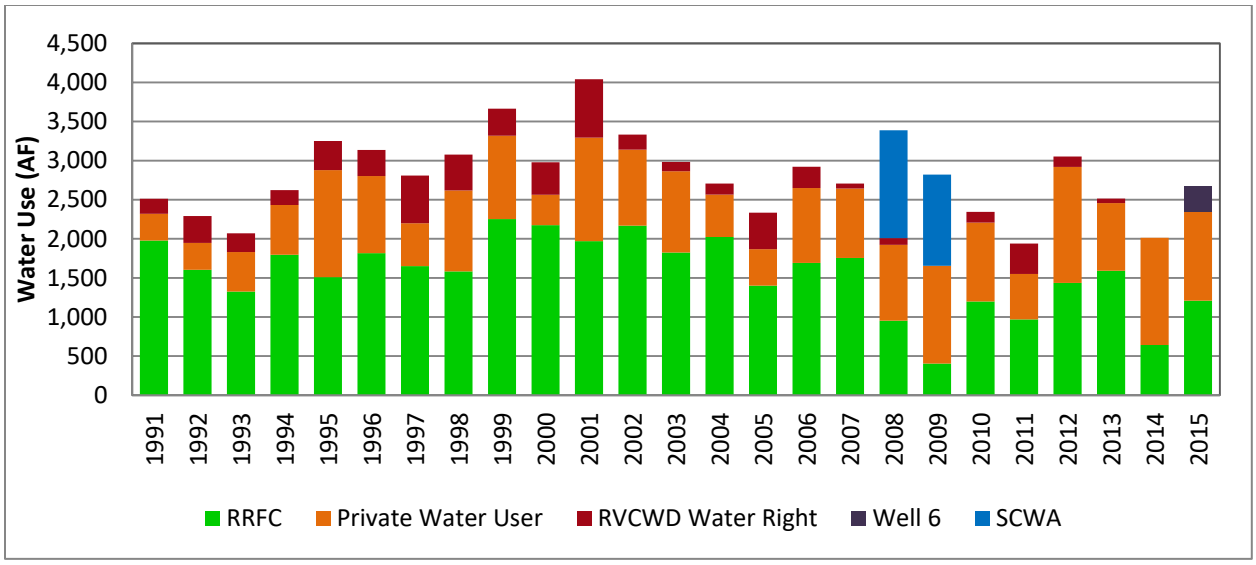


Figure 26.Annual water supplies for Redwood Valley.

Figure 27 summarizes the total water used in the Ukiah Valley Groundwater Basin and water use by type and water source, on average from 1991 to 2015. A total of 17,947 AF/y of water was used for the entire Ukiah Valley Groundwater Basin (Ukiah Valley and Redwood Valley), of which 7,100 AF/y (40%) and 10,182 AF/y (57%) was used to meet municipal and agricultural water use, respectively, and 665 AF/y (3%) of surface water was used to meet water requirements for fire protection, fish and wildlife preservation and enhancement, recreation, and aquaculture (SWRCB 2017). In terms of water sources, 3,411 AF/y (19%) and 14,536 AF/y (81%) was supplied from groundwater and surface water, respectively.

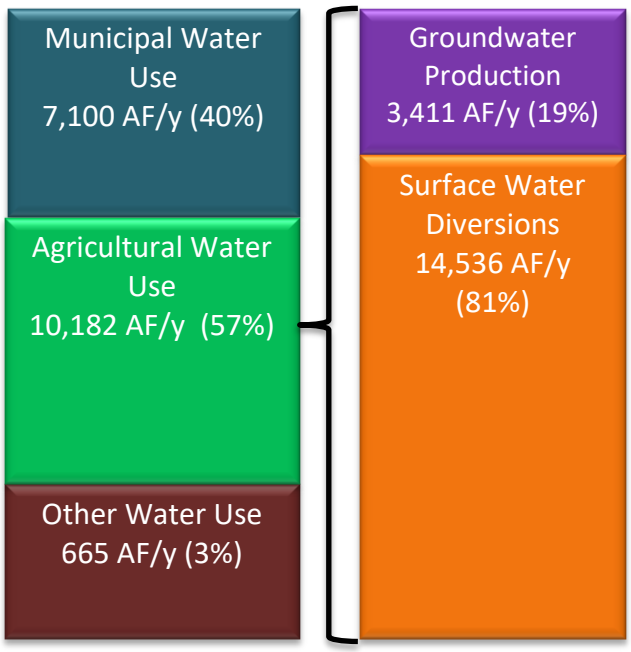


Figure 27.Areas to which water is used in the Ukiah Valley Groundwater Basin, and the total amount of groundwater and surface used for those allocations identified.

5.2 Surface Water Mass Balance Results

Figure 28 shows the monthly distributions of surface water net gains and losses. Surface water gains (values above zero) occur mostly from November to June and are highly variable. Surface water losses (values below zero) occur mostly from July to October. In general, the Russian River mainstem, from the confluence of the East and West fork to Hopland, is a gaining river from November to June, gaining approximately 18,952 AF/y, on average. Surface water gains are from: (1) groundwater discharge into the river mainstem when the groundwater table is higher than the surface of the Russian River, and (2) tributary runoff from creeks in the upper watershed and foothills feeding into the Russian River.

In contrast, the Russian River has net surface water losses, approximately 393 AF/y, from July to October. Surface water losses occur when the groundwater table is lower than the free surface of the Russian River, and recharge from surface water to the aquifer occurs. From July to

October, water in the mainstem mostly comes from Lake Mendocino releases, which in turn is filled with imported water from the Eel River through the Potter Valley Hydropower Project. These results suggest that releases from Lake Mendocino are recharging the Ukiah Valley Groundwater Basin and it is likely that a portion of Lake Mendocino releases come from the water transfers from the Eel River through PVHP and may end up recharging the Ukiah Valley Groundwater Basin during parts of the year. Figure 29 shows the monthly time series data of surface water gains and losses from 1991-2015. In general, surface water gains are more frequent and greater in magnitude than surface water losses. Of the surface water gains, 88% comes from tributaries and 12% comes from groundwater influence (Figure 30).

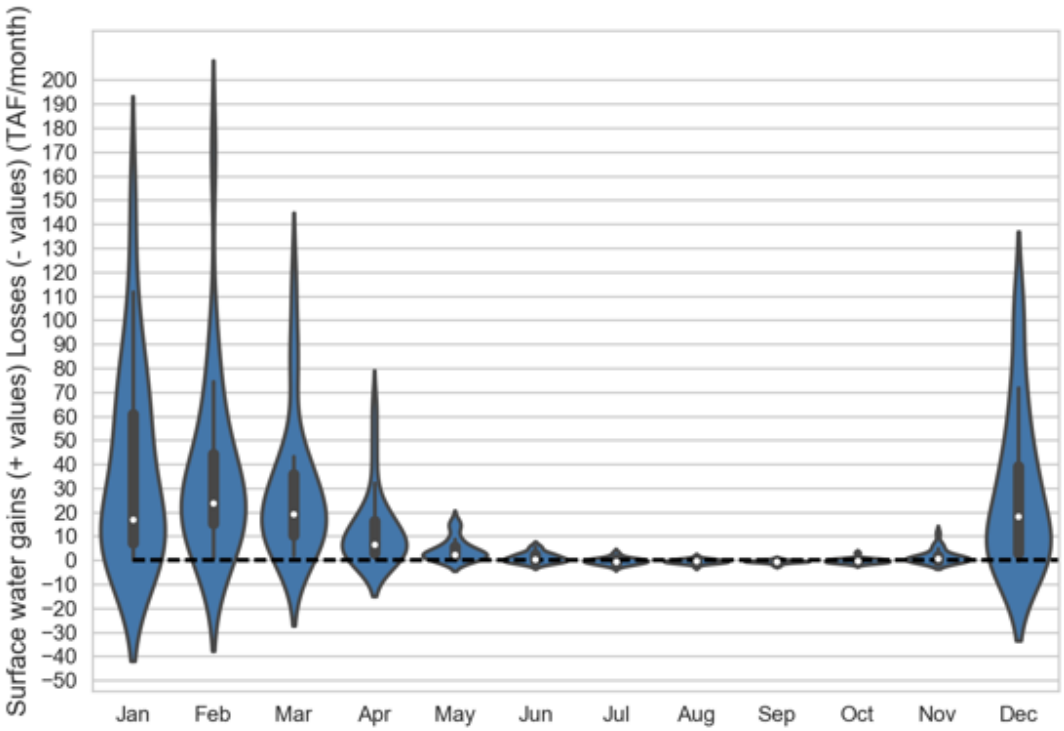


Figure 28. Seasonal distribution of surface water losses and surface water gains, distributions by year.

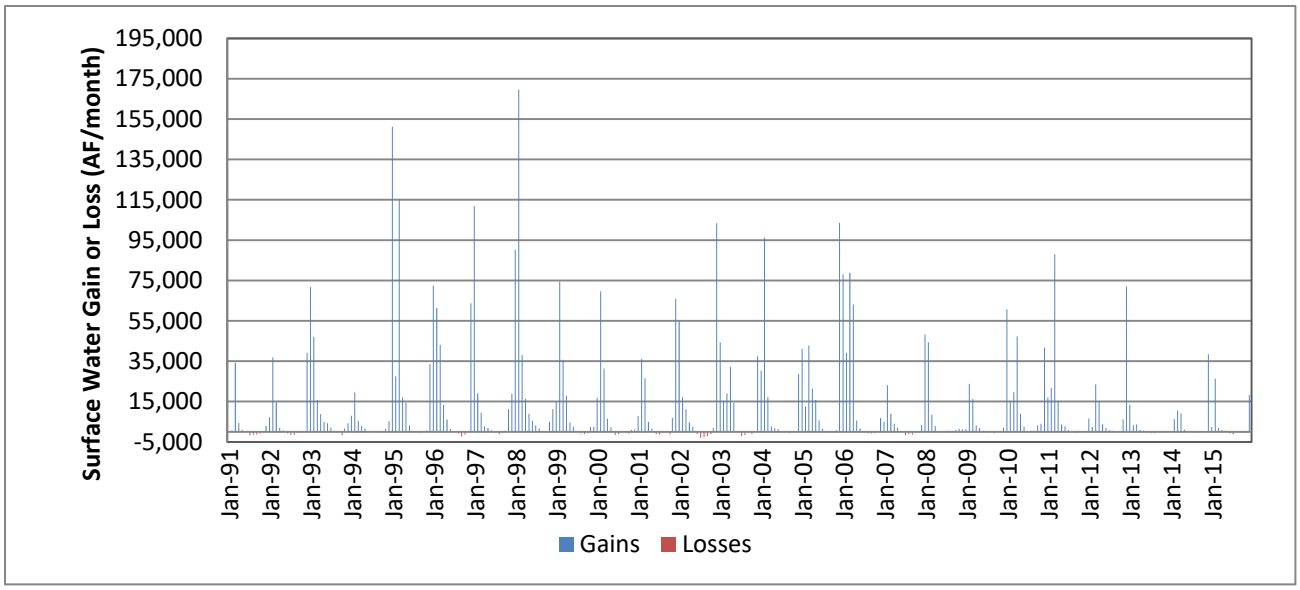


Figure 29. Monthly time series of the surface water losses and gains.

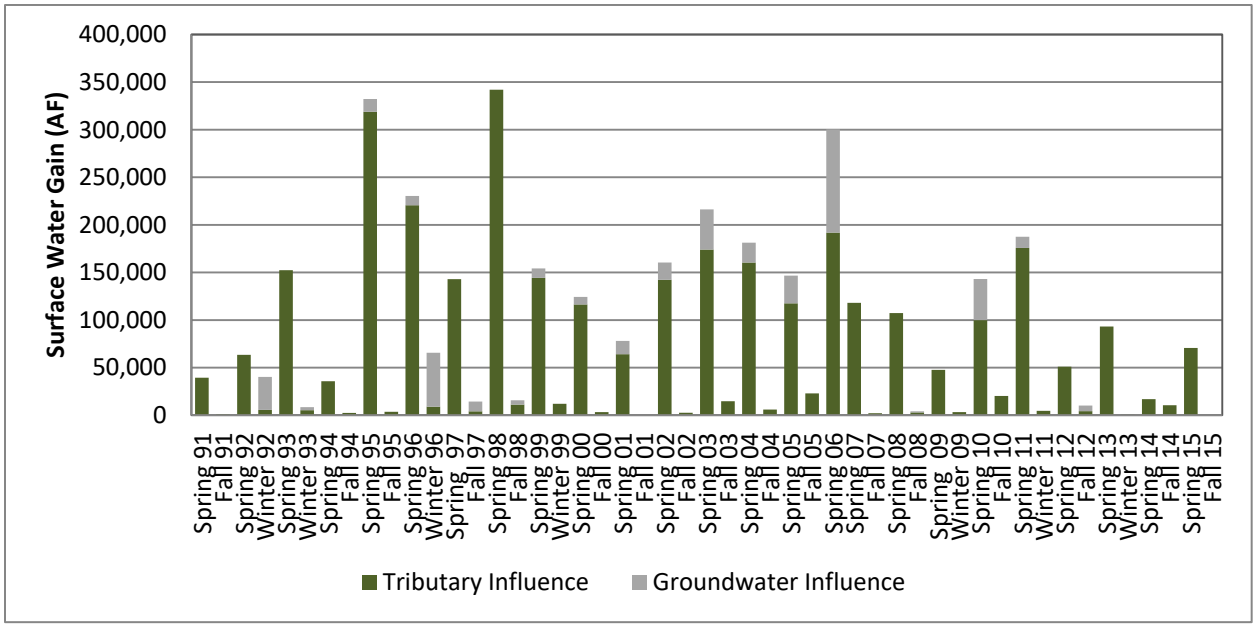


Figure 30. Surface water gains partitioned between groundwater and tributary influence.

5.3 Aquifer Storage Results

Aquifer storage was estimated using the water table elevation data (DWR 2017) and the procedure described in section 4.5. Figure 31 shows estimated aquifer storage and its seasonal fluctuation. The years 2003 and 2009 have kinks in the plot because the water table becomes lower than usual in some parts of the groundwater basin. These lower than normal water table records can be seen in Appendix H for November 2003 and May 2009. Overall the groundwater storage is stable (no chronic decline) with time. In the years from 2011 to 2015 there is a subtle decline in storage, attributable to the 2012 – 2015 drought. Despite the subtle decline in the storage, the storage does stabilize from 2012-2015. In addition, an alternative explanation as to why the storage decreases subtly but then stabilizes in the time span from 2011 to 2015 is because more monitoring wells were introduced starting in the year 2012. With an increase in monitoring wells, more water table data was available to refine estimates of groundwater storage. The conclusion that the groundwater storage is stable is also supported by long term monitoring wells within the basin that do not show a decline in the water levels.

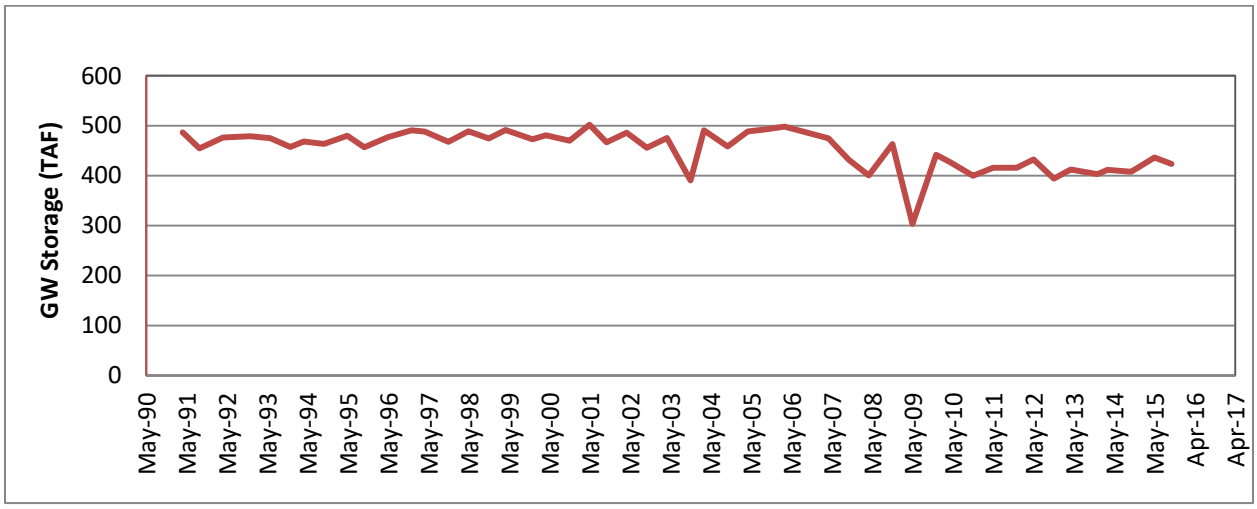


Figure 31.Estimated groundwater storage for the Ukiah Valley Groundwater Basin from 1991-2015.

Change in aquifer storage was calculated from 1991-2015. Figure 32 shows the cumulative distribution of the change in storage (positive and negative) of the aquifer during the 1991 to 2015 period. The cumulative distribution expresses the probability that the change of storage is equal or less than that determined value (ESH). Results show that 50% of the time the aquifer has declining storage, whereas the other 50% of the time the aquifer has increasing storage. There is about an equal number of times there is a net decrease and increase in groundwater storage. These observations suggest that the groundwater basin is roughly in balance, without groundwater overdraft in the Ukiah Valley Groundwater Basin. These conclusions are supported with the water table measurements found in the monitoring wells found in the Ukiah Valley Groundwater Basin. Records show the water table has been consistently stable with time, showing no evidence of water table lowering.

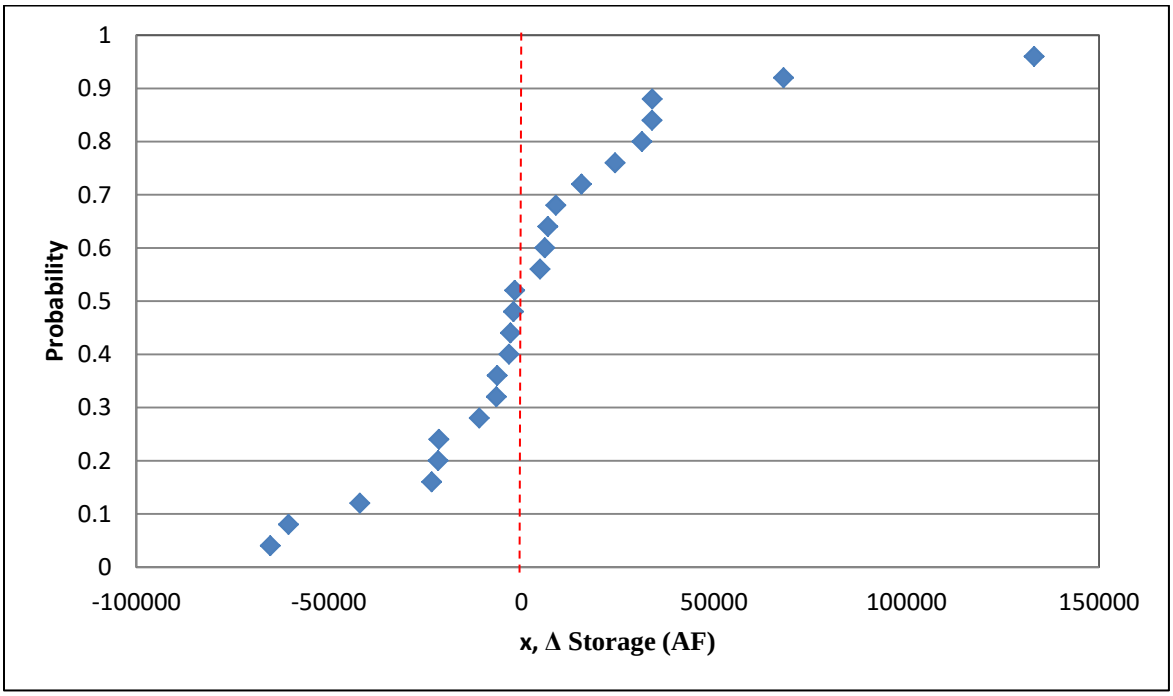


Figure 32. Cumulative distribution showing the probability of obtaining a particular change in storage.

5.4 Groundwater Mass Balance Results

Lateral groundwater inflows and outflows were calculated through the groundwater mass balance. The groundwater elevation data was available at an interval of approximately every 6 months, with a measurement recorded in the spring and another in the fall of each year. Figure 33 shows the lateral groundwater inflows and outflows calculated for the hydrologic period of analysis. The magnitude and occurrence of the lateral groundwater inflows are about equal to the magnitude and occurrence of the lateral groundwater outflows. The lateral groundwater gains observed are assumed to come from tributary streamflow that recharges the Ukiah Valley Groundwater Basin and/or from groundwater contributions, mostly from perched aquifers in the foothills and tributaries of the mainstem. However, it is believed that the driving physical process of the lateral groundwater gains is from tributary influence, as suggested by other reports (RRISRP 2016). In addition, lateral groundwater losses are occurring from downgradient groundwater flow from the Ukiah Valley Groundwater Basin towards the Russian River, and overall moving from the northern end to the southern end of the groundwater basin (Farrar 1986). Given these trends in groundwater movement, the lateral groundwater losses observed are from groundwater moving from the Ukiah Valley Groundwater Basin into the Sanel Valley Groundwater Basin (also known as the Hopland Valley Groundwater Basin).

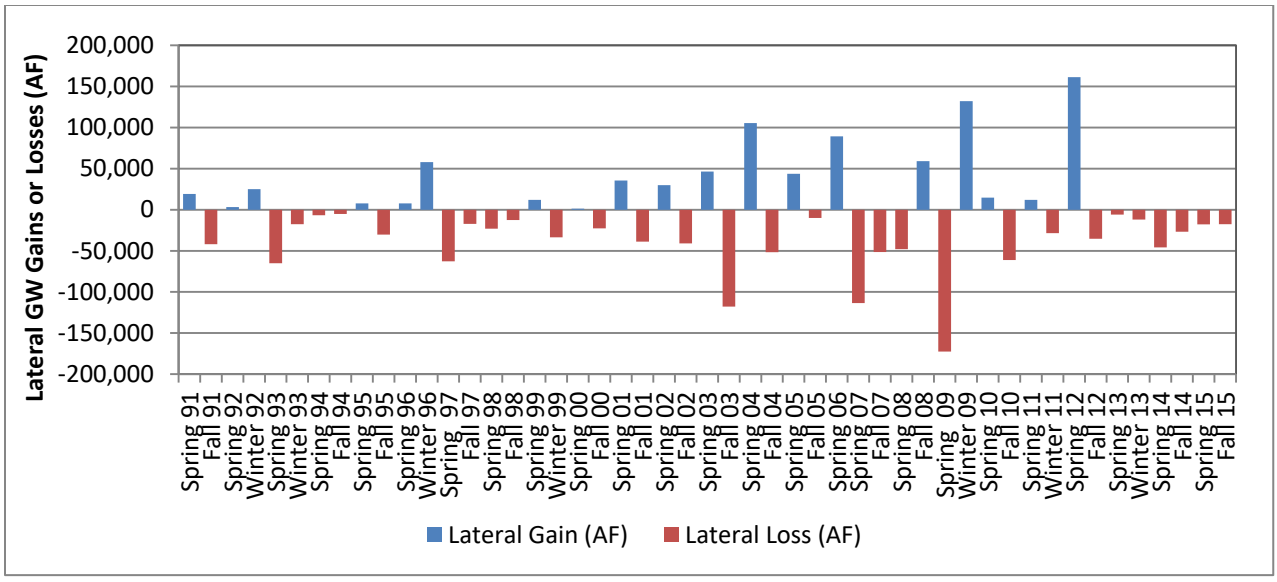


Figure 33. Seasonal lateral groundwater gains and losses in the spring and fall from 1991-2015.

Figure 34 shows the monthly time series of lateral groundwater gains and losses estimated in the Ukiah Valley Groundwater Basin. The monthly time series was estimated by correlating the decrease in storage with groundwater extractions, whereas the increase in storage was correlated with the amount of rainfall experienced in the area. The calculated monthly lateral groundwater gains and losses further show that the lateral groundwater gains and losses have similar magnitudes.

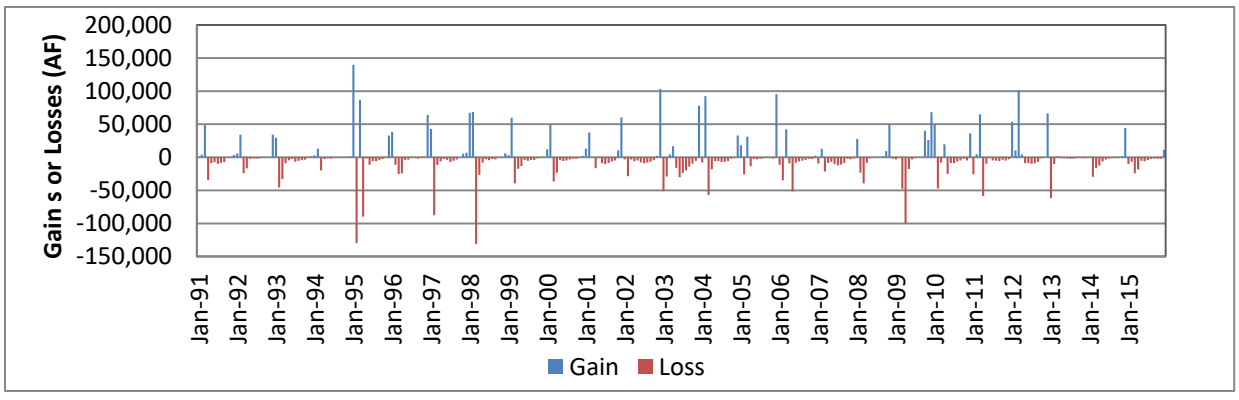


Figure 34. Observed monthly lateral groundwater gains and losses.

6. Discussion

SGMA requires that six undesirable results be avoided: (1) chronic lowering of the groundwater table, (2) reduction in groundwater storage, (3) seawater intrusion, (4) degradation of water quality, (5) land subsidence, and (6) depletion in groundwater-surface water interactions (DWR 2017). According to the data analyzed and the results of the water budget analysis, the Ukiah Valley Groundwater Basin is not experiencing any of these undesirable results. However, this does not mean that there may not be any problems today or in the near future related to groundwater management. For instance, a determined well extracting groundwater may decrease the water table elevation affecting neighboring wells, but not for the whole region. This local issue should be considered when managing the Ukiah Valley Groundwater Basin. Currently, there is no evidence suggesting a chronic decrease in groundwater storage, the water table declining, land subsidence, and disconnection between surface water-groundwater interactions.

Seawater intrusion is irrelevant to the Ukiah Valley Groundwater Basin since it is inland without risk of salt ocean water entering the fresh water aquifer. Groundwater quality is outside the scope of this study, however Bulletin 118 (DWR 2004) mentioned that groundwater quality here is generally in good condition. Regardless of Bulletin 118, the Ukiah Valley Groundwater Basin will have to test its water at regular intervals to comply with SGMA and confirm the quality of the groundwater. In addition, the interval at which water samples are taken and the number of water quality sampling points will have to be increased.

In accounting for the water and water use in the Ukiah Valley Groundwater Basin, groundwater dependence is relatively small relative to surface water use. Figure 27 shows that of all water used in the Ukiah Valley Groundwater Basin, only 19 % is from groundwater, mostly for agriculture. Despite the quantity of groundwater used to meet municipal and agricultural

water use, the amount of recharge in the Ukiah Valley Groundwater Basin exceeds groundwater extractions, on average (Table 3). Even though the largest uncertainty in this study is in the estimation of frost, post-harvest, and heat protection (15% in Ukiah Valley and 16% in Redwood Valley, see Section 4.3), this uncertainty does not change the result that the recharge is greater than the amount of groundwater extracted in the Ukiah Valley Groundwater Basin (Table 3).

Table 3. Average groundwater recharge and extractions observed in the Ukiah Valley Groundwater Basin.

	(AF/year)
Precipitation & Irrigation Recharge	23,011
Percolation Pond Recharge, City of Ukiah	2,264
Percolation Pond Recharge, Calpella County WD	42
Average Aquifer Recharge	**25,317**
Ag Water Pumping	2,468
Municipal GW Use	943
Average Aquifer Extractions	**3,411**

The Ukiah Valley Groundwater Basin has surface water – groundwater interactions. A strategy to keep this interaction should focus on two main tasks. First, protect and enhance recharge zones so the current level of recharge is maintained. Some strategies for achieving this may include: protecting the upper watershed (tributaries) so water can reach the mainstem and recharge the aquifer, enhance aquifer recharge in urban and agricultural land, among other strategies. Second, keep the current levels of water use and/or avoid increasing groundwater extractions, which will keep the interaction between the aquifer and the river in the future. If

groundwater pumping is not managed, excessive pumping may lower the water table and lead to disconnecting the surface water and groundwater systems. Thus, the water tables should continue to be monitored with additional monitoring wells throughout the groundwater basin. This effort of identifying additional monitoring wells has been initiated by LACO Associates, a consulting firm offering engineering, geology, and environmental planning services to Mendocino County to draft an initial groundwater sustainability plan for the Ukiah Valley Groundwater Basin. To protect the upper watershed tributaries, wells should be managed and monitored, so streamflow from the headwater and foothills continues to provide gains and recharge to the Ukiah Valley Groundwater Basin. If there was to be a drastic decrease in water from the foothills via the tributaries, it may reduce aquifer recharge and the surface water-groundwater interactions since much of the surface water gains result from tributaries. In monitoring the tributaries LACO Associates have also initiated an effort to identify locations to place streamflow and tributary gauges in the Ukiah Valley Groundwater Basin. A way to manage the tributaries can be by preserving the natural terrain in the foothills.

Groundwater may be moving laterally from the Ukiah Valley Groundwater Basin to the Sanel Valley Groundwater Basin. Monitoring wells may have to be placed in the northern end of the Sanel Valley Groundwater Basin and on the southern end of the Ukiah Valley Groundwater Basin to confirm this observation. Field work will also have to be done to estimate groundwater flow from the Ukiah Valley Groundwater Basin to the Sanel Valley Groundwater Basin. With the addition of new monitoring wells groundwater contour maps can be generated and provide greater insight on the seasonal groundwater movement.

7. Conclusions

This study presented a water budget for a groundwater basin classified as medium priority by DWR by looking into the water sources, water supplies, and water use. For the Ukiah Valley Groundwater Basin it was identified that the groundwater basin is not in groundwater overdraft. Surface water – groundwater interactions were identified, it was determined that the Russian River is a gaining river from November to June, gaining on average 18,952 AF/y; and conversely, the Russian River is a losing river from July to October, losing on average 393 AF/y. In addition, it was determined that there is groundwater connectivity between the Ukiah Valley Groundwater Basin and the Sanel Valley Groundwater Basin, where groundwater is flowing laterally from the Ukiah Valley Groundwater Basin to the Sanel Valley Groundwater Basin. Furthermore, it was determined that lateral groundwater gains are occurring which may result from the Sanel Valley Groundwater Basin or tributaries, although it is assumed that tributaries may be the driving force but cannot confirm with the results of this study.

Overall, the groundwater basin does not appear to experience any undesirable results given the criteria outlined by the SWRCB. Given the conditions of the groundwater basin, it is in a unique position where the GSA will have to be proactive in maintaining the current condition under which it is and develop an integrated water resources management plan and detailed monitoring protocol of measuring and thus preventing against the six undesirable results that deem a groundwater basin unsustainable when constructing the GSP.

Multiple efforts are on the horizon for broadening the understanding of the Ukiah Valley Groundwater Basin and the Russian River Watershed. Results from this study are the stepping stone for future efforts for improving water management and for broadening knowledge in the

area. LACO Associates will now use the results of this study to improve upon the water budget and aid in the construction of the GSP. Ultimately, this work and LACO's efforts will better inform the work to be done in the future by the USGS when a model of the Russian River Watershed is created.

It will take decades before the progress of SGMA can be evaluated. However, SGMA is the most promising piece of legislation that has resulted, aimed specifically in improving the framework in which groundwater is managed throughout the state. Although, many questions and concerns have arisen since its introduction, it holds promise for establishing a new perspective and practices geared at achieving groundwater sustainability. The successful implementation of SGMA will increase water security in communities, maintain environmental stewardship, and improve water quality statewide. For the Ukiah Valley Groundwater Basin, SGMA is the driving force pushing this region towards establishing a comprehensive, integrated water resources management scheme that will promote water security.

7.1 Limitations

The concept of developing a water budget to characterize a groundwater basin is relatively simple, but the quality of the water budget is dependent on the availability and quality of data. The limitations of this study are summarized in this section.

- For this study, the water budget centered around Ukiah Valley and not the whole Ukiah Valley Groundwater Basin. This occurred because there was no active streamflow gauge on the West Fork of the Russian River North of Redwood Valley County Water District. Without an accurate account of the surface water entering the Ukiah Valley Groundwater Basin from the north via the West Fork of the Russian River, the next best alternative was

to center the water budget in an area that could effectively account for all of the water inflows and outflows.

- There was no annual data available for the amount of water used for frost protection, post harvest application, and heat protection, so the water quantities were estimated based off the work presented in Lewis et al. (2008).
- Rogina Water Co. did not share their water production records and thus the amount of water used within its service area was estimated based off the data available from RRFC, SCWA (2015), and MCWA (2010).
- To determine aquifer storage, the one-bucket model is used. To obtain more accurate results of aquifer storage a more robust groundwater model is required.
- Surface water diversions are known to occur by users that have their own water right. To capture these diversions in the analysis data from the SWRCB 2010-2013 Average Demand Dataset was obtained. This data provided insight on the diversions occurring from 2010-2013 in Ukiah Valley and Redwood Valley, but for the remaining years of analysis from 1991-2009 and from 2014-2015 monthly averages were used to fill in the data gaps. Records of all surface water diversions from all users would be ideal to have an improved water budget.
- The number of wells and annual production of each well is unknown. The groundwater used for to meet the water use for the City of Ukiah and Calpella County Water District is known, but for the few tribes and families that have their domestic supply well, the groundwater production is unknown. Likewise, the amount of groundwater pumped to meet the crop water requirements is unknown and was estimated given the agricultural water use present in the area and the surface water supply available to meet them.

- There were data gaps presented in some of the water records obtained so the missing values were estimated using the median of the data that was available. Doing this may not be ideal, but was considered a good option in seeking to fill in missing data records.

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Appendices

Appendix A. Monthly evapotranspiration (in) values obtained from Sanel Valley, CIMIS station 106.

Monthly Evapotranspiration (in)												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1991	1.27	2.12	2.56	4.85	6.25	7.21	7.94	6.77	5.57	3.79	1.86	1.13
1992	1.21	1.84	2.94	4.73	7.02	6.26	7.66	6.83	4.80	2.79	1.39	0.65
1993	0.93	1.37	2.82	4.48	5.41	7.25	8.01	7.44	5.56	3.42	2.02	1.32
1994	1.58	2.02	4.15	5.59	5.71	6.96	8.23	7.54	5.49	3.72	1.66	1.12
1995	1.40	2.13	2.84	4.34	5.85	6.91	7.40	7.06	4.88	3.52	1.48	0.60
1996	0.79	1.29	3.40	4.22	6.15	7.78	8.32	7.52	5.45	3.61	1.58	0.89
1997	1.05	2.26	3.87	4.80	7.09	7.37	8.27	6.61	5.27	3.23	1.27	1.31
1998	0.68	0.98	2.82	4.30	4.37	5.99	8.18	7.47	5.16	3.64	1.27	1.30
1999	1.35	1.20	2.77	5.19	6.08	7.77	8.26	6.73	5.42	3.64	1.39	1.48
2000	0.85	1.18	3.64	4.82	6.21	7.49	7.74	6.93	4.94	3.21	1.53	1.19
2001	1.27	1.60	3.66	4.82	7.44	7.89	8.16	7.27	5.39	3.66	1.21	0.84
2002	1.27	1.85	3.44	4.39	6.99	8.20	8.25	6.96	5.61	3.75	1.81	0.80
2003	1.11	1.92	3.64	3.21	6.16	7.57	8.01	6.81	5.22	3.98	1.20	0.75
2004	1.07	1.47	4.02	4.93	6.57	7.53	7.82	7.03	5.50	3.06	1.46	1.03
2005	1.05	1.56	3.16	4.37	5.30	6.26	8.24	6.92	5.10	3.38	1.54	0.70
2006	0.98	2.00	2.12	3.30	6.34	7.12	8.32	6.97	5.39	3.30	1.36	1.14
2007	1.62	1.47	3.94	4.83	6.74	7.59	8.07	7.21	4.93	2.65	1.72	1.10
2008	0.81	1.84	3.36	4.92	5.95	7.54	8.19	7.31	5.23	3.46	1.49	1.14
2009	1.63	1.59	3.62	5.28	6.46	7.11	8.58	7.14	5.53	3.72	1.69	0.95
2010	1.66	2.12	3.48	3.88	5.44	7.51	7.86	6.85	5.15	2.85	1.55	0.73
2011	1.45	1.78	2.15	4.20	5.27	5.91	7.12	6.59	5.31	3.37	1.42	1.42
2012	1.45	2.10	2.33	4.39	7.01	7.21	7.82	7.34	5.58	3.41	1.38	0.93
2013	1.44	2.42	3.31	6.06	7.16	7.49	8.58	7.22	5.21	3.95	2.19	1.60
2014	1.91	1.75	3.44	5.28	7.22	7.90	7.05	6.79	5.26	3.45	1.64	1.15
2015	1.88	2.70	3.91	5.31	6.29	7.80	7.38	6.72	5.13	3.84	1.90	0.96

Appendix B. Crop Coefficients

Crop Coefficients												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
Apples	0	0	0	0	0.63	0.80	0.96	1	1	0.96	0.30	0
Cherries	0	0	0.59	0.70	0.82	0.87	0.87	0.87	0.85	0.84	0	0
Grapes, Red Wine	0	0	0	0.15	0..30	0.30	0.30	0.30	0.30	0.30	0	0
Grapes, White Wine	0	0	0	0.15	0..30	0.30	0.30	0.30	0.30	0.30	0	0
Grapes, Rootstock	0	0	0	0.15	0..30	0.30	0.30	0.30	0.30	0.30	0	0
Olives	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Pears, Bartlett	0	0	0	0	0.28	0.67	0.83	0.87	0.87	0.87	0.81	0.68
Pears, Other	0	0	0	0	0.28	0.67	0.83	0.87	0.87	0.87	0.81	0.68
Pistachios	0	0	0	0.25	0.81	1.13	1.19	1.16	0.93	0.59	0.18	0
Walnuts, English	0	0	0.06	0.61	0.83	0.97	1.14	1.14	1.03	0.70	0.14	0
Pasture	0	0	0	0	0.80	0.80	0.80	0.80	0.80	0.80	0	0
Grapes, Raisin	0	0	0	0.15	0.30	0.30	0.30	0.30	0.30	0.30	0	0

Appendix C. Land use time series for Ukiah Valley

Ukiah Valley Land Use (Acres)									
Year	**Cherries**	**Grapes, Red Wine**	**Grapes, White Wine**	**Pears, Bartlett**	**Olives**	**Pears, Other**	**Pistachios**	**Walnut, English**	**Pasture**
1990	1.8	1,760	1,497	1,514	0	98	0.2	1	0
1991	1.8	1,873	1,553	1,514	0	114	0.2	1	0
1992	1.8	1,956	1,675	1,514	0	114	0.2	1	0
1993	1.8	2,081	1,725	1,514	0	116	0.2	1	0
1994	1.8	2,275	1,804	1,514	0	116	0.2	1	0
1995	1.8	2,409	1,885	1,514	4	126	0.2	1	10
1996	1.8	2,673	2,030	1,516	4	126	0.2	1	10
1997	1.8	2,840	2,086	1,516	4	126	0.2	1	10
1998	1.8	3,247	2,188	1,516	4.2	126	0.2	1	10
1999	1.8	3,436	2,216	1,516	4.2	126	0.2	1	10
2000	1.8	3,603	2,315	1,516	4.2	126	0.2	1	10
2001	1.1	3,497	1,974	1,201	5.2	101	0.2	5.4	10
2002	0.4	3,391	1,632	886	6.1	77	0.2	9.7	0
2003	0.4	3,464	1,668	886	6.2	83	0.2	9.7	0
2004	0.4	3,510	1,739	886	6.3	89	0.2	9.7	0
2005	0.4	3,538	1,758	886	6.9	89	0.2	9.7	0
2006	0.4	3,496	1,560	878	9.1	80	0.2	9.7	0
2007	0.4	3,522	1,702	883	9.3	80	0.2	9.7	0
2008	0.4	3,535	1,761	888	9.3	80	0.2	9.7	0
2009	0.4	3,548	1,877	888	9.3	80	0.2	9.7	0
2010	0.4	3,592	1,887	888	9.3	80	0.2	9.7	0
2011	0.4	3,626	1,909	888	9.3	80	0.2	9.7	0
2012	0.4	3,788	1,989	888	9.3	83	0.2	9.7	0
2013	0.4	3,829	2,017	888	9.3	83	0.2	9.7	0
2014	0.4	3,862	2,036	888	9.3	83	0.2	9.7	0
2015	0.4	3,908	2,095	888	9.3	83	0.2	11	0

Appendix D. Land use time series for Redwood Valley

Redwood Valley Land Use (Acres)										
Year	**Apples**	**Grapes, Red Wine**	**Grapes, White Wine**	**Grapes, Rootstock**	**Pears, Bartlett**	**Olives**	**Pistachios**	**Pasture**	**Walnuts, English**	**Grapes, Raisin**
1990	0.8	1,088	480	0	40	0	12.4	0	32.4	0
1991	0.8	1,142	530	0	40	2	12.4	0	32.4	0
1992	0.8	1,199	577	0	40	2	12.4	0	32.4	0
1993	0.8	1,264	624	0	40	2	12.4	0	32.4	0
1994	0.8	1,299	631	1.7	40	2	12.4	0	32.4	0
1995	0.8	1,388	631	1.7	40	2	12.4	200	32.4	0
1996	1	1,478	636	1.7	40	2	12.4	200	32.4	0
1997	1	1,570	666	1.7	40	2	12.4	200	32.4	0
1998	1	1,621	675	1.7	40	2	12.4	200	32.4	0
1999	1	1,680	690	1.7	40	2	12.4	200	32.4	0
2000	1	1,783	690	7.2	40	2	12.4	200	32.4	0
2001	1.6	1,783	627	3.6	39	4.4	12.4	200	19.6	0
2002	2.2	1,784	564	0	38	6.7	12.4	0	6.7	0
2003	2.2	1,805	564	0	38	8.0	12.4	0	6.7	0
2004	2.2	1,823	564	0	38	8.1	12.4	0	6.7	0
2005	2.2	1,853	570	0	38	8.1	12.4	0	6.7	0
2006	2.2	1,794	489	0	38	10.1	12.4	0	6.7	0
2007	2.2	1,847	496	0	38	11.2	12.4	0	6.7	0
2008	2.2	1,855	504	0	38	11.2	12.4	0	6.7	0
2009	2.2	1,872	505	0	38	11.2	12.4	0	6.7	0
2010	3.2	1,887	505	0	38	11.2	12.4	0	6.7	0
2011	3.2	1,913	512	0	38	11.2	12.4	0	6.7	0
2012	3.2	1,914	512	0	38	11.2	12.4	0	6.7	0.1
2013	3.2	1,951	515	0	38	11.2	12.4	0	6.7	0.1
2014	3.2	1,961	515	0	38	11.2	12.4	0	6.7	0.1
2015	3.2	1,967	516	0	38	11.2	12.4	0	6.7	0.1

Appendix E. Land use time series for the Ukiah Valley Groundwater Basin

Ukiah Valley Groundwater Basin Total Land Use (Acres)												
Year	**Apples**	**Cherries**	**Grapes, Red Wine**	**Grapes, White Wine**	**Grapes, Rootstock**	**Olives**	**Pears, Bartlett**	**Pears, Other**	**Pistachios**	**Walnut, English**	**Pasture**	**Grape, Raisin**
1990	0.80	1.80	2,849	1,977	0	0	1,554	98.40	12.60	33.40	0	0
1991	0.80	1.80	3,015	2,083	0	2.00	1,554	114.40	12.60	33.40	0	0
1992	0.80	1.80	3,155	2,251	0	2.00	1,554	114.40	12.60	33.40	0	0
1993	0.80	1.80	3,345	2,349	0	2.00	1,554	116.40	12.60	33.40	0	0
1994	0.80	1.80	3,574	2,435	1.70	2.00	1,554	116.40	12.60	33.40	0	0
1995	0.80	1.80	3,797	2,516	1.70	6.00	1,554	125.90	12.60	33.40	210	0
1996	1.00	1.80	4,151	2,666	1.70	6.00	1,556	125.90	12.60	33.40	210	0
1997	1.00	1.80	4,410	2,752	1.70	6.00	1,556	125.90	12.60	33.40	210	0
1998	1.00	1.80	4,868	2,864	1.70	6.20	1,556	125.90	12.60	33.40	210	0
1999	1.00	1.80	5,117	2,906	1.70	6.20	1,556	125.90	12.60	33.40	210	0
2000	1.00	1.80	5,386	3,005	7.20	6.20	1,556	125.90	12.60	33.40	210	0
2001	1.60	1.10	5,280	2,601	3.60	9.50	1,240	101.40	12.60	24.90	210	0
2002	2.20	0.40	5,175	2,196	0	12.80	924	76.90	12.60	16.40	0	0
2003	2.20	0.40	5,268	2,232	0	14.20	924	83.30	12.60	16.40	0	0
2004	2.20	0.40	5,333	2,303	0	14.40	924	89.30	12.60	16.40	0	0
2005	2.20	0.40	5,392	2,328	0	15.00	924	89.30	12.60	16.40	0	0
2006	2.20	0.40	5,290	2,049	0	19.20	916	79.80	12.60	16.40	0	0
2007	2.20	0.40	5,370	2,198	0	20.50	921	79.80	12.60	16.40	0	0
2008	2.20	0.40	5,389	2,265	0	20.50	926	79.80	12.60	16.40	0	0
2009	2.20	0.40	5,420	2,382	0	20.50	926	79.80	12.60	16.40	0	0
2010	3.20	0.40	5,479	2,391	0	20.50	926	79.80	12.60	16.40	0	0
2011	3.20	0.40	5,539	2,421	0	20.50	926	79.80	12.60	16.40	0	0
2012	3.20	0.40	5,702	2,502	0	20.50	926	82.50	12.60	16.40	0	0.10
2013	3.20	0.40	5,781	2,532	0	20.50	926	82.50	12.60	16.40	0	0.10
2014	3.20	0.40	5,823	2,551	0	20.50	926	82.50	12.60	16.40	0	0.10
2015	3.20	0.40	5,875	2,611	0	20.50	926	82.50	12.60	17.70	0	0.10

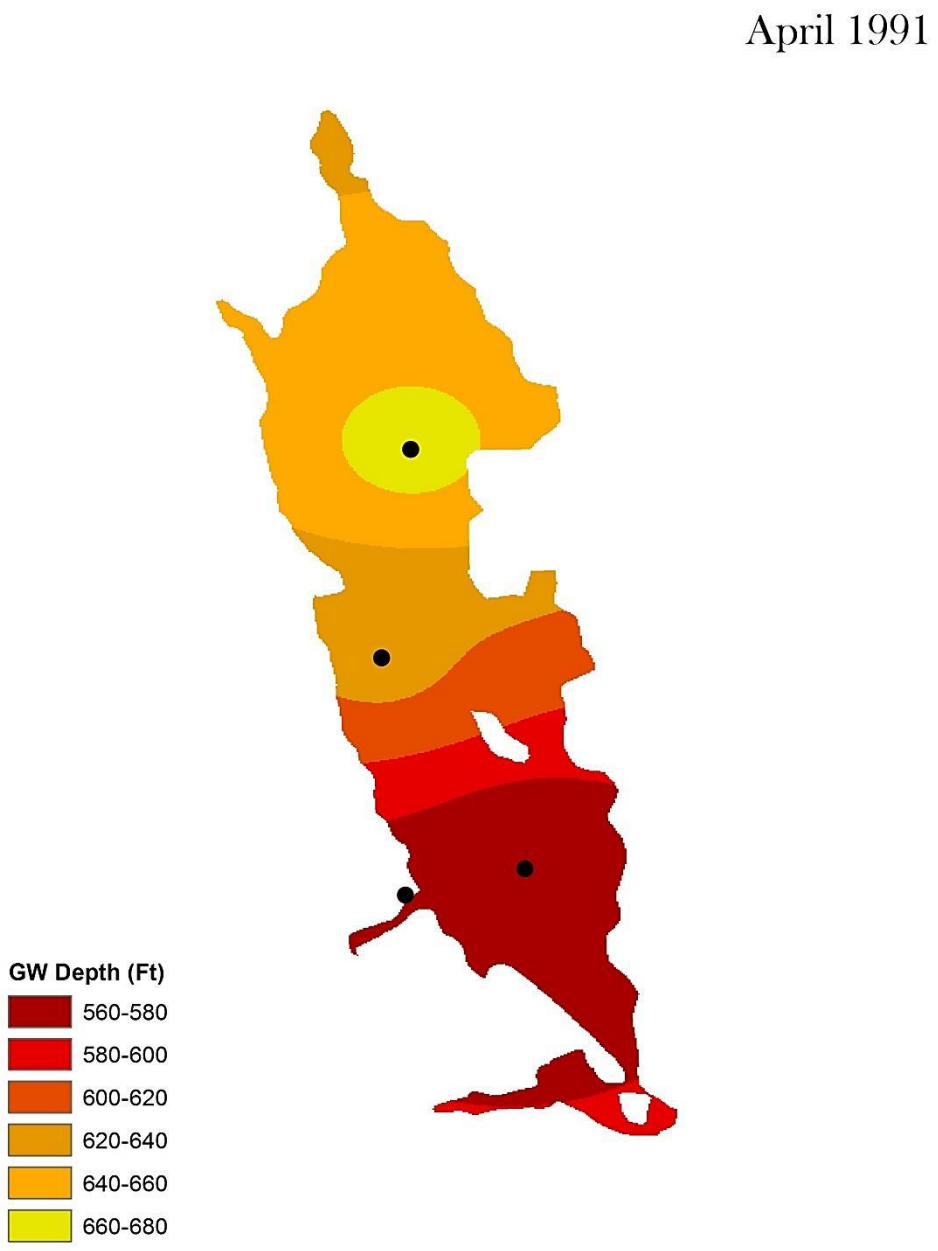
Appendix F. Monthly precipitation (in) values obtained through the Thiessen Polygon Method for precipitation.

Monthly Precipitation(in)												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1991	0.97	3.40	14.06	0.97	0.45	0.50	0.04	0.00	0.01	2.02	2.50	3.13
1992	4.01	9.67	4.30	1.03	0.30	1.26	0.01	0.00	0.00	3.10	1.09	13.80
1993	10.08	7.94	2.59	2.17	3.24	1.19	0.00	0.00	0.00	0.45	1.90	4.27
1994	2.18	5.95	0.26	2.31	0.53	0.02	0.01	0.00	0.00	0.38	5.81	4.07
1995	18.97	0.39	12.72	2.83	1.62	0.53	0.00	0.00	0.01	0.00	0.44	14.24
1996	12.21	9.03	3.09	2.96	1.65	0.00	0.00	0.00	0.17	1.60	4.12	15.69
1997	10.77	1.48	2.09	1.07	0.78	0.78	0.00	0.92	0.68	2.15	9.50	4.05
1998	16.26	20.31	6.82	2.43	4.33	0.12	0.00	0.00	0.00	1.57	6.70	2.02
1999	2.92	12.15	5.71	1.42	0.05	0.02	0.00	0.51	0.07	1.09	5.19	1.18
2000	7.31	10.88	2.41	2.50	1.64	0.62	0.02	0.03	0.19	2.83	1.65	1.77
2001	5.48	7.69	3.18	0.85	0.02	0.27	0.00	0.00	0.08	0.33	4.18	4.83
2002	1.89	1.30	0.95	0.31	0.35	0.03	0.08	0.02	0.00	0.02	2.59	10.05
2003	1.71	2.62	4.27	9.69	0.86	0.07	0.01	0.00	0.14	0.03	4.62	14.97
2004	3.06	11.61	1.37	0.67	0.27	0.19	0.00	0.00	0.11	4.51	1.90	9.54
2005	6.02	3.45	5.87	2.57	3.81	2.19	0.00	0.00	0.01	0.91	6.15	17.56
2006	8.16	5.09	10.58	7.42	0.47	0.01	0.00	0.00	0.00	0.23	3.87	6.71
2007	0.50	9.23	0.57	2.40	0.90	0.13	0.09	0.00	0.08	1.86	0.75	7.65
2008	13.74	4.74	1.21	0.26	0.00	0.00	0.02	0.02	0.22	1.03	6.31	3.36
2009	0.44	8.10	3.39	0.33	2.92	0.02	0.01	0.00	0.04	2.71	1.83	4.61
2010	12.48	4.25	4.61	6.13	2.32	0.24	0.00	0.00	0.10	6.22	3.71	9.46
2011	1.91	4.15	12.08	1.09	2.37	1.68	0.02	0.00	0.02	3.66	2.65	0.19
2012	5.68	2.02	9.66	1.56	0.27	0.10	0.00	0.00	0.00	1.36	8.24	13.27
2013	1.47	0.47	2.23	1.07	0.51	0.25	0.09	0.01	0.88	0.02	1.04	0.97
2014	0.70	9.41	6.19	1.64	0.19	0.14	0.11	0.17	1.03	1.28	4.54	13.07
2015	0.62	4.61	0.71	2.00	0.57	0.43	0.44	0.53	0.58	0.12	2.21	9.82

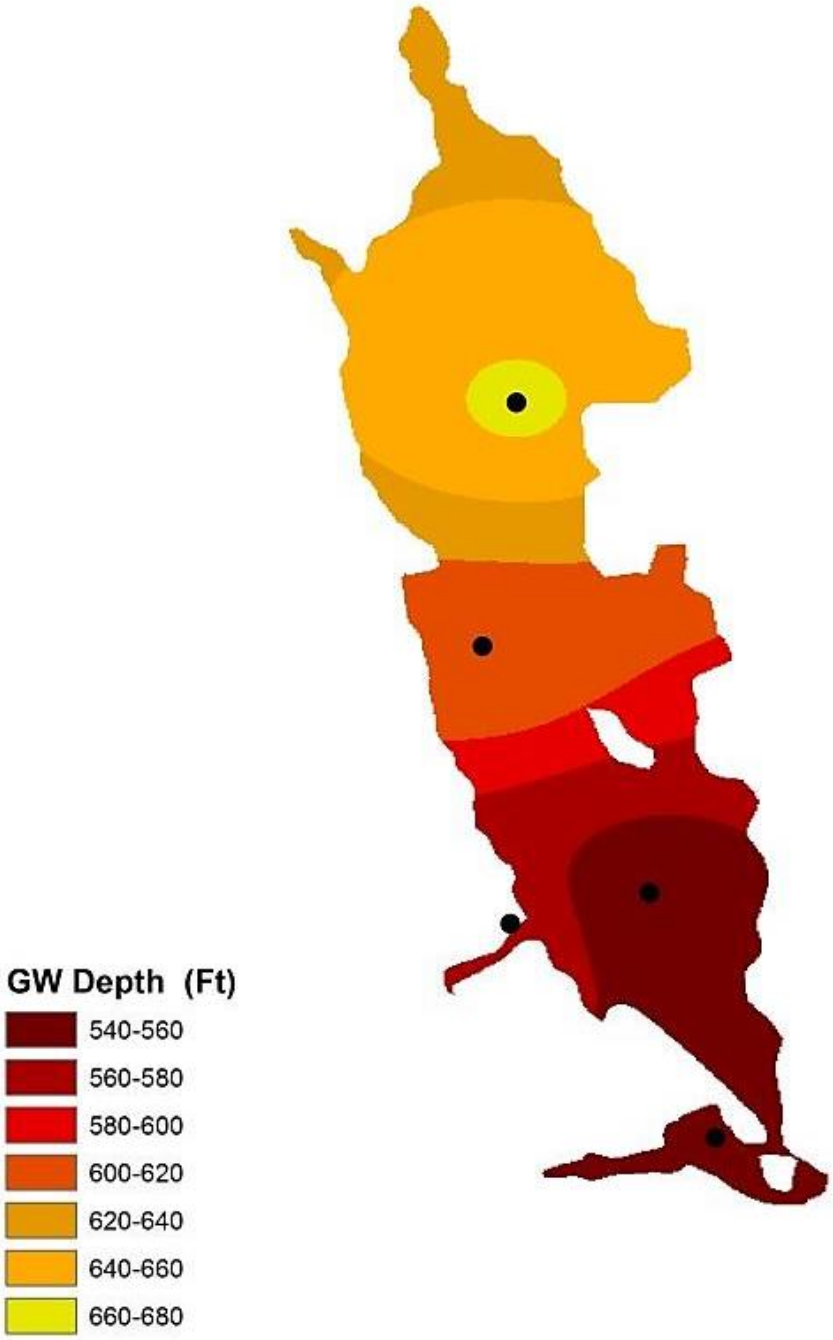
Appendix G. Application efficiency values.

	Apples, Cherries, Olives, Bartlett Pears, Pears (Other), & Pistachios	**White Wine Grapes, Red Wine Grapes, Grapes (Rootstock), & Raisin Grapes**	**Pasture**
1991	0.884	0.888	0.693
1992	0.885	0.889	0.697
1993	0.885	0.891	0.700
1994	0.886	0.892	0.704
1995	0.887	0.893	0.708
1996	0.887	0.895	0.711
1997	0.888	0.896	0.715
1998	0.889	0.897	0.718
1999	0.889	0.899	0.722
2000	0.890	0.900	0.726
2001	0.891	0.901	0.729
2002	0.891	0.903	0.733
2003	0.892	0.904	0.737
2004	0.893	0.905	0.740
2005	0.893	0.907	0.744
2006	0.894	0.908	0.747
2007	0.895	0.909	0.751
2008	0.895	0.911	0.755
2009	0.896	0.912	0.758
2010	0.897	0.913	0.762
2011	0.897	0.915	0.766
2012	0.898	0.916	0.769
2013	0.899	0.917	0.773
2014	0.899	0.919	0.776
2015	0.900	0.920	0.780

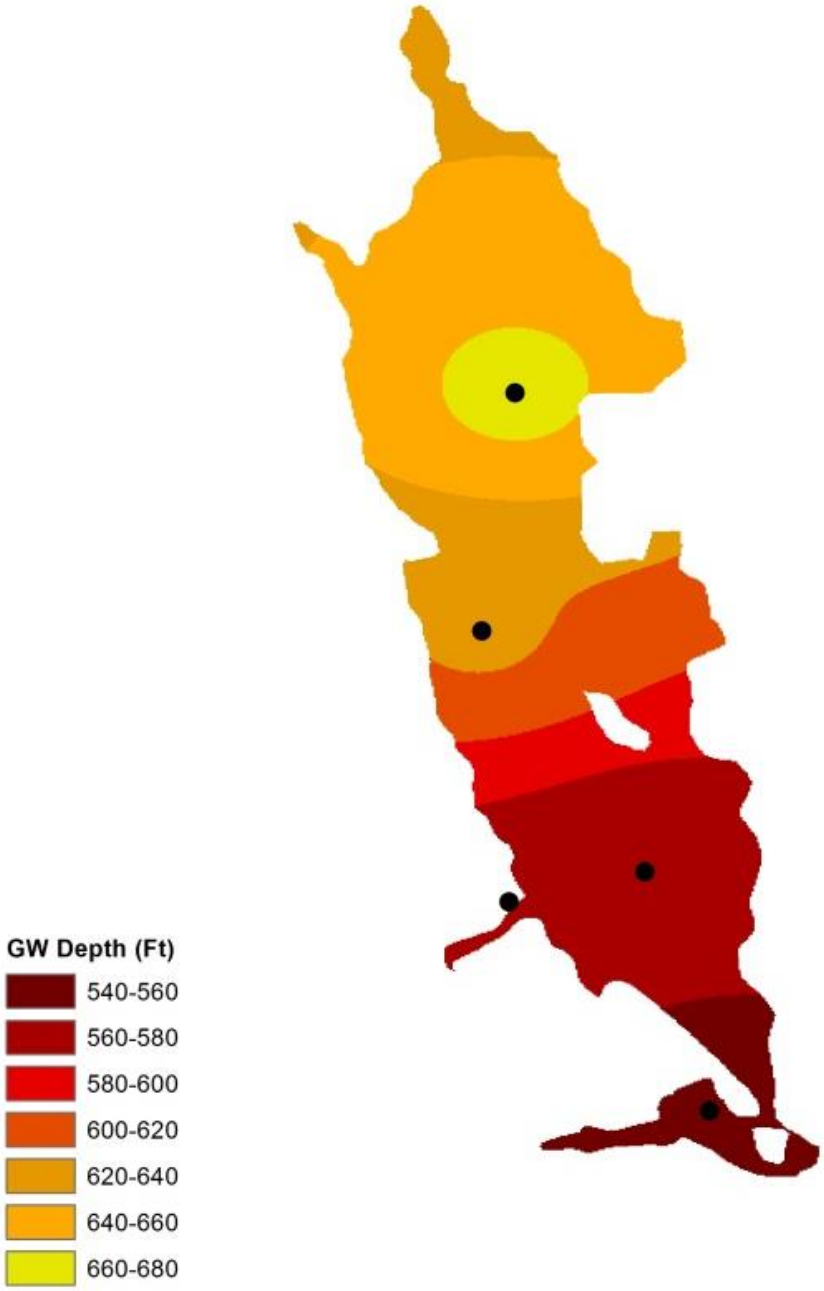
Appendix H. GIS generated groundwater depth contours based off water table elevations derived from monitoring wells through DWR's water data library found online. The black dots represent the monitoring well location from which the water table data was obtained. The color scheme represents the water table elevations with respect to sea level that were generated using Inverse Distance Weighted Interpolation.



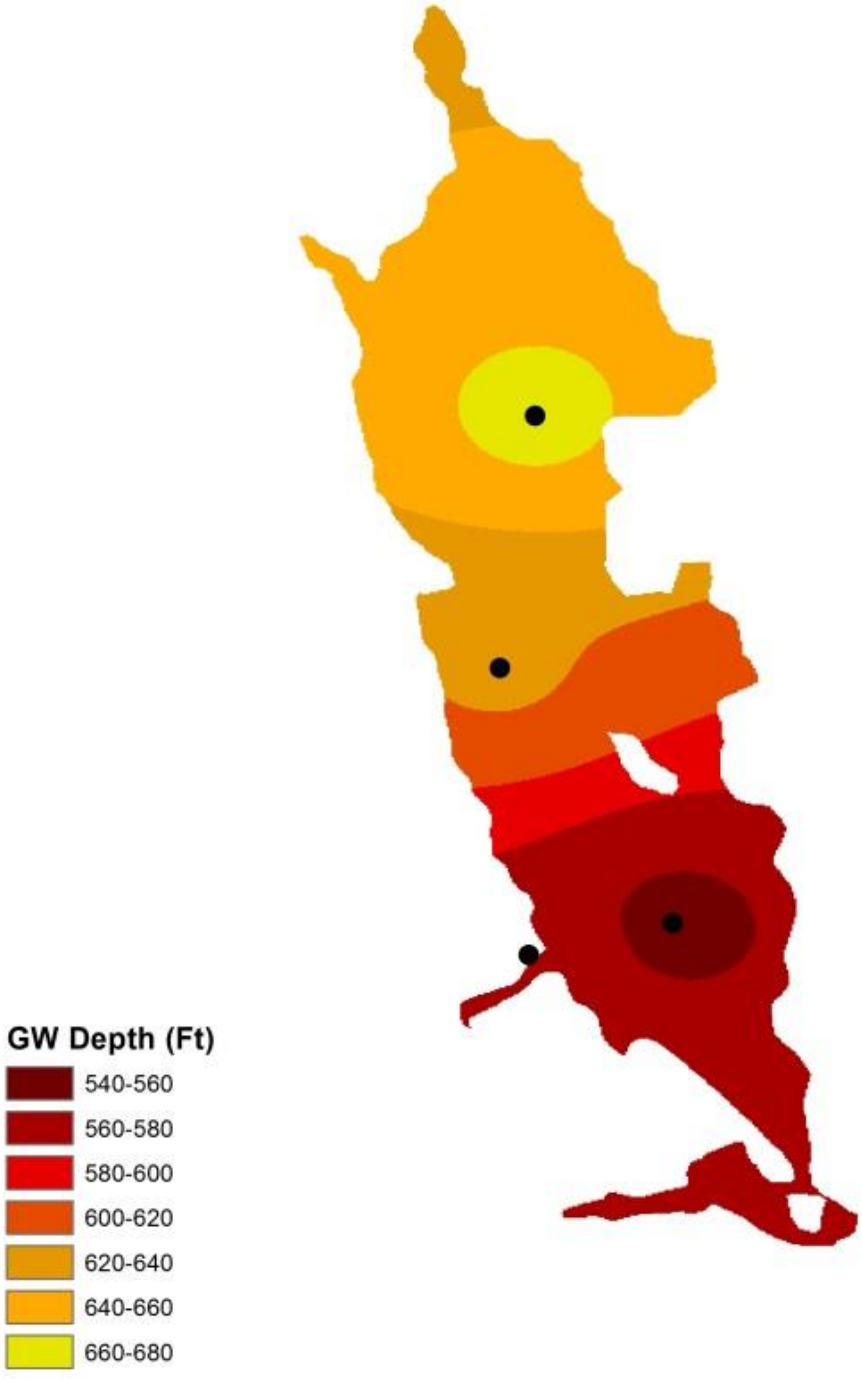
September 1991



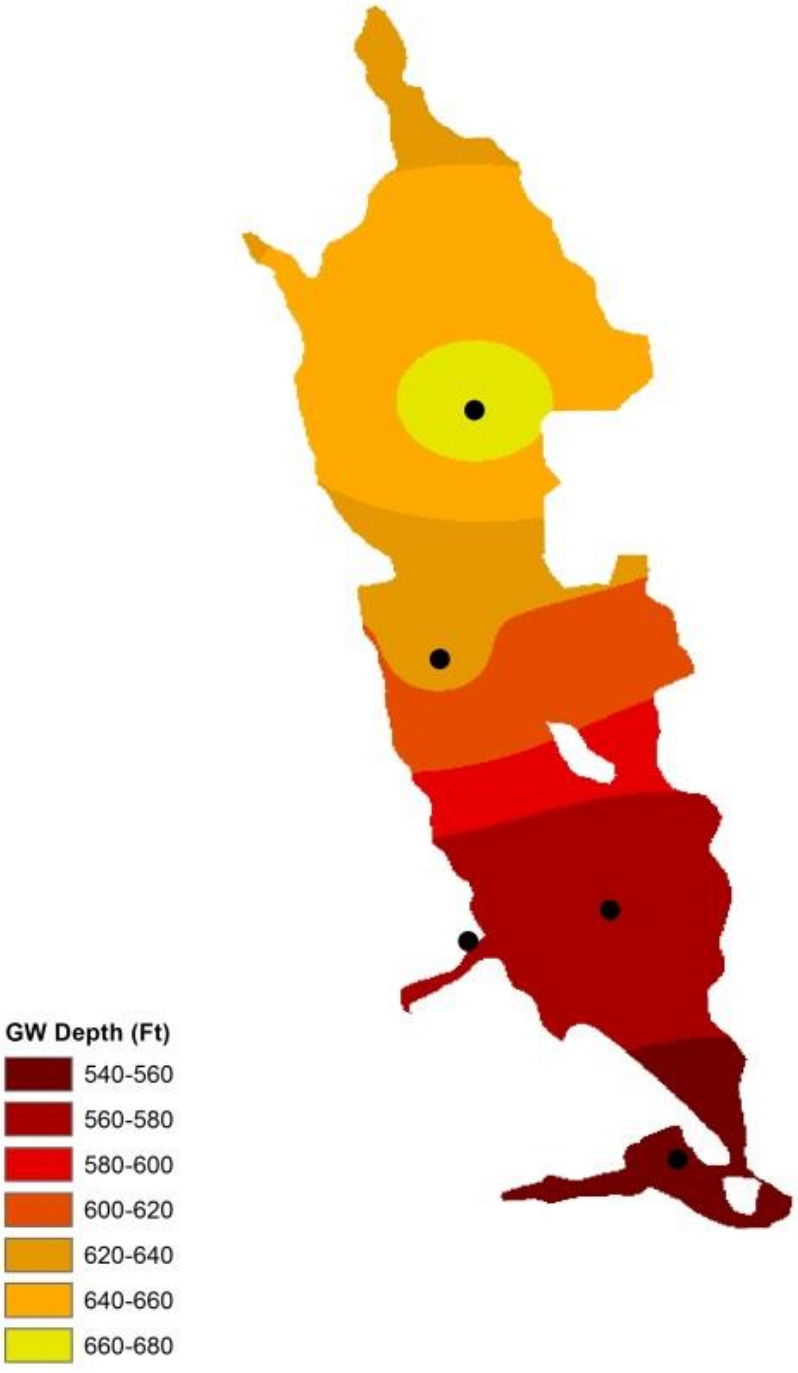
April 1992


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680

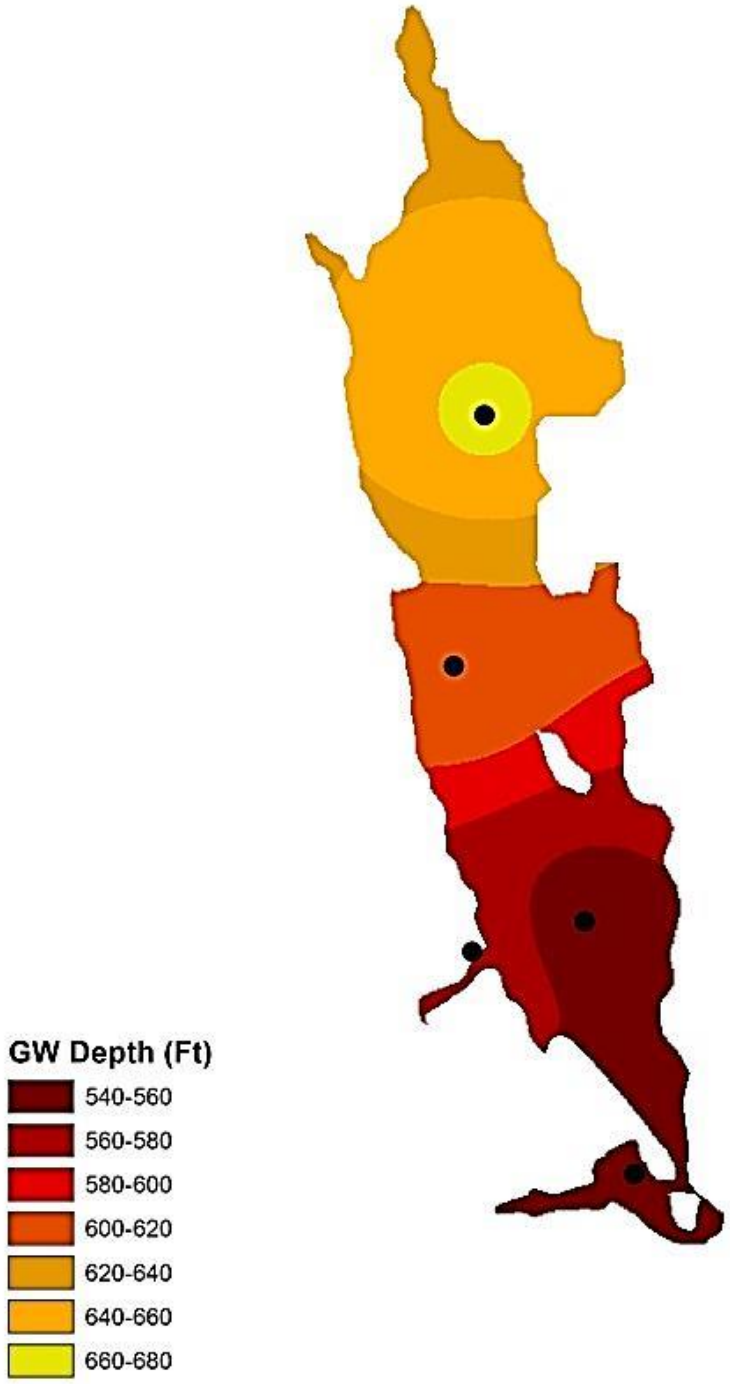
December 1992



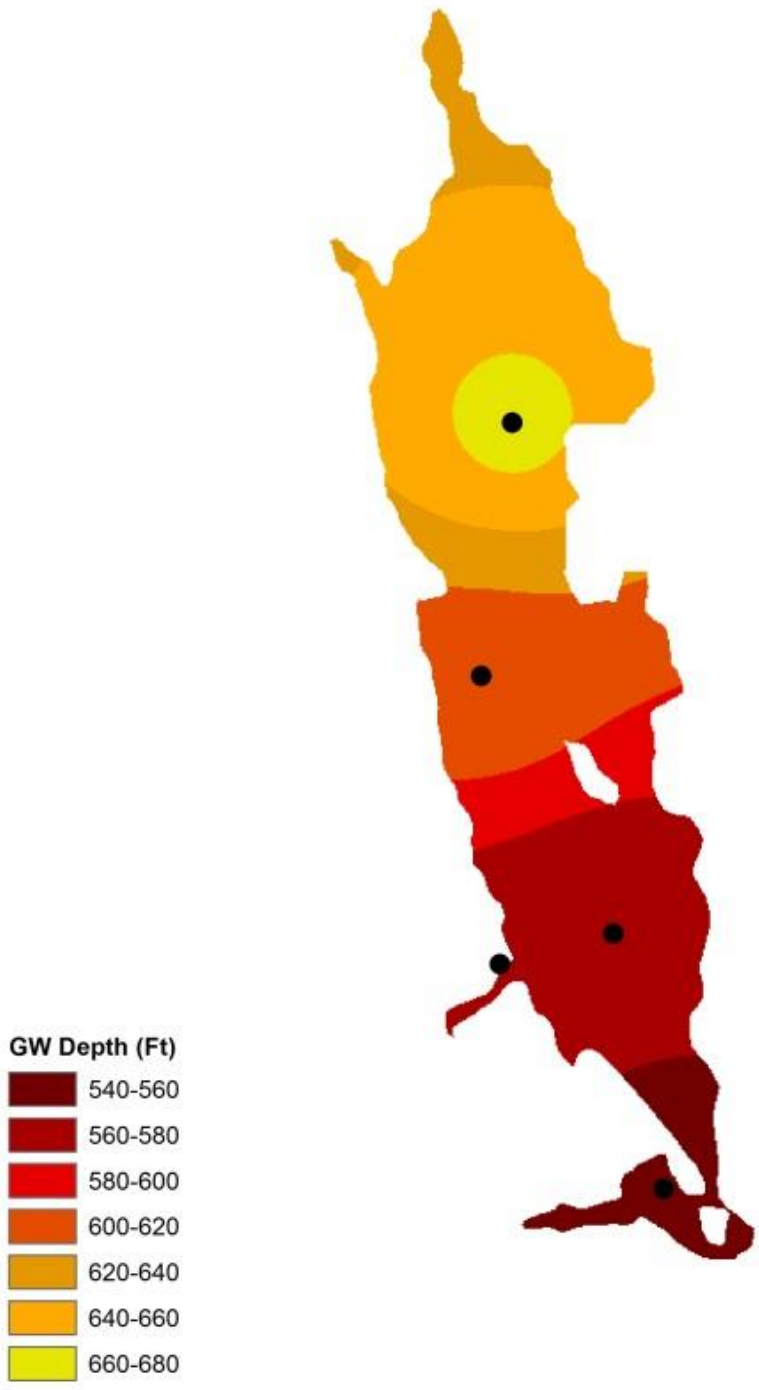
June 1993


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680

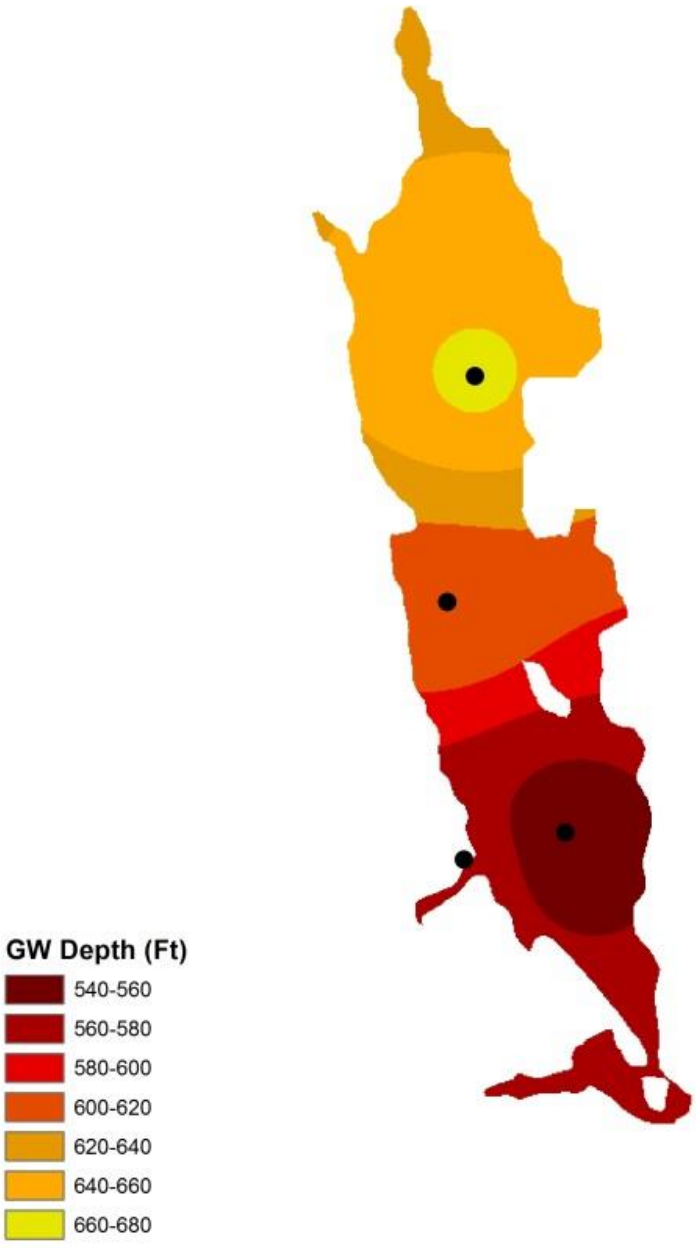
December 1993



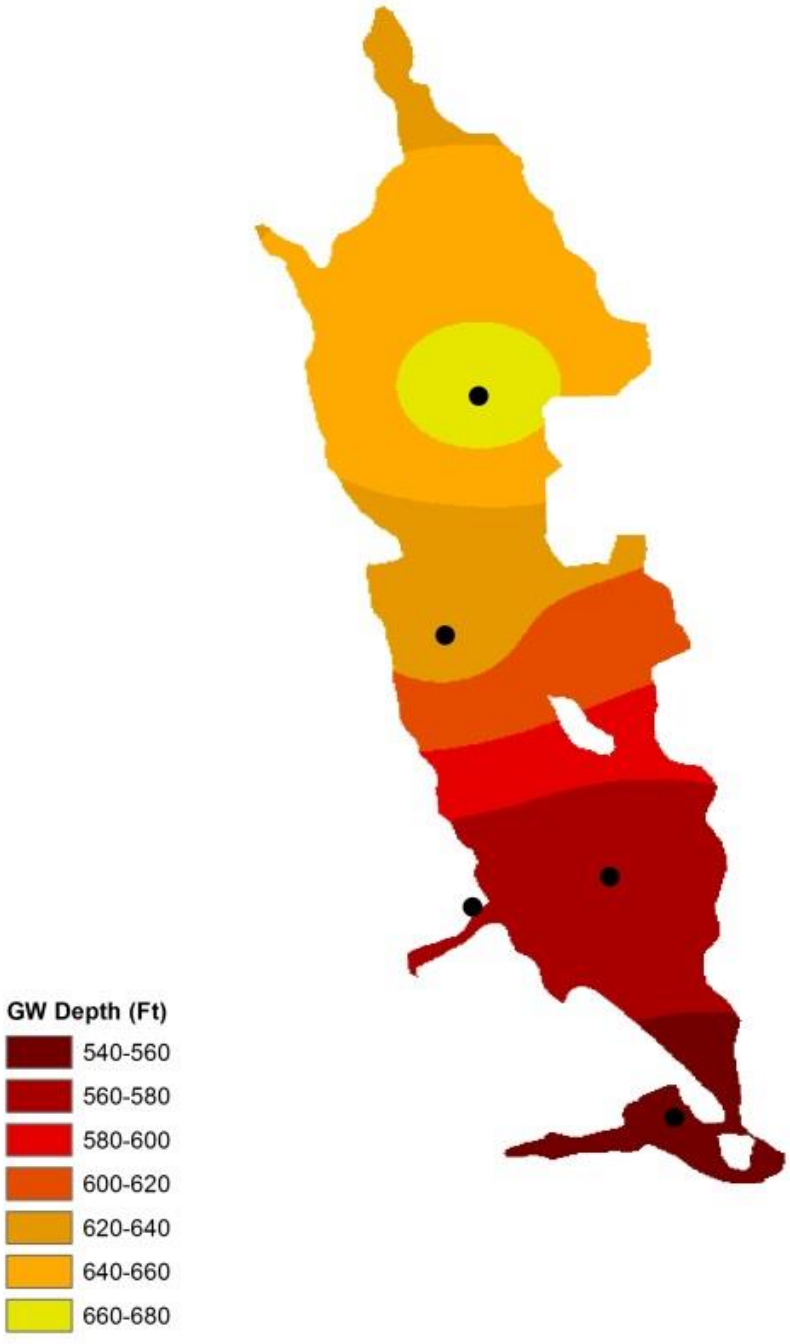
April 1994


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680

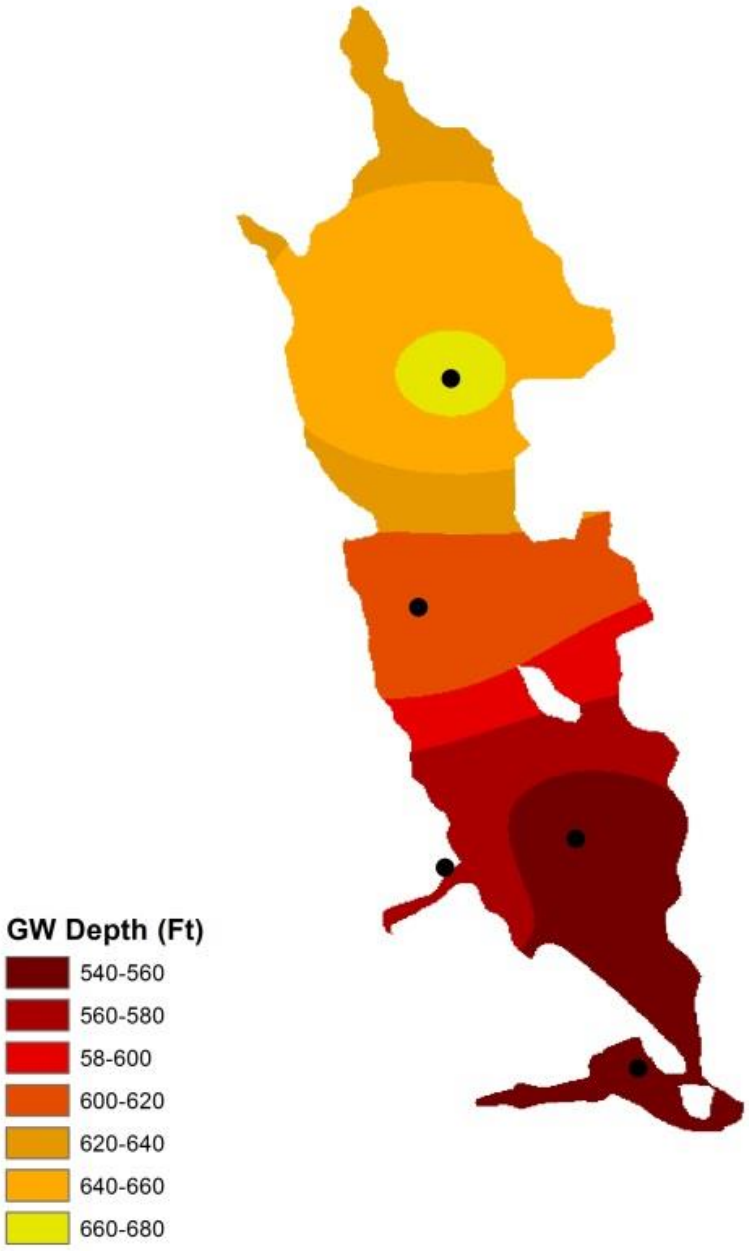
October 1994



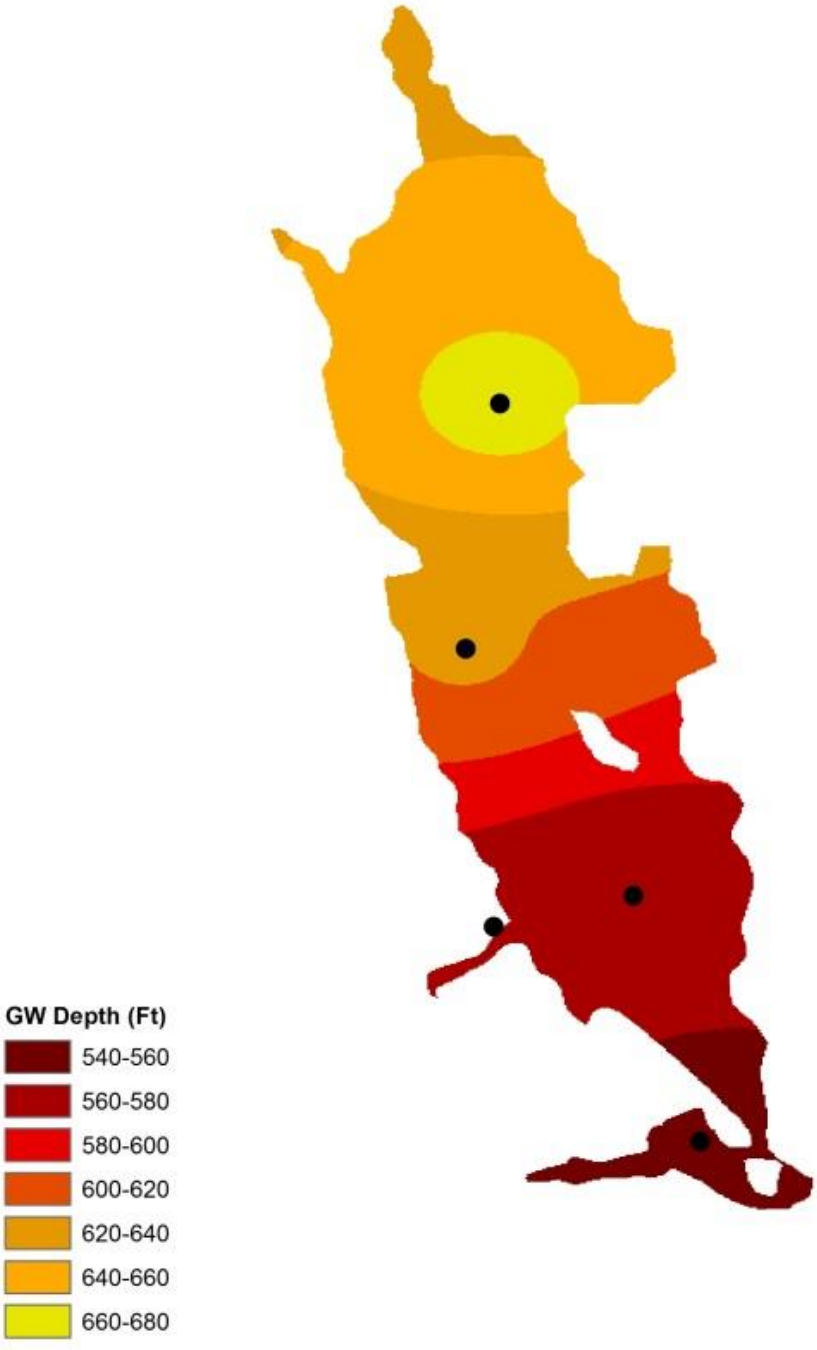
May 1995


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680

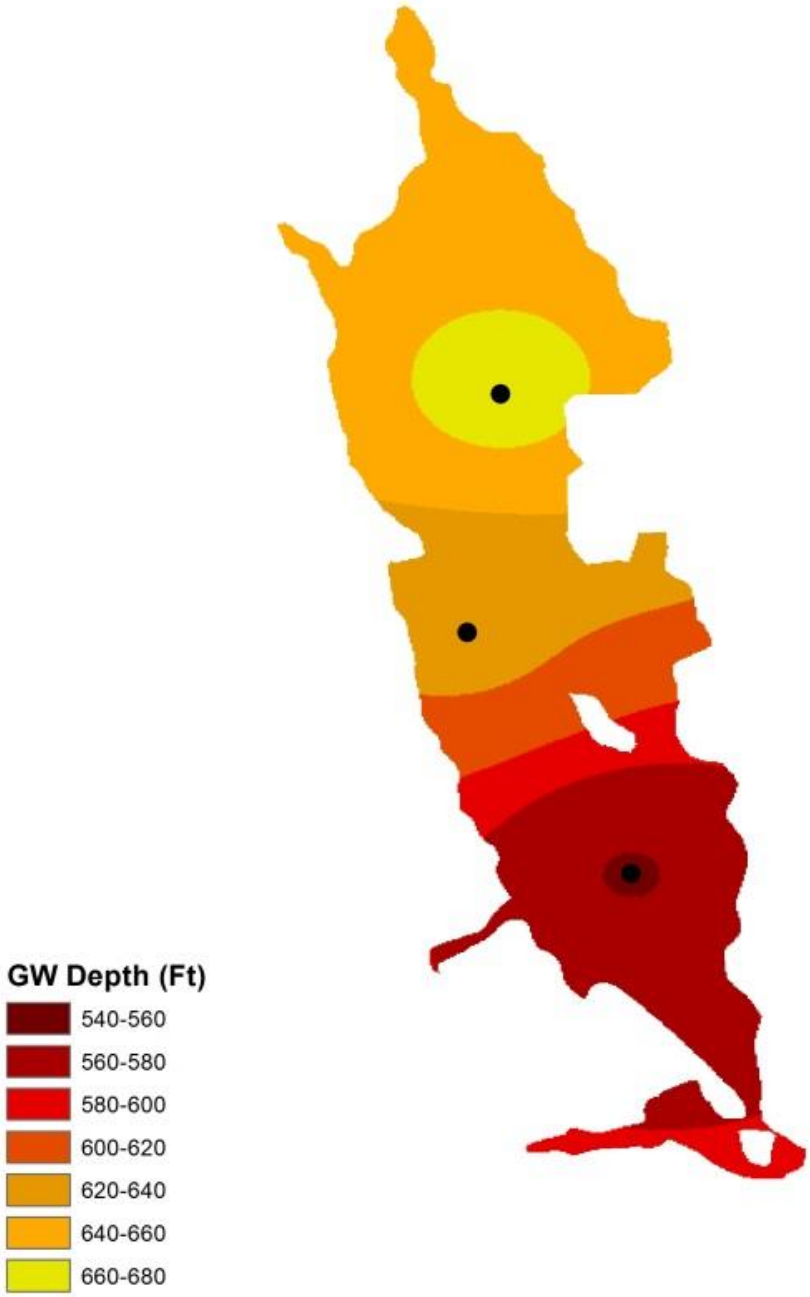
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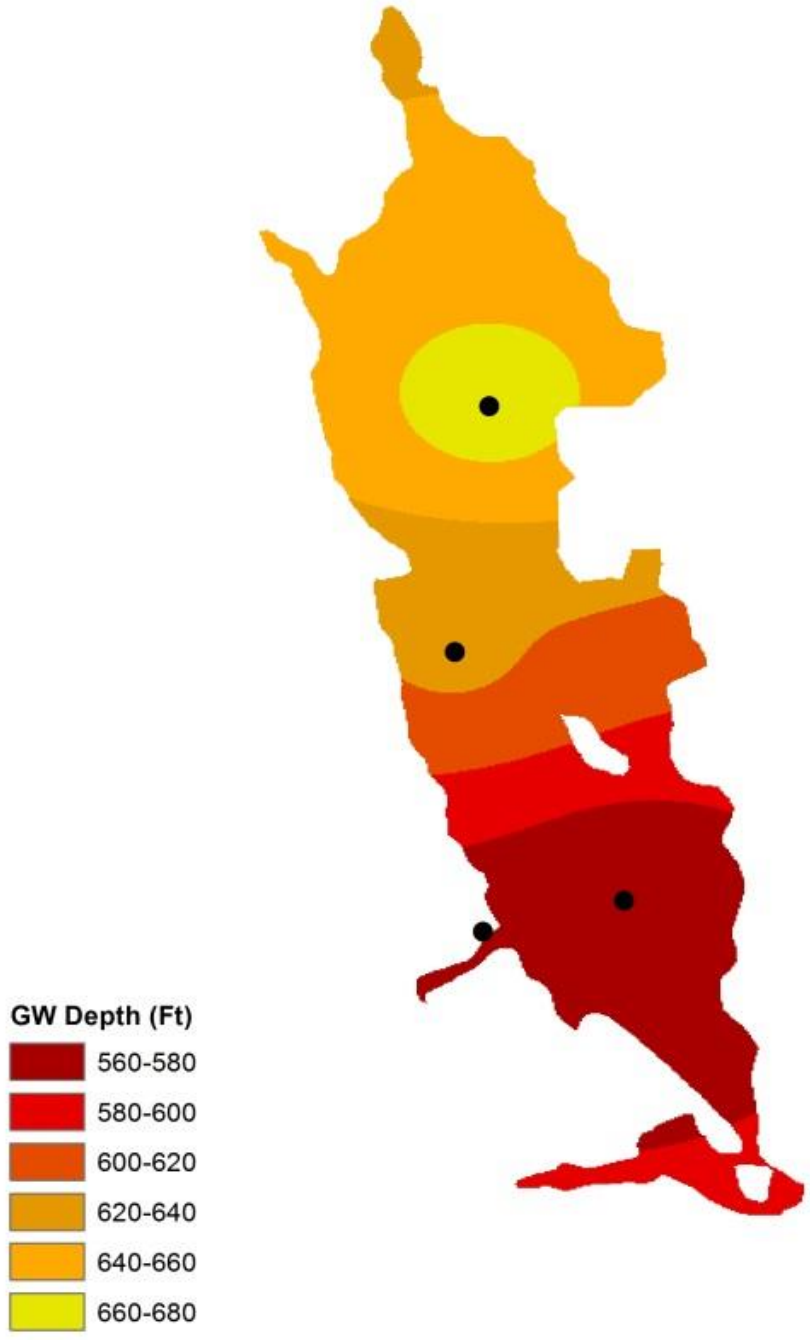
May 1996


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680

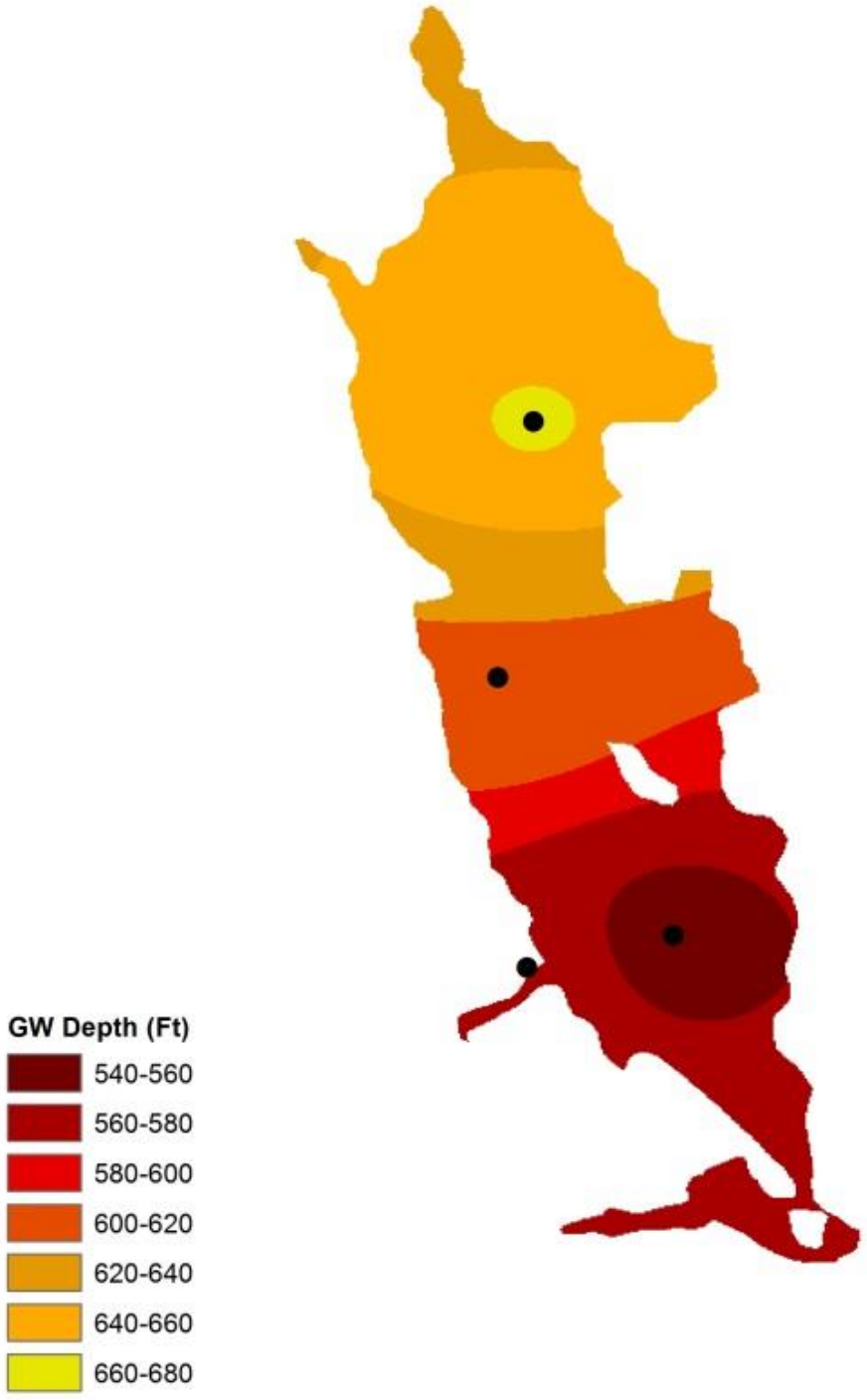
December 1996



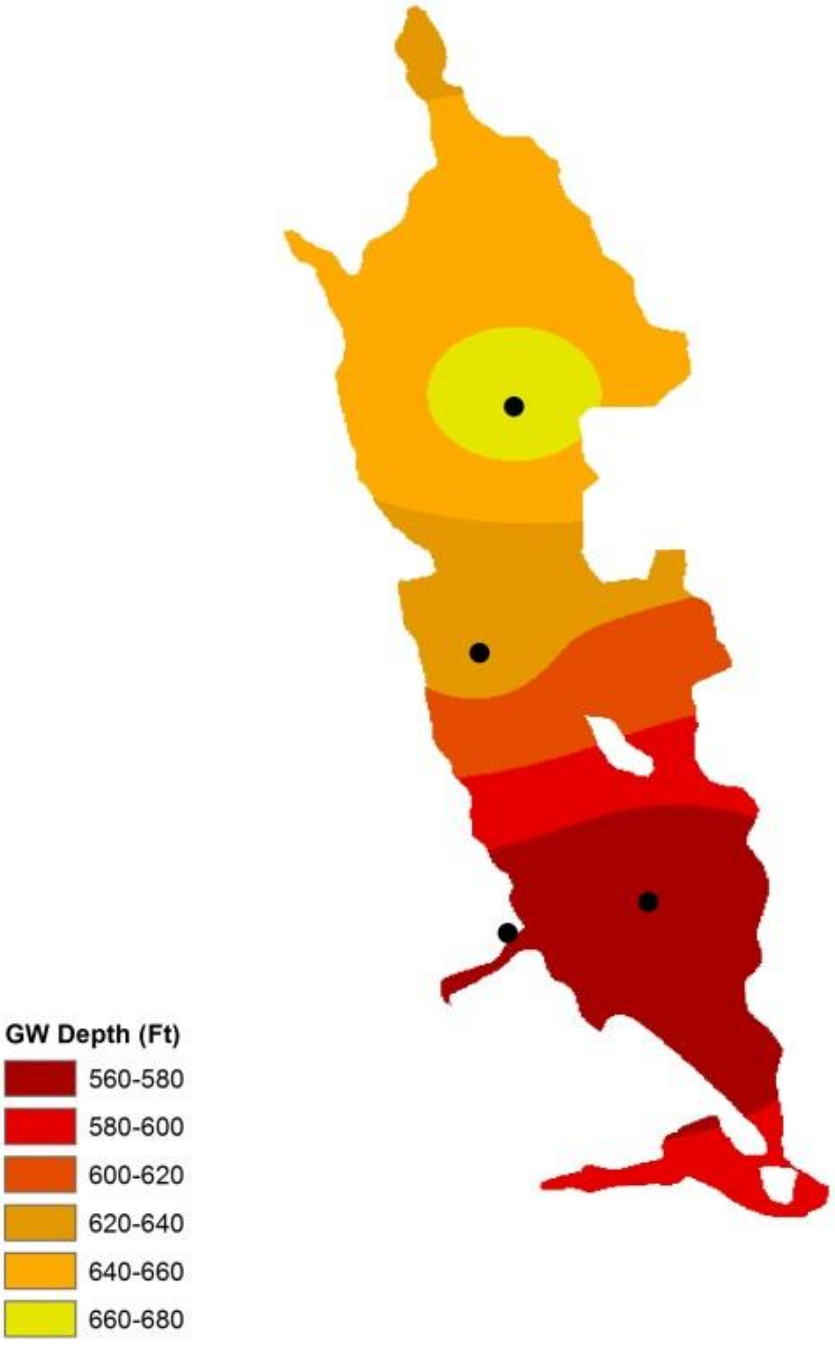
April 1997



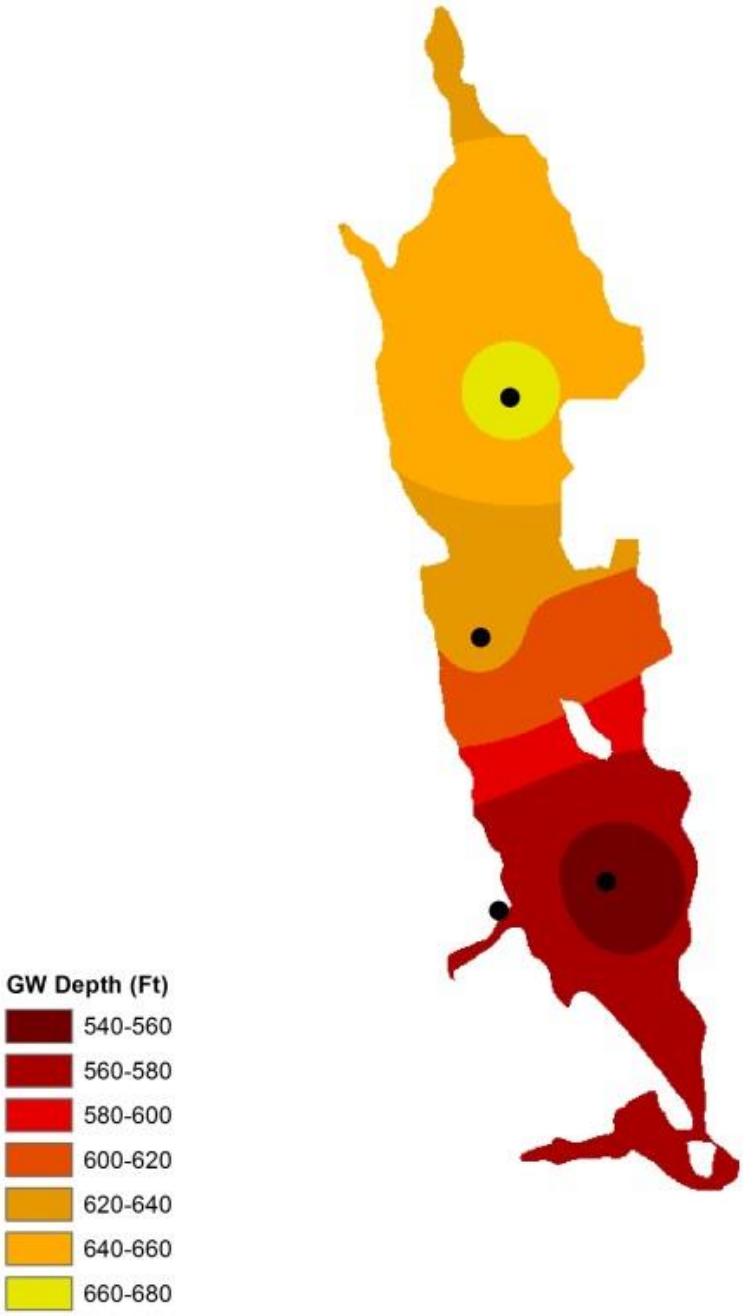
November 1997



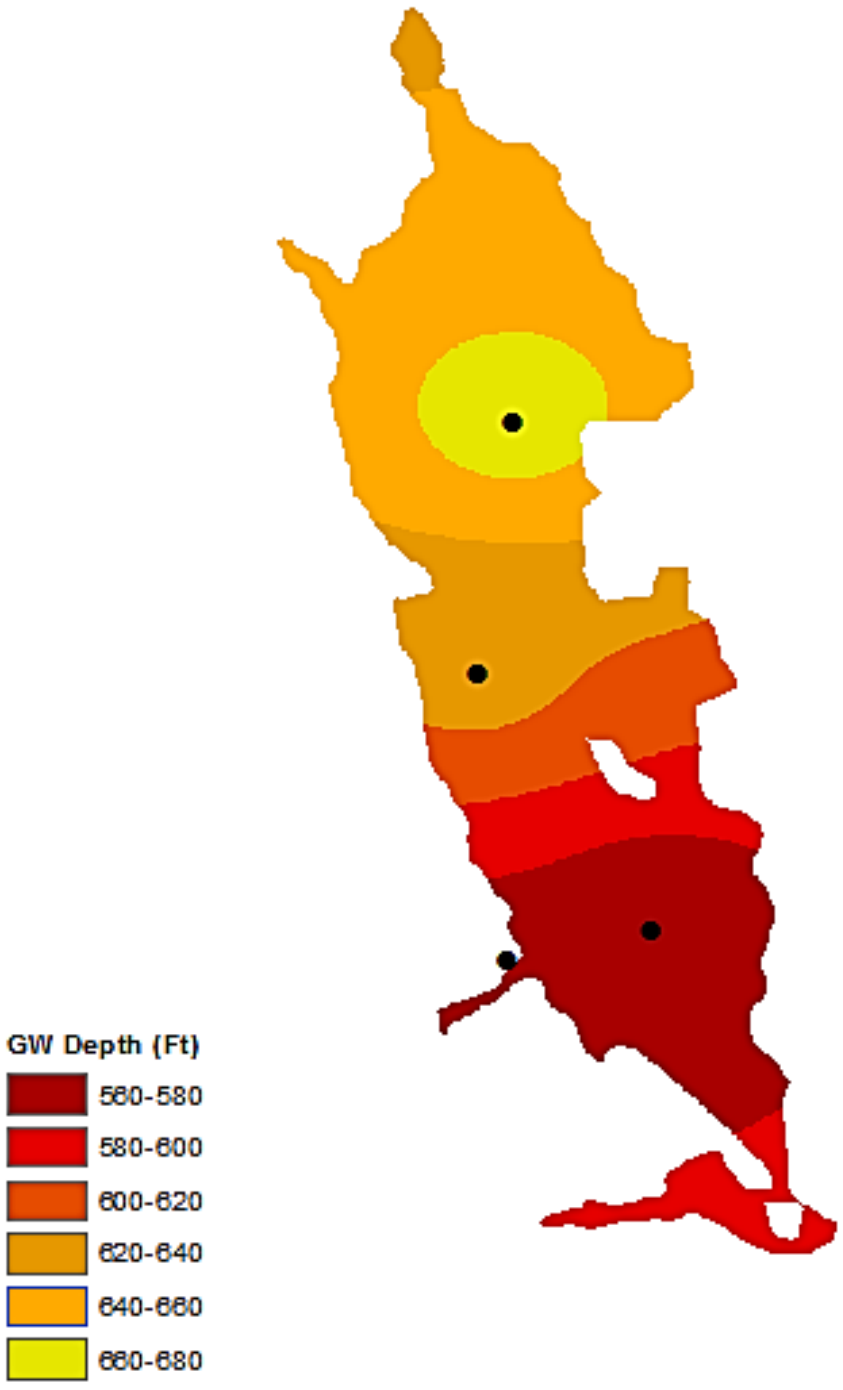
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November 1998



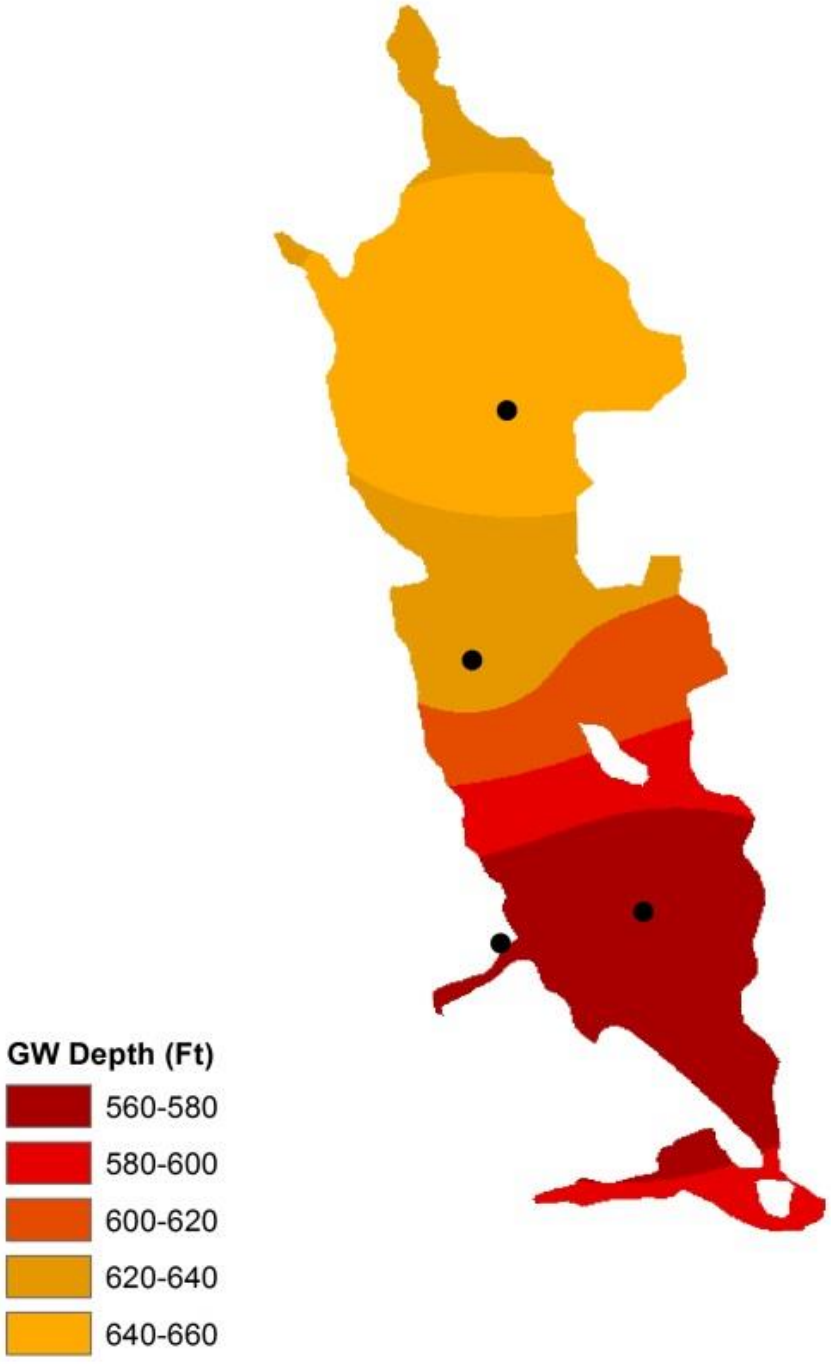
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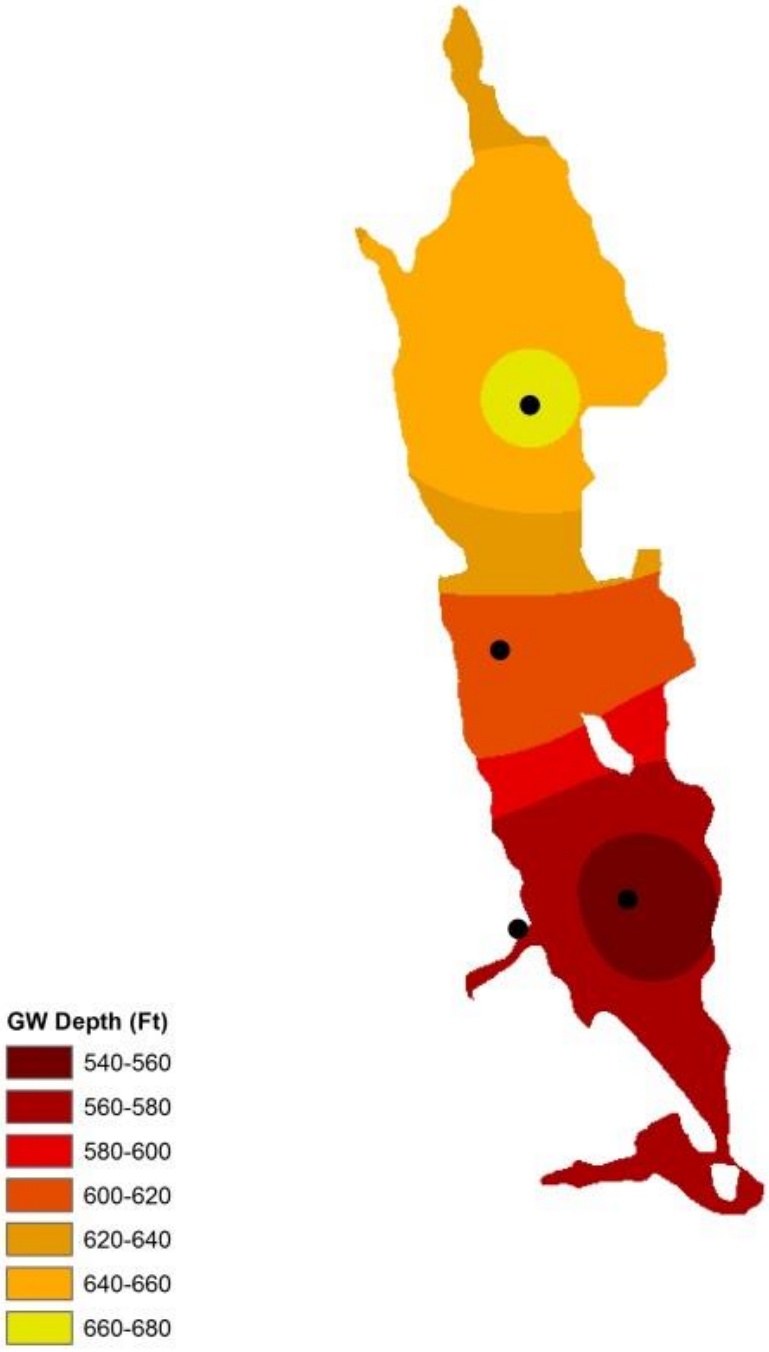
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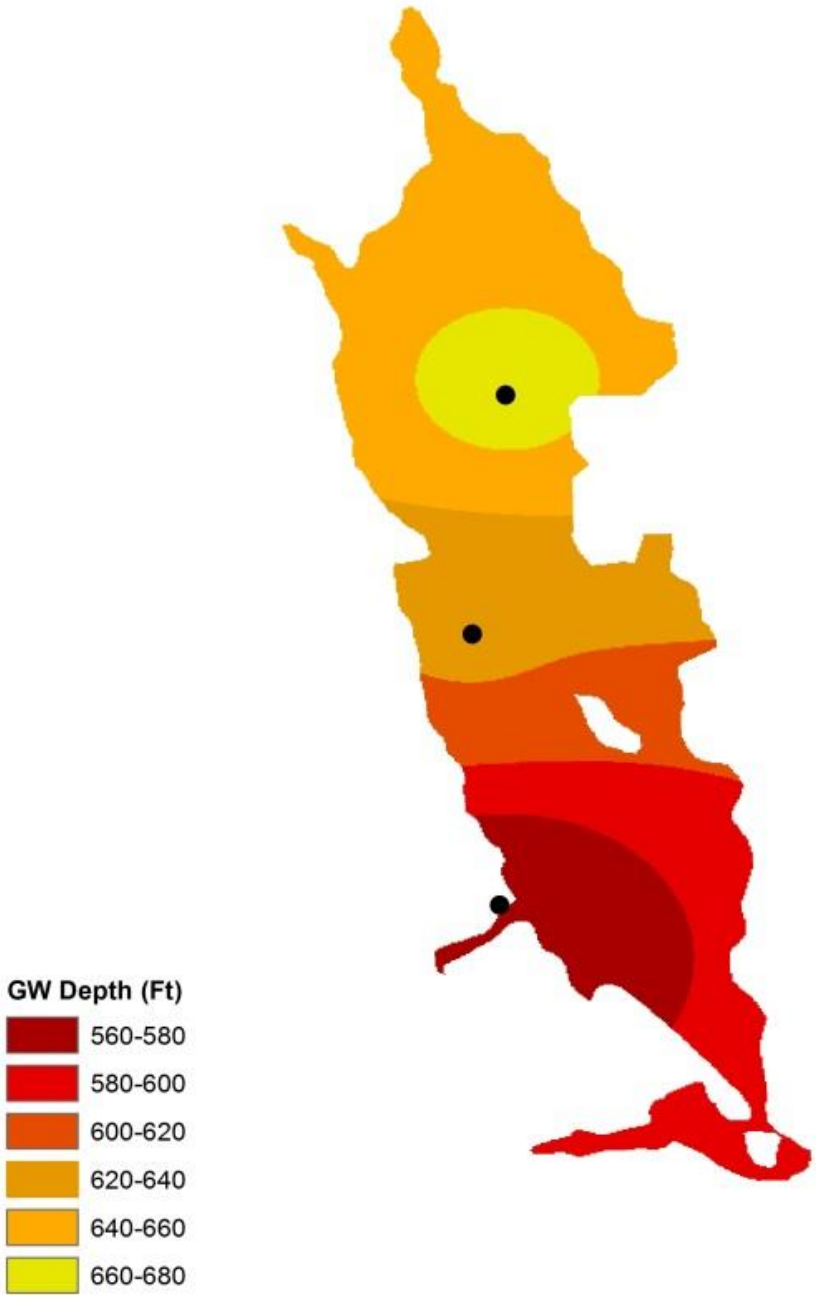
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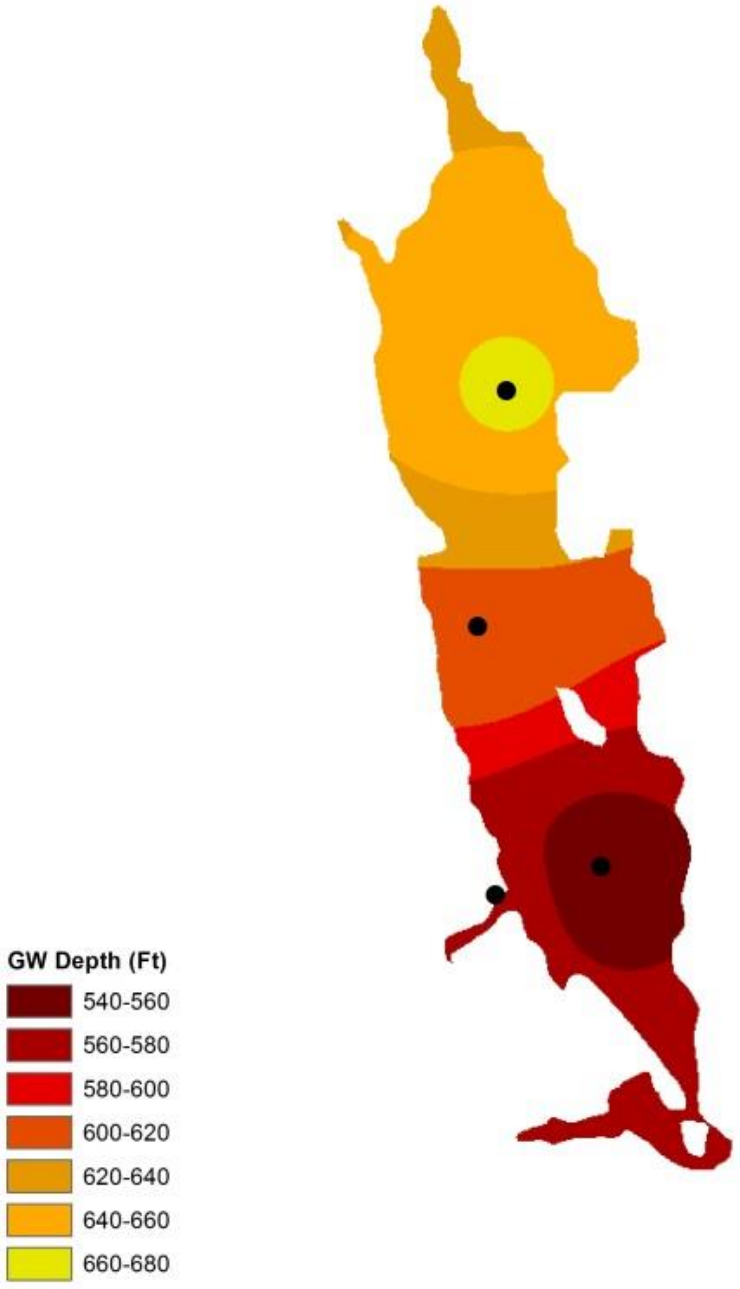
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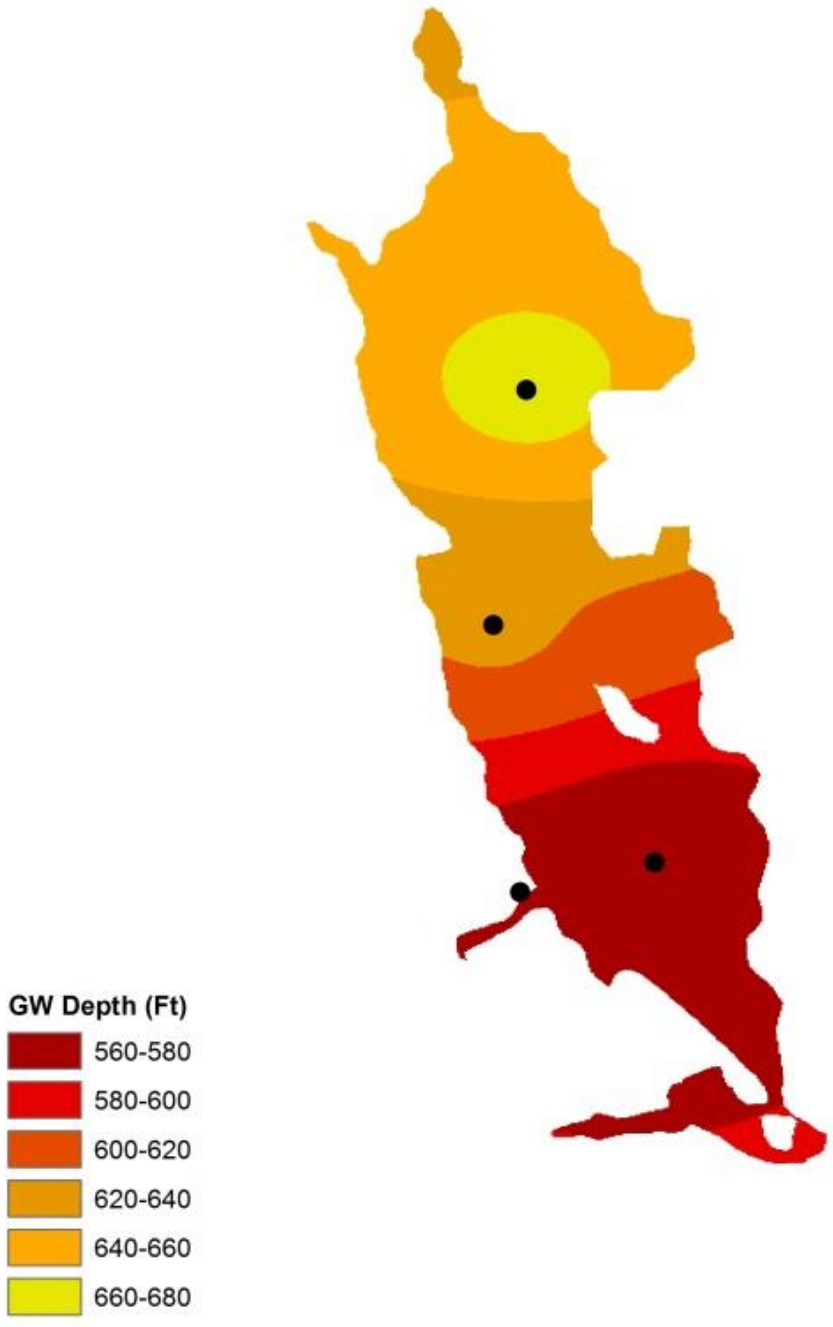
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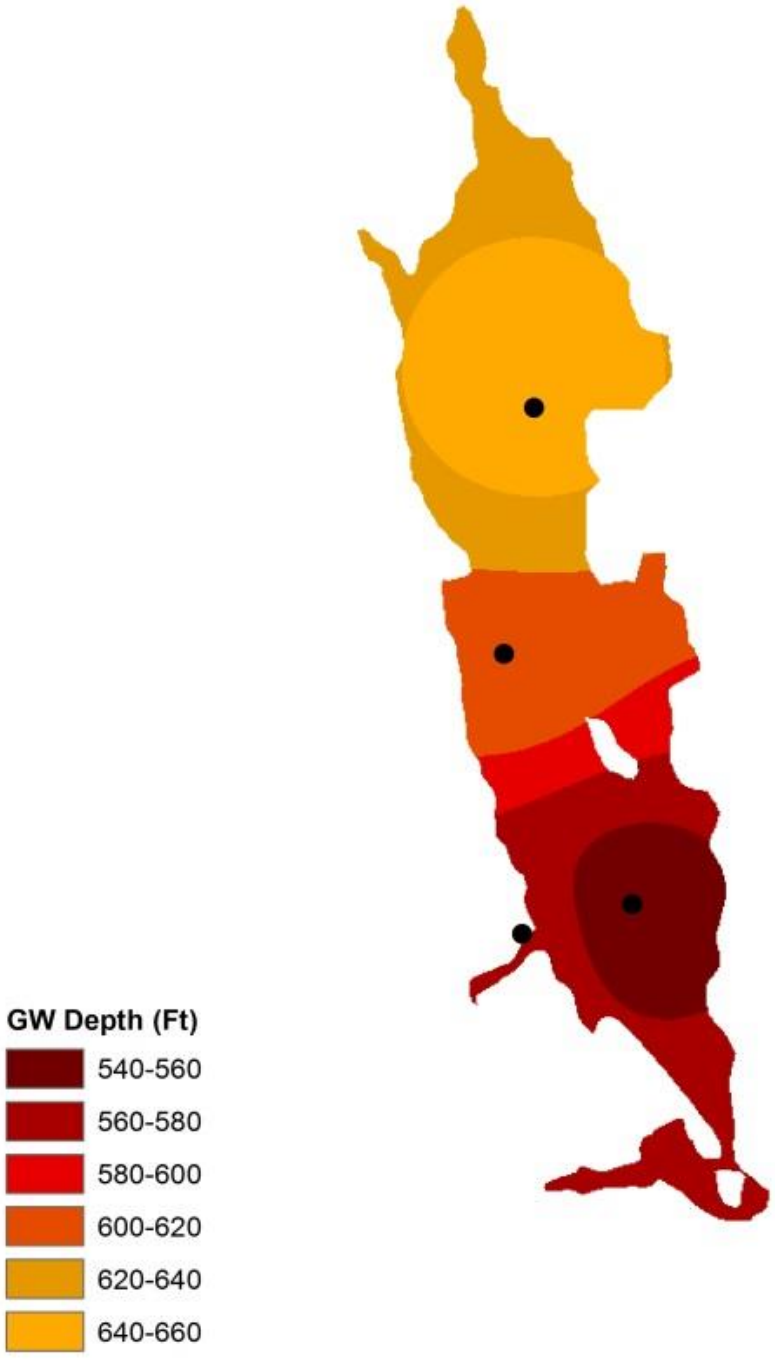
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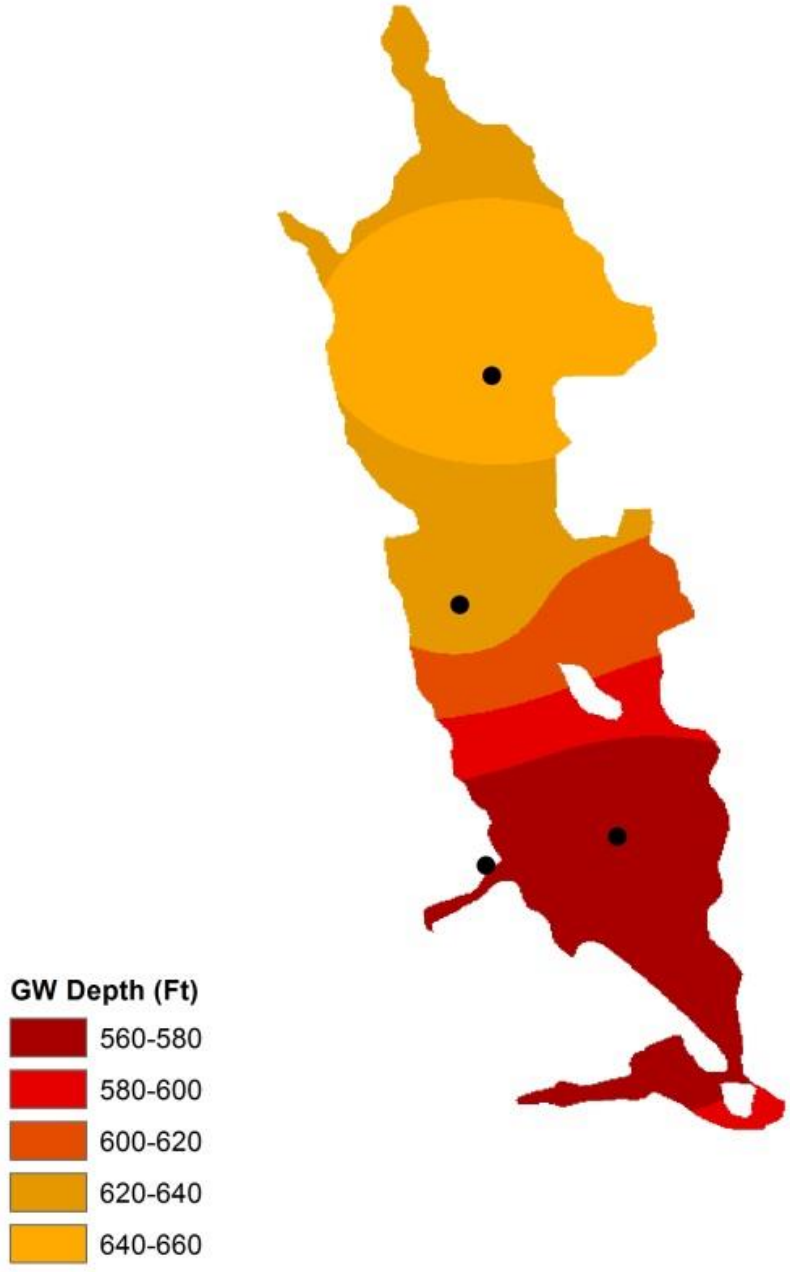
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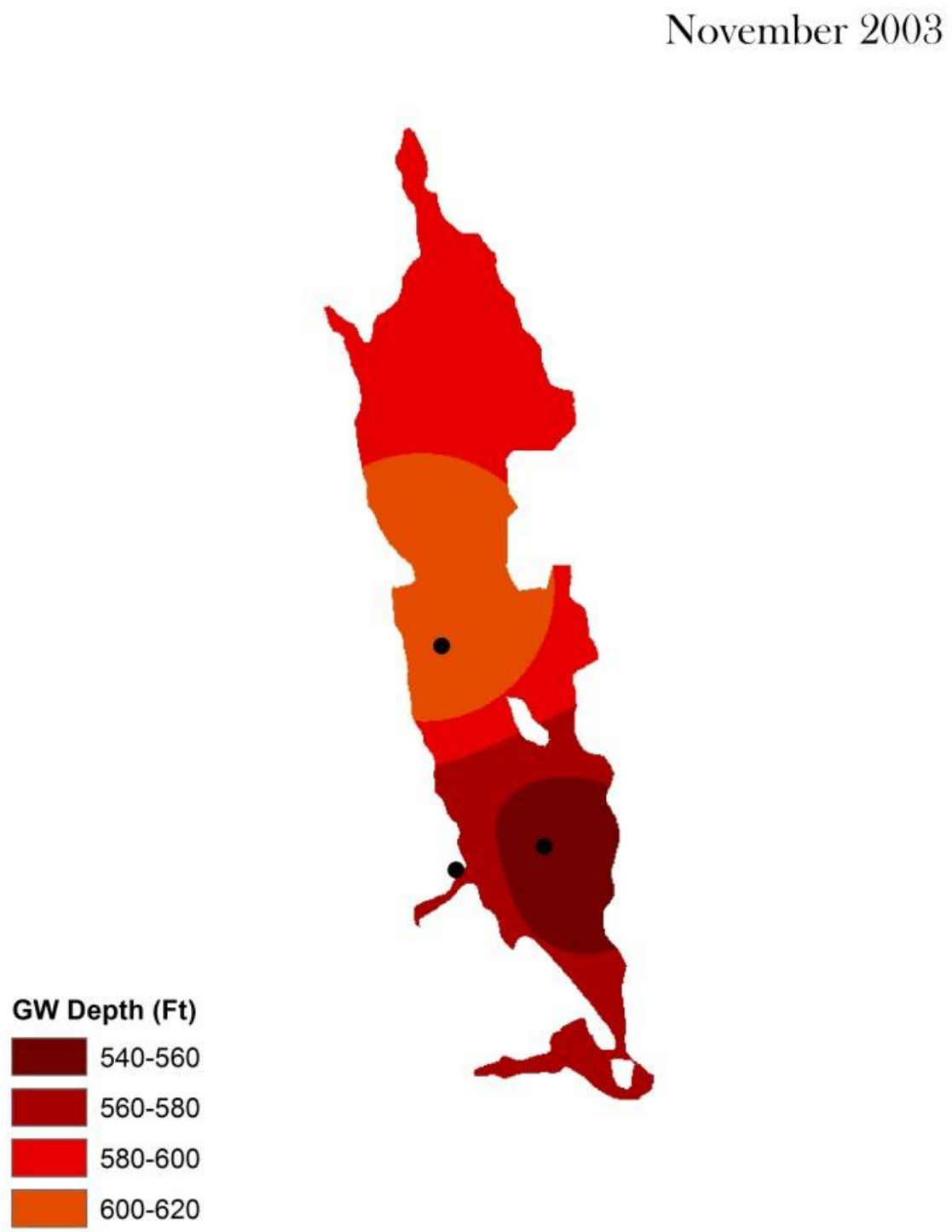


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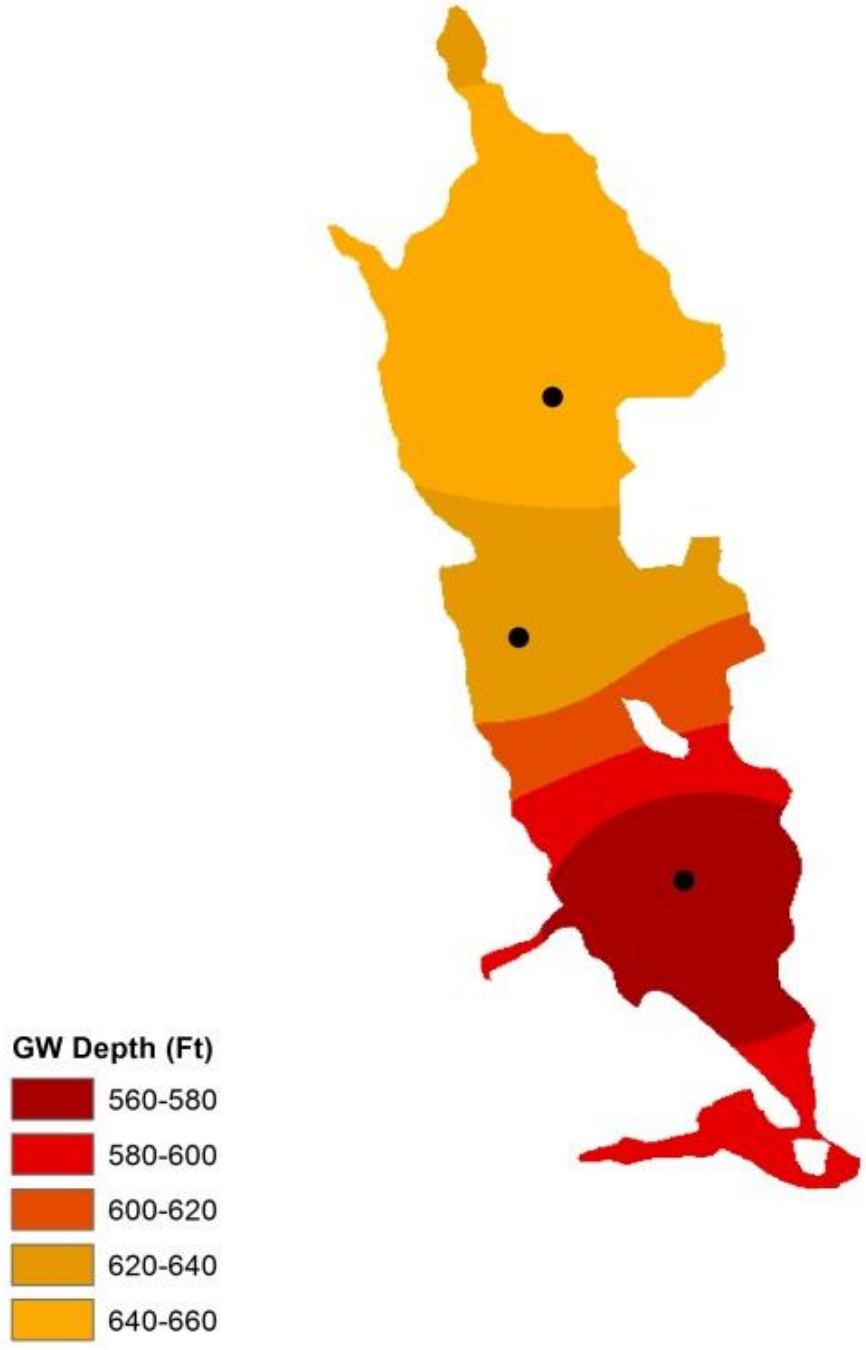
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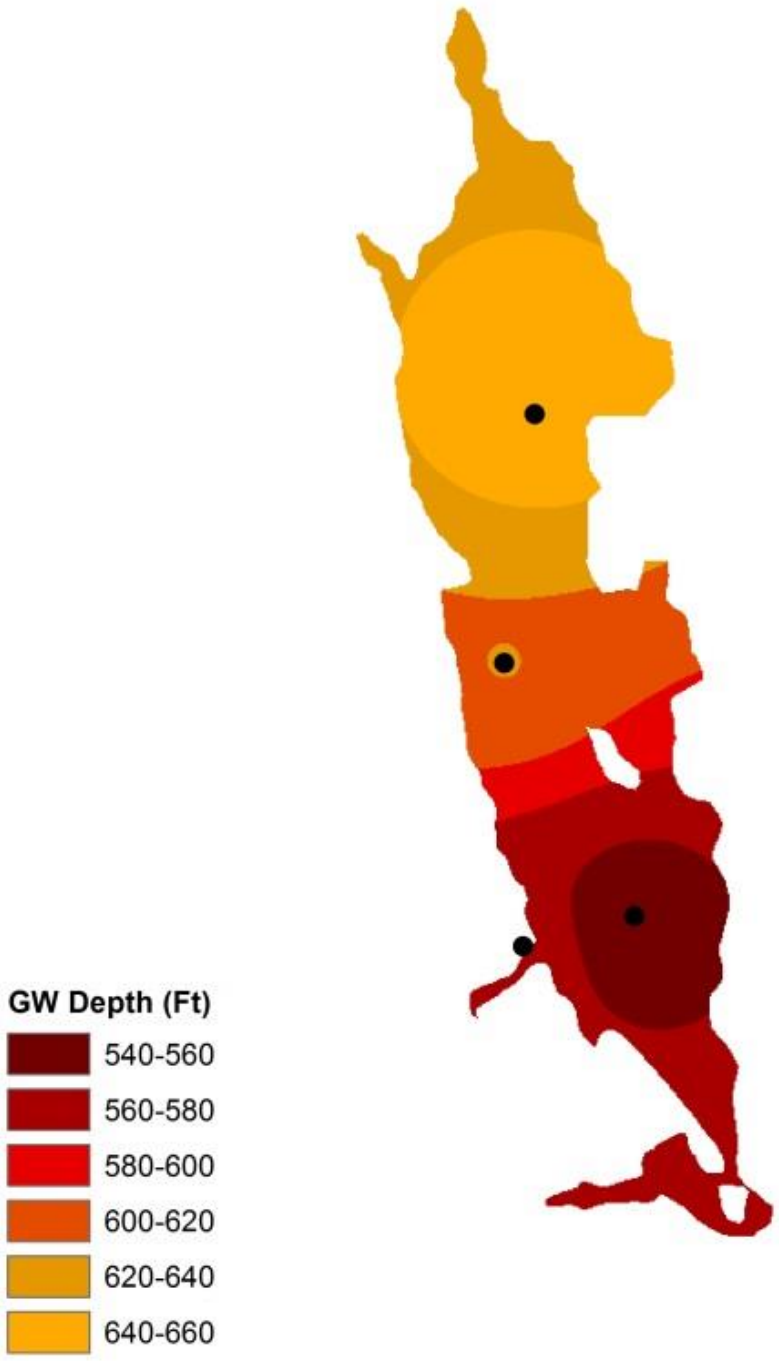


For November of 2013, only three monitoring wells had data available. The southern end of the basin had water table measurements in the low range of 540-560 ft with respect to sea level. This data is what is responsible for the kink seen in Figure 31 for the year 2003.

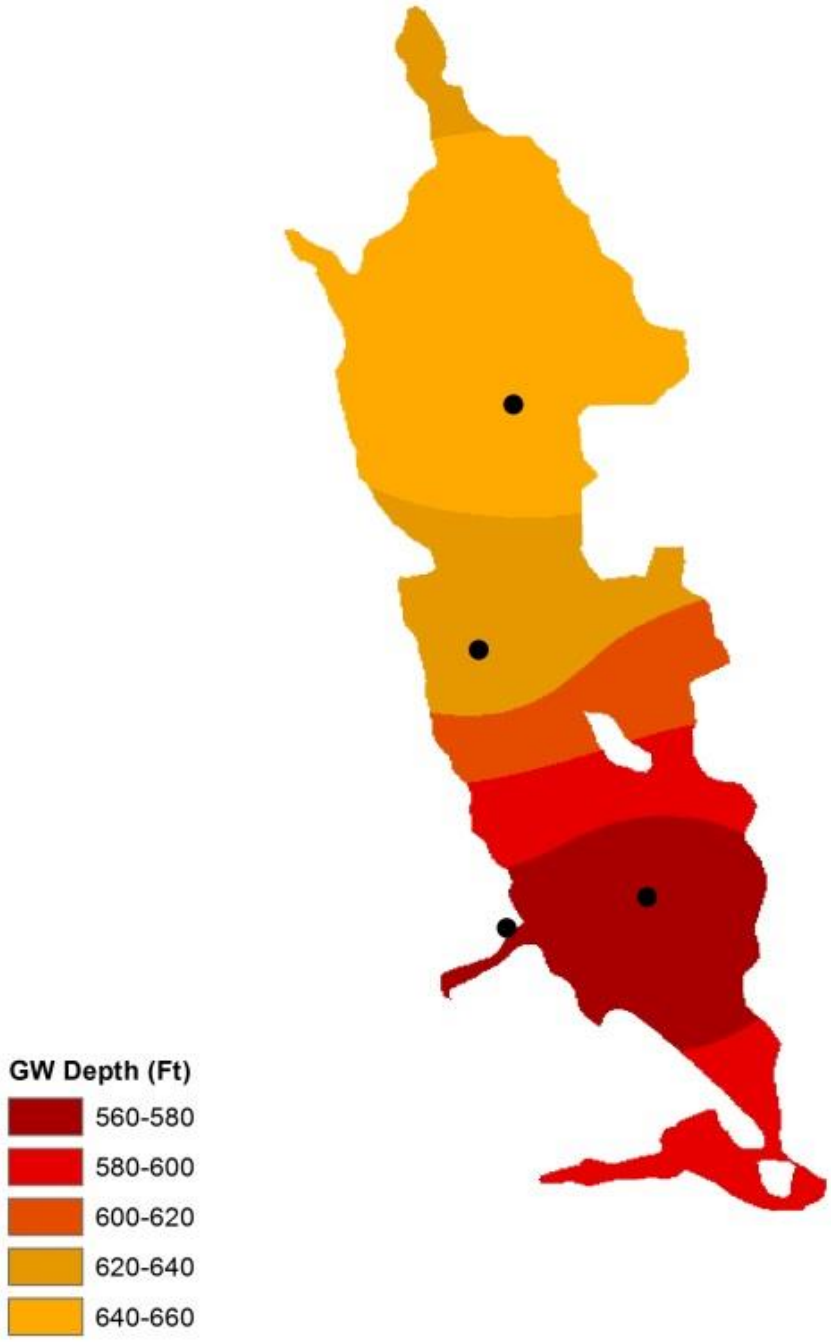
March 2004



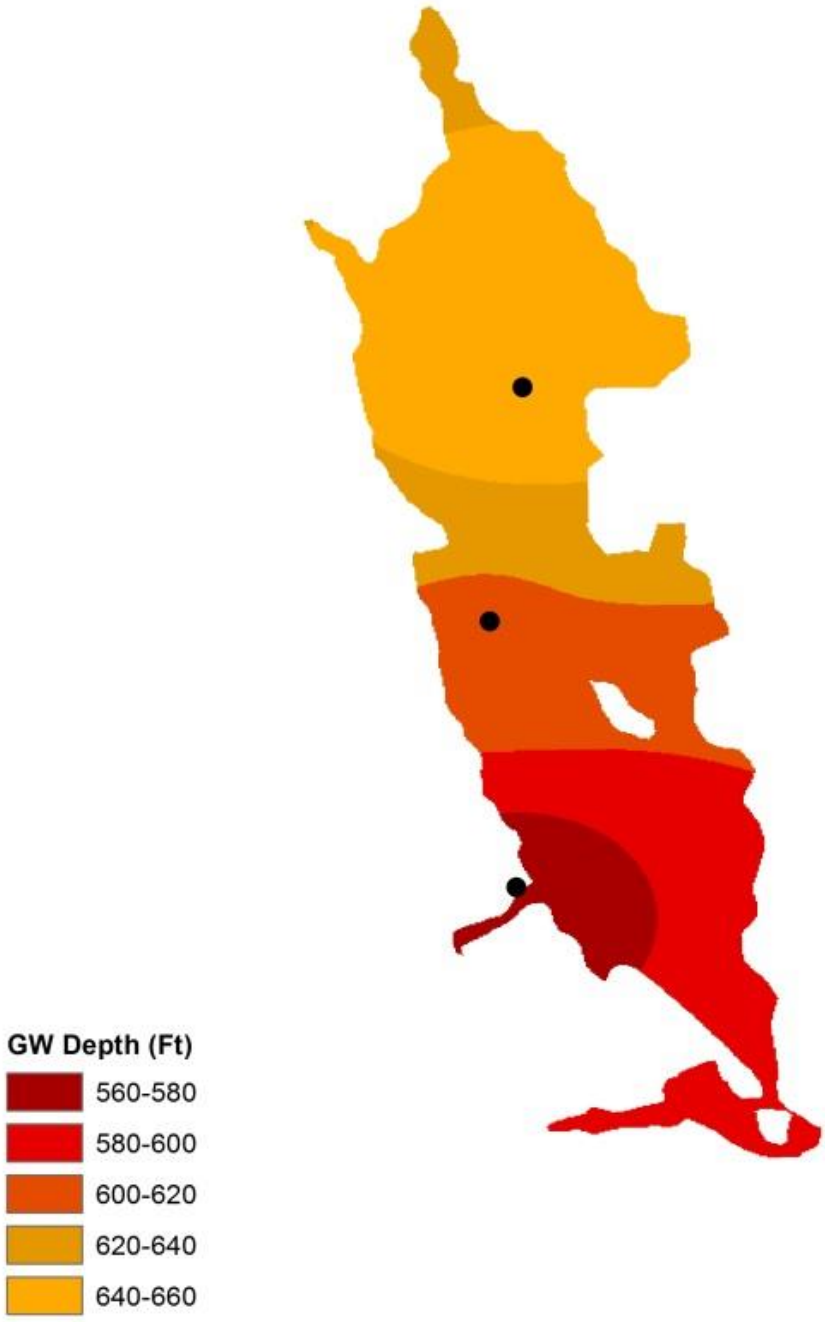
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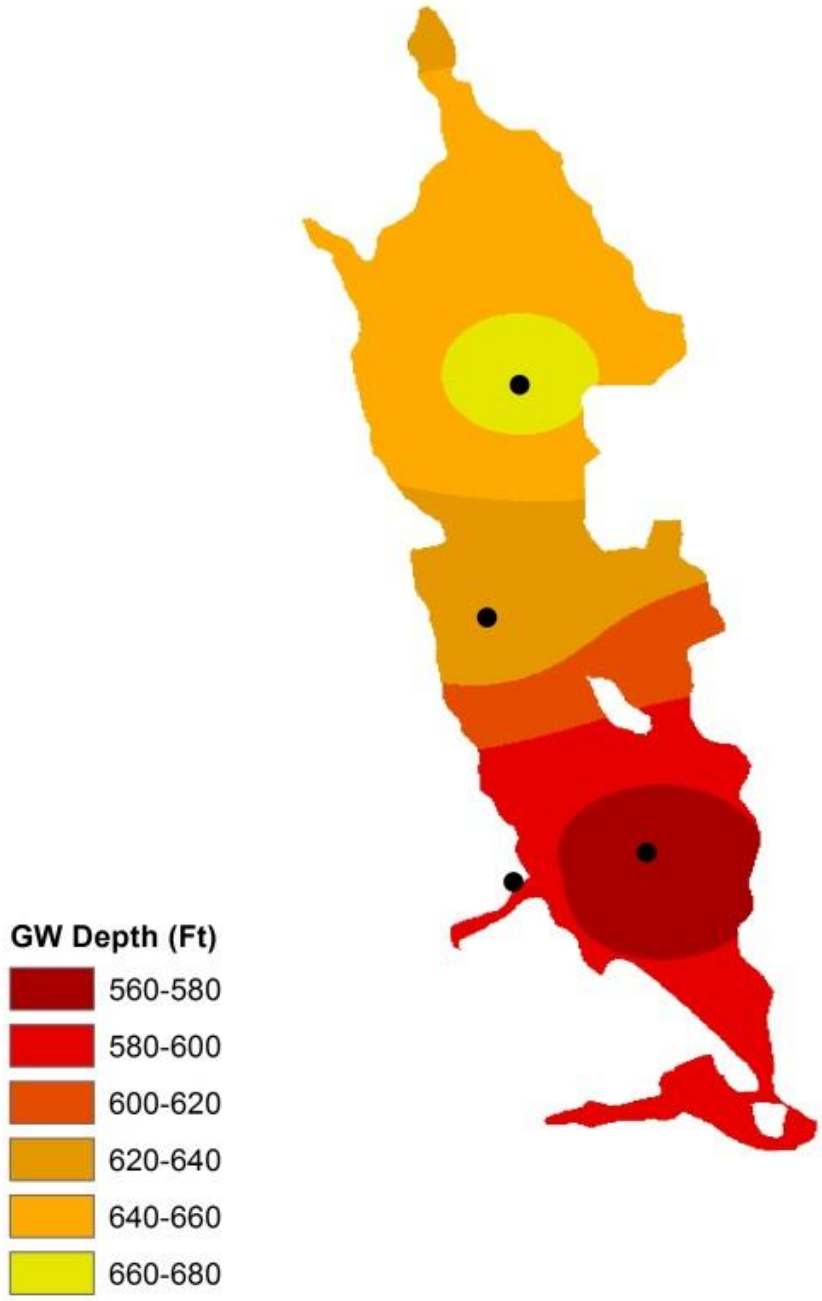
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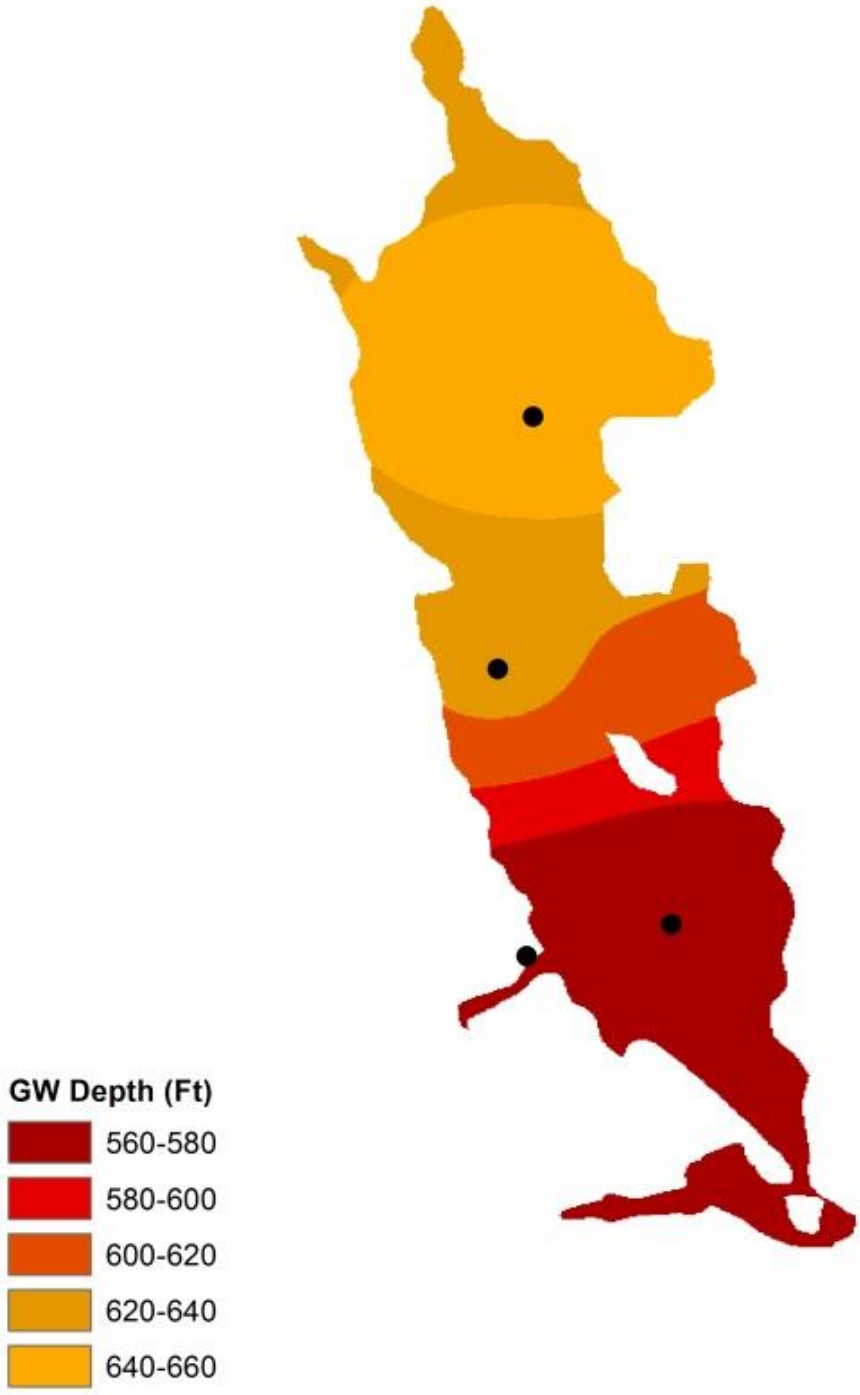
September 2005



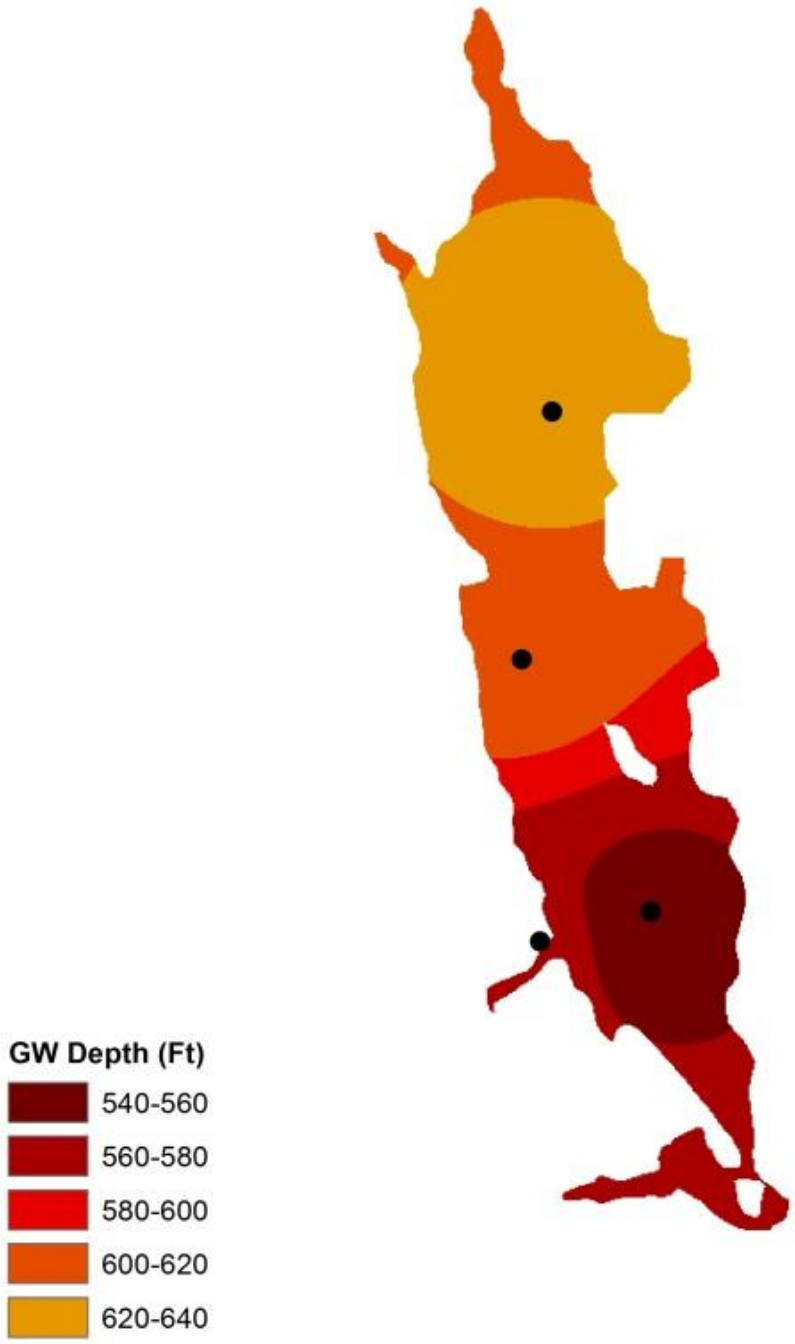
March 2006



April 2007



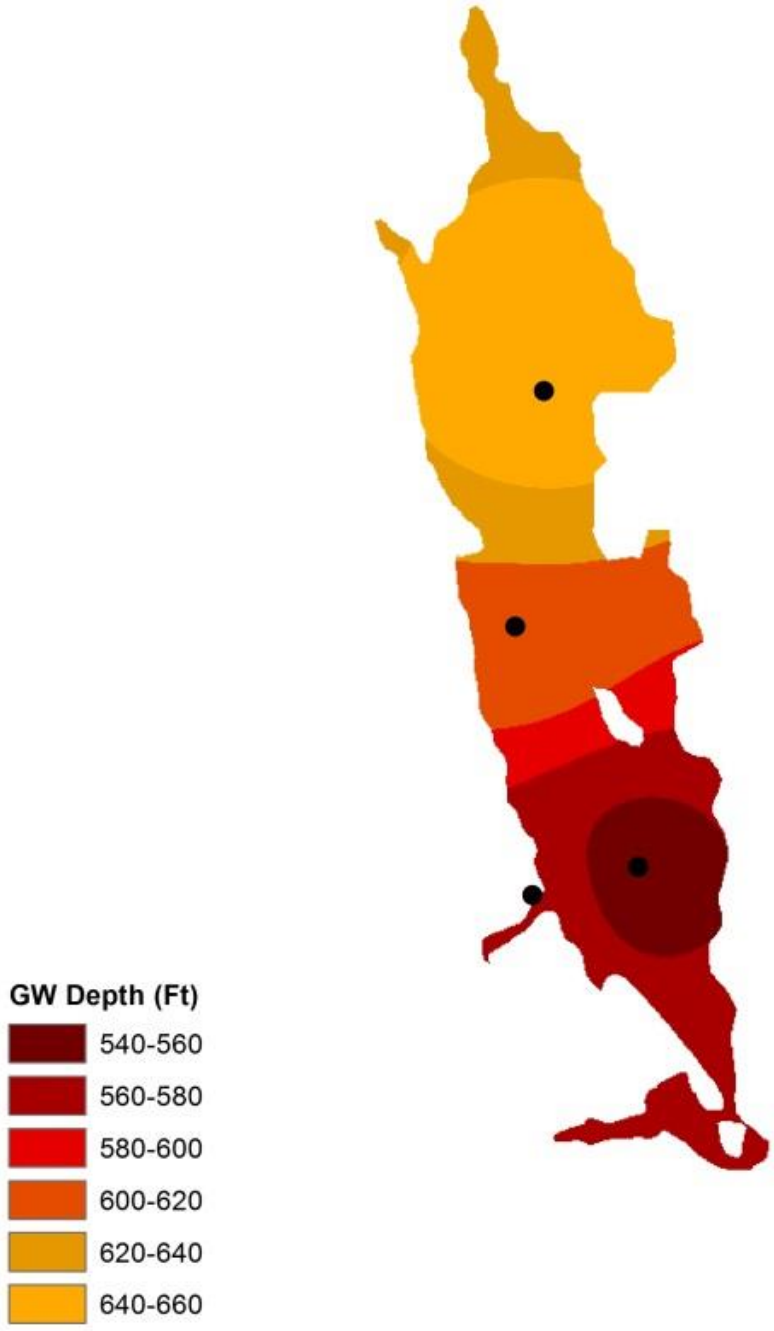
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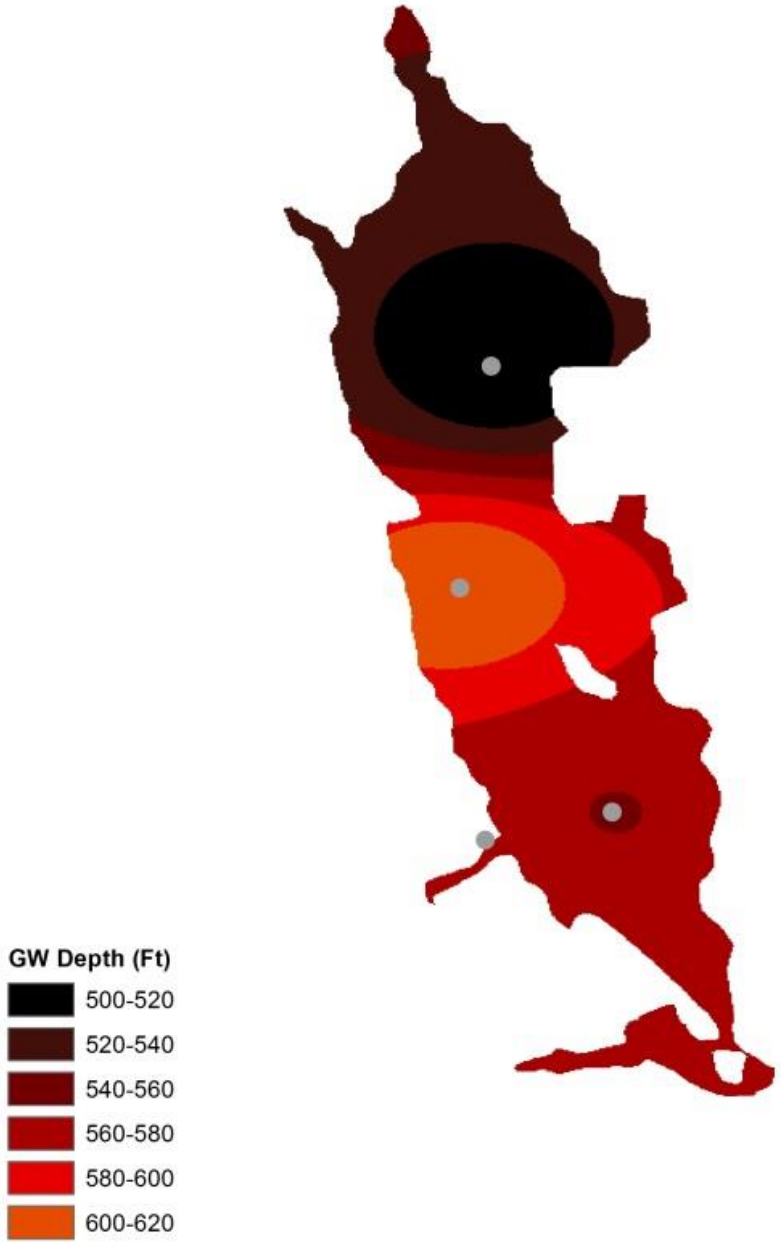
April 2008



November 2008

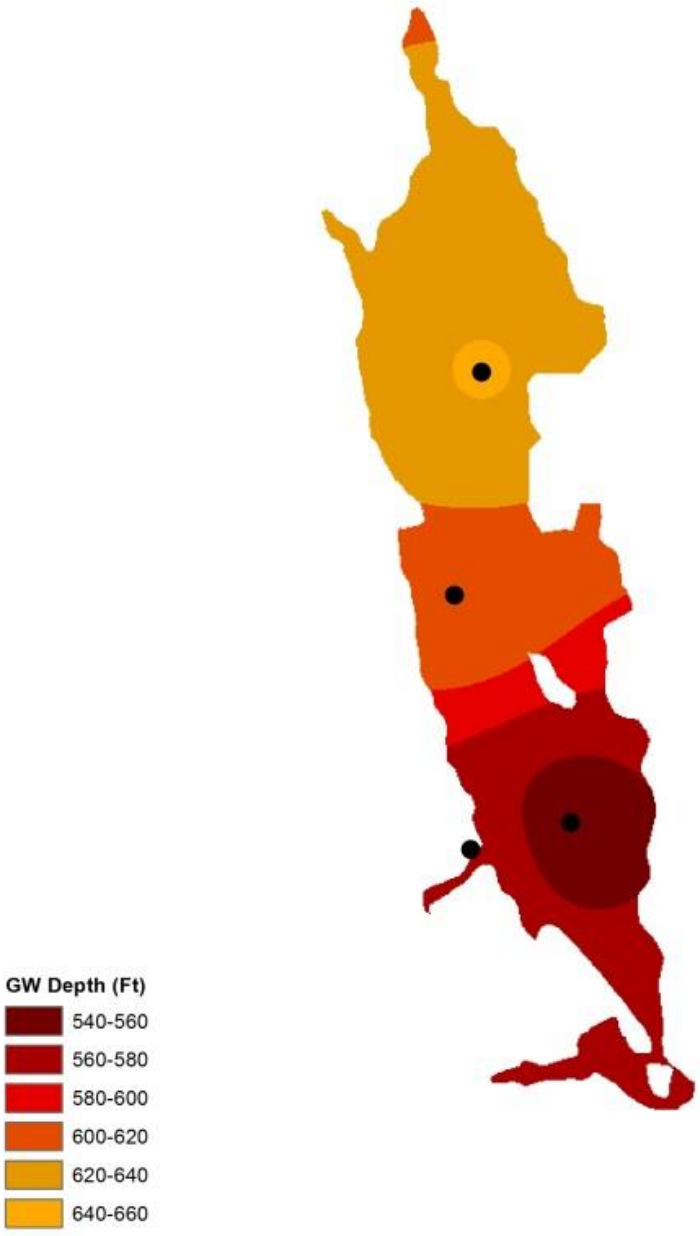


May 2009

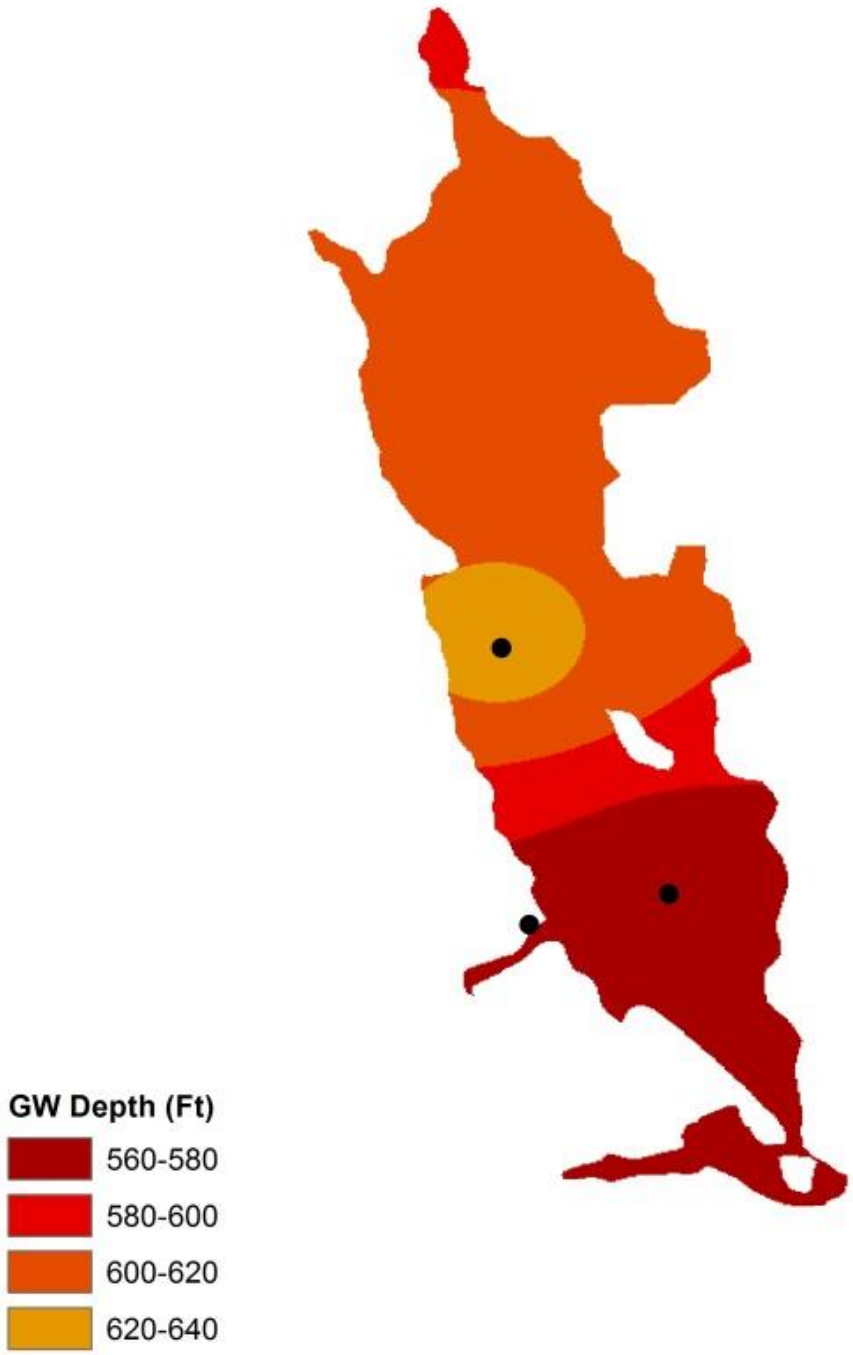


For May of 2009, the water table measurement taken in the northern end of the groundwater basin was abnormally low in range of 500-520 ft with respect to sea level. As a result of the water table data obtained at this point, the kink presented in Figure 31 results.

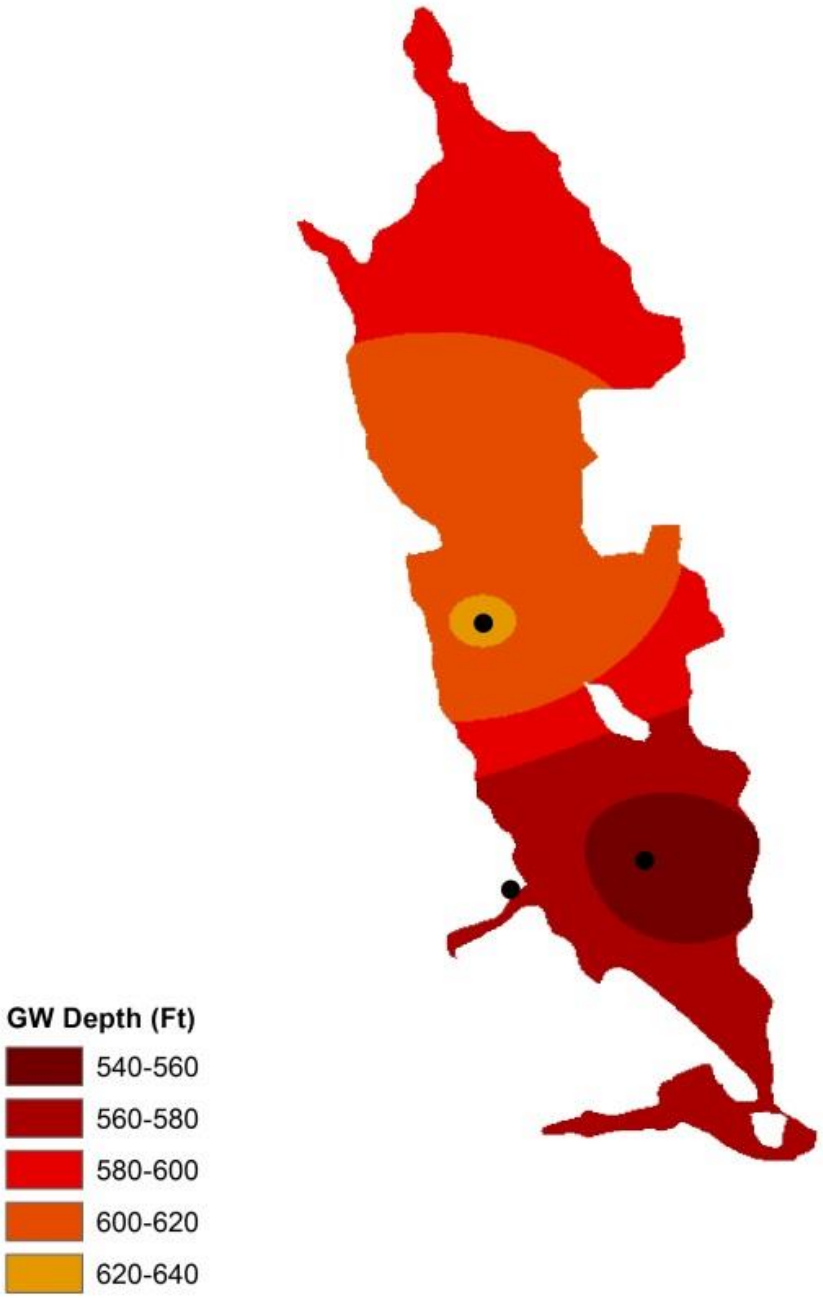
December 2009



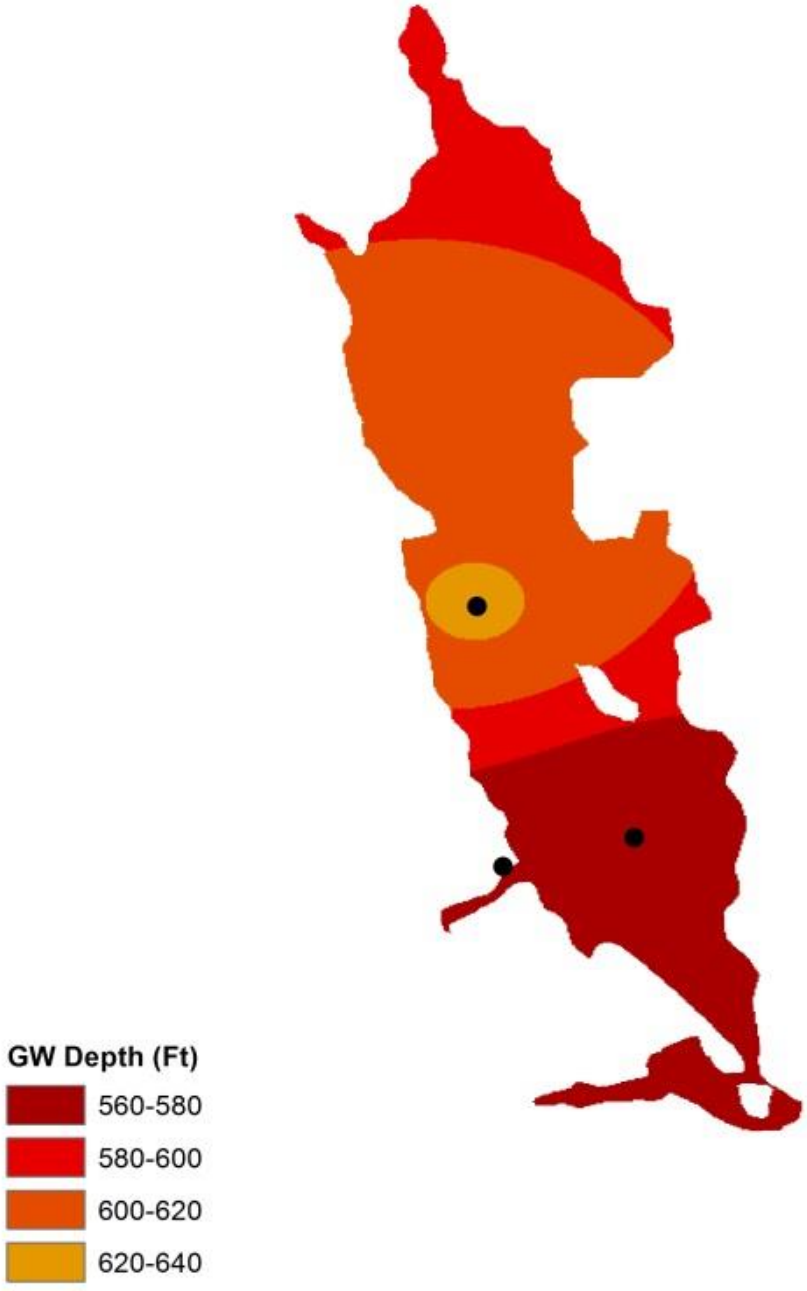
April 2010



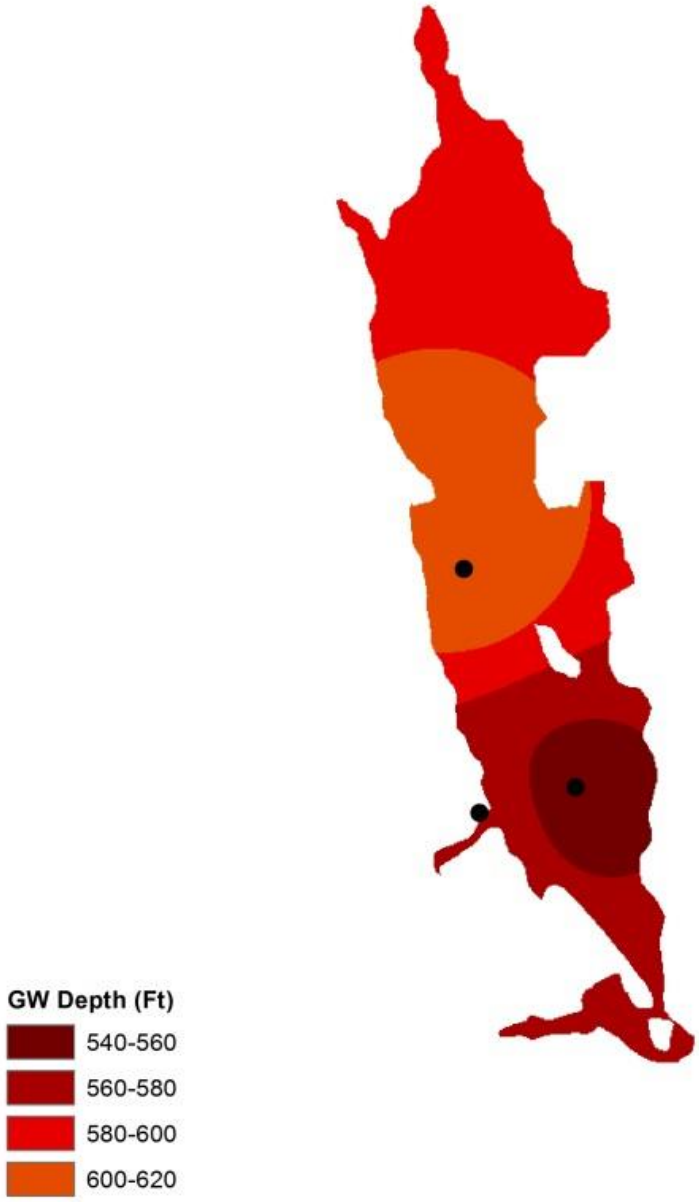
November 2010



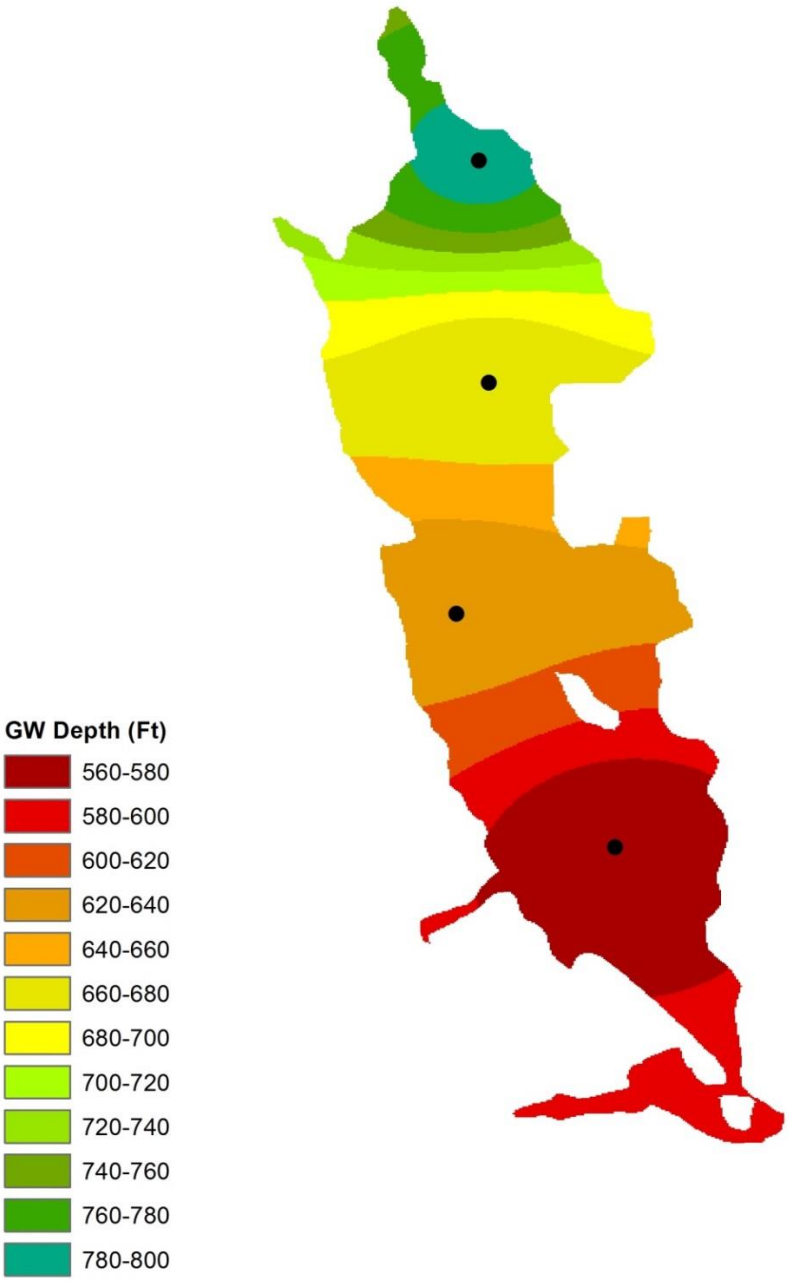
May 2011



December 2011

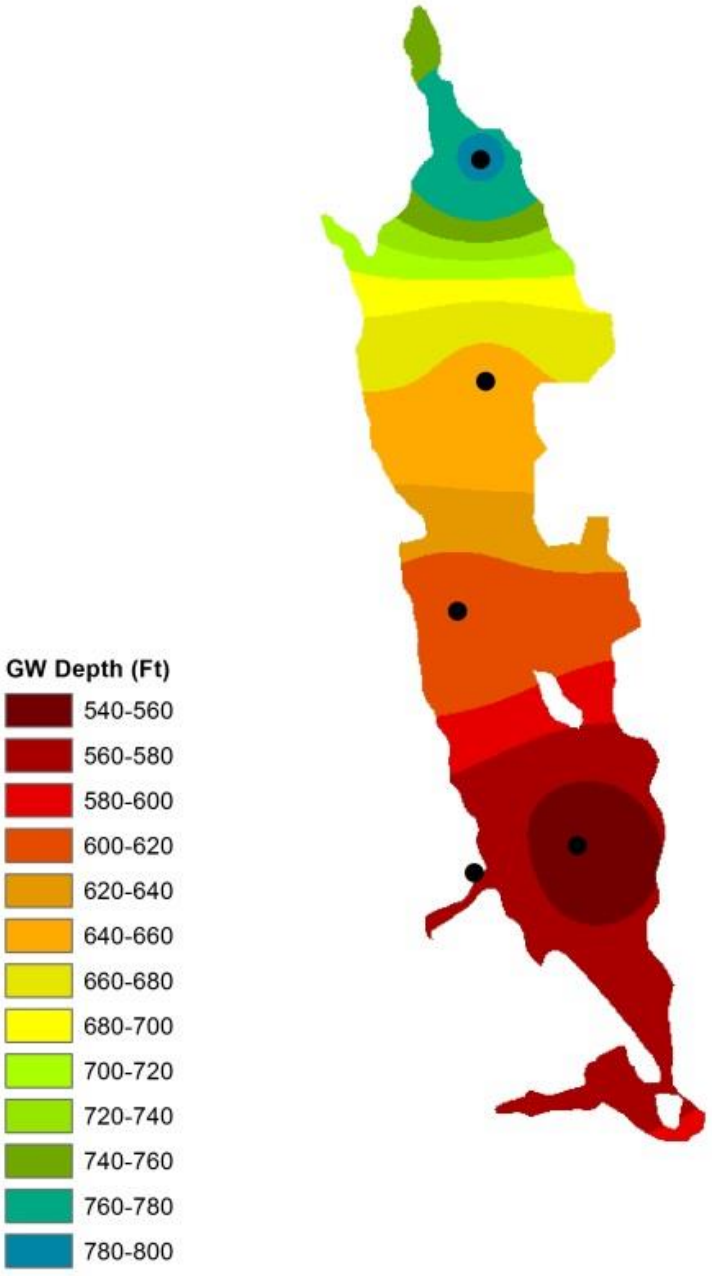


May 2012

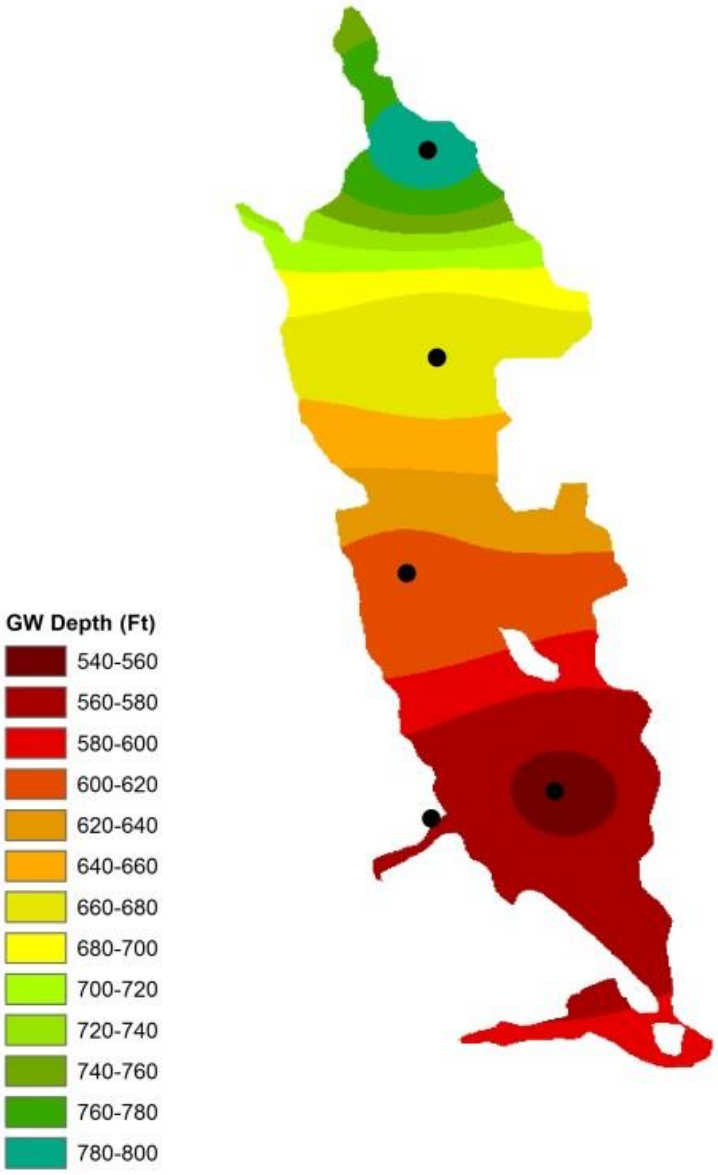


In May of 2012 a monitoring well found on the northern end of the groundwater basin began recording data.

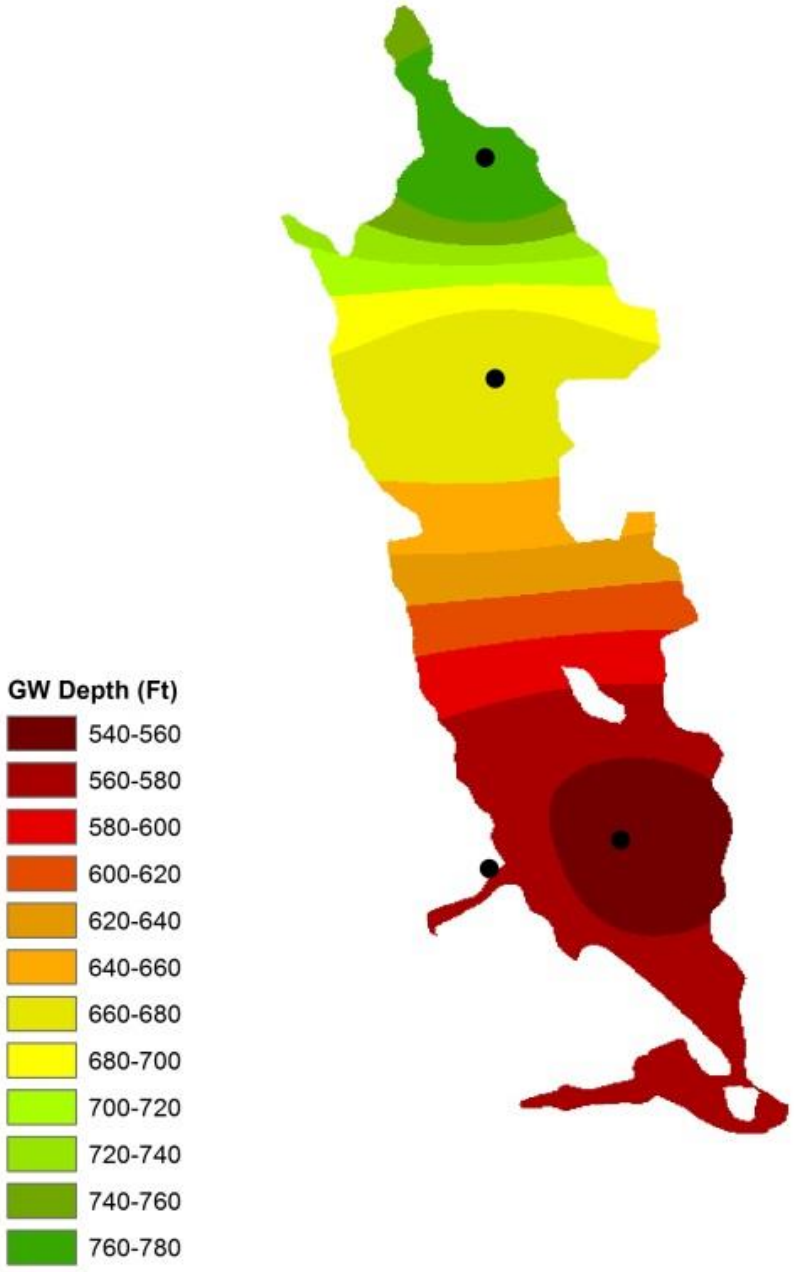
November 2012



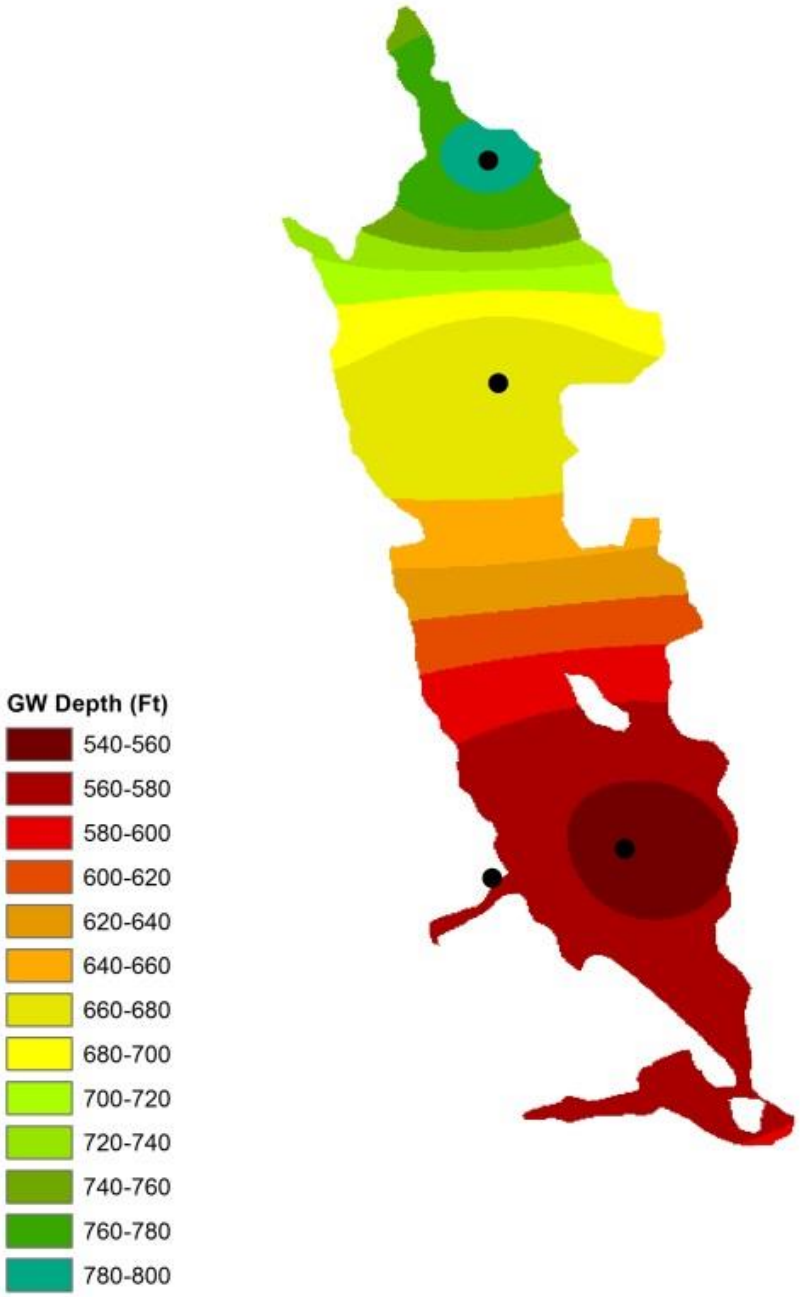
April 2013

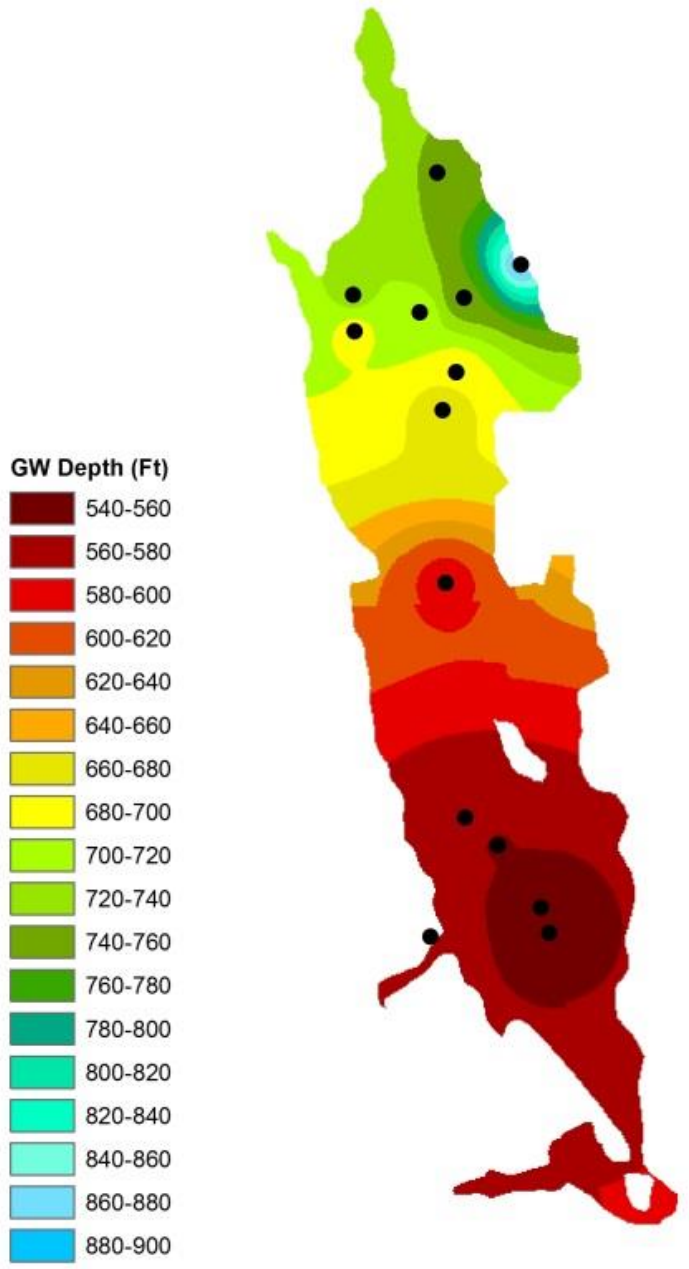

GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680
680-700
700-720
720-740
740-760
760-780
780-800

December 2013



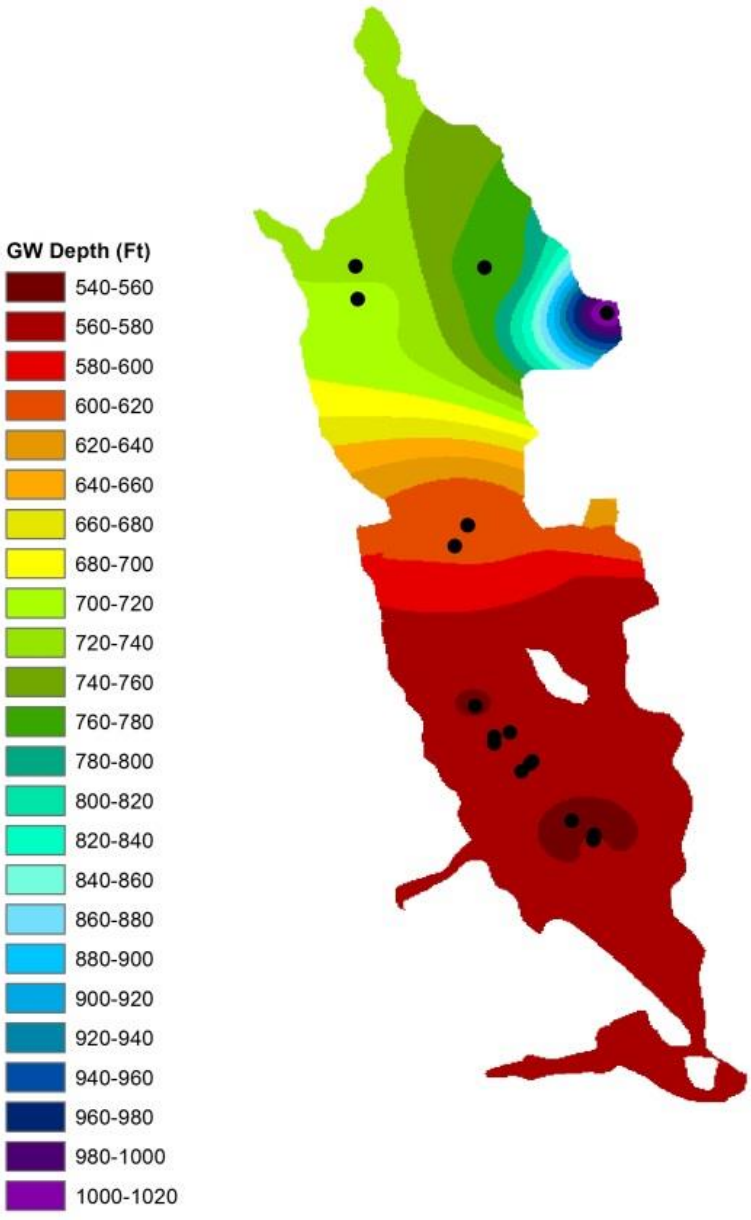
March 2014


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680
680-700
700-720
720-740
740-760
760-780
780-800

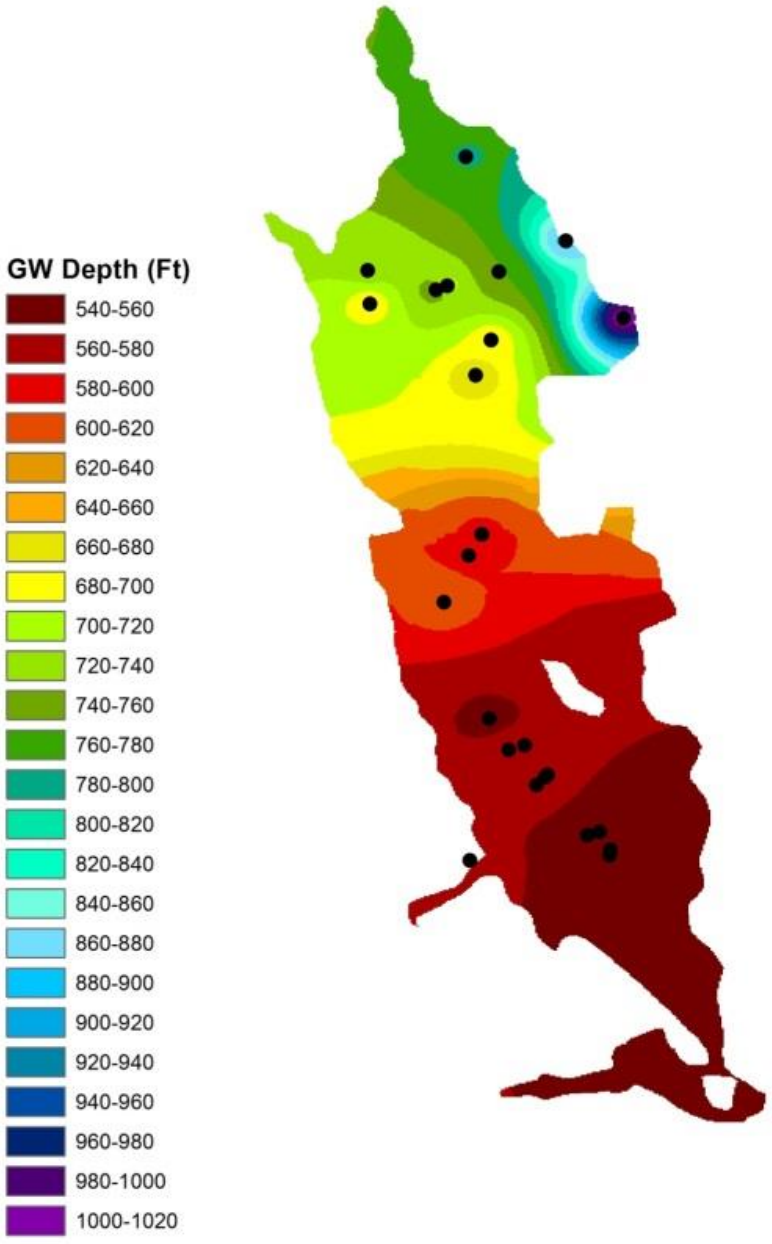


The number of monitoring wells significantly increased in the fall of 2014.

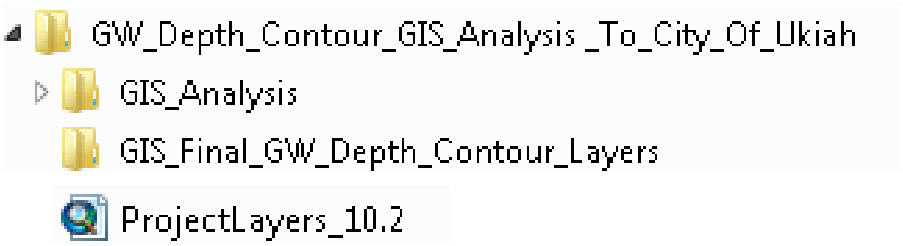
May 2015


GW Depth (Ft)
540-560
560-580
580-600
600-620
620-640
640-660
660-680
680-700
700-720
720-740
740-760
760-780
780-800
800-820
820-840
840-860
860-880
880-900
900-920
920-940
940-960
960-980
980-1000
1000-1020

October 2015

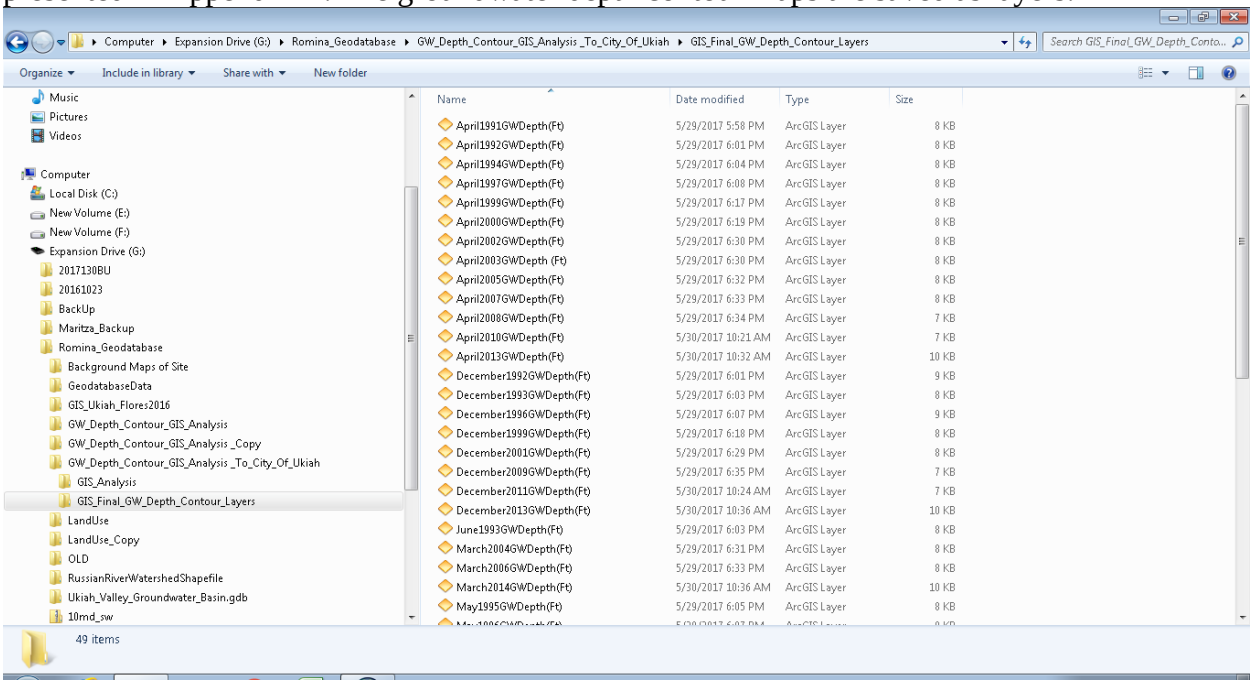


Appendix I. The GIS generated groundwater depth contour maps presented in Appendix H were stored and shared. The following is a description of the folder contents in *GW_Depth_Contour_GIS_Analysis _To_City_Of_Ukiah.*

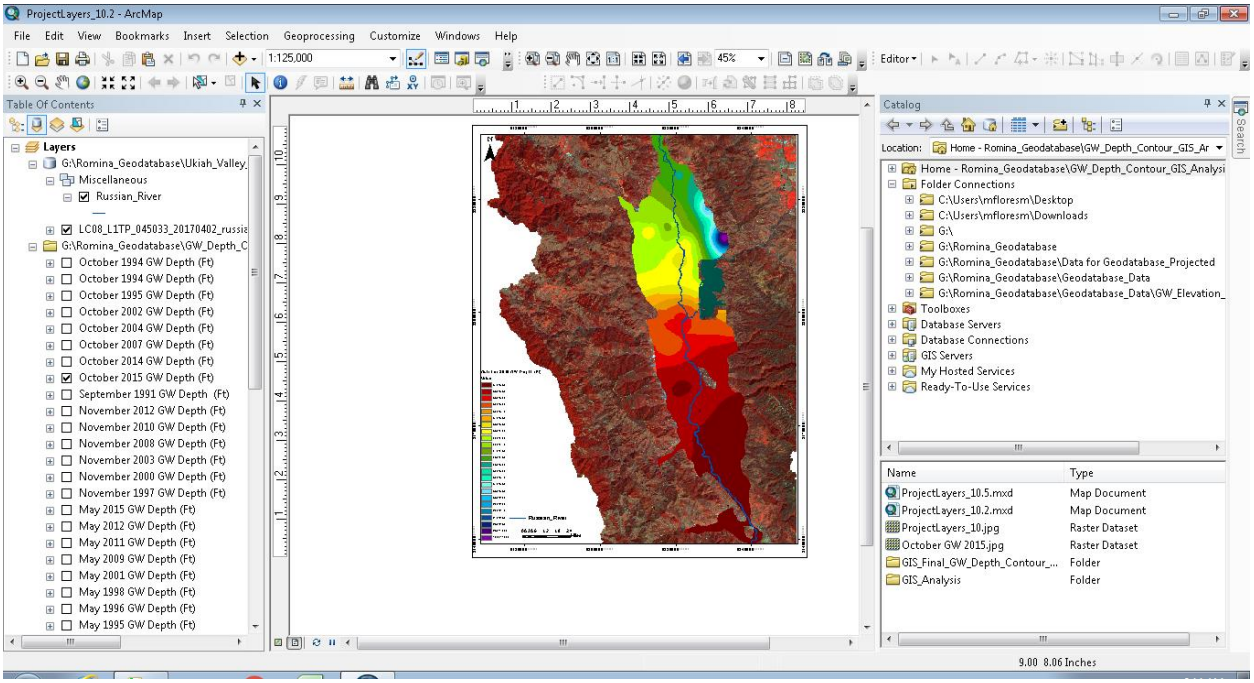


GIS_Analysis: Folder contains the files and data used to create the groundwater depth contour maps using Inverse Distance Weighted Interpolation in GIS (Section 4.5).

GIS_Final_GW_Depth_Contour_Layers: Folder contains the groundwater depth contour maps presented in Appendix H. The groundwater depth contour maps are saved as layers.



ProjectLayers_10.2: ArcMap file contains the groundwater depth contour map layers. The file has been set up to easily export formatted maps with the desired groundwater depth contour map. This file can be opened using the ArcMap version 10.2.



Characterization of the Ukiah Valley Groundwater Basin

Part 2- Ukiah Valley Groundwater Basin Geodatabase

1. Geodatabase Structure

Accompanying this report is a geodatabase. The geodatabase has the collected data used to build the water budget for the Ukiah Valley Groundwater Basin as well as the data estimated from the water budget. The constructed geodatabase is organized into 4 parts:

1) Agriculture
2) Groundwater
3) Miscellaneous
4) Surface Water

The additional contents are relevant to Section 4.2 found in Part 1 of the report. The organization of the geodatabase closely aligns with the framework followed to construct the water budget (Figure 12, Part 1 of report).

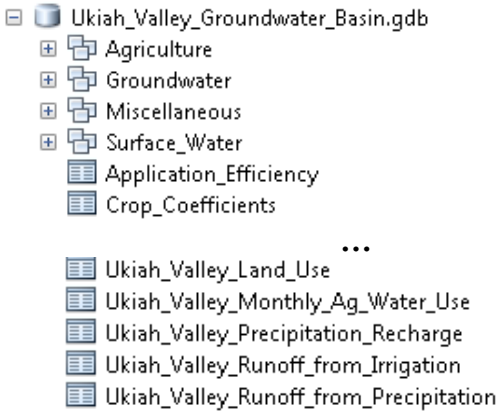


Figure 1. Geodatabase structure.

The Agriculture, Groundwater, Miscellaneous, and Surface Water sections expand and contain stored information. The following sections of the report elaborate on the contents stored in the geodatabase. For more details on the stored content, the metadata found in the geodatabase can be referenced.

2. Geodatabase Contents

2.1 Agriculture

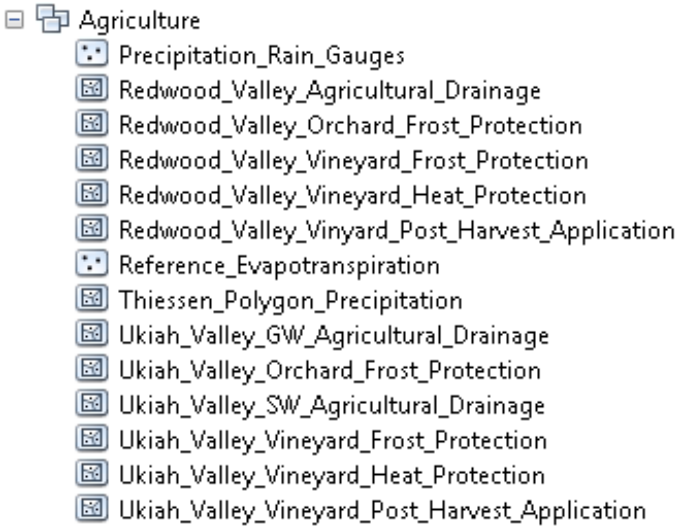


Figure 2. Dataset stored under Agriculture.

Table 1. Description of the dataset found under the Agriculture section of the geodatabase.

Dataset	Description	Source	Relevant Section in Part 1 of Report
Precipitation_Rain_Gauges	Monthly cumulative precipitation data from Sanel Valley (CIMIS Station #106), Lake Mendocino (COY, CDEC), and Ukiah (UKH, CDEC).	CDEC, CIMIS	4.2.1.4
Redwood_Valley_Agricultural_Drainage	Estimated monthly agricultural drainage in Redwood Valley.	Estimated	4.2.2.6
Redwood_Valley_Orchard_Frost_Protection	Estimated monthly frost protection for orchards in Redwood Valley.	Lewis et al. (2008)	4.3
Redwood_Valley_Vineyard_Frost_Protection	Estimated monthly frost protection for vineyards in Redwood Valley.	Lewis et al. (2008)	4.3
Redwood_Valley_Vineyard_Heat_Protection	Estimated monthly heat protection, water application volumes, for vineyards in Redwood Valley.	Lewis et al. (2008)	4.3
Redwood_Valley_Vinyard_Post_Harvest_Application	Estimated monthly post harvest application to vineyards in Redwood Valley.	Lewis et al. (2008)	4.3
Reference_Evapotranspiration	Monthly reference evapotranspiration from Sanel Valley (CIMIS Station #106).	CIMIS	4.2.1.3
Thiessen_Polygon_Precipitation	Estimated average monthly precipitation over the Ukiah Valley Groundwater Basin. The Thiessen Polygon method was used to obtain monthly estimates.	Estimated	4.2.1.4
Ukiah_Valley_GW_Agricultural_Drainage	Estimated agricultural drainage in Ukiah Valley. Agricultural drainage that results from any groundwater applied to meet any of the agricultural water demands.	Estimated	4.2.2.6
Ukiah_Valley_Orchard_Frost_Protection	Estimated monthly frost protection for orchards in Ukiah Valley.	Lewis et al. (2008)	4.3

Ukiah_Valley_SW_Agricultural_Drainage	Estimated agricultural drainage in Ukiah Valley. Agricultural drainage that results from any surface water applied to meet any of the agricultural water demands.	Estimated	4.2.2.6
Ukiah_Valley_Vineyard_Frost_Protection	Estimated monthly frost protection for vineyards in Ukiah Valley.	Lewis et al. (2008)	4.3
Ukiah_Valley_Vineyard_Heat_Protection	Estimated monthly heat protection water application volumes in Ukiah Valley for vineyards.	Lewis et al. (2008)	4.3
Ukiah_Valley_Vineyard_Post_Harvest_Application	Estimated monthly post harvest application to vineyards in Ukiah Valley.	Lewis et al. (2008)	4.3

2.2 Groundwater

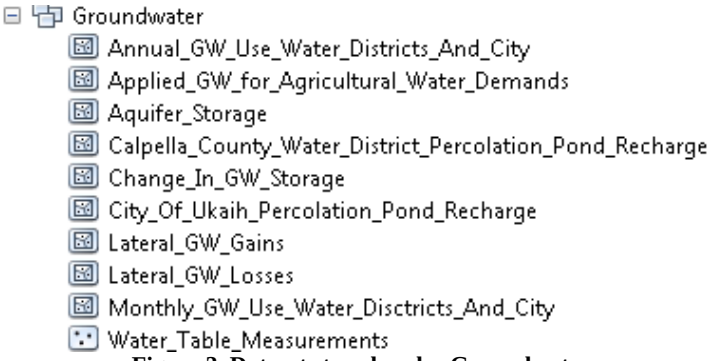


Figure 3. Dataset stored under Groundwater.

Table 2. Description of the dataset found under the Groundwater section of the geodatabase.

Dataset	Description	Source	Relevant Section in Part 1 of Report
Annual_GW_Use_Water_Districts_And_City	Annual groundwater use by Calpella County Water District, City of Ukiah, Millview County Water District, Redwood Valley County Water District, Rogina Water Co, and Willow County Water District from 1991 to 2015.	Water Districts, City of Ukiah	4.6.2.3
Applied_GW_for_Agricultural_Water_Demands	Estimated monthly groundwater used to meet the agricultural water demands in Ukiah Valley from 1991 to 2015.	Estimated	4.6.2.1
Aquifer_Storage	Estimated groundwater storage in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.5
Calpella_County_Water_District_Percolation_Pond_Recharge	Estimated monthly percolation pond recharge from the Calpella County Water District Waste Water Treatment Plant from 1991 to 2015.	Estimated	4.6.1.3
Change_In_GW_Storage	Estimated change in groundwater storage in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.5
City_Of_Ukaih_Percolation_Pond_Recharge	Estimated monthly percolation pond recharge from the City of Ukiah's Waste Water Treatment Plant from 1991 to 2015.	City of Ukiah	4.6.1.3
Lateral_GW_Gains	Estimated lateral groundwater gains in the	Estimated	4.6.1.5

	Ukiah Valley Groundwater Basin from 1991 to 2015.		
Lateral_GW_Losses	Estimated lateral groundwater losses in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.6.2.4
Monthly_GW_Use_Water_Disctricts_And_City	Monthly groundwater use by Calpella County Water District, City of Ukiah, Millview County Water District, Redwood Valley County Water District, Rogina Water Co, and Willow County Water District from 1991 to 2015.	Water Districts, City of Ukiah	4.6.2.3
Water_Table_Measurements	Water table measurements from monitoring wells locating in the Ukiah Valley Groundwater Basin.	DWR	4.5

2.3 Miscellaneous

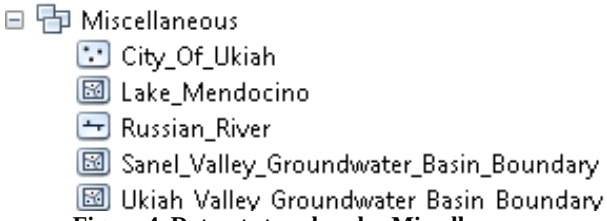


Figure 4. Dataset stored under Miscellaneous.

Table 3. Description of the dataset found under the Miscellaneous section of the geodatabase.

Dataset	Description	Source	Relevant Section in Part 1 of Report
City_Of_Ukiah	This layer represents location of the City of Ukiah.	CalAtlas	NA
Lake_Mendocino	Shapefile holds location and shape of Lake Mendocino.	CalAtlas	NA
Russian_River	Contains the location and shape of the Russian River found over the Ukiah Valley Groundwater Basin.	CalAtlas	NA
Sanel_Valley_Groundwater_Basin_Boundary	Shapefile holding the location and boundary for the Sanel Valley Groundwater Basin.	DWR	NA
Ukiah_Valley_Groundwater_Basin_Boundary	Shapefile holding the location and boundary for the Ukiah Valley Groundwater Basin.	DWR	NA

2.4 Surface Water

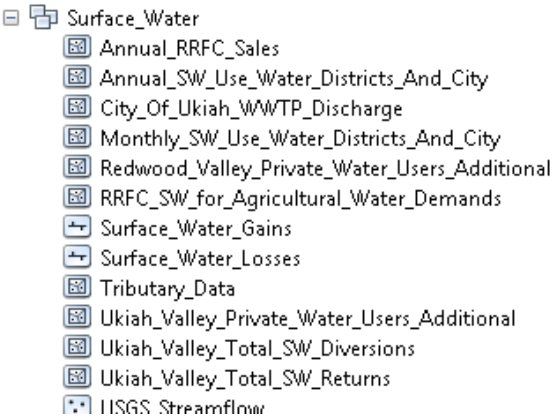


Figure 5. Dataset stored under Surface Water.

Table 4. Description of the dataset found under the Surface Water section of the geodatabase.

Dataset	Description	Source	Relevant Section in Part 1 of Report
Annual_RRFC_Sales	Surface water sold annually by the Russian River Flood Control and Water Conservation Improvement District (RRFC) from 1991 to 2015.	RRFC	4.4.2.2
Annual_SW_Use_Water_Districts_And_City	Annual surface water use by Calpella County Water District, City of Ukiah, Millview County Water District, Redwood Valley County Water District, Rogina Water Co, and Willow County Water District from 1991 to 2015.	Water Districts, City of Ukiah	4.4.2.2
City_Of_Ukiah_WWTP_Discharge	Estimated amount of treated effluent from the City of Ukiah's Waste Water Treatment plant that is discharged monthly into the Russian River.	City of Ukiah	4.4.1.2
Monthly_SW_Use_Water_Districts_And_City	Monthly surface water use by Calpella County Water District, City of Ukiah, Millview County Water District, Redwood Valley County Water District, Rogina Water Co, and Willow County Water District from 1991 to 2015.	Water Districts, City of Ukiah	4.4.2.2
Redwood_Valley_Private_Water_Users_Additional	Estimated monthly surface water diverted by private water users that have their own water to right to divert from the Russian River in Redwood Valley.	SWRCB	4.4.2.2
RRFC_SW_for_Agricultural_Water_Demands	Estimated monthly RRFC surface water used to meet the agricultural water demands in Ukiah Valley from 1991 to 2015.	Estimated	4.4.2.2
Surface_Water_Gains	Estimated monthly surface water gains on the Russian River (from the confluence of the East and West fork to Hopland) from 1991 to 2015.	Estimated	4.4.1.3
Surface_Water_Losses	Estimated monthly surface water losses on the Russian River (from the confluence of the East and West fork to Hopland) from 1991 to 2015.	Estimated	4.4.2.3
Tributary_Data	Monthly tributary data for Ukiah Valley.	Flint et al. (2015)	4.6.1.4
Ukiah_Valley_Private_Water_Users_Additional	Estimated monthly surface water diverted by private	SWRCB	4.4.2.2

	water users that have their own water to right to divert from the Russian River in Ukiah Valley.		
Ukiah_Valley_Total_SW_Diversions	Estimated total monthly surface water diversions in Ukiah Valley from the Russian River. Total surface water diversions include diversions from private water users that have their own water right to divert, the City of Ukiah, Willow County Water District, Millview County Water District, Rogina Water Co, and RRFC surface water sold to meet agricultural water demands.	Estimated	4.4.2.2
Ukiah_Valley_Total_SW_Returns	Estimated monthly surface water returns into the Russian River in Ukiah Valley. Surface water returns include agricultural drainage (from surface water and groundwater sources) and waste water treatment plant discharge (City of Ukiah Waste Water Treatment Plant).	Estimated	4.4.1.2
USGS_Streamflow	Monthly streamflow data from the USGS. Data from the USGS gauges 11461000, 11462000, and 11462500.	USGS	4.4.1.1 4.4.2.1

2.5 Additional Content (Rasters and Tabulated Data)

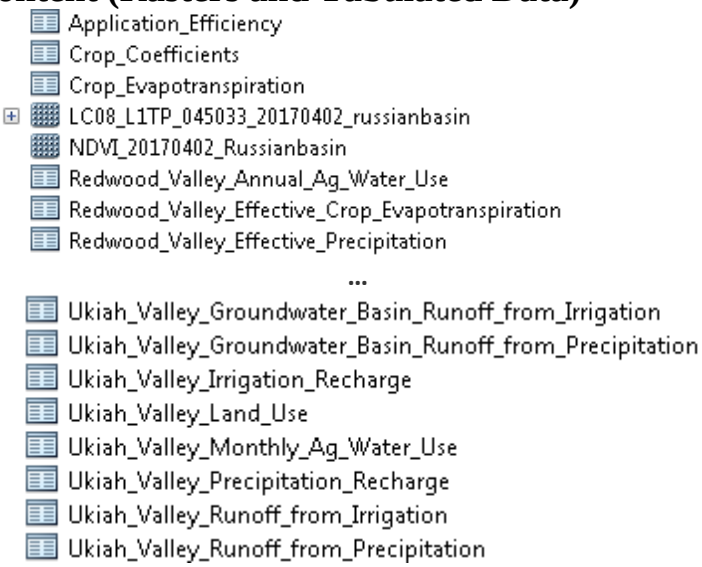


Figure 6. Additional datasets stored in the geodatabase.

Table 5. Description of the additional datasets stored in the geodatabase.

Dataset	Description	Source	Relevant Section in Part 1 of Report
Application_Efficiency	Estimated monthly application efficiency values for the crops found in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.2.1.5

Crop_Coefficients	Crop coefficients for the crops found in the Ukiah Valley Groundwater Basin.	Schwankl et al. (2010)	4.2.1.2
Crop_Evapotranspiration	Estimated monthly crop evapotranspiration for the crops found in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.2.1.3
LC08_L1TP_045033_20170402_russianbasin	Landsat 8 OLI, path 045 row 033, dated 2017-04-02, Earth explorer USGS. Layer staking. Multiband raster from Landsat 8 OLI.	Earth Explorer USGS	4.2
NDVI_20170402_Russianbasin	NDVI Index, NDVI stands for normalized difference vegetation index, NIR for near-infrared radiation, and VISr for visible red spectrum. NDVI values range from −1 (usually water) to +1 (strongest vegetative growth). NDVI is a potential index to identify crops and natural vegetation.	Estimated	4.2
Redwood_Valley_Annual_Ag_Water_Use	Estimated annual agricultural water use in Redwood Valley from 1991 to 2015.	Estimated	4.2.2.3
Redwood_Valley_Effective_Crop_Evapotranspiration	Estimated monthly effective crop evapotranspiration in Redwood Valley.	Estimated	4.2.2.1
Redwood_Valley_Effective_Precipitation	Estimated monthly effective precipitation in Redwood Valley.	Estimated	4.2.2.2
Redwood_Valley_Land_Use	Annual land use found in Redwood Valley.	Mendocino County	4.2.1.1
Redwood_Valley_Monthly_Ag_Water_Use	Estimated monthly agricultural water use in Redwood Valley from 1991 to 2015.	Estimated	4.2.2.3
Redwood_Valley_Recharge_from_Irrigation	Estimated monthly recharge from irrigation in Redwood Valley.	Estimated	4.2.2.5
Redwood_Valley_Recharge_from_Precipitation	Estimated monthly	Estimated	4.2.2.5

	recharge from precipitation in Redwood Valley.		
Redwood_Valley_Runoff_from_Irrigation	Estimated monthly runoff from irrigation in Redwood Valley.	Estimated	4.2.2.4
Redwood_Valley_Runoff_from_Precipitation	Estimated monthly runoff from precipitation in Redwood Valley.	Estimated	4.2.2.4
Total_Annual_Recharge_from_Precipitaion_and_Irrigation	Estimated total annual recharge from precipitation and irrigation in Ukiah Valley, Redwood Valley, and the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.5
Total_Monthly_Recharge_from_Precipitation_and_Irrigation	Estimated total monthly recharge from precipitation and irrigation in Ukiah Valley, Redwood Valley, and the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.5
Ukiah_Valley_Annual_Ag_Water_Use	Estimated annual agricultural water use in Ukiah Valley from 1991 to 2015.	Estimated	4.2.2.3
Ukiah_Valley_Effective_Crop_Evapotranspiration	Estimated monthly effective crop evapotranspiration in Ukiah Valley.	Estimated	4.2.2.1
Ukiah_Valley_Effective_Precipitation	Estimated monthly effective precipitation in Ukiah Valley.	Estimated	4.2.2.2
Ukiah_Valley_Groundwater_Basin_Annual_Ag_Water_Use	Estimated annual agricultural water use in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.2.2.3
Ukiah_Valley_Groundwater_Basin_Effective_Crop_Evapotranspiration	Estimated monthly effective crop evapotranspiration in the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.1
Ukiah_Valley_Groundwater_Basin_Effective_Precipitation	Estimated monthly effective precipitation in the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.2.
Ukiah_Valley_Groundwater_Basin_Irrigation_Recharge	Estimated monthly recharge from irrigation in the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.5

Ukiah_Valley_Groundwater_Basin_Land_Use	Annual land use found in the Ukiah Valley Groundwater Basin.	Mendocino County	4.2.1.1
Ukiah_Valley_Groundwater_Basin_Monthly_Ag_Water_Use	Estimated monthly agricultural water use in the Ukiah Valley Groundwater Basin from 1991 to 2015.	Estimated	4.2.2.3
Ukiah_Valley_Groundwater_Basin_Precipitation_Recharge	Estimated monthly recharge from precipitation in the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.5
Ukiah_Valley_Groundwater_Basin_Runoff_from_Irrigation	Estimated monthly runoff from irrigation in the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.4
Ukiah_Valley_Groundwater_Basin_Runoff_from_Precipitation	Estimated monthly runoff from precipitation in the Ukiah Valley Groundwater Basin.	Estimated	4.2.2.4
Ukiah_Valley_Irrigation_Recharge	Estimated monthly recharge from irrigation in Ukiah Valley.	Estimated	4.2.2.5
Ukiah_Valley_Land_Use	Annual land use found in Ukiah Valley.	Mendocino County	4.2.1.1
Ukiah_Valley_Monthly_Ag_Water_Use	Estimated monthly agricultural water use in Ukiah Valley from 1991 to 2015.	Estimated	4.2.2.3
Ukiah_Valley_Precipitation_Recharge	Estimated monthly recharge from precipitation in Ukiah Valley.	Estimated	4.2.2.5
Ukiah_Valley_Runoff_from_Irrigation	Estimated monthly runoff from irrigation in Ukiah Valley.	Estimated	4.2.2.4
Ukiah_Valley_Runoff_from_Precipitation	Estimated monthly runoff from precipitation in Ukiah Valley.	Estimated	4.2.2.4

Appendix M: City of Ukiah 2014 Climate Action Plan

City of Ukiah 2020 Urban Water Management Plan

Public Draft

CITY OF UKIAH

Climate Action Plan

Prepared for
City of Ukiah

March 12, 2014

ESA



Public Draft

CITY OF UKIAH

Climate Action Plan

Prepared for
City of Ukiah

March 12, 2014

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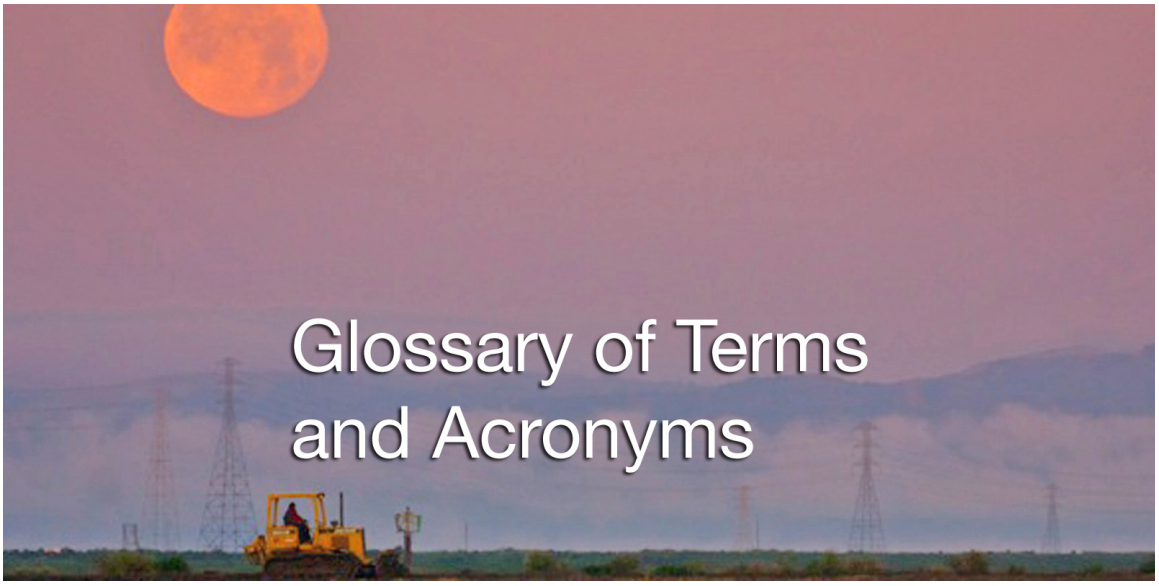
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Glossary of Terms and Acronyms

AAAS	American Association for the Advancement of Science
AB 32	Assembly Bill 32, the California Global Warming Solutions Act of 2006. Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases for the state of California. Makes the California Air Resources Board responsible for monitoring and reducing statewide greenhouse gas emissions, with a target to reduce emissions to 1990 levels by 2020.
Action	Detailed steps Ukiah will take to implement the Climate Action Plan strategies. Each action was carefully considered by the City to ensure that appropriate staff and resources would be available for implementation. Each action is also designated a code that corresponds to the goal and strategy it will implement. For example, Action TLU-2.1a is associated with Strategy 2.1, which in turn is associated with Goal TLU-2.
Adjusted BAU	An adjusted emissions forecast that includes the effects of state-wide emissions reductions measures such as updates to building energy standards and implementation of programs to decrease emissions from on-road vehicles
ARRA	American Recovery and Reinvestment Act
Baseline Inventory	The base year for assessment of energy trends against which future progress can be measured for a single calendar year (2005), consistent with legislative guidance and the Assembly Bill 32 Scoping Plan.
BAU	Business as Usual. A scenario that assumes that no new local actions will be taken to reduce energy usage or associated greenhouse gas emissions from current and future residents and businesses within the City.
BTA	Bicycle Transportation Act. An annual program providing state funds for city and county projects that improve safety and convenience for bicycle commuters.
CAP	Climate Action Plan
CalEPA	California Environmental Protection Agency

CALGreen	Refers to CALGreen component of the California Building Code. See California Building Code
California Building Code	California Code of Regulations, Title 24, also known as the California Building Standards Code (composed of 12 parts). Title 24, Part 6 sets forth California's energy efficiency standards for residential and nonresidential buildings and was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.
CARB	California Air Resources Board
CAPCOA	California Air Pollution Control Officers Association
CCA	Community Choice Aggregation
CEC	California Energy Commission
CEESP	California Long Term Energy Efficiency Strategic Plan. A plan adopted by the California Public Utilities Commission in 2008 that presents a single roadmap to achieve maximum energy savings across all major groups and sectors in California. This comprehensive plan for 2009 to 2020 is the state's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs.
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CFL	Compact fluorescent light
CH4	Methane
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent. A metric measure used to compare the emissions of various greenhouse gases based upon their global warming potential (GWP). The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP factor. For example, the GWP factor for methane is 21. This means that emissions of one million metric tons (MT) of methane are equivalent to emissions of 21 million $MTCO_2e$.
Community-wide	Refers to all activities within a city's geographic boundary. Typical sectors include government and civic, residential, commercial, and industrial energy use, transportation, off-road equipment, waste generation, and energy associated with water delivery and treatment.
CDC	Community Development Commission of Mendocino County
COPD	Chronic obstructive pulmonary disease
CPUC	California Public Utilities Commission
Demand Response	Mechanism for managing end-user electricity consumption in response to energy supply conditions, especially during summer periods when electricity demand on the California power grid is high. A demand response system directly or remotely controls electrical equipment such as lights or air

	conditioning to reduce electricity consumption during times of increased energy demand and/or constrained energy availability.
Direct Access Electricity	Direct access service is an optional choice that customers can select to purchase electricity and other services from an electric service provider (ESP), instead of from a public or private utility company. An ESP is an entity that contracts directly with its customers to provide electric service, and is responsible for arranging an adequate supply of electricity. ESPs are required to meet certain requirements with the California Public Utilities Commission in addition to meeting financial and technical requirements with individual utility companies.
DOE	United States Department of Energy
DOF	California Department of Finance
DOT	California Department of Transportation
E	Energy
EECBG	Energy Efficiency and Conservation Block Grant. The Energy Efficiency and Conservation Block Grant program was funded through the American Recovery and Reinvestment Act and managed by the US Department of Energy to assist cities, counties, states, and territories to develop, promote, and implement energy efficiency and conservation programs and projects.
ELF	Energy Localization/Energy Loan Fund
ENERGY STAR	A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy to provide consumers with energy efficiency information and incentives to purchase the most energy-efficient products available.
ESA	Environmental Science Associates
ESCO	Energy service company
First Cost	Immediate purchase and installation cost. First costs do not include lifecycle or long-term operating costs, which may result in long-term cost savings from increased efficiency, reduced maintenance, and other factors.
FHA	Federal Housing Administration
Forecast	Energy and GHG emissions are forecast to future years based on current consumption patterns and projected increases in population, job growth and other local trends.
GHG	Greenhouse Gases. Gases which cause heat to be trapped in the atmosphere, generally warming the Earth. Greenhouse gases are necessary to keep the Earth warm, but increasing concentrations of these gases are implicated in global climate change. The majority of greenhouse gases come from natural sources, although human activity is also a major contributor. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide (CO_2), methane (CH_4), nitrous Oxide (N_2O) and fluorinated Gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride).
gpcd	gallons per capita-day
Goal	A general statement of aspiration or intent to achieve a desired condition. In the Ukiah CAP there are one or more goals for each of the four sectors, and

	each goal is labeled according to the sector it is associated with, as follows: Energy Section (E), Transportation & Land Use (TLU), Solid Waste (SW), and Water (W). For example, Goal E-1 is the first goal of the Energy sector.
Green Building	Sustainable or "green" building is a holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community.
Green Team	A formal or informal group of people within an organization or community that promotes more environmentally sustainable practices and sustainability plans and management approaches.
Greenhouse Gas Inventory	A greenhouse gas inventory provides estimates of the amount of greenhouse gases emitted to and removed from the atmosphere by human activities. A city or county that conducts an inventory looks at both community emissions sources as well as emissions from government operations.
GWh	Gigawatt hour
GWP	Global warming potential
HELP	Home Energy Link Program
HFCs	Hydrofluorocarbons
HPS	High pressure sodium
HVAC	Heating, ventilation and cooling
ICLEI	Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
JPA	Joint Powers Agency
kWh	Kilowatt-hour. A unit of energy equivalent to one kilowatt (kW) of energy used for an hour. For example, if an appliance requires a kW of energy to function, leaving the appliance on for one hour would consume one kWh of energy.
KYC	Keep Your Cool
LCFS	Low carbon fuel standard. Requires fuel providers in the State to decrease lifecycle fuel carbon intensity by 2020. The LCFS applies, either on a compulsory or opt-in basis, to all fuels used for transportation in California.
LED	Light emitting diode
LEED	Leadership in Energy and Environmental Design. An internationally recognized green building certification system, which provides third-party verification that a building or community was designed and built using sustainable approaches, with particular regard to energy savings, water efficiency, CO2 emissions reductions, and improved indoor environmental quality, among others.
LID	Low impact development
MCAQMD	Mendocino County Air Quality Management District
MCEW	Mendocino County Energy Watch

MCOG	Mendocino Council of Governments
MGD	million gallons daily
mpg	miles per gallon
MPO	Metropolitan Planning Organization
MTA	Mendocino Transit Authority
Municipal	Refers to energy use and greenhouse gas emissions from City-owned and operated facilities and equipment.
MH	Metal halide
MT	Million tons
MT CO2e	Metric tons of carbon dioxide equivalent
N2O	Nitrous oxide
NAS	National Academy of Sciences
NOAA	National Oceanic and Atmospheric Administration
NCES	North Coast Energy Services
NPCA	Northern California Power Agency
NSHP	California Energy Commission's New Solar Homes Partnership. Part of the comprehensive statewide solar program, known as the California Solar Initiative.
NREL	National Renewable Energy Laboratory
OPR	California Governor's Office of Planning and Research
PACE	Property-Assessed Clean Energy. A form of long-term financing that creates municipal finance districts to provide loans to homeowners and businesses for energy-efficient retrofits and renewable energy system installations. Loans are repaid through an annual surcharge on property tax assessments.
PFCs	Perfluorocarbons
PG&E	Pacific Gas and Electric. An investor-owned utility that is the primary electricity and natural gas provider to City of American Canyon and Napa County.
POU	Publically owned utility
PPA	Power Purchase Agreement
ppm	Parts per million
PV	Photovoltaic
Rebate	Offered by the state, utility, or local government to promote the installation of renewables and energy efficiency projects.
REAP	Responsible Energy Awareness Practices (REAP) program of the Community Development Commission of Mendocino County
REDI	Renewable Energy Development Institute

Renewable Energy	Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power.
RPS	Renewable Portfolio Standard. Requires utility providers to increase the portion of generated energy that comes from renewable sources to 20% by 2010 and to 33% by 2020.
RTPA	Regional Transportation Planning Agency
SBX707	The Water Conservation Bill of 2009
SB 375	Senate Bill 375: Enhances California's ability to reach its AB 32 goals by planning more sustainable communities.
SB 97	Senate Bill 97: Requires the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of GHG emissions.
SBEA	Small Business Energy Alliance
SCS	Sustainable Community Strategy
SEEC	California State-wide Energy Efficiency Collaborative
SOI	Sphere of influence
SOVs	Single occupancy vehicles
Strategy	A course of action to be undertaken by Ukiah to meet the goals related to climate change. Each strategy is designated with a code that corresponds to its sector and goal. As an example, Strategy SW-2.1 is the first strategy of the second goal for the Solid Waste Sector.
SW	Solid Waste
TDM	Transportation demand management
TEA-21	Transportation Equity Act for the 21st Century) program. A federal program administered through the state and regional governments.
Title 24	California Code of Regulations, Title 24, also known as the California Building Standards Code (composed of 12 parts). Title 24, Part 6 established California's energy efficiency standards for residential and nonresidential buildings. See California Building Standards.
TLU	Transportation and Land Use
UWMP	Urban Water Management Plan
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
W	Water
WWTP	Waste water treatment plant
Zero Net Energy	For buildings, use of no more energy over the course of a year than can be generated onsite through renewable resources such as solar, wind, or geothermal power.



1 Introduction

Overview

Given the scientific consensus that anthropogenic or "man-made" greenhouse gas (GHG) emissions are contributing to global climate change, and the GHG reduction policies established by the State of California, the City of Ukiah is joining an increasing number of California local governments committed to addressing climate change at the local level. The City recognizes the risk that climate change poses to its residents, business owners, and visitors, and is acting now to reduce the GHG emissions from both its government operations and the community at-large through the strategies set forth in this Climate Action Plan. Although state and regional policies and programs are being implemented to reduce GHG emissions, ultimately local action is needed to ensure that Ukiah is doing its part to mitigate climate change and adapt to its current and future effects. This Climate Action Plan takes a common sense approach to reducing GHG emissions in the City of Ukiah, with policies and cost-effective programs that the City itself, as well as its residents and businesses, can implement to reduce GHG emissions associated with energy consumption, transportation, water use, and solid waste sent to local landfills.

Purpose and Scope

This Climate Action Plan outlines strategies, goals, and actions for reducing municipal and community-wide GHG emissions. It is designed to ensure that Ukiah does its part to contribute to the goals of California's Global Warming Solutions Act of 2006 (AB 32), while remaining consistent with the Ukiah General Plan vision for future growth.

AB 32 directs the state to reduce state-wide GHG emissions to 1990 levels by 2020. To achieve these reductions, the California Air Resources Board (CARB) and the State Office of Planning and Research (OPR) recommend that local governments target their community-wide 2020 emissions to be 15 percent below 2005 levels, deemed to be equivalent to 1990 emissions levels.

As is further described in Chapter 3, *Greenhouse Gas Emissions, Forecasts, and Reduction Target*, the baseline 2005 Community GHG Emissions Inventory for Ukiah includes 155,480 metric tons of CO2 equivalents (MT

CO2e), which decreased to 144,625 MT CO2e in 2010. Emissions from municipal operations,[1] included in the community inventory, were 1,969 MT CO2e in 2005 and 1,814 MT CO2e in 2010. Under business-as-usual (BAU) conditions, annual community GHG emissions are forecasted to be 149,108 MT CO2e by 2020. To be consistent with the AB 32 goal, the City must reduce its annual emissions to approximately 132,158 MT CO2e by the year 2020. This is a reduction of 11% (16,950 MT CO2e) from the 2020 BAU forecast.

Several initiatives at the state level will reduce GHG emissions in the City of Ukiah. The 'adjusted' 2020 forecast for Ukiah, including anticipated reductions from statewide measures, is 132,437 MT CO2e – nearly enough for the City to meet its 2020 target. This Climate Action Plan outlines local GHG reduction strategies and actions that will enable the City to attain (and likely exceed) the 2020 target. It also considers the years beyond 2020, when deeper reductions in global GHG emissions will be needed if the world is to avoid catastrophic climate change.

In developing this Climate Action Plan, the City of Ukiah considered many potential GHG-reduction strategies and actions. Best-suited measures were chosen primarily based on community support, their ability to reduce GHG emissions, and cost-benefit characteristics, with additional considerations for funding availability and feasibility of implementation. As the City is in the early stages of shifting towards a low-carbon economy, high priority was also given to strategies and actions that support local economic development by creating new jobs, boosting existing and creating new local green businesses, reducing energy costs, increasing energy security, and reducing traffic congestion. Additional considerations included public health impacts, energy security, air quality impacts, and quality of life impacts.

The measures in this Climate Action Plan address energy consumption and generation, transportation and land use, solid waste disposal, and water use. For each emissions sector, the Climate Action Plan presents goals, strategies, and specific actions for reducing emissions, along with local economic and other co-benefits, such as improved air quality and reduced energy and water bills. An implementation and monitoring plan is also provided. The initial implementation timeframe will span approximately seventeen years, from 2013 through 2030.

In addition to reducing GHG emissions, the Climate Action Plan helps Ukiah's Planning and Community Development Department streamline its review process for development projects. As is further described in Chapter 2, *Climate Change Background and Regulatory Setting*, per guidance by the OPR, a lead agency may determine that an individual project's incremental contribution to a cumulative effect on climate change is not cumulatively considerable if the project complies with the requirements of a previously adopted plan to reduce GHGs. This Climate Action Plan will serve as such a plan. See Chapter 5, *Implementation and Monitoring*, for additional information on this Climate Action Plan's benefits for CEQA project review in Ukiah.

1 Excluding the City Landfill. For additional information, see Chapter 3, Greenhouse Gas Emissions Inventories, Forecasts, and Target

Relationship to Other City Plans

This Climate Action Plan, in presenting measures for reducing community GHG emissions and increasing resilience to climate change, is closely aligned with the goals and policies outlined in the Ukiah General Plan (adopted in 1995, updated in 2004), Ukiah's municipal code, and other City policies related to sustainability. The Climate Action Plan is a "stand alone" policy document, and will help the City meet its long-term planning goals.

The strategies presented in Chapter 5 of this Climate Action Plan are consistent with and support implementation of goals and strategies included in the Ukiah General Plan. Key goals and policies pertaining to energy, water, waste, transportation and land use are provided below.

- **Goal EG-1:** Create land use patterns which facilitate the conservation of energy.
    - **Policy EG-1.1:** Locate shopping, employment and recreation opportunities within walking or bicycling distance of proposed and existing housing.
- **Goal EG-2:** Improve the efficiency of energy use within the private transportation system.
    - **Policy EG-2.1:** Encourage the use of alternatively powered vehicles.
- **Goal EG-3:** Improve the efficiency of energy use within the City's and County's vehicle fleet.
    - **Policy EG-3.1:** The City and County shall serve as models for programs to operate fleet vehicles at maximum fuel efficiency.
    - **Policy EG-3.2:** Support car-pooling.
- **Goal EG-4:** Maximize on-site solar energy use, especially in new developments.
    - **Policy EG-4.1:** Incorporate solar energy considerations into the design, review and approval of all development.
- **Goal EG-5:** Site design shall incorporate shade trees for energy conservation.
    - **Policy EG-5.1:** Encourage minimum canopy coverage of all paved area on a lot.
- **Goal EG-6:** Promote energy efficiency features in the design of all new structures and in the retrofitting of existing structures.
    - **Policy EG-6.1:** Design new buildings with the maximum feasible energy efficiency.
    - **Policy EG-6.2:** Public buildings shall operate at the highest energy efficiency level economically and operationally feasible.
    - **Policy EG-6.3:** Promote retrofitting of privately -owned buildings to increase energy efficiency.
- **Goal EG-7:** Educate residents and businesses about the importance of energy efficiency.
    - **Policy EG-7.1:** Promote energy education programs.
- **Goal EG-8:** Manage existing energy resources to meet increased demands and explore the use of new energy efficient technologies.

- **Goal CF-4:** Improve the City water distribution system.
    - **Policy CF-4.1:** Work to avoid preventable water loss from the distribution system.
- **Goal CF-3:** Promote water conservation.
    - **Policy CF-3.1:** Actively develop programs to decrease the need for new water sources.

By helping to implement these General Plan goals and policies, the Climate Action Plan will reduce Ukiah's carbon footprint by ensuring buildings operate at the highest energy efficiency level, developing a balanced land use pattern, developing a connected street pattern that serves a variety of transportation modes, supporting public transit service, providing a safe and convenient bicycle and pedestrian network, improving water use efficiency, and reducing solid waste.

Document Content

The Climate Action Plan is organized into the following chapters, as described below:

Chapter 1: Introduction. This chapter provides an overview of the document, the purpose and scope of the Climate Action Plan, and its relationship the Ukiah General Plan.

Chapter 2: Climate Change Background and Regulatory Setting. This chapter presents the basic science behind climate change and the ongoing research related to its effects on the natural and human world. In addition, Chapter 2 provides a brief explanation of potential impacts of climate change in the greater Ukiah region, as well as a discussion of federal regulations, state actions, and local actions pursuant to state requirements to reduce GHG emissions.

Chapter 3: Greenhouse Gas Emissions Inventory, Forecasts, and Targets. This chapter presents the community-wide inventory of GHG emissions for the 2005 base year, and an update showing emission in 2010. A subset of those emissions—municipal emissions attributable to government operations—are also presented. Using projections of population, employment, and new residential and commercial development, future emissions for the years 2020 and 2030 are estimated for BAU market-based conditions. This chapter also estimates the cumulative effect of implementing state-wide measures to reduce GHG emissions, and provides an 'adjusted' 2020 emissions forecast that includes reductions from state-wide measures. Finally, this chapter establishes the 2020 GHG emissions target as 15 percent below base year 2005 emissions, and describes the emissions gap that the City of Ukiah Climate Action Plan must close to reach that target.

Chapter 4: Greenhouse Gas Reduction Goals and Strategies. Reducing emissions to at least 15 percent below the 2005 base year inventory will require the City of Ukiah and its residents and businesses to commit to strategies that impact energy use, transportation and land use, solid waste diversion, and water consumption. Chapter 4 addresses each of these major categories, summarizing their contribution to total city-wide emissions and describing the strategies and actions that will be implemented to reduce emissions from each category over time. Emissions reduction estimates are provided for individual strategies and actions through the years 2020 and 2030. Chapter 4 also summarizes the policies and programs that Ukiah has implemented since the 2005 base year.

Chapter 5: Implementation and Monitoring. This chapter outlines recommended steps for implementing the GHG reduction strategies described in Chapter 4, and for monitoring the progress of

implementation. It assigns implementation and monitoring responsibility to specific City departments and presents a schedule for implementation. Chapter 5 discusses potential funding sources, and partnerships the City may enter into to leverage existing work and local resources. This chapter also describes how the adopted Climate Action Plan will be used to streamline CEQA review of future development projects that are consistent with the strategies and programs in the Plan.

Chapter 6: Adaptation: Preparing Ukiah for Climate Change. This chapter presents an overview of the impacts Ukiah is expected to experience due to projected changes in the climate, and what the City can do to begin preparing for them. It describes expected local impacts and vulnerabilities, and adaptation planning strategies.

Chapter 7: Conclusion. This chapter briefly summarizes Ukiah's key challenges to meeting its 2020 GHG reduction target, and discusses opportunities to begin longer-term climate action planning, looking out to 2050.

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2 Climate Change Background and Regulatory Setting

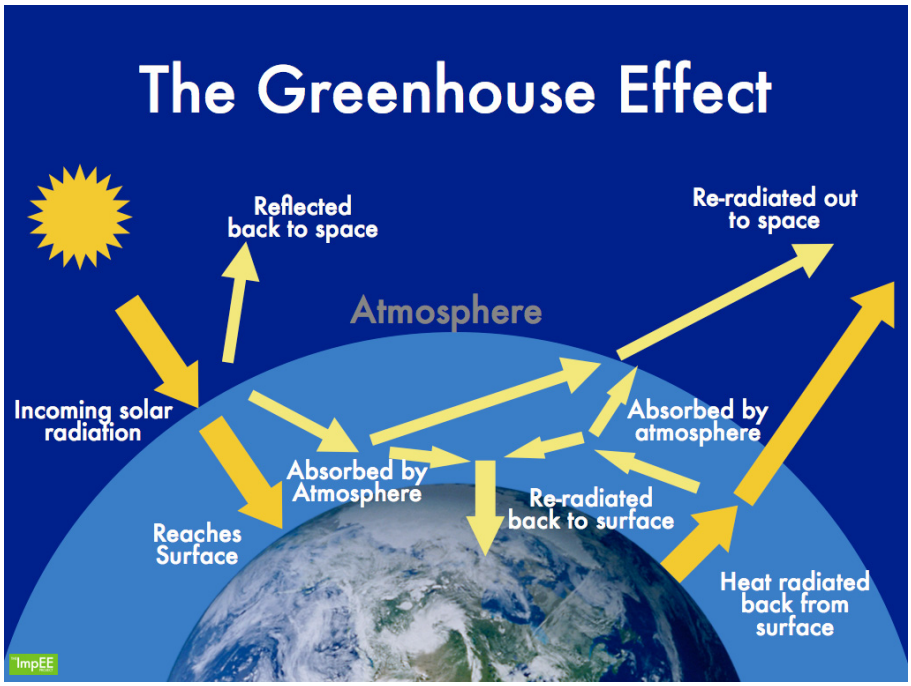
What is Climate Change?

Climate change is described as a significant and lasting change in the planet's weather patterns over a long time period. The scientific community has reached consensus that climate change is occurring at a global scale, and climate change is a widely discussed economic and political issue in California, the United States, and internationally. According to the Intergovernmental Panel on Climate Change (IPCC), "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level."[1] Regional changes in climate, particularly temperature increases and changing precipitation patterns, are already affecting natural systems worldwide, and will have widespread impacts on water availability, food production, ecosystem biodiversity, and human health. These changes can result in significant impacts to the health, economy and environment of the Ukiah community and beyond.

GHGs are gases that trap heat in the atmosphere and regulate the Earth's temperature. This effect, known as the Greenhouse Effect, is responsible for maintaining a habitable climate, as shown in **Figure 2-1**. Climate change is occurring because of the ever-rising rate of emissions of warming-inducing gases into the atmosphere. According to the IPCC, it is very likely that human-generated GHG emissions, which have increased considerably since the mid-20th century, are a primary cause of climate change. Since the dawn of the Industrial Revolution around 1750, human activities have increased atmospheric concentrations of GHG emissions, levels of which now far exceed the average atmospheric concentrations of the past several thousand years. Land use changes, burning of fossil fuels, and agricultural practices have all contributed to this observed increase. Global climate models clearly show that human activity is having an effect on global temperatures.

1 Intergovernmental Panel on Climate Change Fourth Assessment Report, 2007. Available at: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml

Figure 2-1
The Greenhouse Effect



SOURCE: (University of Cambridge, 2006)[2]

The most prevalent GHGs are carbon dioxide (CO2) and water vapor. Others important GHGs are methane (CH4), nitrous oxide (N2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). These gases are emitted through a variety of natural processes and human activities, as follows:

- CO2 and N2O are byproducts of fossil fuel combustion;
- N2O is associated with agricultural operations, such as fertilization of crops;
- CH4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock), anaerobic composting, and landfills;
- CFCs were widely used as refrigerants, propellants, and cleaning solvents; their production has been mostly eliminated by international treaty, but past emissions remain in the atmosphere due to their long lifespan;
- HFCs are now used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- PFCs and SF6 emissions are common byproducts of industries such as aluminum production and semi-conductor manufacturing.

Global Warming Potential (GWP) is a quantitative measurement that expresses the relative warming potency of each GHG. CO2 is assigned a GWP value of 1. SF6 is several orders of magnitude stronger with a GWP of 22,800. For GHG emission inventories, the weight of each gas is multiplied by its GWP and presented in units of CO2 equivalents (CO2e). **Table 2-1** lists the six primary GHGs (also known as the Kyoto GHGs), their chemical formula, the lifetime of the compound, and their GWPs relative to CO2.

2 University of Cambridge, 2006. The Greenhouse Effect. Accessed on June 14, 2011, www-g.eng.cam.ac.uk/impee/?section=topics&topic=ClimateChange&page=materials

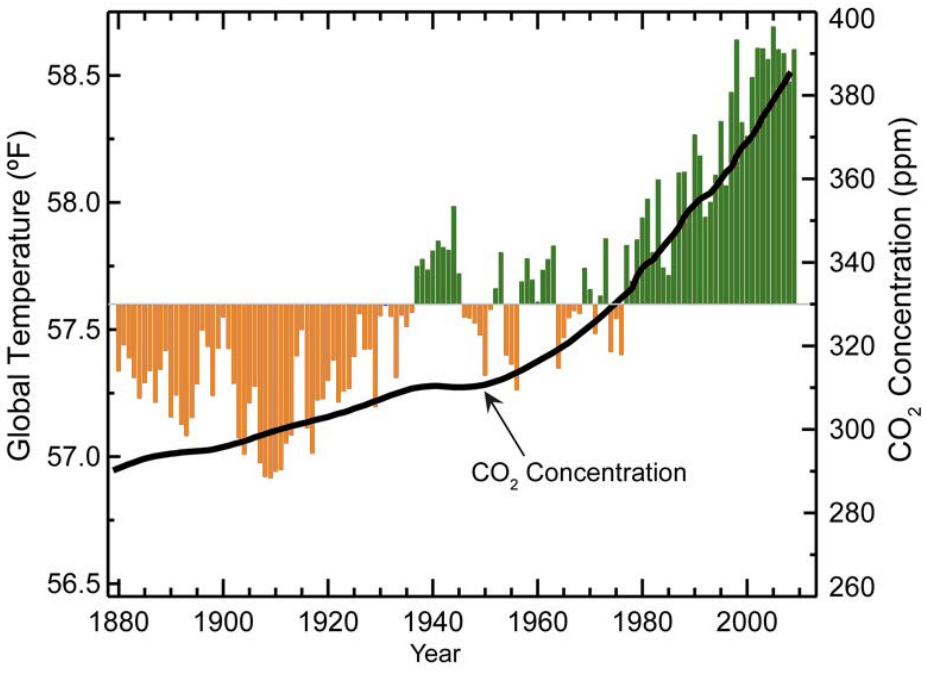
Though CO2 has a lower GWP than other GHGs in the atmosphere, it is the largest contributor to anthropogenic warming over the last century because of the sheer volume of human-induced CO2 emissions over that time. **Figure 2-2** shows the strong correlation between atmospheric CO2 levels and observed global temperatures over the past 130 years. Red bars indicate temperatures above and blue bars indicate temperatures below the 1901-2000 average temperature. The black line shows atmospheric carbon dioxide concentration in parts per million. Concentrations of CO2 have risen most rapidly since 1980, closely tracking the rise in temperature.

Table 2-1
Greenhouse Gases Covered by the Kyoto Protocol

GHG	Chemical Formula	Lifetime (years)	Global Warming Potential for 100-year horizon
Carbon Dioxide	CO_2	1	1
Methane	CH_4	12	25
Nitrous Oxide	N_20	114	298
Sulfur Hexafluoride	SF_6	3,200	22,800
Hydrofluorocarbons	HFCs	14–270	1,430–14,800
Perfluorocarbons	PFCs	1,000–50,000	7,390–22,800

SOURCE: IPCC Fourth Assessment Report: Climate Change 2007 (AR4). Available at: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#1

Figure 2-2
Global Temperature and Carbon Dioxide

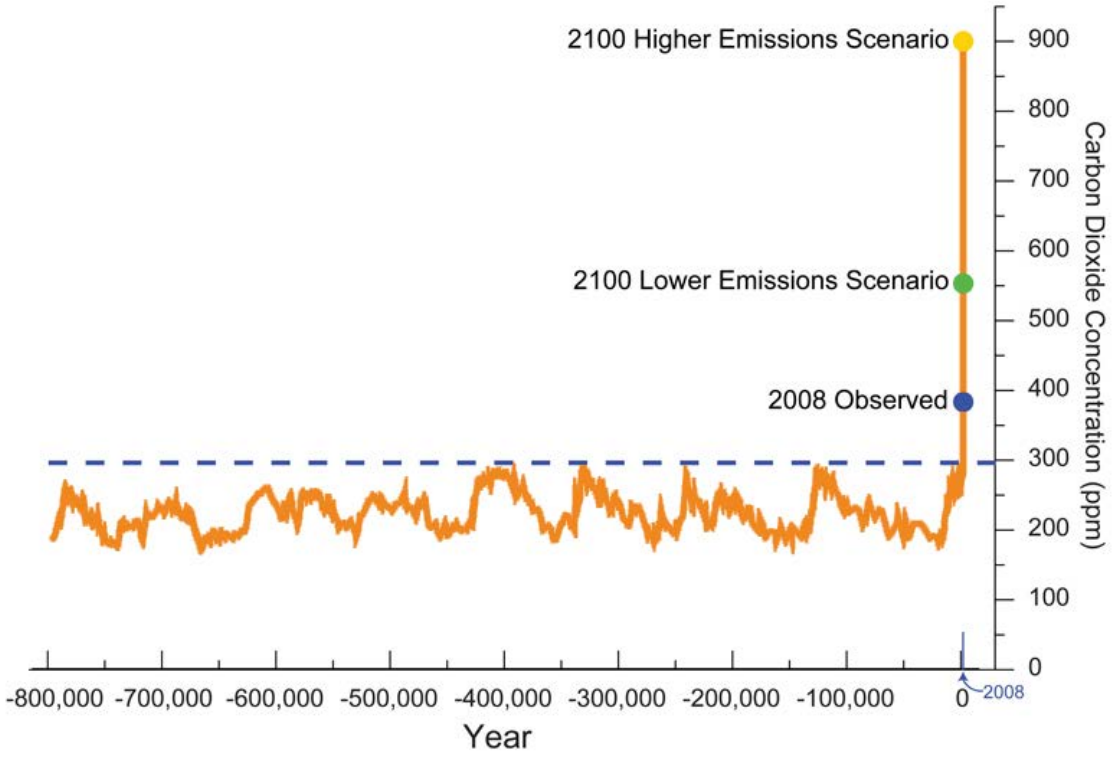


SOURCE: NOAA Satellite and Information Service, www.ncdc.noaa.gov/indicators/, 2010

As shown in **Figure 2-3**, atmospheric CO2 levels have periodically risen and fallen over the past 800,000 years, within a relatively narrow range of approximately 180 to 300 parts per million (ppm), corresponding to repeating cycles of carbon uptake and release as continental ice sheets advance and retreat. The current era, already near the peak of an historical warming cycle, is experiencing atmospheric CO2 levels far higher than at any time over the past 800,000 years. Current concentrations are nearly 400 ppm, compared with approximately 280 ppm just 250 years ago.

Figure 2-3

800,000 Year Record of Carbon Dioxide (CO2) Concentrations



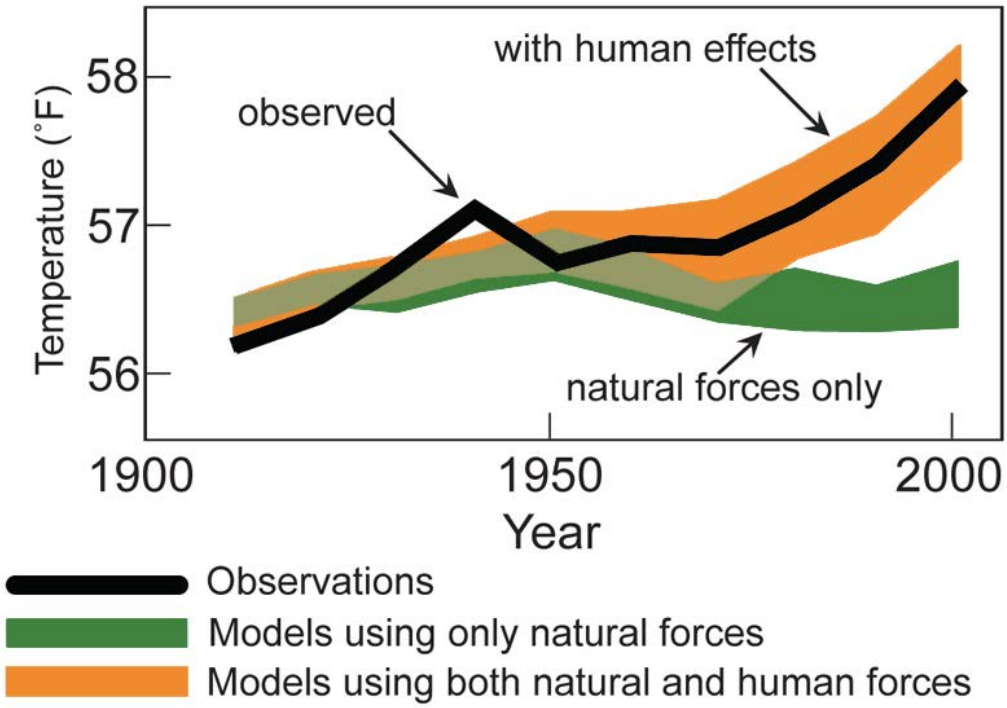
SOURCE: NOAA Satellite and Information Service, 2010, www.ncdc.noaa.gov/indicators/

By the end of the 21st Century, even the lower threshold of expected levels shown in **Figure 2-3** will far exceed known levels going back more than one million years. Climate models cited by the IPCC predict that by 2100, average atmospheric CO2 concentrations will increase to a range of 540–970 ppm, while global average temperatures are expected to rise between 1.1 and 6.4 °C (2.0 and 11.5 °F), with the greatest increases occurring at the poles. Already, observed average temperatures have increased by about 3°C at the poles since the 1980s, compared with 0.7 °C in the Earth's more temperate zones. Climate dynamics are complex, and predictions about our future climate include a level of uncertainty. Even so, current observations are consistent with modeling predictions and in many cases prove that the models are conservative.

An expanding body of scientific research supports the theory that human activity is a major contributor to observed increases in atmospheric CO2 and other GHGs. As shown in **Figure 2-4**, climate model experiments that include only natural factors, such as cycles of solar radiation variability, show a relatively

stable global temperature over the past century, while models that include human influences produce results that track very closely to the observed temperature increases over that same time period.

Figure 2-4
Climate Model Indications and the Observed Climate



SOURCE: NOAA, 2010

Impacts of Climate Change

In 2009, a consortium of U.S.-based science organizations led by the National Oceanic and Atmospheric Administration (NOAA) released its second comprehensive National Climate Assessment, a study of climate impacts in the United States.[3] The next revision is scheduled to be completed in 2014. The key findings of the 2009 Assessment are summarized as follows:

1. **Global warming is unequivocal and primarily human-induced.**

   Average global temperature has increased over the past 50 years. This observed increase is due primarily to human-induced emissions of heat-trapping gases.

2. **Climate changes are under way in the United States and are projected to grow.**

   Climate-related changes have already been observed in the United States and its coastal waters. These changes include increases in heavy downpours, rising temperatures and sea level, rapidly retreating glaciers, thawing permafrost, lengthened growing seasons, lengthened ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows.

3 U.S. Global Change Research Program, 2009. Global Climate Change Impacts in the United States. Page 12. Available at: http://www.globalchange.gov/what-we-do/assessment/previous-assessments

3. **Widespread climate-related impacts are occurring now and are expected to increase.**

   Climate changes are already affecting water, energy, transportation, agriculture, ecosystems, and health. These impacts are different from region to region and will grow under projected climate changes.

4. **Climate change will stress water resources.**

   Access to clean water is an issue in every region, but the nature of the potential impacts varies. Drought—related to reduced precipitation, increased evaporation, and increased water loss from plants—is an important issue especially in the western U.S. Floods and water quality problems are likely to be amplified by climate change in most regions. Declines in mountain snowpack are important in the western states and Alaska, where snowpack provides vital natural water storage.

5. **Crop and livestock production will be increasingly challenged.**

   Agriculture is considered one of the sectors most adaptable to changes in climate. However, increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production.

6. **Coastal areas are at increasing risk from sea-level rise and storm surge.**

   Sea-level rise and storm surges place many U.S. coastal areas at increasing risk of erosion and flooding, especially along the Atlantic and Gulf Coasts, Pacific Islands, and parts of Alaska. Energy and transportation infrastructure and other property in coastal areas are very likely to be adversely affected.

7. **Threats to human health will increase.**

   Health impacts resulting from climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. A robust public health infrastructure can reduce the potential for negative impacts.

8. **Climate change will interact with many social and environmental stresses.**

   Climate change will combine with pollution; population growth; overuse of resources; urbanization; and other social, economic, and environmental stresses to create larger impacts than from any of these factors alone.

9. **Thresholds will be crossed, leading to large changes in climate and ecosystems.**

   There are a variety of thresholds in the climate system and ecosystems. These thresholds determine, for example, the presence of sea ice and permafrost and the survival of species, from fish to insect pests, with implications for society.

10. **Future climate change and its impacts depend on choices made today.**

    The amount and rate of future climate change depend primarily on current and future human-caused emissions of heat-trapping gases and airborne particles. Responses involve reducing emissions to limit future warming and adapting to the changes that are unavoidable.

According to the IPCC Fourth Assessment Report, a 2°C increase in average global temperature over the next century is a “safe” level of global warming. To keep warming at this level, GHG concentrations must be stabilized at less than 450 parts per million (ppm). Currently, the global atmospheric concentration of GHGs averages nearly 400 ppm. Avoiding dangerous warming requires reducing global GHG emissions by at least 50 percent below 1990 levels by the year 2050. A target this aggressive is made especially challenging due to the current rapid rise of emissions in the developing world.

Many of California’s important natural resources are threatened by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion, and degradation of

wetlands. Mass migration and/or loss of plant and animal species, many unique to our Mediterranean climate, could also occur.

More information is available on the science of climate change from the following organizations:

- U.S. Global Change research Program, National Climate Assessment: http://www.globalchange.gov/what-we-do/assessment
- Intergovernmental Panel on Climate Change Fourth Assessment Report: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml
- National Ocean and Aeronautical Administration (NOAA): http://www.climate.gov/#climateWatch
- Pew Center on Climate Change: http://www.pewclimate.org/
- U.S. Environmental Protection Agency: http://www.epa.gov/climatechange/indicators.html
- U.S. National Academy of Sciences: http://americasclimatechoices.org/
- The American Association for the Advancement of Science (AAAS): http://www.aaas.org/

Expected Local Impacts

The City of Ukiah, like other communities in California, is likely to face serious economic, social, and environmental challenges in the 21st Century due to climate change. Although Ukiah is not susceptible to the projected rises in sea level due to melting ice caps and warming oceans, it will still be impacted directly and indirectly on many fronts as global temperatures rise.

The recently published *California Adaptation Planning Guide: Understanding Regional Characteristics (July 2012)* designates climate impact regions based on county boundaries in combination with projected climate impacts, existing environmental setting, socioeconomic factors, and regional designations. The City of Ukiah and Mendocino County are located within the North Coast climate impact region. Within this region, the Adaptation Planning Guide identifies the following climate change impacts:

- Reduced snowpack
- Increased wildfires
- Threats to sensitive species (e.g., coho salmon)
- Loss in agricultural productivity (e.g., forestry, wine grapes, nursery products, dairy)
- Public health and safety
- Sea level rise and inland flooding (not a concern for the City of Ukiah)

In addition, the Adaptation Planning Guide[4] shows the following climate projections for the North Coast Region:

Reduced snowpack. In the eastern, higher-elevation portion of the North Coast region, march snow levels will drop to almost zero by the 2090s, a decrease of 2 to 10 inches from 2010 levels. In areas with currently little snow (less than 3 inches), such as Ukiah, the snowpack is projected to be near zero by 2050.

Increased wildfires. The North Coast region is projected to experience substantial increase in fire risk. By 2050, the region will experience modest increases in area burned are projected for 2050. By 2100, the

4 Data in the Adaptation Planning Guide is taken from Cal-Adapt, the state's web-based climate adaptation planning tool (http://cal-adapt.org/)

projected frequency increases dramatically, eight times greater in parts of Mendocino County. Northern Mendocino County is projected to have up to 2.5 times greater wildfire frequency.

Temperature increases. January temperatures are predicted to increase by about 2 degrees Fahrenheit by 2050 and up to 5 degrees Fahrenheit by the year 2100 within the North Coast climate impact region. July increases in average temperatures are anticipated to be 3 degrees Fahrenheit and 6 degrees Fahrenheit by the year 2100.

Reduced precipitation. The North Coast region is expected to experience a subtle decrease in precipitation in most areas throughout the century. The City of Ukiah is projected to see a decrease of around 3 to 4 inches by 2050, and 6 inches of precipitation by 2011. Reduced precipitation will adversely impact the water supply of the City, region, and State.

Public health and heat. Ukiah is not projected to see a large increase in the number of heat waves, defined regionally as five consecutive days with temperatures as high as 93°F. Little change is expected by 2050 with possibly one to three more heat waves projected in region. By 2100, projected heat waves are more variable, with predictions of between two and eight more waves per year. However, when heat waves do occur, vulnerable populations in Ukiah may be severely affected because of a historic lack of adaptive capacity having to do with historically milder temperatures. Frequent heat waves can have the greatest impact on the elderly and children less than five years of age. Mendocino County is one of the state's counties with the highest proportion of elderly living alone.

Regulatory Setting

Strategies for monitoring and addressing climate change have emerged at the international, national, and state levels, but California has been a leader in developing mitigation and adaptation strategies. Since 2005, California has been developing policy and passing legislation that seeks to control emissions of gases that contribute to global warming. These have included regulatory approaches, such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as market-based cap-and-trade. Some regulations apply at the state level, but others are state-imposed mandates that are applicable at the municipal level and required of local agencies and jurisdictions.

State of California Executive Order S-3-05

In June 2005, the Governor of California signed Executive Order S-3-05, which identified the California Environmental Protection Agency (CalEPA) as the lead coordinating state agency for establishing climate change emission reduction targets in California. A "Climate Action Team," a multi-agency group of state agencies, was set up to implement Executive Order S-3-05. The Governor's Executive Order established aggressive emissions reductions goals: by 2010, GHG emissions must be reduced to 2000 levels; by 2020, GHG emissions must be reduced to 1990 levels; and by 2050, GHG emissions must be reduced to 80 percent below 1990 levels. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

Global Warming Solutions Act of 2006 (AB 32)

In 2006, the California legislature adopted AB 32, requiring that California cap GHG emissions state-wide at 1990 levels by 2020. AB 32 requires CARB to establish a program for statewide GHG emissions reporting, and monitoring/enforcement of that program.

The **Climate Change Scoping Plan**, adopted in 2008, outlines the State's plan to achieve the GHG reductions required in AB 32. The actions vary by type, which include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and other mechanisms. The Scoping Plan identifies local governments as "essential partners" in achieving California's goals to reduce GHG emissions, encouraging the adoption of reduction targets for community and municipal operations emissions that are consistent with the State's commitment (identified as equivalent to 15% below "current" (i.e., 2008) levels).

Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) requires fuel providers in the State to decrease lifecycle fuel carbon intensity by 2020. The LCFS applies, either on a compulsory or opt-in basis, to all fuels used for transportation in California. It is expected that the LCFS will reduce tailpipe carbon emissions from passenger vehicles and heavy duty trucks by approximately 10 percent by 2020[5]. CARB identified specific eligibility criteria in April 2009, and the regulation became effective in January 2010.

Assembly Bill 1493 (Pavley)

Assembly Bill (AB) 1493 (2002), known as the Pavley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. AB 1493 requires GHG emission reductions from passenger trucks and light cars beginning in 2011. CARB's AB 32 Early Action Plan released in 2007 included a strengthening of the Pavley regulation for 2017. The U.S. EPA granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles in June 2009. In September, CARB adopted amendments to the regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016. It is expected that the Pavley regulations will reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, all while improving fuel efficiency and reducing motorists' costs.[6]

Renewable Portfolio Standard

California's Renewable Portfolio Standard (RPS) was established in 2002 under SB 1078 and accelerated in 2006 under SB 107. The program was further expanded in 2011 under SB 2. Under AB 32, the Renewable Portfolio Standard requires increased production of energy from renewable sources, like solar, wind, geothermal, and biomass generation. Investor-owned utilities, electric service providers, and community choice aggregators must increase their renewable portfolio to reach 33 percent of total procurement by 2020.

Ukiah uses electricity generated by the City-operated Lake Mendocino Hydroelectric plant, as well as electricity purchased from individual suppliers including wholesale power suppliers and PG&E. As of 2010,

5 California Air Resources Board, 2008. Climate Change Scoping Plan: a framework for change. Published December 2008.

6 California Air Resources Board. Clean Car Standards – Pavley, Assembly Bill 1493. Available at: http://www.arb.ca.gov/cc/ccms/ccms.htm

Ukiah's electric power mix was made up of approximately 55% eligible renewable sources, including geothermal (41.23%), small hydroelectric (12.33%), wind (0.74%), biomass and waste (0.64%) and solar (0.07%).

California Building Code

Title 24, of the California Code of Regulations, Part 6 sets forth California's energy efficiency standards for residential and nonresidential buildings and was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The most recent standards were adopted on April 23, 2008, and went into effect on January 1, 2010. The update to the Code supports the goals as described in AB 32, by enhancing energy efficiency of all new residential and non-residential development. It is expected that the 2008 update will reduce GHG emissions from California residential buildings for electricity by approximately 21% and natural gas by 9%, and non-residential buildings for electricity by approximately 5% and natural gas by 9%. A further update to Title 24 (the 2013 Standards) is expected to be effective on January 1, 2014.

The 2010 California Green Building Standards Code, referred to as CALGreen, is a component of the California Building Code. CALGreen went into effect on January 1, 2011, requiring that new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant emitting finish materials. CALGreen has roughly 50 nonresidential mandatory measures and an additional 130 provisions that have been placed in the appendix for optional use. Some key mandatory measures for commercial occupancies include specified parking for clean air vehicles, a 20% reduction of potable water use within buildings, a 50% construction waste diversion from landfills, use of building finish materials that emit low levels of volatile organic compounds, and commissioning for new, nonresidential buildings over 10,000 square feet.[7] CALGreen Nonresidential updates became effective July 1, 2012, and additional updates are anticipated to become effective January 1, 2014.[8]

Senate Bill 375 (Steinberg)

In 2008, SB 375 was enacted to address indirect GHG emissions caused by urban sprawl. SB 375 develops emissions-reduction goals that apply to a region's transportation planning activities. SB 375 provides incentives for local governments and developers to create new walkable and sustainable communities, revitalize existing communities, and implement conscientiously planned growth patterns that concentrate new development around public transportation nodes. CARB has been working with the state's metropolitan planning organizations (MPOs) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. Since Mendocino County is a relatively rural county and not part of an MPO, the county (including the City of Ukiah) is not subject to the requirements of SB 375.

7 California Building Standards Commission. The CALGreen Story. Available at: http://www.documents.dgs.ca.gov/bsc/CALGreen/The-CALGreen-Story.pdf

8 California Building Standards Commission. CALGreen. Available at: http://www.bsc.ca.gov/Home/CALGreen.aspx

Senate Bill 97 (Dutton) and OPR Guidance for CEQA

Recognizing that AB 32 did not discuss how GHGs should be addressed in documents prepared under the California Environmental Quality Act (CEQA), the legislature enacted SB 97 to require the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of emissions. The draft guidelines were formalized on March 18, 2010, and all CEQA documents prepared after this date are required to comply with the OPR-approved amendments to the CEQA Guidelines.

OPR's guidance for agency compliance with CEQA requires that lead agencies analyze and document the environmental impacts of proposed projects. OPR has developed guidance on the analysis and mitigation of GHG emissions in CEQA documents. This guidance states that lead agencies should develop their own approach to performing climate change analysis for projects that generate GHG emissions, and that compliance with CEQA can be achieved by identification and quantification of GHG emissions, assessment of significance of the impact on climate change, and identification of mitigation measures and/or alternatives if the impact is found to be significant.

OPR developed, and the California Resources Agency has adopted, amendments to the *CEQA Guidelines* to incorporating this guidance. *CEQA Guidelines* Section 15183.5(b) states that a lead agency may choose to analyze and mitigate significant GHG emissions in a plan for the reduction of GHGs or similar document, and that such a plan may be used in a cumulative impacts analysis of a project. A lead agency may determine that an individual project's incremental contribution to a cumulative effect on climate change is not cumulatively considerable if the project complies with the requirement of the previously adopted plan to reduce GHGs. This plan should:

1. Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
2. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
3. Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
4. Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
5. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
6. Be adopted in a public process following environmental review.

In developing the Ukiah Climate Action Plan, the City will fulfill OPR steps (1) through (6) for the full spectrum of GHG emissions.

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3 Greenhouse Gas Emissions Inventories, Forecasts, and Targets

Overview

The City of Ukiah Greenhouse Gas (GHG) Inventory serves multiple purposes. It quantifies the GHG emissions resulting from activities taking place throughout the City of Ukiah by the City's residents, businesses, and local government (i.e., community-wide emissions), as well as emissions attributed to operation of the local government (i.e., municipal emissions). The inventory provides an understanding of where GHG emissions are originating, and creates an emissions baseline against which the City can set emissions reduction targets and measure future progress. The inventory further allows the City to develop effective policies, strategies, and programs to reduce emissions.

The 2005 and 2010 inventories provide a breakdown of GHG emissions by sector to illustrate the contribution of various sources in the community and in municipal operations. 2005 was chosen as the baseline year based on guidance from the California Air Resources Board (CARB) and the California State-wide Energy Efficiency Collaborative (SEEC), and is consistent with most local government climate action plans in California. The 2010 updated inventory is based on more recent data and the general trend for each sector over time.

In addition to accounting for the 2005 baseline and 2010 updated emissions, this chapter forecasts future emissions using current best estimates for population, households, and job growth within the City under "business-as-usual" conditions, and under an 'adjusted' forecast scenario that includes the effect of state-mandates on GHG reductions. This chapter further provides a reduction target for 2020, based on guidance from CARB.

The boundaries of analysis, along with the methodology and assumptions used to develop Ukiah's GHG inventory and future projections, are included as Appendix A. The technical report on transportation modeling of base year and future conditions in Ukiah, provided by Fehr & Peers, is included as Appendix B.1.

Community-Wide Emissions

The emission sources and activities chosen for inclusion in the Ukiah community-wide inventory are based on the reporting framework for local governments developed by ICLEI in their *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. As such, emissions in the community-wide inventory include those that derive from sources located within the jurisdiction and from activities by community members for which the local government has significant influence to mitigate by 2020. This generally includes activities taking place within the City's geopolitical boundary where the local government has jurisdictional authority, as well as community-related activities taking place outside of City-limits that are attributable to community activities (e.g., landfill waste from City residents). The community-wide inventory includes emissions from residential, commercial, and industrial activities, as well as municipal operations, broken into 12 sectors: Residential Electricity, Residential Natural Gas, Commercial/Industrial Electricity, Commercial/Industrial Natural Gas, Stationary Sources Energy, Water Conveyance Electricity, On-road Transportation, Off-road Transportation, Agricultural Equipment, Wastewater Treatment (process emissions[1]), Solid Waste Generation, and City Landfill.

Emissions from municipal operations are included in the appropriate community inventory sectors, and for informational purposes a separate accounting of GHG emissions associated with municipal operations is included in the following section. That accounting includes emissions from City's operation of Ukiah Municipal Airport, from electricity, natural gas, vehicle fleet, solid waste, and stationary sources sectors, as appropriate. Emissions from privately-owned aircraft using the airport are not included in the municipal or community inventories because: 1) the City does not have operational control or significant influence over the privately-owned aircraft using the airport, and: 2) methods for quantifying and apportioning emissions from private aircraft rely on fuel and travel data that is typically of low quality or very difficult to obtain. Emissions from sources not subject to significant influence by the community were not included within the community inventory, such as the upstream impacts of materials used by the community, since the local government has limited means to influence community material uses. The community inventory also excludes emissions sources that meet the following criteria:

- Very small or insignificant sources – this includes sources such as propane-fired cooking grills or acetylene welding torches that contribute very little in terms of overall emissions, and for which accurate and complete data is difficult to obtain. In general, sources can be excluded from the analysis (e.g., are "de minimis") if, when combined, the excluded emissions from them total less than 5% of the total emissions inventory.
- Prohibitively difficult to track with accuracy or lack necessary data to calculate, especially where the science is still evolving or the data may not be available (e.g., non combustion industrial emissions sources such as the use of hydrofluorocarbons).
- Largely located outside the jurisdiction's boundaries, and outside its control or influence – such as transportation fuel used by intercity air and rail traffic.

1 Process emissions consist of methane (CH_4) and nitrous oxide (N_2O) generated by combustion of digester gas, plant processes, and fugitive emissions from effluent discharge. Natural gas and electricity consumed by the Wastewater Treatment plant are captured in the natural gas and electricity sectors.

The baseline 2005 GHG inventory for the community of Ukiah totals 155,480 metric tons (MT) of carbon dioxide equivalent (CO_2e[2]). Figure 3-1 and Table 3-1 show total GHG emissions by sector. In 2005, On-road Transportation accounted for of the largest portion of overall community-wide emissions, constituting 47.9 percent of total emissions. Contributions from other sectors, in order of magnitude, include: City-operated Landfill[3] (23.8 percent), Residential Energy (electricity and natural gas, 10.4 percent), Commercial/Industrial Energy (electricity and natural gas, 9.0 percent), Solid Waste Generation (3.0 percent), Agriculture (2.8 percent), Off-road Transportation (2.7 percent), Wastewater Treatment (0.2 percent), Water Conveyance Electricity (0.1 percent), and Stationary Sources (<0.1 percent).

Figure 3-2 shows changes in GHG emissions by sector between 2005 and 2010, when community-wide emissions decreased by approximately 7 percent to 144,625 MT CO2e, with 9 of the 12 sectors experiencing a decrease. The 44 percent reduction in emissions from Solid Waste Generation is due to a large increase in waste diversion between 2005 and 2010 (i.e., increased recycling). The decrease at the City-operated Landfill is due to the natural attenuation of methane (CH4) emissions as the waste in place decomposes and releases less landfill gas over time. Electricity-related reductions (Residential, Commercial, and Water Conveyance) can be attributed to lower power consumption resulting from the economic downturn, and an increase in the amount of low-carbon renewable energy sources in the City's electricity portfolio from 2005 to 2010. Overall, the percent that each sector contributed to total emissions did not change significantly between 2005 and 2010, with On-road Transportation continuing to comprise the largest sector (51.1 percent), followed by the City Landfill (21.1 percent), and Residential Energy (electricity and natural gas, 11.2 percent).

Table 3-1
2005 Baseline and 2010 Updated Community GHG Emissions by Sector

Emission Sector	2005 Baseline (MT CO2e)	2005 (% Total)	2010 (MT CO2e)	2010 (% Total)	2005-2010 (% Change)
Residential – Electricity	1,918	1.2%	1,679	1.2%	-12.4%
Residential - Natural Gas	14,370	9.2%	14,490	10.0%	0.8%
Commercial/Industrial - Electricity	4,323	2.8%	3,212	2.2%	-25.7%
Commercial/Industrial - Natural Gas	9,658	6.2%	9,231	6.4%	-4.4%
Stationary Sources - Energy	47	<0.1%	48	<0.1%	0.8%
Water Conveyance - Electricity	126	0.1%	78	0.1%	-38.1%
Transportation - Off-road	4,200	2.7%	4,302	3.0%	2.4%
Transportation - On-road	74,477	47.9%	73,896	51.1%	-0.8%
Agricultural Equipment	4,330	2.8%	4,134	2.9%	-4.5%
Wastewater Treatment	377	0.2%	372	0.3%	-1.3%
Solid Waste Generation	4,722	3.0%	2,641	1.8%	-44.1%
City Landfill	36,934	23.8%	30,543	21.1%	-17.3%
Total	155,480	100%	144,625	100%	-7.0%

2 Carbon dioxide equivalent (CO2e) includes carbon dioxide, methane (CH4) and/or nitrous oxide (N2O).
3 The City-Operated Landfill stopped accepting new waste in 2000. However, it continues to emit GHGs from the breakdown of stored waste.

Figure 3-1
2005 Baseline Community GHG Emissions by Sector

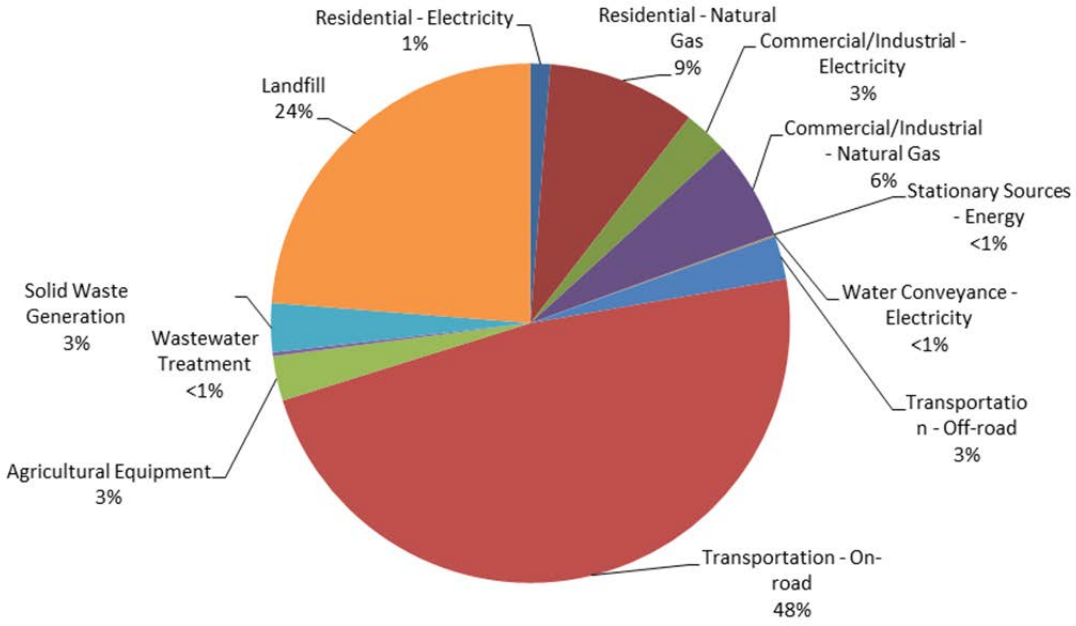
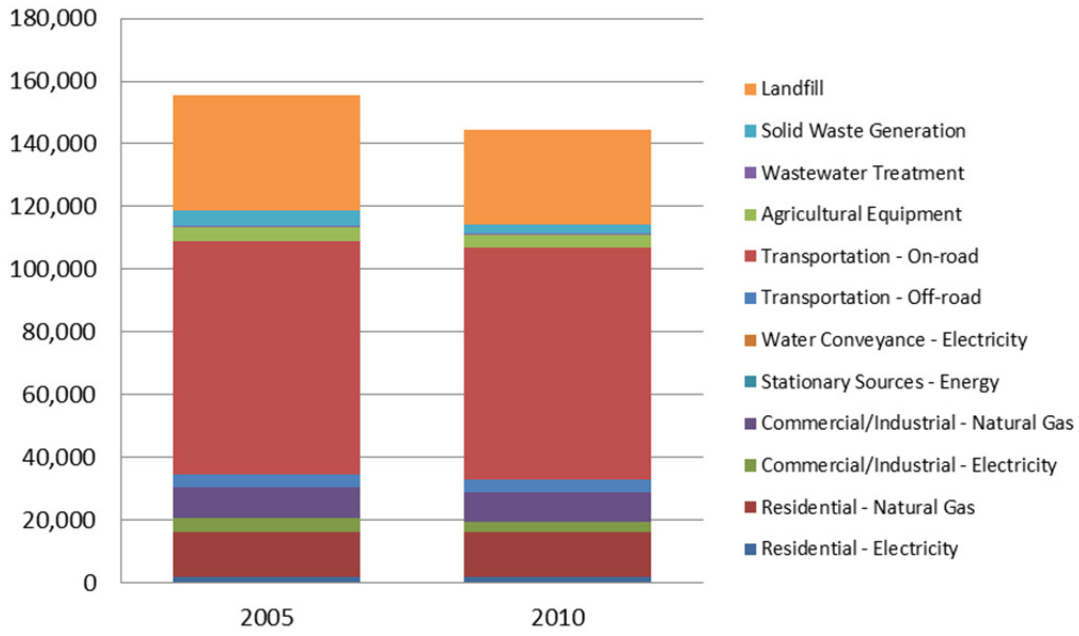


Figure 3-2
2005 and 2010 Community GHG Emissions by Sector (MT CO2e)



Municipal Operations Emissions

Although emissions from Ukiah municipal operations are included in the community inventory, this chapter provides added detail on the GHG emissions from municipal operations. The Ukiah municipal operations inventory includes all sources of GHG emissions that are under the direct control of the City, and details emissions from eight categories: Electricity, Natural Gas, City Vehicle Fleet (fuel), Solid Waste Generation, Employee Commute, Stationary Sources, Wastewater Treatment (process emissions), and City Landfill. Emissions from Ukiah Regional Airport operations are included within the municipal electricity, natural gas, vehicle fleet, solid waste, and stationary sources sectors, as appropriate.

Table 3-2 and Table 3-3 demonstrate the large influence that the closed City Landfill has the municipal operations inventory. Table 3-2 summarizes the municipal inventory with the City Landfill emissions included, resulting in a total inventory of 38,903 MT CO2e. Table 3-2 excludes the City Landfill emissions, showing a total 1,969 MT CO2e from municipal operations, but providing a clearer picture of the contributions from existing city operations. As shown in Table 3-3, between 2005 and 2010 municipal operations emissions decreased by approximately 7.8 percent (excluding City Landfill emissions) to 1,814 MT CO2e. As in 2005, in 2010 the three sectors with the highest emissions remained City Vehicle Fleet Fuel (30.2 percent), Wastewater Treatment processes (26.2 percent), and Electricity for facilities and streetlights (15.6 percent). If City Landfill emissions are included (Table 3-2), municipal emissions decreased 16.8 percent to 32,357 MT CO2e. As discussed previously for community-wide emissions, the 17.3 percent decrease City Landfill emissions is due to a natural reduction in the decomposition rate of deposited waste over time, and the 40.1 percent decrease in emissions from Solid Waste Generation is likely due to a large increase in waste diversion. Electricity-related emissions also show a sharp decrease (39.1 percent), both from lower electricity consumption in 2010 likely due to a smaller staff, and an increase in the amount of low-carbon renewable energy sources in the City's electricity portfolio. Natural Gas for municipal facilities increased 26.4 percent between 2005 and 2010, primarily due to four new facilities being brought online.

Table 3-2
2005 Baseline and 2010 Updated Municipal Operations GHG Emissions by Sector – With Landfill

Emission Sector	2005 Baseline (MT CO2e)	2005 (% Total)*	2010 Update (MT CO2e)	2010 (% Total)*	2005-2010 (% Change)
Electricity	465	1.2%	283	0.9%	-39.1%
Natural Gas	129	0.3%	164	0.5%	26.4%
City Vehicle Fleet - Fuel	550	1.4%	549	1.7%	-0.2%
Solid Waste Generation	48	0.1%	29	0.1%	-40.1%
Stationary Sources	25	0.1%	24	0.1%	-3.8%
Wastewater Treatment	474	1.2%	475	1.5%	0.1%
Employee Commute	277	0.7%	291	0.9%	4.9%
City Landfill	36,934	94.9%	30,543	94.4%	-17.3%
Total (with City Landfill)	38,903	100%	32,357	100%	-16.8%

Table 3-3
2005 Baseline and 2010 Updated Municipal Operations GHG Emissions by Sector – Without Landfill

Emission Sector	2005 Baseline (MT CO2e)	2005 (% Total)*	2010 Update (MT CO2e)	2010 (% Total)*	2005-2010 (% Change)
Electricity	465	23.6%	283	15.6%	-39.1%
Natural Gas	129	6.6%	164	9.0%	26.4%
City Vehicle Fleet - Fuel	550	27.9%	549	30.2%	-0.2%
Solid Waste Generation	48	2.4%	29	1.6%	-40.1%
Stationary Sources	25	1.3%	24	1.3%	-3.8%
Wastewater Treatment	474	24.1%	475	26.2%	0.1%
Employee Commute	277	14.1%	291	16.0%	4.9%
Total (without City Landfill)	1,969	100%	1,814	100%	-7.8%

Figure 3-3 shows 2005 baseline municipal GHG emissions by sector, excluding City Landfill emissions. The primary sources were City Vehicle Fleet Fuel (27.9 percent), Wastewater Treatment processes (24.1 percent), and Electricity for facilities and streetlights (23.6 percent). Remaining emissions came from Employee Commuting (14.1 percent), Natural Gas for facilities (6.6 percent), Solid Waste Generation (2.4 percent), and Stationary Sources fuel (1.3 percent). Figure 3-4 shows baseline emissions including the City Landfill, in which case the City Landfill generated approximately 94.9 percent of total municipal operations emissions. Figure 3-5 shows changes in GHG emissions by sector between 2005 and 2010.

Figure 3-3
2005 Baseline Municipal GHG Emissions by Sector, Excluding City Landfill

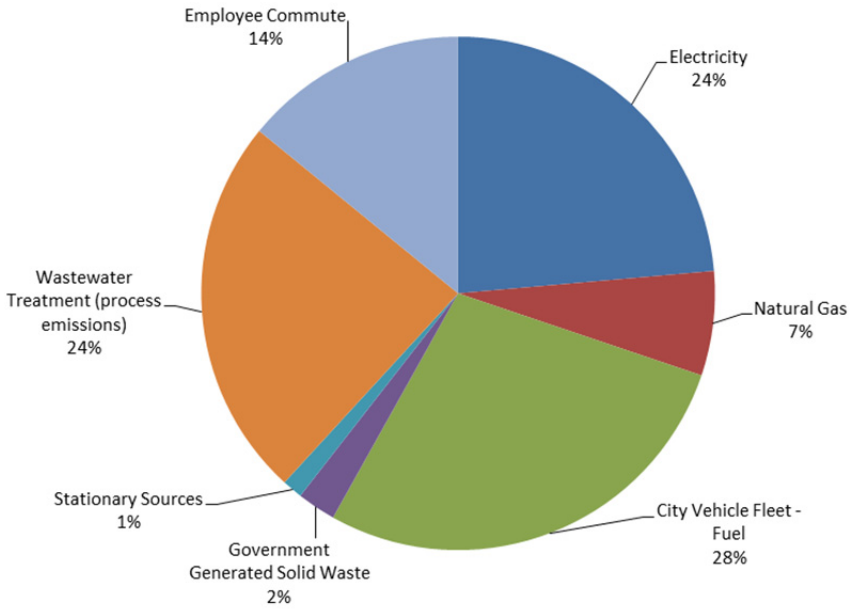


Figure 3-4
2005 Baseline Municipal GHG Emissions by Sector, Including City Landfill

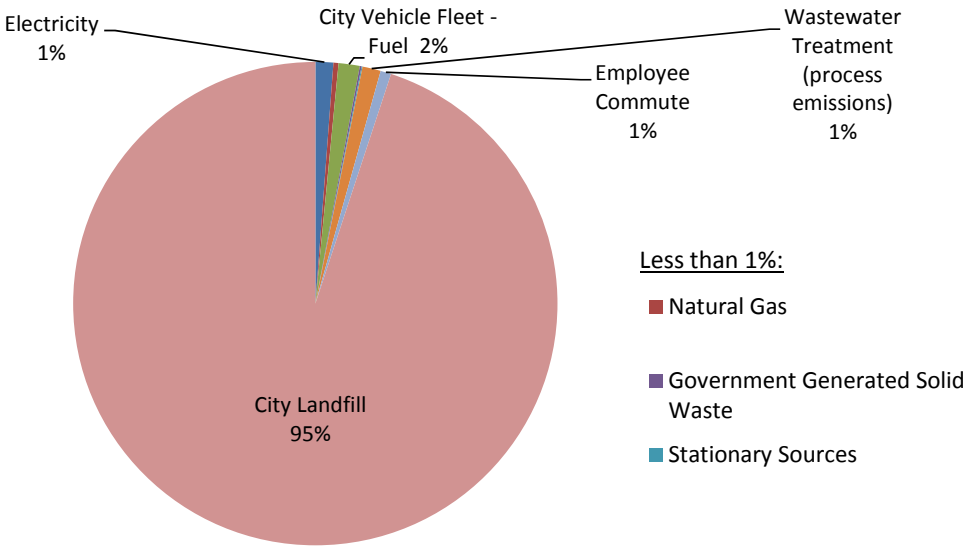
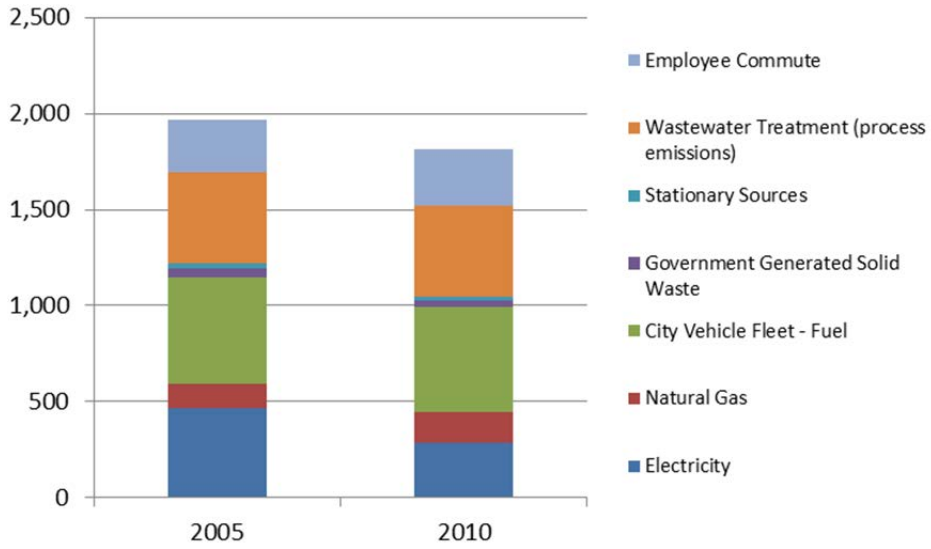


Figure 3-5
2005 Baseline and 2010 Updated Municipal Emissions by Sector (MT CO2e) (Excluding City Landfill)



Emissions Forecasts

GHG emissions projections for 2020 and 2030 were developed under a business-as-usual (BAU) scenario, i.e., a scenario that does not include regulatory actions or GHG reduction measures that were not in place by the 2005 base year. For community-wide emissions, this section also includes a 2020 "adjusted" forecast that includes the effects of state-wide emissions reductions measures such as updates to building energy standards and implementation of programs to decrease emissions from on-road vehicles.

Business-as-Usual Forecast

GHG emissions projections for the community and for municipal operations were based primarily on anticipated growth in total population, employment and/or housing in the City of Ukiah for the periods 2010 to 2020 and 2010 to 2030. Historical City population data was obtained from the California Department of Finance (DOF, 2012)[4], and future population projections were taken from the City of Ukiah 2010 Urban Water Management Plan. For community-wide employment, historical estimates were obtained from the 2010-2011 Mendocino County Economic & Development Profile (labor force only). Future employment projections were taken from the model used to estimate future vehicle miles traveled (see Appendix A). Historical housing data was obtained from the California Department of Finance, and future housing estimates were taken from the Fehr & Peers Ukiah VMT Inventory Memo (see Appendix B.1)[5]. For municipal employment, historical estimates were obtained from City records and projected trends were calculated using historical growth patterns. See Appendix A for more detail on growth factors and estimates.

Community-wide Projections

Table 3-3 shows anticipated GHG emissions for the twelve sectors included in the City's community-wide 2005 and 2010 GHG inventories. The table includes a description of the specific growth projections used as a proxy to project future emissions for each sector.

Table 3-4
Community-wide Baseline and Projected GHG Emissions 2005-2030 under a BAU Scenario (MT CO2e)

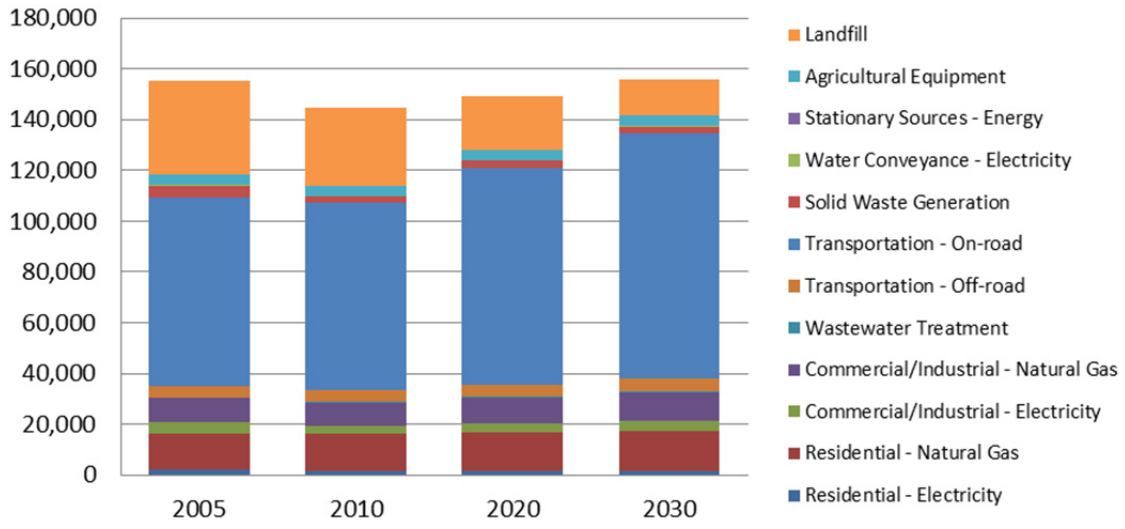
Emission Sector	2005 Emissions	2010 Emissions	2020 Emissions	2030 Emissions	Growth Proxy
Residential - Electricity	1,918	1,679	1,744	1,806	Average of population and household growth
Residential - Natural Gas	14,370	14,490	15,047	15,582	Average of population and household growth
Commercial/Industrial - Electricity	4,323	3,212	3,544	3,849	Employment growth
Commercial/Industrial - Natural Gas	9,658	9,231	10,185	11,063	Employment growth
Stationary Sources - Energy	47	48	50	51	Average of population and household growth
Water Conveyance - Electricity	126	78	82	87	Average of pop., household, and employment growth

4 California Department of Finance, (E-8 Historical Population and Housing Estimates for Cities, Counties and the State, 2000-2010). Accessible at: http://www.dof.ca.gov/research/demographic/reports/view.php#objCollapsiblePanelEstimatesAnchor

5 See Appendix B.1.

Emission Sector	2005 Emissions	2010 Emissions	2020 Emissions	2030 Emissions	Growth Proxy
Transportation – Off-road	4,200	4,302	4,718	5,155	Employment growth
Transportation – On-road	74,477	73,896	85,523	96,456	Vehicle miles traveled (VMT)
Agricultural Equipment	4,330	4,134	4,134	4,134	No growth
Wastewater Treatment	377	372	395	415	Average of pop., household, and employment growth
Solid Waste Generation	4,722	2,641	2,799	2,945	Average of pop., household, and employment growth
Landfill	36,934	30,543	20,887	14,215	N/A (Projections used California ARB Landfill Emissions Tool, and EPA's LandGEM software)
Total	**155,480**	**144,625**	**149,108**	**155,759**	

Figure 3-6
2005 Baseline, 2010 Update, and 2020 and 2030 BAU Community Emissions by Sector (MT CO2e)



Municipal Projections

For projecting municipal emissions, it was assumed that wastewater treatment (process emissions) would grow commensurate with community population, household, and employment growth, whereas other municipal departments, facilities, and services would grow in proportion to municipal employment trends. Municipal employment is anticipated to grow at a slightly slower rate than the City population from 2010 to 2020 and 2030, following the same annual rate of growth in municipal employment during the 2000 to 2011 period. Table 3-4 shows historic and projected GHG emissions for municipal sources.

Table 3-5
Municipal Baseline and Projected GHG Emissions 2005-2030 under a BAU Scenario (MT CO2e)

Emission Sector	2005 Emissions	2010 Emissions	2020 Emissions	2030 Emissions	Growth Proxy
Electricity	465	283	303	324	City employee FTE
Natural Gas	129	164	175	187	City employee FTE
City Vehicle Fleet - Fuel	550	549	586	627	City employee FTE
Solid Waste Generation	48	29	31	33	City employee FTE
Stationary Sources	25	24	26	28	City employee FTE
Wastewater Treatment	474	475	503	529	Average of pop., household and employment growth
Employee Commute	277	291	311	333	City employee FTE
Total (without City Landfill)	**1,969**	**1,814**	**1,935**	**2,060**	
City Landfill	36,934	30,543	20,887	14,215	Historical landfill emissions
Total (with City Landfill)	**38,903**	**32,357**	**22,822**	**16,275**	

'Adjusted' Forecast including State Regulations and Programs

State-wide emissions reduction measures will contribute to Ukiah's overall GHG reductions by 2020. Several high-impact state-wide measures included in the AB 32 Scoping Plan target emissions from transportation and power generation.

The Low Carbon Fuel Standard (LCFS) to reduce the carbon intensity of transportation fuels and the Pavley Bill for reducing passenger vehicle emissions (Assembly Bill 1493) are each expected to provide significant emissions reduction benefits for the City of Ukiah, particularly since on-road emissions constitute such a large proportion of total community-wide emissions (57.4% in 2020). By 2020, the impact of both the Pavley Bill and the LCFS in Mendocino County is projected to reduce on-road transportation emissions by approximately 19.3 percent.[6]

In addition, updates to California's Title 24 (Building Energy Efficiency Standards for Residential and Non-residential Buildings) will provide improvements to the energy efficiency of new residential and commercial structures constructed between 2005 and 2020. By 2020, residential energy improvements for electricity and natural gas efficiency are projected to reach 10.0 percent and 22.7 percent above pre-2005 Title standards, respectively, and commercial energy improvements for electricity and natural gas efficiency are projected to reach 9.4 percent and 4.9 percent.[7] These energy savings impact new development in the City of Ukiah

6 EMFAC 2011 Model Run for Mendocino County, accessed February, 2013.
7 Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings Available at: http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF

between the base year (2005) and 2020, with a corresponding annual reductions in electricity-related emissions of 28 MT CO2e, and natural gas-related emissions of 131 MT CO2e, by the year 2020.

The state's Renewable Portfolio Standard (RPS) requires the renewable energy portion of a utility's portfolio to be at least 33 percent by 2020. However, the City-owned Electric Utility that serves Ukiah has a portfolio with eligible renewable sources already accounting for 55 percent, with hydroelectric and nuclear sources providing an additional 21 and 4 percent, respectively. Since the City Electric Utility has already far surpassed the RPS goal, and since PG&E provides less than 1 percent of the City of Ukiah's electricity needs[8], the State-wide RPS will not have a significant effect on Ukiah's emissions in 2020, and is so is not included in the adjusted emissions forecast for Ukiah.

The collective impact of state-wide measures on the City of Ukiah emissions forecast is presented in Table 5. By 2020, these measures are expected to reduce city-wide GHG emissions by an estimated 11.2 percent, resulting in annual emissions of approximately 132,437 MT CO2e.

Table 3-6
Annual GHG Reductions from State-wide Measures by 2020

State Measure	GHG Emissions (MT CO2e/year)
2008 Title 24 –Electricity	28
2008 Title 24 –Natural Gas	131
Pavley Bill and Low Carbon Fuel Standard	16,513
Total Reductions	**16,671**

Emissions Reduction Target

The City of Ukiah is setting its community-wide GHG emissions reduction target at 15 percent below its 2005 baseline by the year 2020, for both community-wide and municipal emissions. A 15 percent reduction target is deemed by CARB and the California Attorney General to be consistent with the state-wide AB 32 goal of reducing emissions to 1990 levels,[9] and is in line with current best practice for climate action plans developed for numerous California cities, many of which use a 2005 baseline.

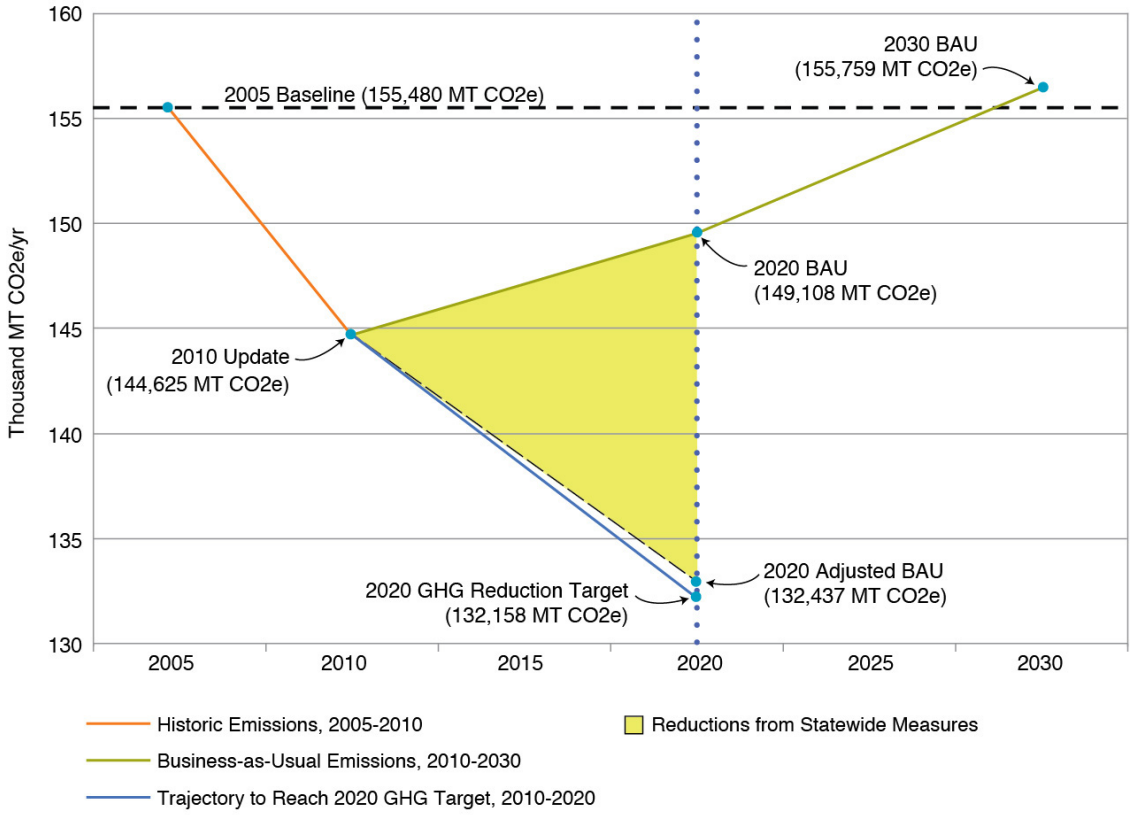
Community Emissions

The City's target of 15 percent below 2005 baseline by 2020 equates to 132,158 MT CO_2e per year for community emissions, which is 23,322 MT CO_2e below the 2005 baseline, 16,950 MT CO_2e below the projected 2020 BAU emissions, and 279 MT CO2e below the adjusted BAU. The community-wide emissions reduction target is depicted graphically in Figure 3-7.

8 Based on data provided by the City of Ukiah Electric Utility Department.

9 In its Climate Change Scoping Plan of September 2008, CARB recommends that local governments adopt a GHG reduction target consistent with the State's commitment to reach 1990 levels by 2020. This is identified as equivalent to 15% below "current" levels at the time of writing (2008).

Figure 3-7
Community-wide GHG Emissions under 2005 Baseline, 2010 Update, 2020 BAU, 2020 Adjusted BAU, and 15% Reduction Target for 2020



Municipal Operations Emissions

Though municipal operations emissions are much lower than emissions from the overall community, a reduction target for municipal operations is appropriate because many of the measures included in this Climate Action Plan apply to facilities or operations under the direct control of the City, and because the City intends to lead by example in meeting the mandates of AB 32. Applying the 15 percent reduction to the 2005 baseline emissions (without landfill) results in a 2020 target of 1,673 MT CO_2e, representing a reduction below business-as-usual of 262 MT CO2e per year in 2020.



4 Greenhouse Gas Reduction Goals and Strategies

Overview

This chapter describes the strategies that the City of Ukiah plans to implement to reduce greenhouse gas (GHG) emissions and work toward the reduction target described in Chapter 3. To be in compliance with AB 32 and CARB guidelines, Ukiah must reduce its community-wide GHG emissions to 15 percent below 2005 levels, or 132,158 MT CO_2e per year; this is equivalent to 16,950 MT CO_2e below the 2020 forecast under business-as-usual (BAU) conditions. The impacts of statewide measures included in the AB 32 Scoping Plan account for annual emissions reductions of 16,671 MT CO_2e, leaving a remainder of 279 MT CO_2e to be reduced by the strategies described herein.

This chapter presents GHG reduction goals and strategies for four different sectors: Energy, Transportation and Land Use, Solid Waste, and Water. Each section begins with a summary of the GHG reductions anticipated from the sector, followed by a general discussion of existing conditions and effective strategies for reducing emissions, and presentations of individual strategies and implementing actions. Detailed calculations used to quantify the costs and emissions reductions associated with individual strategies and actions are included in Appendix C. The City's municipal strategies are included within each relevant sector, where appropriate. In total, locally implemented strategies and measures are expected to reduce GHG emissions by 4,233 MT CO2e annually by the year 2020, thereby far exceeding the reduction target of 279 MT CO2e.

Table 4-1, below summarizes the expected contribution from each emissions reduction sector resulting from implementation of the Climate Action Plan, by the year 2020.

Table 4-1
Estimated Annual GHG Reduction Potential of Climate Action Plan Sectors, by 2020

Reductions from:	MT CO2e	Relative Contribution
Energy strategies	1,692	40%
Transportation and Land Use strategies	944	22%
Solid Waste Minimization strategies	1,597	38%
Water strategies	NA	NA
Total	4,233	100%

Outreach and Stakeholder Engagement

At the City's April 24, 2013 Planning Commission meeting, staff conducted a workshop on the Climate Action Plan and reported the results of the municipal and city-wide GHG emissions inventories. The workshop provided an opportunity for the public to learn about local and statewide GHG reduction goals, and learn about the City's current and projected emissions. At the workshop, the City sought public input about what the City can to do chart a feasible course of action for reducing community-wide emissions and to begin preparing the City for the impacts of climate change. The City gathered public input on issues such as:

- Level of support for specific actions the City can take to reduce the community's GHG emissions and prepare the City for climate change;
- The challenges and barriers to implementing such initiatives in Ukiah; and
- Suggestions for programs or policies that could help overcome the challenges and barriers.

An interactive format allowed workshop attendees to indicate preferences and ask questions about specific strategies. For interested residents and businesses who could not attend the workshop, an online survey about the CAP was made available on the City of Ukiah website. Along with the feedback gathered at the workshop, the City received over 100 responses to its survey. Information learned at the public workshop and from the survey results informed the specific goals, strategies, and actions that are included in this Climate Action Plan. Appendix D provides a copy of the survey, as well as summary of results and input from public engagement.

Nomenclature and Strategy Prioritization

The City of Ukiah has significant policy influence over four main sectors of the City's GHG emissions profile: Energy, Transportation & Land Use, Solid Waste, and Water. For each of these sectors, this chapter provides one or more goals, strategies, and actions:

Goals are general statements of aspiration or intent to achieve a desired condition. There are one or more goals for each of the four sectors, and each goal is labeled according to the sector with which it is associated, as follows: Energy Section (E), Transportation & Land Use (TL), Solid Waste (SW), and Water (W). For example, Goal E-1 is the first goal of the Energy sector.

Strategies are a course of action to be undertaken by the City to meet the goals related to climate change. Each strategy is designated with a code that corresponds to its sector and goal. As an example, Strategy SW-2.1 is the first strategy of the second goal for the Solid Waste Sector.

Actions are detailed steps the City will take to implement the strategies. Each action was carefully considered by the City to ensure that appropriate staff and resources would be available for implementation. Each action is also designated a code that corresponds to the goal and strategy it will implement. For example, Action TL-2.1a is associated with Strategy 2.1, which in turn is associated with Goal TL-2.

The goals, strategies, and actions are organized using the following numeric order:

Sector (E, TL, SW, W)

Goal 1	Goal 2
Strategy 1.1	Strategy 2.1
Action 1.1a	Action 2.1a

Each strategy was evaluated to identify the greatest opportunities for GHG reduction that can be achieved with minimum cost. The City estimated the upfront costs and ongoing staff resources needed for strategy implementation (e.g., low, medium, high), as well as the anticipated energy, GHG, and cost reduction benefits (e.g., minimal or indirect, moderate, high). Strategies in this chapter are broadly prioritized as 1 (high priority), 2 (medium priority), and 3 (low priority), based on the following matrix:

Table 4-2
Prioritization of Community Strategies

		Annual Cost		
		Low	Medium	High
Benefits	High	1	1	2
	Medium	1	2	3
	Low	2	3	3

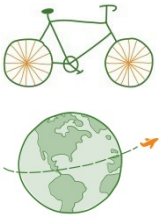
Priority 1 and some Priority 2 strategies were evaluated for estimates of GHG reductions to be achieved by 2020 resulting from implementation. Priority 2 and 3 strategies are generally considered to have low-to-medium GHG benefits, and medium-to-high costs. Some strategies are categorized as 'supporting strategies,' meaning they do not result in direct reductions in energy use but provide beneficial support to other Climate Action Plan strategies. This plan does not include calculations of GHG savings for supporting strategies. Co-benefits, including local economic benefits (e.g., helps create local jobs), public health benefits, energy security, air quality impacts, and quality of life impacts were also considered, and are summarized for each strategy in this chapter.

The analysis considered anticipated costs of implementation, including any upfront capital investment needed to implement the strategy, ongoing annual costs, and City staff time required. Annual costs are broadly categorized as falling within one of three ranges: low (less than $10,000), medium (between $10,000 and $50,000), and high (greater than $50,000). For example, Strategy E.1.1 (Promote Commercial Energy Efficiency), it is estimated that the City will spend, on average, between $10,000 and $50,000 annually through the year 2020 on implementation and monitoring, including staff time. As such, annual cost is characterized as medium. Since Strategy E.1.1 has a relatively high impact in terms of reducing GHG emissions, it is rated as a Priority 1 strategy.



Energy (E)

Energy is an essential part of our daily lives, used for a variety of things including the lighting of buildings and outdoor spaces, heating homes, and powering equipment at homes and businesses. The energy sector, which comprises all electricity and natural gas usage in the City of Ukiah, is a significant contributor to citywide emissions, representing 20.5 percent of the projected 2020 BAU emissions. However, Ukiah has the advantage of operating its own electric power utility, providing many advantages in terms of controlling its energy sources and implementing efficiency programs for local residents and businesses. As a result, Ukiah has been very successful in lowering the GHG footprint of its energy usage to a level that is much lower than found in a typical California city. Energy-related reduction strategies in this chapter target efficiency improvements in the commercial/industrial, residential, and municipal sectors, and the expansion of renewable energy generation. Expanded public outreach to support energy efficiency projects is also important. Energy strategies account for 1,692 MT CO2e in avoided GHG emissions, or 40 percent of local CAP strategies.



Transportation and Land Use (TL)

The transportation and land use sector accounts for emissions associated with the development patterns of the City and the mobility behavior of its residents. Transportation is the largest contributor to forecasted citywide emissions, representing about 63.3 percent of the 2020 BAU emissions. Strategies for emissions reduction include pursuing sustainable growth patterns with mixed use and infill development, as encouraged by Ukiah's recently adopted Downtown Zoning Code, as well as reducing single-occupancy vehicle travel and improving non-motorized mobility. Reducing the number of vehicle miles travelled through promotion of alternative transportation will not only reduce GHG emissions but also improve air quality and public health. Transportation and land use strategies account for a reduction of 944 MT CO2e, or 22 percent local CAP strategies.



Solid Waste (SW)

The transport and disposal of solid waste is expected to account for about 1.9 percent of citywide BAU missions in 2020. Ukiah currently disposes its municipal solid waste (MSW) at the Potrero Hills landfill in Solano County. Disposing of used products, packaging, and waste creates GHG emissions when it is buried in landfills and emits GHG emissions during decomposition. Also contributing to the City's GHG emissions inventory are methane emissions from the City-owned landfill on Vichy Springs Road, which has been closed since 2000. Even though the landfill is capped, the buried organic material at the landfill produces methane (CH4), which is released through a pumping system installed at the landfill. Those emissions represent approximately 14.0 percent of the community's 2020 BAU total emissions. The level of

CH4 emissions at the closed landfill will attenuate over time, in effect providing a built-in reduction mechanism. Strategies for reducing emissions from currently generated waste include increased recycling, reducing landfill methane emissions at the Potrero Hills landfill, and reducing vehicle emissions associated with waste hauling. Strategies for this sector account for a reduction of 1,597 MT CO2e, or 38 percent of local CAP strategies.



Water (W)

The primary sources of water for the City of Ukiah are groundwater, surface water from the underflow of the Russian River, and project water available from the Mendocino County Russian River Flood Control and Water Conservation Improvement District. The energy and GHG emissions associated with the pumping and conveyance of water typically represent a small portion of a city's overall inventory, and this is the case for Ukiah (approximately 0.1 percent of 2020 BAU emissions for water conveyance and 0.3 percent for wastewater treatment). However, strategies to reduce water consumption have important co-benefits to local water supply and they are outlined here to facilitate water conservation goals established by the State and by the City of Ukiah Urban Water Management Plan (UWMP).

Municipal Commitment

As explained in Chapter 3, GHG emissions associated with municipal operations are included within the scope of the community-wide inventory. For example, vehicular use for government operations is a subset of the community-wide vehicle miles traveled (VMT), municipal building energy use is included in the community-wide non-residential electrical and natural gas usage, and solid waste generation at the municipal level is incorporated into the generation rate for Ukiah as a whole.

With respect to reduction strategies, municipal operations are considered in the context of community-wide strategies. Regardless, the City government will take a leadership role by taking specific steps to reduce emissions associated with its operations. For each of the Energy, Transportation / Land Use, Solid Waste, and Water sectors described below, strategies applicable to municipal operations or activities are presented. In most cases, GHG reductions achieved through a community-oriented strategy would also reduce emissions from municipal operations. Nonetheless, the City is committed to directly reducing its own GHG emissions.

Energy

- 2020 Adjusted Business-as-Usual GHG Emissions: 30,412 MT CO2e[1]
- Annual GHG emissions reductions by 2020: 1,692 MT CO2e
- Annual GHG emissions reductions by 2030: 3,381 MT CO2e

Emissions associated with consumption of electricity and natural gas account for approximately 23 percent of the City's 2020 adjusted BAU GHG emissions projection. 45 percent of this is associated with commercial buildings and industrial use, while the remainder is associated with residential buildings. Municipal operations, including the energy used for street lighting and traffic lights, contribute a small fraction (approximately 2 percent) of total energy use.

Energy Providers

The City of Ukiah Electric Utility Department is a City-owned utility governed by the City Council. The Electric Utility Department oversees the procurement of wholesale electric power, maintains and operates the local electric distribution system, provides system engineering and planning for , designs and maintains Ukiah's street lighting system,, and maintains and operates the Lake Mendocino Hydroelectric Plant, with a capacity of 3.5 megawatts (MW) and an annual production of 10,000 megawatt-hours (MWh).

The City of Ukiah is committed to providing environmentally friendly electric power to its City residents and businesses. Ukiah Electric Utility Department's latest annual report to the CEC, for fiscal year 2012, indicates that the utility serves more than 8,200 residences and businesses and provides approximately 115,000 MWh of power annually. Ukiah Electric Utility Department is a member of the Northern California Power Agency (NCPA), from which it receives the majority of its electricity supply. The NCPA is a joint powers association (JPA) where members including Ukiah have elected to participate in power generation projects. Due to Ukiah's participation in NCPA projects and power purchasing strategies, Ukiah's electricity GHG footprint is much lower than most California cities.

As described in Chapter 2, the California Renewable Portfolio Standard (RPS) seeks to reduce the proportion of fossil fuel-based electricity generation, and increase the amount of clean, low-emission renewable energy to the power grid. The RPS program requires investor-owned and publically-owned utilities, electric service providers, and community choice aggregators to increase their use of renewable energy resources by up to 33 percent of procurement by 2020. As of 2010, the City's electric power mix was comprised of approximately 41 percent geothermal, 21 percent large hydro, 12 percent small hydro, 14 percent natural gas, 6 percent coal, 4 percent nuclear, and 1 percent each solar, wind, and biomass[2]. In 2010, 55 percent of the electricity supplied by the Ukiah Electric Utility Department qualified under RPS rules as renewable power. This was up from 46.7 percent in 2005.

Pacific Gas and Electric (PG&E) Company serves as the City's primary natural gas utility, providing natural gas for residential, commercial, industrial, and government customers.

[1] Includes impact of statewide GHG reduction measures
[2] Percentages do not add up to 100 because of rounding.

Existing Energy Programs

The majority of electricity and natural gas-related GHG emissions in the City are related to residential and commercial buildings. Under State Assembly Bill 2021, as a publically-owned utility (POU), Ukiah Electric Utility Department must establish 10-year energy efficiency savings targets and identify all potentially achievable cost-effective efficiency savings. The City recently revised its 10-year energy goals that cover energy conservation, solar energy, low-income assistance, and research and development.

The City of Ukiah's electric utility manages a comprehensive energy efficiency incentive program for residential and commercial customers, focusing on peak load reduction and energy conservation. For residential customers, rebates are offered for the installation of various energy efficiency measures. For commercial customers, rebates are available for upgraded lighting, refrigeration equipment, HVAC equipment, and customized programs for specialized customer equipment and applications that reduce energy use. The City's current residential and commercial efficiency programs are summarized below.

City of Ukiah Residential Programs:

- Energy Efficiency Hotline: The City offers electricity customers a toll free to answer questions and provide information on energy efficiency related matters.
- Home Energy Audits: The City provides on-site energy audits to residential customers. Energy efficiency measures are evaluated and recommended based on each audit. Energy savings and rebate analysis are provided for identified measures.
- Appliance Rebates: The City provides rebates for the purchase of several ENERGY STAR® Qualified appliances.
- Residential Heat Pump and Efficient Air Conditioning Rebates: The City offers rebates for residential and small business customers who install high performance heat pumps or air-conditioners that exceed current state efficiency requirements.
- Residential Lighting Rebates: The City offers rebates to homeowners who install ENERGY STAR Qualified compact florescent lamps (CFLs) and LED lighting.
- Insulation, Windows and Weatherization Rebates: The City offers a wide range of rebates to homeowners who invest in insulation, windows and weatherization upgrades.
- Photovoltaic (PV) Buy-Down Program: This program offsets the investment required to install a PV system. The City utility provides rebates to its residential customers to reduce the initial system cost.

City of Ukiah Commercial and Industrial Programs:

- Energy Audits and Rebates: This program offers complementary, on-site energy audits for both commercial and industrial customers. Energy efficiency recommendations and follow up visits support implementation of recommended energy efficiency measures. Rebates and analysis are available for energy efficiency upgrades identified in these audits.
- Commercial Lighting: This program engages local lighting and electrical contractors to promote and install energy efficient lighting upgrades using technical assistance and financial incentives available from the City.
- Keep Your Cool: This offer provides a free, no obligation check of commercial refrigeration equipment. A third-party Keep Your Cool (KYC) contractor examines the condition of fan motors, controls, case

lighting, door gaskets, strip curtains and door closers. If the contractor finds that the current equipment is in need of replacement or upgrading, recommendations are made to customers to have the appropriate equipment installed. Most measures are installed at no cost to the customer, while other measures may require customer co-pay.

- PV Buy-Down Program: This program offsets the investment required to install a PV system. The City utility provides rebates to its commercial customers to reduce the initial system cost.

Table 4-3 shows the estimated energy savings and GHG emissions reductions achieved through energy efficiency programs since fiscal year 2005.[3] The bulk of the savings have come from efficiency improvements to commercial lighting and refrigeration systems. Over this period, the cost of energy efficiency programs has averaged $0.41 per annual kWh saved.

Table 4-3
City of Ukiah: Impact of Energy Efficiency Programs Since 2005

Fiscal Year	Estimated Annual Savings (kWh)	City rebates & admin cost	Approximate GHG equivalent (MT CO2e)**4**
2005	245,644	$100,100	11
2006	252,824	$103,026	11
2007	2,518	$14,510	0
2008	278,721	$105,440	12
2009	552,727	$148,727	24
2010	281,198	$112,838	12
2011	1,095,800	$593,189	48
2012	802,099	$253,122	35
CUMULATIVE	3,511,531	$1,430,952	154

[3] Derived from the City of Ukiah Electric Utility Department's records and annual summary reports submitted to the CEC since FY2007, which outline the City utility's efficiency programs and their performance results, including energy savings achieved. kWh savings estimates for FY2005 and FY2006 are based on annual city expenditures and the average kWh saved per $ spent on rebates and administrative costs from FY2007 through FY2012.

[4] Estimates based on 2010 emission factor for Ukiah Electric Utility Department.

Table 4-4 shows the estimated installed capacity of solar PV systems resulting from City rebates since 2005, and the equivalent GHG emissions reductions.[5]

Table 4-4
City of Ukiah: Impact of Solar PV Rebates Since 2005

Fiscal Year	Estimated Installed PV Capacity (KW)	Estimated Annual GHG equivalent (MT CO2e)[6]
2005	8.0	1.0
2006	23.5	3.0
2007	15.0	1.9
2008	12.0	1.5
2009	7.0	0.9
2010	0.0	0.0
2011	20.0	2.6
2012	18.4	2.3
CUMULATIVE	103.9	13.3

North Coast Energy Services

North Coast Energy Services (NCES), a non-profit business based in Ukiah, provides low-income weatherization services in Ukiah in addition to other communities. These programs complement what the City offers in terms of energy efficiency programs. The NCES weatherization programs are federally funded through the federal Department of Health and Human Services and the Department of Energy, and administered by the Department of Community Services and Development of the State of California. NCES administers these funds for seven California counties, including Mendocino County. They install CFL's, low flow showerheads, faucet aerators, caulking, weather stripping, attic insulation, underfloor insulation, dual pane window replacements, storm windows, door replacements, heater replacements, and AC or evaporative cooler installations. They also provide duct testing, blower door testing, and safety testing for carbon monoxide.

As shown in Table 4-5, from 2005 through 2012, the NCES weatherization program serviced nearly 1,300 households with Ukiah addresses,[7] accounting for more than $1,650,000 in improvements.

In 2011, NCES administered a special program where PV solar panels were installed on 14 households in Ukiah (average 3KW systems). Installations were performed using third-party contractors.

[5] City of Ukiah Electric Utility Department records.
[6] Estimates based on 2010 emission factor for Ukiah Electric Utility, and assumption of 8 hours PV production per day on average.
[7] Figure includes some households that are located outside the city limits.

Table 4-5
NCES Low-Income Weatherization Program

Year	Households Serviced	Total Value of Jobs
2005	79	$97,321
2006	129	$172,692
2007	104	$163,160
2008	85	$91,519
2009	136	$214,008
2010	304	$302,078
2011	313	$407,975
2012	138	$202,365
TOTAL	1,288	$1,651,117

PG&E Programs

Pacific Gas and Electric (PG&E) provides commercial energy audits for its natural gas customers in Ukiah. PG&E also offers rebates and incentives to its natural gas customers, for efficiency upgrades to hot water heaters, furnaces, boilers, ovens, steamers, and other natural gas consuming equipment.[8] The latest information is available on PG&E's web site.

Mendocino County Energy Watch

In 2008, the Community Development Commission of Mendocino County partnered with Pacific Gas and Electric (PG&E) to create Mendocino County Energy Watch (MCEW), which offers a energy efficiency solutions and education for non-residential PG&E customers in the County. Services offered through the partnership include energy efficiency audits and advice, energy benchmarking, informative seminars, GHG emissions inventorying, ENERGY STAR ® benchmarking services, and access to l PG&E incentives/rebates for small businesses, nonprofits, and local governments.

MCEW provides advice and assistance to non-residential energy consumers for taking advantage of available rebates and incentives. Since Ukiah has its own Electric Utility, MCEW's focus in Ukiah is on natural gas, and they actively engage with Ukiah businesses to provide many free or low-cost services to the community, including free auditing and benchmarking services, and assistance with PG&E's programs for improving the energy efficiency of hot water heaters, furnaces, boilers, and other natural gas consuming equipment.

Green Building

The City of Ukiah has implemented a green building education program. The program promotes the use of green building materials and techniques in construction projects to reduce waste and inefficient resource use, reduce pollution and reduce toxicity in the places we live and work, and reduce GHGs. The program is geared towards all construction projects and includes free information about alternative building materials and products, site design techniques, architecture, energy, and ways to reduce waste in the construction process.

[8] Visit www.pge.com/moneybacksolutions to access the latest rebate information, catalogs, application and guidance

The program offers a link to green building resources, and suggestions on the following issue areas:

- Green building design
- Build it to scale
- Energy efficiency
- Site inventory and assessment
- Reduce/reuse/recycle
- Water conservation
- Multiple functions
- Low Impact Development (LID) (a sustainable storm water management strategy that manages storm water at its source and collects rainwater for secondary use.)

In October of 2012, the City adopted the Downtown Zoning Code. The Code promotes infill and other sustainable development concepts, including infill development, more mixed use and pedestrian-oriented development, the reuse and improvement of existing buildings, green building and resource conservation (such as the enhancement of the creek corridor, tree planting, and tree preservation). The update uses a new a hybrid form-based code, a kind of zoning code that does not differentiate between usage types, but instead by physical forms. Specific development standards that apply to green building, and energy and water demands include:

- Outdoor Lighting, Energy Efficiency: Energy efficient fixtures/lamps, such as high pressure sodium, hard-wired compact fluorescent, LED, or other lighting technology that is of equal or greater energy efficiency.
- General requirements, Model Water Efficiency Landscape Ordinance (MWELO): Landscaping and irrigation plans for development projects shall comply with the State of California Model Water Efficiency Landscape Ordinance. Landscaping and irrigation plans submitted as part of the development permit application shall demonstrate compliance with the most recently adopted version of the MWELO unless superseded by City ordinance.
- Irrigation, Design: To reduce water usage.
- Roofs, Roof Slope: Shall be designed to accommodate PV.

In addition, the Code contains the following sections on design criteria (Section 12.030, B):

- Landscape elements that integrate opportunities for outdoor use areas and adequate shading of pavement and windows.
- Articulation in rooflines and the type and pitch of roofs and/or mechanical screening and overhangs for proper shading and solar access to windows.
- Location, size, and spacing of windows, doors, and other openings and orientation for passive solar heating and cooling and provision of awnings, enclosures, and overhangs for entryways.
- Location and orientation of windows, doorways, and outdoor use areas and the potential for heat, glare, odors, noise, or other disturbances from on or off-site sources (i.e., direct sun from west exposures, outdoor lighting, food services areas, recycling and refuse areas, mechanical equipment, roadways, railroads, aircraft overflight, etc.).
- Functional awnings to promote passive solar.

Energy Goals and Strategies

Following California's clean energy policy, which prioritizes energy efficiency in the state's quest to meet energy demand[9], this CAP seeks first to reduce energy demand and maximize energy efficiency, and then to expand new sources of renewable electricity to meet a portion of the remaining demand. Table 4-6 summarizes the Climate Action Plan's energy goals and strategies, along with their estimated GHG reduction impact. Specific energy goals, strategies, and actions are described in the sections that follow. Appendix C provides details on the assumptions and methods used to quantify GHG reductions associated with each strategy.

Table 4-6
Summary of GHG Reduction Impacts for Energy Strategies in 2020 and 2030

	Goal/Supporting Strategy	2020 Annual GHG Reduction (MT CO2e)	2020 Percent of Category	2030 Annual GHG Reduction (MT CO2e)
E.1	Decrease Energy Demand Community-Wide			
E.1.1	Promote Commercial Energy Efficiency	646	38%	1,085
E.1.2	Promote Residential Energy Efficiency	567	34%	964
E.1.3	Improve Municipal Energy Efficiency	76	5%	107
E.1.4	Reduce Urban Heat Islands	2	<1%	16
E.1.5	Promote Commercial & Residential Green Building	23	1%	53
	Promote Renewable Energy Generation			
E.2.1	Promote Cost-effective Renewable Energy for Commercial and Industrial Users	247	15%	817
E.2.2	Promote Cost-effective Renewable Energy for Homes	130	8%	337
E.2.3	Expand Municipal Renewable Energy	<1	<1%	1
E3	Increase Outreach, Education and Collaboration			
E.3.1	Increase Local Education and Outreach	Not quantified	--	Not quantified
E.3.2	Establish Regional Renewable Energy Partnerships	Not quantified	--	Not quantified
	TOTAL	1,692	100%	3,381

[9] Energy resource loading order adopted in the state's *2003 Energy Action Plan*, and established by California's principal energy agencies: the California Energy Commission, the California Public Utilities Commission, and the California Consumer Power and Conservation Financing Authority.

Goal E.1 Decrease Energy Demand Community Wide

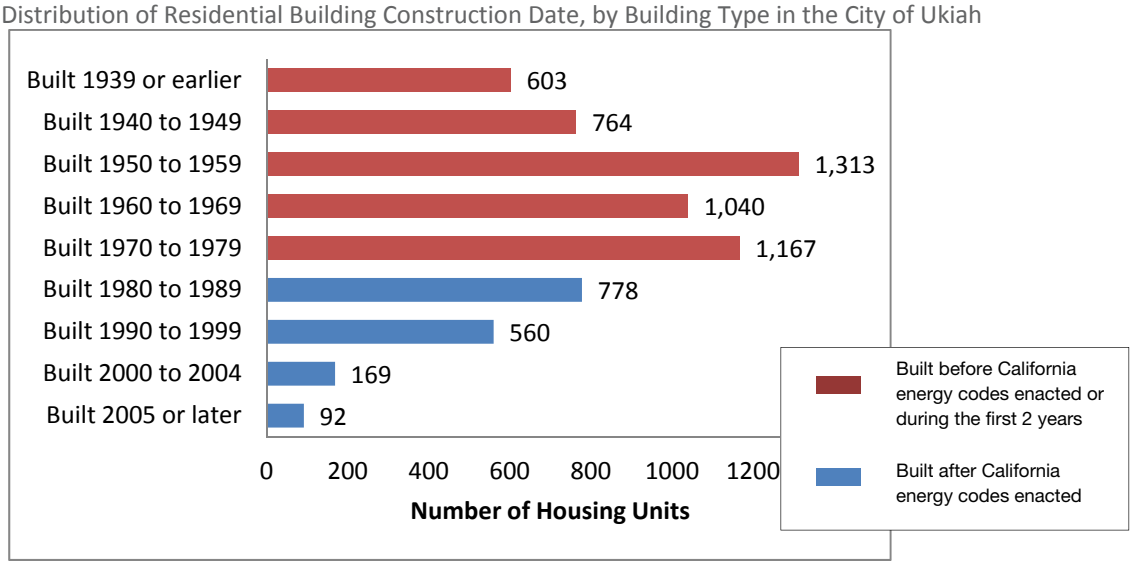
Buildings comprise the largest source of demand for community electricity and natural gas usage. The major factors determining building energy demand are the size and type of building, age of building, and occupancy characteristics. Increasing the energy efficiency of existing homes and buildings can have a significant, ongoing impact on overall energy consumption. Nationwide, single-family detached homes consume twice the energy of multi-unit dwellings, and individuals living in single family homes consume about one and a half times as much as those living in multi-unit dwellings, on average. Typically, the best strategies for reducing energy-related emissions start with conservation (reducing demand) and energy efficiency, followed by assessing the opportunities to add renewable energy generation capacity if cost-effective.

Prior to 1978, there were no energy codes for buildings. Therefore, the greatest opportunities for improving energy efficiency are typically found in the oldest buildings. Starting in 1978, the State of California adopted Title 24, Part 6 of the California Code of Regulations for Energy Efficiency Standards for Residential and Nonresidential buildings. Title 24 code is typically updated every 2 to 4 years. In Ukiah, the majority of buildings were built before Title 24 was enacted, or during the early years of the building energy codes.

Significant reductions in building energy demand can be achieved using construction techniques that increase energy efficiency. Efficiency improvements for buildings can be accomplished by:

- going beyond the state building code (Title 24) for energy efficiency in local construction;
- incentivizing green building practices by streamlining permitting and other City processes;
- leveraging existing utility efficiency incentives and other programs;
- supporting the rollout of smart meter technology;
- improving industrial factory equipment energy efficiency; and
- establishing a shade tree program.

Figure 4-1
Distribution of Residential Building Construction Date, by Building Type in the City of Ukiah



Data Source: American Factfinder of the US Census:
http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_5YR_DP04

Strategy E.1.1: Promote Commercial Energy Efficiency

Promote various federal, State, local and utility programs and other opportunities to improve the energy efficiency of commercial buildings.

Priority:	1
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	646
Estimated Annual Cost to the City in 2020:	Medium (City staff time and promotional materials)
Responsibility:	Planning and Community Development Department; Electric Utility Department
Objective(s):	By 2020: 15% of commercial square footage updated By 2030: 25% of commercial square footage updated
Local Economic Benefits:	Lower energy bills, higher building values, reduced maintenance costs, increased community energy knowledge and training, generates work for local contractors (green jobs)
Other Local Co-benefits:	Lower energy demand, increased indoor comfort in buildings

Action E-1.1a: Promote existing energy audits, rebates, energy efficiency programs offered by City of Ukiah Electric Department to improve energy efficiency in commercial buildings.

Action E-1.1b: Develop a low-cost local education campaign to promote benchmarking and cost-effective commercial energy efficiency improvements.

Action E-1.1c: Outreach to the business community to encourage energy audits and point of sale energy use disclosure, and energy efficiency upgrades; As Staff and resources allow, develop a local "Green Business" program to promote energy efficiency actions.

Commercial building electricity consumption decreased by about 5 percent in the City of Ukiah from 2005 to 2010, while the GHG emissions associated with that electricity usage declined by approximately 26%. This is largely attributed to the City's energy purchasing policies and membership in the NCPA, allowing the City to purchase a portion of its wholesale electricity from renewable sources. PG&E's natural gas usage decreased by approximately 4 percent over the same period, as did the GHG emissions associated with natural gas consumption.

Overall energy consumption and GHG emissions could be further reduced if businesses were more aware of available financial incentives for saving energy. This appears to be particularly true for natural gas supplied by PG&E. Roughly three-quarters of the GHG emissions associated with community energy usage are associated with natural gas combustion. It is evident that the City, with its own electric utility serving the Ukiah community, has been successful in recent years with its commercial electricity efficiency programs.

Under this strategy, the City of Ukiah Electric Utility Department will continue to promote energy efficiency programs and rebates available to commercial and industrial customers, as outlined in a previous section. The City will continue these programs for the foreseeable future, with the aim of increasing commercial participation rates and lowering energy demand. The City will also promote energy benchmarking for City

businesses and expand awareness of the free-of-charge EPA Portfolio Manager benchmarking tool to assess a building's energy performance, water efficiency, and carbon emissions.

Commercial Energy Efficiency Tax Credits

Pursuant to the Energy Policy Act of 2005, businesses may qualify for a federal tax credit on a square-foot basis. Owners or tenant businesses are eligible for the credit if a licensed contractor or engineer verifies lighting power density and/or verifies through energy modeling that the portion of the building being submitted for the tax credit is 25%-50% better than ASHRAE 90.1-2001 standards.



Strategy E.1.2: Promote Residential Energy Efficiency

Promote various federal, State, local and utility programs and other opportunities to improve the energy efficiency of residential buildings.

Priority:	1
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	567
Estimated Annual Cost to the City in 2020:	Medium (City staff time and promotional materials)
Responsibility:	Planning and Community Development Department
Objective(s):	By 2020: 15% of residential square footage updated By 2030: 25% of residential square footage updated
Local Economic Benefits:	Lower energy bills, higher home values, reduced maintenance costs, increased community energy knowledge and training, generates work for local contractors (green jobs)
Other Local Co-benefits:	Lower energy demand, increased indoor comfort in homes

Action E-1.2a: Promote existing energy audits, rebates, energy efficiency programs offered by City of Ukiah Electric and Water Departments to improve energy efficiency in commercial buildings.

Action E-1.2b: Develop a low-cost local education campaign for cost-effective residential energy efficiency improvements.

Action E-1.2c: Outreach to residential property owners to encourage energy audits, benchmarking, and energy efficiency upgrades.

Action E-1.2d: Outreach to local realtors to help communicate the value of energy improvements to prospective home buyers and sellers.

The California Public Utilities Commission (CPUC) has set an ambitious goal to reduce energy use in existing homes by 40% and install low-energy heating and cooling systems in 50% of new and existing homes by 2020.[10]

Residential building electricity consumption increased by more than 12 percent in the City of Ukiah from 2005 to 2010, while the GHG emissions associated with that electricity usage declined by approximately

[10] California Public Utilities Commission, 2008. California Long Term Energy Efficiency Strategic Plan: Achieving Maximum Energy Savings in California for 2009 and Beyond.

12%. This is largely due to the City's wholesale electricity purchase policies of cost effective renewable energy. Natural gas usage increased by almost 1 percent over the same period, as did the GHG emissions associated with natural gas consumption.

Overall energy consumption and GHG emissions could be reduced further if residents were more aware of available financial incentives for saving energy. This appears to be particularly true for natural gas supplied from PG&E. Nearly 90% of the GHG emissions associated with the City's residential energy usage are associated with natural gas combustion. It is evident that the City, with its own electric utility serving the Ukiah community, has been very successful in recent years with its residential electricity efficiency programs.

Ukiah's Electric Utility Department offers substantial rebates and energy efficiency programs that provide cost savings to the City's residential property owners, through up-front rebates and a payback in energy savings over time. These rebates are meant to incentivize actions that reduce energy demand and associated GHG emissions.

The City of Ukiah Electric Utility Department will continue to provide audits, energy efficiency programs and rebates available to residential, commercial and industrial customers of the Ukiah Electric Utility Department. As outlined in a previous section, for several years the City has been operating a comprehensive energy efficiency incentive program for residential customers, including energy audits with efficiency recommendations, appliance rebates, heat pump and efficient air conditioning rebates, lighting rebates, weatherization upgrade rebates, and an Energy Efficiency Hotline to answer customer questions and provide information on energy efficiency related matters. The City will continue these programs for the foreseeable future, with the aim of increasing residential participation rates and lowering energy demand.

North Coast Energy Services (NCES), located in Ukiah, operates programs for low-income weatherization in Ukiah plus seven counties. These programs complement what the City does in terms of energy reductions. In addition to financial bill assistance, NCES programs include dual pane windows, storm windows, microwave ovens, refrigerators, CFL lighting, and insulation.

The City will promote energy benchmarking for City residents, and expand awareness of the free-of-charge EPA Portfolio Manager benchmarking tool to assess a building's energy performance, water efficiency, and carbon emissions. The Community Development Department staff could perform outreach to local residents using flyers, inserts, or postings at public locations and during public events. Outreach to local realtors could help communicate the value of energy improvements to prospective home buyers and sellers. Staff time will be focused on distributing materials, discussing the program with interested parties, and directing interested parties to available resources.

Strategy E.1.3: Improve Municipal Energy Efficiency

The City of Ukiah will take steps to increase the energy efficiency of municipal operations, including City buildings and facilities, setting an example and providing leadership to the overall community.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	76

Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	25% of public use building square footage updated by 2020 and 2030
Local Economic Benefits:	Lower energy bills, higher building values
Other Local Co-benefits:	Lower energy demand, increase indoor comfort in buildings

Action E-1.3a: Perform energy audits of existing municipal buildings;

Action E-1.3b: As funding allows, install more energy efficient street lighting, such as LEDs;

Action E-1.3c: Consider requiring that all new municipal construction achieve 15% above 2013 Title 24 Standards.

Electricity usage by City of Ukiah municipal operations (buildings, facilities, streetlights and traffic lights) decreased by approximately 22% from 2005 to 2010, while the GHG emissions associated with that electricity usage declined by approximately 40%. This is largely due to the City's success in purchasing a larger portion of its wholesale electricity from renewable sources. Natural gas consumption in municipal buildings increased 57% over that same period. Meanwhile, natural gas consumed by the waste water treatment Plant (WWTP) decreased by 13%.

The City of Ukiah will continue to seek out energy efficiency opportunities at its existing buildings and facilities by performing audits and benchmarking energy usage at its largest facilities.

For improving the electrical energy efficiency of its existing buildings, the City will continue to take advantage of the same programs and rebates offered to commercial customers by Ukiah's Electric Utility Department as described in Strategy E.1.1. Where it is feasible and cost-beneficial, the City will install more energy efficient street lighting, such as LEDs, and eliminate extraneous streetlights.

For improving natural gas efficiency in existing buildings, the City will consider participation in PG&E programs applicable to municipal operations, such as the PG&E Commercial HVAC Quality Maintenance Program, and rebates for high efficiency boilers and other equipment.

Strategy E.1.4: Reduce Urban Heat Islands

Strive to cool buildings and pavement in the summer, which decreases energy use and reduces the "heat island effect" within the City.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	2
Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	By 2020: 17 housing units and 2 commercial units participating By 2030: 35 housing units and 5 commercial units participating

Local Economic Benefits:	Lower energy demand, lower energy bills
Other Local Co-benefits:	Aesthetic benefits, improved air quality, more comfortable outdoor environment

Action E-1.4a: Implement the existing Master Tree list; consider establishing and monitoring a voluntary shade tree program. Strongly encourage the protection of mature trees on private property and in the community,

Action E-1.4b: Promote light-colored paving material for roads and parking areas, cool roofs, and shade trees for parking lots and buildings.

Action E-1.4c: Implement City policy and zoning ordinance promoting shading of parking lots using trees; promote installation of parking canopies (preferable with solar PV panels) to shade parking lots.

Action E-1.4d: Consider setting up a fund to subsidize the purchase of shade trees for homeowners. Continue to support the efforts of Releaf and the Ukiah Tree Advisory Group.

The "heat island effect" describes the warming of asphalt, concrete and the built environment to higher temperatures than temperatures in surrounding open space and rural areas. In the summertime, heat islands retain heat and radiate that heat long after the sun goes down, increasing the energy needed to cool buildings later in the evening. Shading with trees or canopies can effectively reduce the heat island effect by keeping streets, parking lots, and individual buildings out of direct sunlight, thus, reducing the need for air conditioning and reducing the GHG emissions associated that that energy demand. Light-colored roofs (cool roofs) and paving materials help to reduce heat absorption and retention. Reducing the heat island effect helps reduce energy demand during the hottest parts of the day when grid energy is typically the most expensive and most carbon-intensive energy supplied by utilities, as they tend to utilize their older and least efficient power plants at such times or import power from states where coal-fired power plants are more prevalent.

The City's existing Downtown Zoning Code (2012, Article 18) requires a minimum of one shade tree for every five parking spaces or trees provided to achieve 50% canopy coverage of paved area at maturity, whatever is greater. This applies to new parking lots in the City. The City is working with its Tree Advisory Group (TAG) as well as Mendocino County ReLeaf - a volunteer organization that promotes community and urban forests – to implement the ordinance, and to provide tree care guidelines, a master tree list, and a landmark tree program. The City of Ukiah will consider establishing and monitoring a voluntary shade tree program, particularly for existing parking lots, encouraging the planting of new shade trees and maintaining and preserving existing trees. Additionally, through its building and site development permit process, public outreach, and/or a revision to City design guidelines, the City will continue to encourage cool roofs and pavements (currently allowed and encouraged in compliance with all applicable Building Code requirements, per Article 18 of the Downtown Zoning Code). This strategy will complement Strategy E.1.5 (Promote Commercial and Residential Green Building) and the Title 24 Building Energy Efficiency Standards (CalGREEN) which includes several voluntary measures that relate to heat island mitigation, including shading, cool pavement, and cool roof technologies.



Strategy E.1.5: Promote Commercial and Residential Green Building

Provide incentives, such as permit streamlining and increased outreach, to expand green building and energy efficient design for new commercial and residential development.

Priority:	2
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	23
Estimated Annual Cost to the City in 2020:	Low to Medium (City staff time)
Responsibility:	Planning and Community Development Department; City Building Division
Objective(s):	10% of new commercial and residential properties achieve CalGreen Tier 1 for energy efficiency (15% improvement over minimum requirement).
Local Economic Benefits:	Lower energy and water demand, lower energy and water bills, reduced maintenance costs, higher building values, increased community energy knowledge and training
Other Local Co-benefits:	Better air quality, increased indoor comfort in buildings

Action E-1.5a: Provide incentives, such as permit streamlining and increased outreach, to expand green building and energy efficient design for new commercial and residential development.

The State of California regulates energy consumption under Title 24 of the California Code of Regulations. Strategy E.1.5 assumes that, pursuant to state and Ukiah local building codes, all residential, commercial and industrial development through 2020 will adhere to minimum Title 24 standards for energy and water efficiency.

The current Title 24 Building Energy Efficiency Standards (CalGREEN), developed by the California Energy Commission (CEC), promote efficiency in new construction by reducing energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and non-residential buildings. The CEC updates Title 24 periodically; Assembly Bill 970, signed September 2000, requires the CEC to update and implement its appliance and building efficiency standards to make the "maximum feasible" reduction in unnecessary energy consumption. The 2010 Standards became effective statewide on January 1, 2011. The 2013 edition of the code, with an increased emphasis on energy efficiency, will become effective Jan 1, 2014.

In addition to meeting minimum CalGREEN standards, developers can implement additional energy efficiency measures to achieve voluntary "Tier 1" CalGREEN standards which exceed minimum energy efficiency requirements by 15 percent. Under strategy E.1.5, the Ukiah Planning and Community Development Department will fast-track permit approval of proposed development projects that meet Tier 1 standards.

The City currently has a green building education program that provides an array of green building information to the public. As part of the City's current design review process, the City promotes green building practices and includes reference to the Leadership in Energy and Environmental Design (LEED) standard in its *Design Guidelines for Commercial Development in the City of Ukiah*. The City will continue these programs, and review the following methods for encouraging implementation of the green building practices:

- Reduced fees or fee waivers for "green" permit applications;
- Priority permit processing; or
- Amending the municipal code to further encourage green developments, such as implementing a "Green Pathway" process under which certain projects that require discretionary review (e.g., a use

permit) are approved "as of right" if they meet specific green building requirements. These types of projects may also be streamlined with respect to CEQA review (see Chapter 5, "CEQA Project Review").

The City Building Division will continue to promote and/or provide relevant information to developers on the energy and resource efficiency benefits of exceeding CalGREEN standards. Information on the permit streamlining benefits of exceeding CalGREEN standards will be provided at the City's Building Permit desk, on the City's web site, and through the permit application process itself. The City Council will also promote community green building leaders and projects that exceed CalGreen standards by recognizing them at Council meetings and through print and web media.

Municipal Commitment

Although there are no current plans for new construction of municipal facilities, the City of Ukiah understands that it should lead by example by promoting energy-efficient design and construction. Therefore, the City will consider going beyond CalGREEN standards for any new construction (or major remodeling) of municipal buildings through the year 2030. Options include designing and building to LEED standards, and meeting Tier 1 of the enhanced CalGREEN standard.

Goal E.2  Increase On-site Renewable Energy

Renewable energy is energy from natural sources such as sunlight, wind, geothermal heat, and biomass. The use of renewable energy sources, instead of fossil fuels, substantially reduces GHG emissions. The City of Ukiah has opportunities to supplement or offset grid-supplied electricity with renewable energy that is generated in close proximity to the load being served. Non-grid renewable electricity generation can be implemented at the building scale (i.e., rooftop solar) or at the municipal and/or regional scale, through cooperation among businesses, jurisdictions, and other organizations.

Solar Energy

Solar energy is a source of renewable energy for the residents and businesses of Ukiah, as well as the local government. According to the National Renewable Energy Laboratory (NREL), more energy from the sun falls on the earth in one hour than is used by everyone on the planet in one year. Although solar PV systems will never be 100% efficient in capturing the sun's energy, technological improvements in this area are ongoing; meanwhile, there are a variety of other available approaches and technologies that can efficiently convert sunlight to usable energy for buildings. The most commonly used solar technologies for homes and businesses, other than solar PV, include solar water heating and passive solar design for space heating and cooling. Solar PV and concentrating solar power technologies are also being used by developers and utilities to produce electricity on a massive scale to power cities and small towns.[11]

One key benefit of solar energy is that its peak resource availability corresponds to peak system loads for conventional electricity (i.e., when demand for cooling and air conditioning is highest). Therefore, solar energy systems have the potential to offset electricity usage when it is the most expensive – and typically the most carbon-intensive – as older, less efficient power plants are brought online to meet peak loads.

[11] National Renewable Energy Laboratory (NREL), Solar Energy Basics, available online: http://www.nrel.gov/learning/re_solar.html, accessed April 9, 2013.

Wind Energy

NREL indicates that the average wind energy potential for the City of Ukiah is not considered suitable for cost-effective wind energy development. Areas with annual average wind speeds around 6.5 meters per second and greater at an 80-m height are generally considered to have a resource suitable for wind development. NREL's wind resource map shows that the City of Ukiah is located in an area with wind speeds between 4.0 and 5.0 meters per second.[12] Therefore, wind energy is not considered further as a viable source of renewable energy in Ukiah.



Strategy E.2.1: Promote Cost-effective Renewable Energy for Commercial and Industrial Users

Increase the installation rate of commercial and industrial solar water heating and/or roof-top photovoltaic (PV) systems.

Priority:	1
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	247
Estimated Annual Cost to the City in 2020:	Medium (City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	By 2020: 15% participation By 2030: 30% participation
Local Economic Benefits:	Create jobs, increased real estate values
Other Local Co-benefits:	Increased energy independence

Action E-2.1a: Continue the City Utility's PV Buy-Down Program (rebates for PV systems) for commercial and industrial customers.

Action E-2.1b: Support streamlined permit procedures and/or establish minimum PV installation requirements for new commercial facilities of a certain size (e.g., for facilities larger than 3,000 square feet).

On-site renewable energy systems can substantially reduce GHG emissions associated with energy usage. Generally, renewable energy systems should be installed only after implementing all cost-effective efficiency measures. The best options for Ukiah businesses are solar hot water heating and roof-top PV systems.

The largest barriers to expanding on-site renewable energy are access to information, high up-front financing costs, and long cost-recovery periods. Under this strategy, the City of Ukiah Electric Utility will continue its PV Buy-Down Program, which helps offset the investment in a PV system with customer rebates to reduce the initial system cost. The rebate program is funded through 2017.

The City will continue to disseminate renewable energy information to developers and promote existing financial incentives (local and state) for solar PV and hot water system installation. The City will also consider expediting permits associated with the installation of renewable energy facilities.

[12] NREL, California – Annual Wind Speed at 80 Meters, available online, http://www.windpoweringamerica.gov/wind_resource_maps.asp?stateab=ca, accessed June 26, 2013.

Strategy E.2.2: Promote Cost-effective Small-scale Renewable Energy for Homes

Increase the installation rate of residential solar water heating and/or roof-top photovoltaic (PV) systems.

Priority:	1
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	130
Estimated Annual Cost to the City in 2020:	Medium (City staff time)
Responsibility:	Planning and Community Development Department, Building Division, Electric Utility Department
Objective(s):	By 2020: 675 new solar PV systems (10% of homes) By 2030: 1,747 new solar PV systems (25% of homes)
Local Economic Benefits:	Create jobs, increased home values
Other Local Co-benefits:	Increased energy independence

Action E-2.2a: Continue the City Utility's PV Buy-Down Program (rebates for PV systems) for residential customers.

Action E-2.2b: Require pre-wiring for solar systems in new building development.

Action E-2.2c: Streamline permit processes, and promote existing financial incentives for renewable systems.

Action E-2.2d: Provide public education about various options (including power purchasing agreements - PPAs),

On-site renewable energy systems can substantially reduce GHG emissions associated with energy usage. Generally, renewable energy systems should be installed only after implementing all cost-effective efficiency measures. The best options for Ukiah residences are solar hot water heating and roof-top PV systems.

The largest barriers to expanding on-site renewable energy are access to information, high up-front financing costs, and long cost-recovery periods. Under this strategy, the City of Ukiah Electric Utility will continue its PV Buy-Down Program, which helps offset the investment in a PV system with customer rebates to reduce the initial system cost. The rebate program is funded through 2017.

The City will continue to disseminate renewable energy information to residential developers and homeowners and promote existing financial incentives (local and state) for solar PV and hot water system installation. The City will also consider expediting permits associated with the installation of renewable energy facilities.

Additional Incentive for Developers

The CEC's New Solar Homes Partnership (NSHP) is part of the comprehensive statewide solar program, known as the California Solar Initiative. The NSHP provides financial incentives and other support to home builders, encouraging the construction of new, energy efficient solar homes that save homeowners money on their electric bills and protect the environment. Under this strategy, Ukiah would promote this program to developers seeking permits or other approvals from the City.

Strategy E.2.3: Expand Municipal Renewable Energy

Increase on-site renewable energy generation (e.g. solar PV) at City facilities.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	<1
Estimated Annual Cost to the City in 2020:	Medium to high (Upfront capital for PV system, City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	By 2020: 4 kW solar PV installation By 2030: 12 kW solar PV installation
Local Economic Benefits:	Lower energy bills, create jobs, increased real estate values
Other Local Co-benefits:	Increased energy independence

Action E-2.3a: Evaluate existing installed renewable energy capacity and set future installed goal.

On-site renewable energy systems can substantially reduce GHG emissions associated with energy usage. Generally, renewable energy systems should be installed only after implementing all cost-effective efficiency measures. The best options for Ukiah's municipal buildings are solar hot water heating and roof-top PV systems.

The City currently has solar PV panels installed on the roof of the City Hall Annex. After implementing all feasible energy efficiency programs, the City will consider renewable energy as a viable option to reduce escalating energy costs and increase local generation of energy. As funding and financial incentives allow, the City will evaluate opportunities for additional solar PV and solar hot water installations on City property or infrastructure. The City owns and operates a number of facilities that have available roof space for solar PV systems, as well as parking facilities with the potential for canopy structures. Installations on surface lots provide additional shaded parking areas for City employees and visitors, and increase PV visibility. On a larger scale, solar canopies can reduce a site's contribution to the local "urban heat island" effect, where heat is retained by paved surfaces.

The City will evaluate its capacity for solar PV installations and establish a target (either percentage of total municipal energy used or a number of kW to be installed) for renewable energy generation. Renewable energy projects will be pursued as funding becomes available.

Goal E.3 Increase Outreach, Education and Collaboration

In general, outreach and education is needed to support the other energy goals, strategies and actions in the Climate Action Plan. The overarching goal is to promote personal responsibility for residents and businesses to reduce their carbon footprints, and to raise awareness of existing programs, funding

opportunities, and City and community efforts to reduce GHG emissions. Community engagement and education fosters public involvement, information exchange, and transparency into sustainability initiatives that support the Climate Action Plan. It is difficult to account for the emissions reduction impact of these efforts, but such measures are critical to gaining public support and the participation essential to program success, by seeking to influence personal behavior to become more carbon friendly.

As described earlier in this chapter, the City Electric Utility currently provides outreach and education to its residential, commercial and industrial customers, to raise awareness of its energy efficiency and renewable energy programs. Several organizations in the Ukiah area complement this effort, including NCES, the non-profit that provides low-income weatherization services in Ukiah.

Strategy E.3.1: Increase Local Education and Outreach



Increase local knowledge and training opportunities related to energy efficiency and renewable energy.

Priority:	1
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified – supporting measure
Estimated Annual Cost to the City in 2020:	Low to medium (some City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	None identified
Local Economic Benefits:	Promote education and develop green jobs in the City
Other Local Co-benefits:	Efficient implementation of the Climate Action Plan

Action E-3.1a: Promote existing residential and nonresidential energy efficiency programs, and rebates for solar PV; consider establishing a Committee on Energy and the Environment to assist in promotion activities and/or develop and operate a local public education and/or a direct financing program.

Action E-3.1b: Increase City staff knowledge and training opportunities related to energy efficiency and renewable energy, and dedicate staff time to outreach and education regarding existing programs and financing mechanisms.

Action E-3.1c: Collaborate with local groups and interested organizations to facilitate community outreach and education.

Action E-3.1d: Develop a low-cost local education campaign to promote nonresidential energy efficiency improvements, and conduct at least two events per year to educate the community about energy efficiency options.

This strategy includes a voluntary, education-based approach in which the City would increase outreach/education to residential, commercial and industrial building owners to raise awareness of utility energy efficiency programs, The City will promote and market selected programs to specific sectors of the community, utilizing existing channels of communication. For example, the City could provide information in existing newsletters, or at regular Chamber of Commerce meetings, and could also work with the local school district. Groups that could be useful partners include the Solar Living Institute in Hopland, REDI in Willits, and the Community Development Commission in Ukiah.

Strategy E.3.2: Expand Regional Renewable Energy Partnerships

Continue membership in the NCPA and explore strategies for partnering with nearby jurisdictions for low-cost renewable energy development through economies-of-scale.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified – supporting measure
Estimated Annual Cost to the City in 2020:	Low (some City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	None identified
Local Economic Benefits:	Promote education and develop green jobs in the City and region, support businesses in the local economy
Other Local Co-benefits:	Energy reductions

Action E-3.2a: Promote existing residential and nonresidential energy efficiency programs and rebates for solar PV; consider establishing a Committee on Energy and the Environment to assist in promotion activities and/or develop and operate a local public education.

Action E-3.2b: Work with the County and other cities in the region, Mendocino College, and other organizations, to explore strategies for developing renewable energy resources and to develop a valley-wide clean/green industry and jobs development strategy.

Regional initiatives to promote shared renewable energy can help drive down start-up costs for individuals or smaller organizations by providing economies of scale, and provide community and regional control of energy resources. The City of Ukiah will continue its membership in the NCPA, which has a longstanding commitment to the generation of electricity from environmentally-responsible sources, and which supports federal, regional, and statewide efforts to reduce GHG emissions and combat global climate change.

The City will also be open to partnering with neighboring cities, Mendocino County, Mendocino College, the Employers Council of Mendocino County, the Chamber of Commerce, and green industry/business leaders to develop a valley-wide clean/green industry and jobs development strategy, and to explore strategies for developing renewable energy resources (including grant monies) that can benefit Ukiah's citizens as well as the wider region as a whole.





Transportation and Land Use

- 2020 Adjusted Business-as-Usual GHG Emissions: 77,863 MT CO2e[13]
- Annual GHG emissions reductions by 2020: 944 MT CO2e

GHG emissions associated with transportation and land use patterns represent approximately 59 percent of the City's adjusted BAU emissions forecast for 2020. The bulk of these emissions are expected to be generated by vehicles travelling on state highways and City streets. The remainder will be generated by vehicles engaged in off-road activities, like construction, agricultural production, and recreation.

As of 2009/10, Ukiah encompassed approximately 1,935 businesses[14] (excluding home occupations) which together employed about 11,237 full- and part-time workers.[15] Ukiah consists of 6,497 households with a total of 16,113 residents.[16]

Reducing Emissions with Transportation and Land Use

The job-housing ratio was approximately 1.71 in 2009/10, and jobs are expected to grow faster than new residents over the next 20 years. As such, the vehicle miles travelled (VMT) per capita will increase, as workers from residential locations outside the City boundaries commute in for employment opportunities.[17] The average work-commute for a resident of Ukiah is approximately 14.5 minutes, nearly half that of the average California resident.[18] Driving alone to work represents 86.6 percent of the transportation mode split.[19] As employees are forced to live further from jobs, commute times and VMT will increase if the primary mode of travel continues to be the single-occupancy vehicle. In the absence of GHG reduction strategies, annual VMT in 2020 is expected to increase by 10 percent over 2010 levels, from 399,199 to 439,657.

Existing development patterns and the supporting transportation infrastructure are major factors in the transportation habits of residents because they limit mobility choices, fostering an auto-dependant culture that relies less on walking, biking, and public transit and more on personal daily motor vehicle trips. Further, public transit service is somewhat limited in the City, reducing its efficiency and appeal as a viable alternative to driving. In addition, the lack of an extensive and well-connected pedestrian and bicycle system and associated amenities can be a disincentive to choosing non-motorized mobility alternatives.

State regulations will require higher fuel efficiency and lower carbon fuels over the next few years. However, state regulations alone will not achieve the transportation emissions needed over the long term (i.e., post 2020). Effective local strategies for reducing emissions associated with transportation and land use focus on reducing the total VMT and number of vehicle trips required for City residents and

13 Includes impact of statewide GHG reduction measures
14 U.S. Census Bureau, 2002 and 2007 Economic Census, Available Online: http://quickfacts.census.gov/qfd/states/06/0681134.html, accessed June 14, 2013.
15 Fehr and Peers, 2012. City of Ukiah- Vehicle Miles of Travel (VMT) Inventory. Tellez, K. et al. Memorandum. November 19, 2012.
16 ibid.
17 ibid.
18 U.S. Census Bureau, 2002 and 2007 Economic Census, Available Online: http://quickfacts.census.gov/qfd/states/06/0681134.html, accessed June 14, 2013.
19 ibid.

businesses, and on proliferation of more zero- and low-emission vehicles. VMT can be reduced and traffic congestion relieved by gradually changing land use patterns to be more sustainable, improving pedestrian and bicycle infrastructure, and improving public transit options. Alternative vehicle infrastructure can be improved by partnering with regional agencies.

As explained in Chapter 3 and earlier in this chapter, the City is expected to meet its overall 2020 GHG reduction target relatively easily, without requiring a significant contribution from the transportation and land use sector. However, the challenge will be much greater to achieve the deep GHG emissions reductions needed to help meet the state's longer term goals (e.g., 80% reduction below 1990 levels by the year 2050). Such reductions will require new technologies and additional policies and actions at the federal and state levels, but they will also require profound changes in local development patterns and mobility, many of which we can only begin to envision. As the state continues to develop its longer term policies and strategies for reducing emissions, the City of Ukiah will begin its longer-term visioning on how future growth can be accommodated while still reducing GHG emissions. Over the next several years the City will be embarking on its General Plan Update, providing an excellent opportunity to develop this vision. Chapter 5 provides additional thoughts on how the City will continue to look for long-range opportunities to reduce GHG emissions associated with land use and transportation.

Existing City Policies and Codes

The City's General Plan *Transportation Technical Report* describes several recommended program options for reducing trips that could be considered in Ukiah. Reducing vehicle trips have a direct effect on GHG reduction. The actions presented in the technical report are reflected in Strategy TL 1.1 below.

Further, in October of 2012, the City adopted an update to Article 18: Downtown Zoning Code. The update promotes infill and other sustainable development concepts (e.g. more mixed use and pedestrian-oriented streets, buildings and landscapes), and states as part of its purpose:

"To promote and encourage a sustainable community through the reuse and improvement of existing buildings, infill development, green building and smart growth practices, and resource conservation (such as the enhancement of the creek corridor, tree planting, and tree preservation)."

The update uses a form-based code, a kind of zoning code that differentiates by both use and physical form. This type of zoning addresses the physical layout; proximity and accessibility to goods, services, workplaces, and schools; and the materials and designs used in building and infrastructure—directly affecting energy consumption and vehicle use, and thus GHG emissions.

Transportation and Land Use Goals and Strategies

Specific approaches considered for the City of Ukiah include:

- Create a built environment that allows people to have more transportation choices, including walking, bicycling, or taking public transit, rather than relying solely on single occupancy vehicles (SOVs);
- Encourage higher density, mixed-use development near local-serving commercial areas;
- Encourage the use of lower-emission vehicles, and expand the infrastructure and safety for people to walk or bike;

- Expand alternatives for commuting and local travel, and provide secure bike parking and related amenities for all new development; and
- Continue applying parking reduction policies in the downtown core of the City.

Table 4-7 summarizes the Climate Action Plan's transportation and land use strategies and their estimated GHG reduction impact. Specific goals, strategies, and actions are described in the sections that follow. Appendix C provides details on the assumptions and methods used to quantify GHG reductions associated with each strategy.

Table 4-7
Summary of GHG Reduction Impacts for Transportation and Land Use Strategies in 2020 and 2030

	Goal/Supporting Strategy	2020 Annual GHG Reduction Potential (MT CO2e)	2020 Percent of Category	2030 Annual GHG Reduction (MT CO2e)
TL.1	Reduce Single-Occupancy Vehicle Travel			
TL.1.1	Local Commute Trip Reduction	88	9%	90
TL.1.2	Sustainable Growth Patterns	616	65%	857
TL.1.3	Regional Transportation Management	NA	NA	NA
TL.1.4	Expand/Improve Public Transit	NA	NA	NA
TL.2	Increase Non-Motorized Travel			
TL.2.1	Improve Bicycle and Pedestrian Infrastructure	22	2%	37
TL.2.2	Establish Safe Routes to Schools	173	18%	375
TL.3	Increase Motor Vehicle Efficiency			
TL.3.1	Improve Fuel Efficiency for Municipal Fleet	45	5%	131
	TOTAL	944	100%	1,490

Goal TL.1 Reduce Single-Occupancy Vehicle Travel

In California, approximately 38 percent of all GHG emissions are attributable to transportation, with approximately 92 percent of that coming from on-road vehicles.[20] Light duty passenger vehicles accounted for approximately 74 percent of on-road vehicle emissions in 2009.[21] According to the California Department of Transportation (Caltrans), California can expect a 61 percent increase in the number of light duty passenger vehicle miles traveled (VMT) from 2007 to 2030.[22] One of the biggest contributors to that increase will be commuter trips; commute trips represent the largest contributor to VMTs at the local level.

To reduce commute trips, we must reduce reliance on the single-occupancy vehicle as the primary mode of transportation. Transportation demand management (TDM) strategies are effective at reducing GHG emissions in the transportation sector. TDM strategies include providing telecommuting options, alternative

20 California Environmental Protection Agency Air Resources Board, *California Greenhouse Gas Emission Inventory*, December, 2011.
21 Ibid.
22 California Department of Transportation, *2008 California Motor Vehicle Stock, Travel, and Fuel Forecast*, June 2009.

work and school schedules, on-site amenities, car and vanpooling programs, and parking reduction strategies – in general, anything that entices or encourages people to choose alternatives to traveling alone in vehicles.

Ukiah currently has an abundance of employment opportunities for area residents, resulting in an inflow of employees from neighboring communities to jobs located in Ukiah. The City is also a regional hub of retail services attracting residents from neighboring communities to travel to Ukiah to shop. In order to promote sustainable growth patterns in the future, the Ukiah General Plan encourages the development of a diversity of housing types, to achieve a better jobs-housing balance. When housing and transportation choices are located near jobs and services, the need to travel in single occupancy vehicles goes down. Mixed use, higher-density, and infill development facilitates fewer and shorter car trips by providing more diverse land uses within close proximity of a larger population. These fewer and shorter car trips will reduce total VMT, and associated GHG emissions. According to a study from the National Academy of Sciences (NAS), a private nonprofit chartered by Congress,[23] more compact mixed-use development of residential and employment centers can result in overall GHG reductions of up to 25 percent. The report suggests that such reductions can be accomplished with:

- Smaller lots for detached houses which shorten vehicle trip distances in low-density urban fringes;
- Smaller lots and multiple-unit housing which support public transportation and encourage walking and bicycling in moderate density suburbs; and
- Redevelopment of strategically located underused parcels within proximity of existing services and amenities.



Strategy TL.1.1: Local Commute Trip Reduction

Support local employer-based trip reduction programs to reduce single-occupancy vehicle travel to and from Ukiah.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	88
Estimated Annual Cost to the City in 2020:	Low (some City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	By 2020: 0.5% reduction in VMT By 2030: up to 1.2% reduction in VMT
Local Economic Benefits:	Reduced roadway maintenance, lower fuel costs
Other Local Co-benefits:	Better local air quality, lower fuel demand, less road congestion

Action TL-1.1a: Consider implementing local commute trip reduction requirements in the municipal code. This could require larger employers (50+ employees) to establish TDM programs to

[23] Transportation Research Board, 2009, Special Report 298, "Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use and CO2 Emissions," examines trends in national and metropolitan-area development patterns, effects of land-use patterns on VMT, and the potential effects of more compact development on VMT, energy use, and CO2 emissions.

reduce single-occupancy vehicle trips, which may include 9/80 work weeks, carpooling, telecommuting, car sharing, bike sharing, shuttles, vanpooling, guaranteed rides home, etc.

Action TL-1.1b: Consider a coordinated TDM program covering large employers and concentrations of smaller employers (e.g., shopping malls) to share costs and also travel pool (e.g. vanpooling, carpooling and/or shuttles for the Medical Center and other key employers).

Action TL-1.1c: As staff and resources allow, develop a City Program (with incentives) to encourage private sector employers to implement effective voluntary trip reduction programs.

Action TL-1.1d: Promote telecommuting and alternative work schedules for City employees.

The City of Ukiah will encourage a compressed work week for local employers and City staff. This encouragement could take the form of public information inserts in the local utility bill, e-mail distribution, and/or through Chamber of Commerce presentations and coordination.

Employers would be encouraged to implement a compressed work week, involving at least one of the following:

- Forty hours spread among four workdays days in one week (4/40)
- Eighty hours spread among nine workdays in two weeks (9/80)
- Telecommuting 1.5 days per week

The City will also encourage employers of more than 50 employees, and commercial zones where there are many smaller employers (e.g., shopping malls), to implement TDM measures to support the use of alternatives to single occupancy vehicles during peak hours by employees and others. TDM strategies for employers could include transportation coordinators; on-site transit information and/or pass sales; rideshare matching services; preferential parking for carpools or vanpools; provision of bike lockers, showers, and/or changing facilities; and guaranteed ride home.[24]

Strategy TL.1.2: Promote Sustainable Growth Patterns

Increase neighborhood density (including infilling), mixed-use developments, and increase community pedestrian-friendly design.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	616
Estimated Annual Cost to the City in 2020:	Medium (City staff time and infrastructure costs)
Responsibility:	Planning and Community Development Department
Objective(s):	2020: 1.2% reduction in VMT 2030: up to % reduction in VMT
Local Economic Benefits:	Lower fuel bills
Other Local Co-benefits:	Better local air quality, a more connected community

[24] TRP Report 95 Chapter 19: *Employer and Institutional TDM Strategies -- Traveler Response to Transportation System* Changes, Transportation Research Board, 2010.

Action TL-1.2a: Consider adopting a Complete Streets Ordinance that directs the City to meet the needs of all of its transportation users.

Action TL-1.2b: Continue to consider modifications to the municipal code to achieve smart growth objectives (i.e., increase density and mixed-use infill development).

Action TL-1.2c: Implement SmartCode or form-based code to increase mixed use and pedestrian connectivity in urban core near transit.

Action TL-1.2d: Promote and encourage downtown revitalization and the vitality of small local businesses in the downtown core area.

Action TL-1.2e: Encourage smart growth development by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking.

Action TL-1.2f: Implement traffic calming measures within the downtown core, such as curb extensions (bulb-outs) and rumble strips.

Action TL-1.2g: Promote and encourage clean energy and green jobs/industries ~~with~~ within the City and in its Sphere of Influence.

Action TL-1.2h: Develop a plan for creating urban open spaces and natural resources enhancement to complement the compact infill development and mixed use growth strategy.

The City will continue to encourage and support higher density, infill, and mixed-use development through implementation of the City's Zoning Code. Residential densities in the City of Ukiah are among the highest in Mendocino County. Ukiah's Zoning Code includes a High Density Residential (R-3) zone and a Community Commercial (C1) zone that both allow up to 28 dwelling units per acre. The Downtown Zoning Code allows 28 units per acre as part of mixed-use developments, and has a minimum density requirement as well.

Local-serving commercial areas are typically supported by commercial anchors, as well as by their proximity to adjacent residential or employment areas. Increasing residential uses in close proximity to those commercial areas would allow for residents to walk to these services, thereby reducing VMT and associated GHG emissions. The increase in residential uses would be accomplished through introduction of residential uses in currently exclusively commercial areas such as in the downtown area, or through increasing residential densities in these areas.

In addition, the City will focus future development within the City limits and its Sphere of Influence (SOI) to prevent urban sprawl and leapfrog development. The SOI consists of areas closest to the existing City limits and targeted for development before other parts of the SOI. Areas within the SOI are contiguous with existing urban uses where urban services are already available, which allow for the well-planned expansion of services. The historic growth pattern – north to south – is expect to continue through 2035, as the City is constrained by prime agricultural land and floodplain on the east and by the hillsides on the west.

Strategy TL.1.3: Regional Transportation Management



Support regional transportation management programs to shift single-occupancy vehicle trips to other modes.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified (Supporting strategy)
Estimated Annual Cost to the City in 2020:	Low (some City staff time)

Responsibility:	Planning and Community Development Department
Objective(s):	None identified
Local Economic Benefits:	Lower fuel bills
Other Local Co-benefits:	Improved air quality, less traffic congestion, lower commute times

Action TL-1.3a: Coordinate with Mendocino County and cities within the County to encourage alternatives to SOV travel.

The City of Ukiah will support regional transportation management programs to shift single-occupancy vehicle trips to other modes. The City will coordinate with the Mendocino Council of Governments (MCOG), Mendocino County and neighboring cities within the County to encourage alternatives to single-occupancy vehicles.



Strategy TL.1.4: Public Transit Expansion

Expand public transit options for the Ukiah community.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified (Supporting strategy)
Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	None identified
Local Economic Benefits:	Improved public health, lower fuel bills
Other Local Co-benefits:	Improved air quality, less traffic congestion, better mobility for some segments of the population

Action TL-1.4a: Coordinate with Mendocino Transit Authority (and/or other transit agencies) to increase transit system ridership with incentives, safety and technology improvements, improved bus stop amenities, partnerships, and investments (e.g., coordinate to increase bus frequency and the number of pick-up locations in Ukiah).

Action TL-1.4b: Promote existing and/or additional "Reduced Fares" for residents (i.e., school children, elderly).

Action TL-1.4c: Encourage residents to use the existing Dial-A-Ride transit.

According to the 2000 United States Census, only 0.8 percent of all residents over the age of 16 reported that they ride public transit to get to work; in Ukiah it is less than half a percent.[25] According to the California Air Pollution Control Officers Association (CAPCOA), typical suburban developments close to major cities have only a 1.3 percent public mode share.[26]

The City's public transit ridership is limited by the City's small size, rural surroundings, distance from major cities, and relatively low population and development density. Mendocino Transit Authority (MTA)'s regional bus service area encompasses roughly 2,800 square miles including the Mendocino coast and inland

[25] U.S. Census Bureau, 2002 and 2007 Economic Census, Available Online: http://quickfacts.census.gov/qfd/states/06/0681134.html, accessed June 14, 2013.

[26] California Air Pollution Control Officers Association (CAPCOA), *Quantifying Greenhouse Gas Mitigation Measures*, Transit System Improvements Measures, p 281, 2010.

communities. The transit system includes a network of long distance, commute and local fixed routes, plus Dial-A-Ride services in Ukiah and Fort Bragg.

- According to the 2006 Mendocino County Regional Bikeway Plan, MTA has plans to develop a transit center in the central Ukiah area. The transit center will serve as a link for all local and regional public transit routes, plus Greyhound, AMTRAK, and the Mendocino Stage. In addition, the transit center will provide bicycle racks for bicyclists connecting to any of these services. An exact location for this project has yet to be determined, but one possibility is the Ukiah Depot site on Perkins Street.
- Improving public transit can significantly reduce emissions by moving a large number of people efficiently and providing more opportunities for community members to choose low-carbon transportation modes instead of single-occupancy vehicle use. Improving public transit also has potential local co-benefits, including better access to transportation for the young, elderly, and disabled, as well as health benefits associated with walking to and from public transit stops.

Goal TL.2  Increase Non-Motorized Travel

A City with well-designed pedestrian and bicycle facilities encourages residents to drive less often, which results in reduction of VMT. Bicycling can replace a significant share of motorized travel, typically 5-15 percent with good facilities. In addition, increasing the use of non-motorized travel such as walking and biking helps reduce traffic congestion, improves air quality, promotes a healthy lifestyle, and can contribute to local economic development efforts.

Conventional transportation impact analysis tends to overlook and undervalue non-motorized transportation modes such as multiple short and non-motorized trips. Non-motorized trips are undercounted because they include off-peak trips, non-work trips, travel by children, recreational travel, and non-motorized links of automobile and public transit trips.[27]



Strategy TL.2.1: Improve Bicycle and Pedestrian Infrastructure

Improve community bicycle and pedestrian pathway infrastructure by providing bicycle support facilities at public locations, updating the bicycle systems to become more bicycle-friendly, and evaluating other opportunities to encourage walkable/bikable corridors.

Priority:	2
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	22

[27] Evaluating Non-Motorized Transportation - Benefits and Costs, June 2011, Todd Litman, Victoria Transport Policy Institute, Peter R. Stopher and Stephen P. Greaves (2007), "Household Travel Surveys: Where Are We Going?" Transportation Research A, Vol. 41/5 (www.elsevier.com/locate/tra), June, pp. 367-381.

Estimated Annual Cost to the City in 2020:	Medium to high (City staff time, capital costs for street improvements)
Responsibility:	Planning and Community Development Department Public Works Department
Objective(s):	By 2020: 4 miles of bike lanes added By 2030: 8 miles of bike lanes added
Local Economic Benefits:	Lower fuel bills, improved public health, increased tourism
Other Local Co-benefits:	Improved air quality, less traffic congestion, lower commute times

Action TL-2.1a: Install bicycle support facilities at public locations, transit hubs, and the downtown core.

Action TL-2.1b: Improve the bicycle network to make it friendlier for cyclists (i.e., update and implement the Bicycle and Pedestrian Master Plan).

Action TL-2.1c: Identify street right-of-way reconstruction projects and costs for developing bike paths and lanes.

Action TL-2.1d: Consider a variety of strategies for funding bicycle and pedestrian improvements, such as development density bonuses, expedited planning permits review, development impact fees, etc.

Action TL-2.1e: Evaluate opportunities to encourage walkable/bikable corridors.

Action TL-2.1f: Actively promote walking and biking as safe and healthy modes of travel.

Action TL-2.1g: Consider the use of "sharrows" on selected key street corridors.

Action TL-2.1h: Support and encourage local bicycle special events that promote bicycle use and healthy living, and contribute to the local economy, particularly those that include young people and that contribute to local economic development.

Bicycle improvements provide synergistic effects, where the total impacts are greater than the sum of their individual impacts. A single bicycle lane generally provides little benefit because it will connect few destinations, but a network of integrated bicycle lanes and shared travel lanes can be more beneficial because it provides multiple connections between trip origin and trip destinations, thereby attracting a larger population of potential users with more diverse travel patterns. Therefore, it's generally best to implement and evaluate integrated programs.

Improved pedestrian facilities generally consist of improvements to sidewalks and pedestrian crossings at intersections to create a continuous network. A safe and convenient system of pedestrian facilities can encourage walking.

The City has an adopted Bicycle and Pedestrian Master Plan (1999), which they plan to update in 2014. City zoning codes including those for the Downtown, Neighborhood Commercial, and Heavy Commercial zones, also address bicycle and pedestrian access through policy and requirements including:

- Bicycle Parking: Secure bicycle parking shall be provided at a rate of 0.50 spaces per unit (2 units would require one parking space). Downtown Zoning Code Section 5. Standards for Specific Land Uses)
- Bike/Pedestrian Connections. Bike/pedestrian paths are recommended for areas that lack designated pedestrian/bike connections in order to provide the required circulation pattern, pedestrian orientation, and walkability. (Downtown Zoning Code Section 11.070, B2)



Strategy TL.2.2: Establish Safe Routes to Schools

Increase opportunities for walking and biking by school children to and from school.

Priority:	1
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	173
Estimated Annual Cost to the City in 2020:	Medium to high (City staff time, capital costs for street improvements)
Responsibility:	Planning and Community Development Department Public Works Department
Objective(s):	By 2020: 50% of intersections and streets to be improved By 2030: 100% of intersections and streets to be improved
Local Economic Benefits:	Lower fuel bills, improved public health
Other Local Co-benefits:	Improved air quality, less traffic congestion, lower commute times

Action TL-2.2a: Enhance pedestrian and bicycle facilities around schools.

Action TL-2.2b: Utilize City resources to encourage and educate parents and students about the benefits of walking and biking to school.

Action TL-2.2c: Implement traffic calming measures on identified Safe Routes to School routes.

Action TL-2.2d: Add safety improvements to City transportation infrastructure along applicable routes.

Action TL-2.2e: Continue to work closely with the Mendocino County Public Health Department to promote walking and biking and healthy alternatives for school children

Safe Routes to School is a national and international movement to create safe, convenient, and fun opportunities for children to bicycle and walk to and from schools. The City will increase opportunities for schoolchildren to walk and bike to and from school by continuing to implement safety improvements to City pedestrian and bicycle facilities. All crosswalks around schools in the City of Ukiah have been marked. The City will also support Ukiah Unified School District efforts to encourage and educate parents/students about the benefits of walking and cycling to school.

Goal TL.3  Increase Motor Vehicle Efficiency

Increasing motor vehicle efficiency has a direct affect on GHG emission; as fuel efficiency rises, GHG emissions per VMT go down. Over the last 30 years, the fuel economy (miles per gallon, or mpg) of new passenger vehicles in the United States has improved significantly, increasing by more than 30 percent. Until very recently, most of the gains occurred in the early years of fuel economy regulation under the Corporate Average Fuel Economy (CAFE) program. Fuel economy improvements were nearly stagnant from

the late 1980s to the early 2000s. Over this period, the technical efficiency (amount of energy needed to move a given vehicle mass) of light-duty vehicles improved, although fuel economy (the amount of gasoline consumed per mile traveled) remained unchanged, as consumer preferences shifted to larger, heavier, and more powerful vehicles. Fuel economy standards for light trucks were increased slightly in 2003, and recent federal vehicle standards adopted in 2010 and 2012 are expected to raise average fuel economy as high as 54.5 mpg for model year 2025.[28]

Beyond improving fuel efficiency in vehicles, another method for reducing GHGs through fuel economy is to switch to electric and hybrid vehicles. A vehicle that operates on electricity only does not emit any tailpipe emissions. A fuel cell vehicle operating on hydrogen emits only water vapor. Plug-in hybrid vehicles that operate on either electricity or gasoline only emit lower tailpipe GHG emissions compared to their gasoline-powered counterparts.[29]



Strategy TL.3.1: Improve Municipal Fleet Fuel Efficiency

Upgrade City fleet vehicles to include more electric, hybrid-electric, and alternative fuel vehicles to reduce emissions associated with City operations.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	45
Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Planning and Community Development Department
Objective(s):	By 2020: 10 City vehicles replaced with electric, hybrid-electric, or alternative fuel vehicles By 2030: 30 City vehicles replaced with electric, hybrid-electric, or alternative fuel vehicles
Local Economic Benefits:	Lower fuel bills
Other Local Co-benefits:	Improved air quality

Action TL-3.1a: Participate in City-wide marketing efforts for Clean Air Days, Bike-to-Work Days, Sunday Streets/Car-Free Sundays, etc.

Action TL-3.1b: Consider setting aside funding and/or pursuing grant funding to replace the City fleet vehicles with additional electric, hybrid-electric, and alternative fuel vehicles.

In 2005, the City Vehicle Fleet Fuel represented approximately 28 percent of the municipal GHG emissions. The use of alternative fuels, electric vehicles, and other cleaner forms of transportation by the City government will set a positive example to the rest of the community and provide leadership in reducing GHG emissions associated with transportation. To promote fuel efficient and alternative vehicle use, the City will strive to develop infrastructure for alternative vehicles and will continue to upgrade the City fleet vehicles with more fuel efficient and alternative fuel vehicles to reduce emissions associated with City

[28] Source: NHTSA, *Summary of Fuel Economy Performance*, 2012. http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/2011_Summary_Report...

[29] EPA, Greenhouse Gas Emissions from a Typical Passenger Vehicle, December 2011.

operations. Ukiah will implement this strategy by continuing to set aside existing budget and by pursuing grant funding to replace the City fleet with additional electric, hybrid-electric, and alternative fuel vehicles.



Solid Waste

- 2020 Adjusted Business-as-Usual GHG Emissions: 23,686 MT CO2e
- Annual GHG emissions reductions by 2020: 1,703 MT CO2e

Emissions associated with the landfilling of solid waste constitute approximately 18 percent of the City's 2020 adjusted BAU GHG emissions forecast. Diverting more solid waste from landfills is an effective way to reduce GHG emissions by avoiding anaerobic decomposition of organic material and recovering the embodied energy in recycled materials. Strategies for reducing the amount of solid waste generated by the community include partnering with the local waste hauler to build on existing diversion programs and incentivizing the community to increase diversion rates.

C&S Waste Systems (C&SWS) holds the City contract for hauling and managing the City's solid waste. C&SWS subsidiary Ukiah Waste Systems is the City's franchise hauler, providing solid waste and curbside recycling collection within the City of Ukiah. Curbside collection containers are provided separately for trash, mixed recycling (paper products, metal, glass, and plastics), and yard (green) waste. For Ukiah trash customers, residential and commercial, there is no charge for recycling and yard waste collection service. Single-stream recyclables are processed at a local materials recovery facility, and yard waste is locally composted. Ukiah has a Pay as You Throw (PAYT) system, which provides an economic incentive to customers to reduce landfill materials and increase recycling. Another C&SWS subsidiary, Solid Waste Systems, operates the Ukiah Transfer Station, for members of the public who wish to self-haul their trash and recyclable materials, including green waste and construction debris. C&SWS recently opened a Material Recovery Facility (MRF) in Ukiah, which processes single-stream recyclables collected by Ukiah Waste Solutions and other C&SWS-affiliated haulers.

Solid waste collected from the Ukiah community is currently hauled to the Eastlake Landfill in Lake County, a distance of approximately 54 miles. A City-owned landfill located on Vichy Springs Road was closed in 2001, but continues to generate methane emissions from existing waste.

Waste Diversion

Energy is expended in the extraction, processing, and transporting of raw materials, and in manufacturing and delivering goods to market. Reuse and recycling helps conserve much of the energy embodied in these goods and materials, which in turn avoids GHG emissions. Sending glass, plastic, and metal to landfill represents a loss of resources as many of these materials can be recycled into other products, thereby reducing the demand for virgin materials in manufacturing and production. In addition to being energy intensive, upstream extraction and processing of raw materials (mining, construction, fuel production, metals processing, etc.) generates enormous volumes of waste material. Forty to seventy times more waste (and associated emissions) is generated from the upstream industrial processes associated with product manufacturing than with their disposal to landfill.[30]

[30] Makower, Joel, Strategies for the Green Economy: Opportunities and Challenges in the New World of Business, McGraw-Hill. 2009.

Composting organic waste material, including food scraps, non-recyclable paper products, and plant material keeps these materials out of out of landfills, where anaerobic decomposition releases methane (CH4) – a powerful GHG. A well-managed composting operation provides a direct reduction of landfill methane emissions while producing a nutrient rich soil amendment that can be used to reduce pesticides and chemical fertilizers, retain water, build soil, and increase food productivity. Compost also helps increase carbon sequestration in soils.

The City decreased its solid waste disposal rate substantially between 2007 and 2010, going from an average of 5.6 pounds per person per day (PPD) in 2007 to 3.2 PPD in 2010. This decrease is the result of a large increase in recycling between 2005 and 2010. Primarily, this was due to improved floor sorting at the Ukiah Transfer Station. Over the past few years the Transfer Station has diverted approximately two-thirds of the 30,000 tons per year it receives, due to floor sorting and adding to the types of materials that it recycles, including porcelain, carpet, carpet padding, asphalt shingles, and various scrap metals. It has also added a buy-back program which incentivizes the recycling of metal. Another reason for a decrease in disposal rates is the economic recession starting in 2008, which resulted in a significant decrease in new construction/remodel projects, and related construction waste. The recession also led to more waste customers downsizing their gray garbage carts.

The city-wide diversion rate for 2010 and 2011 was estimated at 69% (Municipal Services Review, 2012). Pursuant to AB 341 (2011), the State of California is required to divert 75 percent of its solid waste from landfills by 2020. Recycling and organics diversion are the two fundamental tactics recommended for reaching this goal. The City can attain this goal, and contribute to reaching its GHG reduction target, by focusing on improving recycling and composting programs and increasing participation.

Solid Waste Goals and Strategies

Table 4-8 summarizes the Climate Action Plan's solid waste diversion strategies and their estimated GHG reduction impact. Specific energy goals, strategies, and actions are described in the sections that follow. Appendix C provides details on the assumptions and methods used to quantify GHG reductions associated with each strategy.

Table 4-8
Summary of GHG Reduction Impacts for Solid Waste Strategies in 2020 and 2030

	Goal/Supporting Strategy	2020 Annual GHG Reduction Potential (MT CO2e)	2020 Percent of Category	2030 Annual GHG Reduction (MT CO2e)
SW.1	Reduce Solid Waste Sent to Landfill			
SW.1.1	Increase Community Landfill Diversion Rate	1,686	99.0%	2,320
SW.1.2	Increase Municipal Operations Landfill Diversion Rate	17	1.0%	24
SW.2	Reduce Release of Landfill Methane			
SW.2.1	Explore Potential of Flaring Landfill Gas	Not quantified	Not quantified	
	TOTAL	1,703	100%	2,343

Goal SW.1 Reduce Solid Waste Sent to Landfill

The City will prioritize the diversion of waste from landfill as its primary solid waste goal. Increasing waste diversion will entail expanding and improving recycling and composting programs, maximizing the use of technical assistance, and increasing public awareness and education.

Strategy SW.1.1: Increase Community Landfill Diversion Rate

Increase recycling, green waste diversion, and waste reduction associated with the Community; Increase landfill diversion rate to 75% (or higher).

Priority:	1
Timeframe to start implementation:	In progress
Annual GHG Reduction Potential in 2020 (MT CO2e):	1,686
Estimated Annual Cost to the City in 2020:	Medium (City staff time)
Responsibility:	Public Works Department
Objective(s):	By 2020: Community waste diversion 75% or higher By 2030: Community waste diversion 85% or higher
Local Economic Benefits:	Lower cost to the City
Other Local Co-benefits:	Reduce waste, lower energy demand, improve traffic and air quality, educate the public

Action SW-1.1a: Develop a Community Waste Reduction Plan (i.e., Zero Waste Plan).

Action SW-1.1b: Work with the local hauler to increase curbside recycling rate and divert organics (food and/or green waste) from landfill.

Action SW-1.1c: Work with the local hauler and/or solid waste agency to ensure that services for solid waste collection, recycling and disposal meet the needs of the community. Improve composting programs.

Action SW-1.1d: Launch outreach campaigns to increase participation in residential and commercial recycling and composting programs, and to promote waste reduction. Work with the Mendocino Solid Waste Management Authority and the solid waste local hauler to distribute public education materials on solid waste source reduction, recycling and composting, and the proper handling of household hazardous waste.

The City aims to increase its landfill diversion rate to 75% by 2020, through additional recycling, green waste diversion and composting, and waste reduction associated within the community. The City is well positioned to achieve this goal, with a current (2010/2011) diversion rate equivalent of 69%/72%, and with its adoption in March 2013 of the *City of Ukiah Zero Waste Resolution* which calls for achieving zero waste through "action plans and measures that significantly reduce waste and pollution including environmentally preferred product procurement, recycling and composting."

Ukiah will develop a Community Waste Reduction Plan or Zero Waste Plan for residents and businesses to delineate a path for future actions, including ways to encourage residents, businesses, agencies and institutions to use, reuse, and recycle materials judiciously, to compost organic wastes, and to encourage

manufacturers to produce and market less toxic and more durable, repairable, reusable, recycled, and recyclable products. The plan will provide a blueprint for achieving interim goals and a strategy for reaching out to the community. In order to meet the community zero waste goal, a cultural shift will be needed so that both businesses and residents learn to value discards as resources and shift away from the "single use" mentality.

Close coordination with the City's hauler will also be required in order to successfully expand recycling and organics/food collection services to underserved sectors such as small restaurants and multifamily residential units. C&SWS is currently working to consolidate its recycling and composting operations at a new site in Ukiah (the former Thomas pear sheds), but the company has not been successful in securing a permit from the County to compost food waste at that site. Meanwhile, C&SWS recently began a pilot program for collecting food waste from Ukiah businesses and trucking it to a composting facility in Lake County.

The City will also coordinate with the hauler and the Mendocino Solid Waste Management Authority to prepare and distribute educational materials to the public on recycling programs, and to promote solid waste source reduction and benefits of composting. These educational materials could consist of brochures and flyers made available or sent to residents and businesses, and information about recycling programs can be posted on the City's website. The City will also strive to raise consumer awareness about environmentally preferable product alternatives, reducing unnecessary consumption, and promoting the reuse and sharing of goods within the community.

Under California law (AB 341), any commercial business or public entity that generates more than four cubic yards of commercial solid waste per week, or is a multifamily residential dwelling of five units or more, is required to recycle after July 1, 2012. The City will continue to work with C&SWS to ensure the recycling program addresses this requirement, and includes other non-residential entities not in compliance so that recycling is maximized in Ukiah.



Strategy SW.1.2: Increase Municipal Operations Landfill Diversion Rate

Increase recycling, green waste diversion, and waste reduction associated with municipal government operations. Increase municipal operations landfill diversion rate to 75% (or higher).

Priority:	1
Timeframe to start implementation:	2013-2014
Annual GHG Reduction Potential in 2020 (MT CO2e):	17
Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Public Works Department
Objective(s):	By 2020: Municipal waste diversion 75% or higher By 2030: Municipal waste diversion 85% or higher
Local Economic Benefits:	Lower cost to the City
Other Local Co-benefits:	Reduce waste

Action SW-1.2a: Include municipal operations in the Community Waste Reduction Plan or Zero Waste Plan.

Action SW-1.2b: Work with the local hauler to expand recycling and organics diversion at City facilities.

Action SW-1.2c: Consider adopting an environmentally friendly purchasing policy for municipal operations.

Concurrent with the community-wide waste diversion goal, the City will commit to a landfill diversion rate to 75% by 2020 for its own operations. Similar to how the City reduces landfill waste at the community level, the City will achieve its municipal target through additional recycling, green waste diversion, and waste reduction associated with government operations. The City will coordinate with the local hauler to expand recycling and organics diversion at City facilities, and will consider adopting an environmentally friendly purchasing policy for municipal operations. Under this policy, the City would use and purchase recycled products and recycled materials, and encourage its contractors and consultants to do so as well, when practical and financially viable. This policy could also encourage or require the City to make resource conservation an integral part of its waste reduction and recycling programs.

Goal SW.2  Reduce Release of Landfil Methane

As described in Chapter 3, a large portion of the City's solid waste-related emissions come from the City-operated landfill. Closed since 2001, the landfill nevertheless continues to generate methane emissions from existing waste. These emissions will naturally attenuate over time as the waste in place decomposes and releases less landfill gas. However, the City will explore ways to continue to reduce landfill emissions via flaring of methane or other means.

Strategy SW.2.1: Explore Potential of Flaring Landfill Gas



Explore ways to flare the Landfill gas that is currently captured from the closed City landfill

Priority:	3
Timeframe to start implementation:	2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified
Estimated Annual Cost to the City in 2020:	Medium (City staff time and potential capital improvements)
Responsibility:	Planning and Community Development Department and Public Works Department
Objective(s):	None identified
Local Economic Benefits:	None identified
Other Local Co-benefits:	Educate the public

Action SW-2.1a: Explore the feasibility of cost-effectively flaring Ukiah's landfill gas.

The City of Ukiah has a perimeter gas extraction system at its closed landfill on Vichy Springs Road, consisting of 17 vertical extraction wells located between the southwestern edge of the waste and the property line. The gas collected in the extraction system is discharged through a vacuum blower. When the system was installed it was determined that there was insufficient quality and quantity of landfill gas to

feasibly operate a landfill gas-to-energy project. However, if the LFG was flared, then methane gas would be converted into CO2, thus greatly reducing the global warming potential (GWP) of the off gas (methane has a GWP potential of 21 compared to 1 for CO2). The City will explore the feasibility of flaring the landfill gas in a cost-effective way.



Water

- 2020 Adjusted Business-as-Usual GHG Emissions: 477 MT CO2e
- Annual GHG emissions reductions by 2020: Not quantified (supporting measures)

Emissions associated with water consumption in Ukiah are due to the energy required to convey water from its source to end users in Ukiah, energy needed to convey wastewater through the City's sewer system, and treatment of wastewater. Water-related emissions are anticipated to constitute less than 1 percent of community-wide emissions in 2020. Since the City has already achieved its 2020 water conservation goals (as set by state law) it is not committing to further reduction in water use per capital by 2020. However, the City will continue to strive for better water efficiency in the community and in its own operation, recognizing that water is a precious and limited resource that must be conserved to meet future demands.

Water Conservation

Water conservation reduces the energy required for upstream water collection, conveyance, and treatment, and reduces the energy requirements and the process emissions associated with wastewater collection and treatment. The energy intensity of water conveyance is dependent on the distance water is transported and elevation changes.

Effective ways of conserving water include incentivizing reductions in commercial/industrial outdoor irrigation, providing rebates for residential water conservation devices, and utilizing recycled water. Water conservation actions have many benefits beyond reducing GHG emissions. In addition to maintaining water as a sustainable resource for future generations, conservation buffers communities from the effects of droughts, saves money, and helps sustain wildlife habitats.

The City takes its responsibility to conserve water seriously and actively supports State policies aimed at reducing water use. The California Urban Water Management Planning Act (UWMP Act) requires every California urban water supplier of more than 3,000 customers to adopt an Urban Water Management Plan (UWMP). In 2009, the State passed the Water Conservation Bill of 2009 (SBX7-7), which requires an updated UWMP every 5 years. It also sets a target of a 20 percent reduction in State-wide water use by 2020, requiring local jurisdictions to act to meet the statewide goal.

The City of Ukiah adopted its most recent UWMP in 2011. The Ukiah UWMP describes 2010 water use and projected water demand in five-year increments through 2035. In 2010, the sectors with the highest water use were multi-family and single family residential (738 acre-feet per year [AFY], each), followed by commercial/institutional (707 AFY), landscape (192 AFY), and industrial (51 AFY). No water use was reported for agriculture or other (fire service). According to the UWMP, Ukiah's average daily water use

ranged from a low of 168 gallons per capita-day (gpcd) in 2010 to a high of 245 gpcd in 1999.[31] The UWMP outlines strategies to meet the 20 percent reduction goal of SBX7-7 through Demand Management Measures, which are incorporated into the strategies below.

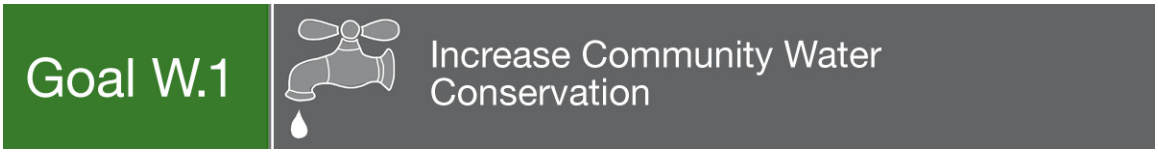
An additional challenge faced by the City is that reducing water consumption through conservation efforts reduces the revenue generated by water "sales" to customers. Reduced revenues can adversely affect operations and maintenance.

Water Goals and Strategies

The following strategies support the goal to reduce community water use. GHG emissions reductions are not estimated for these strategies, as they are considered supporting measures for overall energy efficiency goals, and the reductions associated with the water sector would have a relatively minor impact on overall reductions in the City.

Table 4-9
Summary of GHG Reduction Impacts for Water Conservation Strategies in 2020 and 2030

	Goal/Supporting Strategy	2020 Annual GHG Reduction Potential (MT CO2e)	2020 Percent of Category	2030 Annual GHG Reduction (MT CO2e)
W.1	Increase Community Water Conservation			
W.1.1	Decrease Community Water Consumption	Not quantified	Not quantified	Not quantified
W.1.2	Reduce Municipal Operations Water Consumption	Not quantified	Not quantified	Not quantified
W.1.3	Expand Use of Recycled Water	Not quantified	Not quantified	Not quantified
	TOTAL	NA	NA	NA





Strategy W.1.1: Decrease Community Water Consumption

Reduce community water consumption by 20% by 2020.

Priority:	3
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified
Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Planning and Community Development Department; Public Works Department
Objective(s):	Community water consumption reduced 20% by 2020

[31] City of Ukiah, 2010 Urban Water Management Plan. Published June 2011.

Local Economic Benefits:	Lower community water bills
Other Local Co-benefits:	More reliable local water supply, improved fisheries and aquatic ecosystem health

Action W-1.1a: Consider establishing a rebate program with the City Public Works Department to promote the installation of higher efficiency plumbing fixtures.

Action W-1.1b: As staff and resources allow, prepare and adopt a more water efficient landscaping ordinance.

California's Water Conservation Bill of 2009 (SBx7-7) requires that all water suppliers increase water use efficiency with the overall goal to decrease per-capita consumption within the state by 20 percent from a 2005 baseline. The City of Ukiah 2010 UWMP explains how this target will be met for the City and describes many different programs that the City has implemented, and will continue to promote, for reducing water demand and for making the water conveyance system more efficient. The UWMP requires that retail water agencies develop an implementation plan for compliance with the SBx7-7 water use targets.

The City is currently below its 2020 water targets as expressed in the UWMP. The City intends to continue and develop its water conservation programs, implementing water conservation and water recycling programs to maximize sustainability in meeting future water needs for its customers.

The City will continue its water conservation efforts while striving to reduce water usage even further. Many of the City's ongoing efforts are highlighted in the UWMP and other City documents:

- Continue to perform system-wide leak detection and repair on an ongoing basis. The City calculates system water losses annually and reports this information to Department of Water Resources (DWR). In addition to calculating system losses, the City is in the process of replacing old meters in the system. New meters will provide a more comprehensive portrayal of water use within the City.
- Reduce water consumption in existing residential and commercial buildings by increasing the efficiency of existing plumbing fixtures (as described in Strategy E.1.5 and in the City's Downtown Zoning Code Section 5.030), and by promoting available rebates from utility companies for the installation of higher efficiency plumbing fixtures.
- Consider a survey program for single-family and multi-family residences to identify water use problems, recommend improvements, provide instruction in landscape principles and irrigation timer use, and identify indoor and outdoor leaks.
- Through the City's planning review process the City manages its large landscape water consumers to ensure responsible water use for new developments. The City's Planning and Community Development Department reviews all landscape plans for proposed new developments. Included in the City's Municipal Code is a requirement for all landscape planting to be "those which grow well in Ukiah's climate without extensive irrigation."
- Continue to promote public awareness of water conservation through occasional bill stuffers, distribution of its Annual Water Quality Report, radio broadcasts, and the City website. In addition, City employees are encouraged to discuss conservation measures with customers.
- Continue to enforce the City's water waste ordinance. The City's Municipal Code states "Where negligent or wasteful use of water exists on a customer's premises, seriously affecting the general service, the City may discontinue the service if such conditions are not corrected within five (5) days

after giving customer written notice of intent to do so" (§4.1.7.3571). If the City determines that a customer is wastefully using water, the City first sends a letter to the customer to call attention to their wasteful practice and ask for correction. If the water waste condition is not corrected within five days after the written notice, service may be discontinued if necessary.



Strategy W.1.2: Reduce Municipal Operations Water Consumption

Reduce municipal operations water consumption by 20% by 2020.

Priority:	3
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified
Estimated Annual Cost to the City in 2020:	Low-Medium (City staff time, new plumbing fixtures)
Responsibility:	Planning and Community Development Department; Public Works Department
Objective(s):	Municipal water consumption reduced 20% by 2020
Local Economic Benefits:	Lower water bills
Other Local Co-benefits:	Educate the community, show leadership

Action W-1.2a: Utilize available rebates from utility companies for the installation of higher efficiency plumbing fixtures.

Action W-1.2b: As staff and resources allow, prepare and adopt a water efficient landscaping ordinance.

In addition to community water conservation (Strategy W.1.1) the City will reduce water use at the government operations level by 20% by 2020, as called for under the Water Conservation Act of 2009 (SB7x7). This will include application of the water conservation strategies described under Strategy W.1.2, as applied to all City-operated facilities. The City has the opportunity to be a leader in modeling water efficient behavior including by doing a water loss audit, developing a water conservation plan and annual report, installing water efficient fixtures in municipal facilities, converting landscaping to use native and/or water efficient plants, and publicizing efforts. The City will expand upon past efforts to model water efficient landscaping, such as the landscaping plan at the City's electrical substation on South Orchard Avenue. Landscaping included a "demonstration garden" that shows what residents can grow in this area, as well as a walking path and extra trees. The City will consider converting a portion of its City Hall lawn to a model, drought-tolerant landscape, similar to what the City of Petaluma did at its City Hall. Pelaluma replaced its City Hall's lawn with water-efficient landscaping that acts as a catchment system and includes community gardens with native and edible plants.



Strategy W.1.3: Expand Use of Recycled Water

Implement Recommendations of the 2012 Recycled Water Feasibility Study.

Priority:	2
Timeframe to start implementation:	2015-2016
Annual GHG Reduction Potential in 2020 (MT CO2e):	Not quantified
Estimated Annual Cost to the City in 2020:	Low (City staff time)
Responsibility:	Community Development Department; Public Works Department
Objective(s):	None identified
Local Economic Benefits:	Benefits to local agricultural industry, enhance regional partnerships
Other Local Co-benefits:	Increased water supply reliability

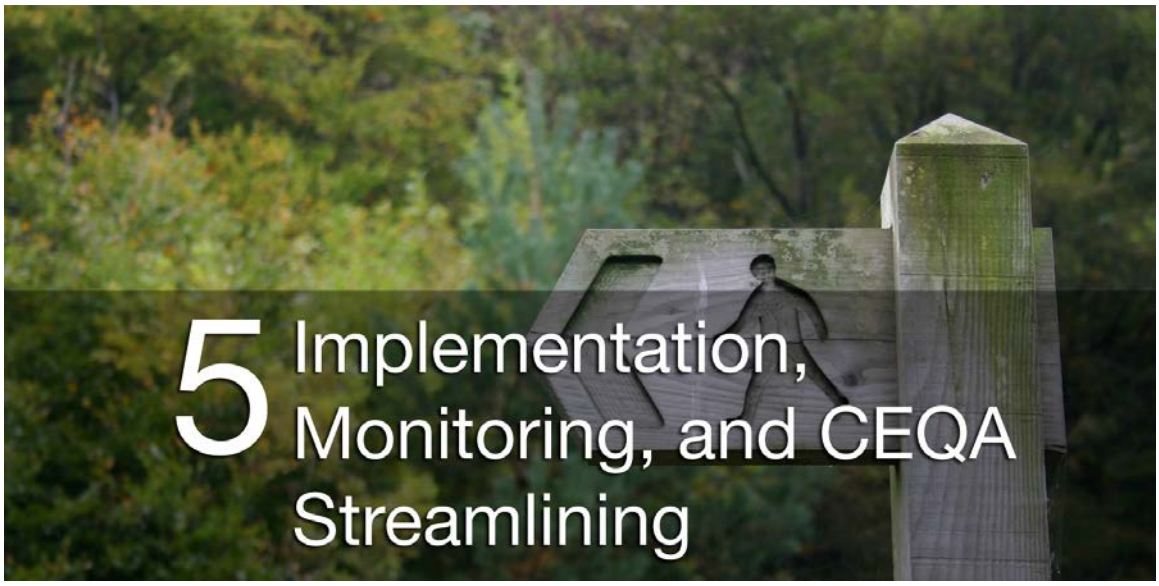
Action W-1.3a: Consider adopting a policy requiring the installation of "purple pipes" in open trenches for both public and private projects if the trenches are within planned routes for recycled water transport.

In 2012, the City completed a Recycled Water Feasibility Study to determine the feasibility of constructing a recycled water system to replace or augment existing water supplies in Ukiah Valley. Recycled water use would offset existing and future water demands for irrigation and frost protection of agricultural land, benefitting the local agricultural industry, reducing demands for limited groundwater and surface water resources, and improving the reliability of the water supply over a wider range of hydrologic conditions. The study examines the feasibility of directing wastewater effluent from the WWTP water to agricultural use, and includes the City's plan for implementing recycled water use in the City of Ukiah and surrounding areas. As the source of recycled water is dependent on the size of the local population, the anticipated increases in Ukiah's population would result in increased wastewater supplies available for recycled water use.

The study identifies potential recycled water use sites including agricultural areas and urban landscaping; evaluates several water recycling alternatives; provides planning level cost estimates; and provides a recommended alternative based on a variety of variables including environmental considerations, regulatory impacts, public acceptance, funding, and difficulty of implementation. Successful implementation of the recycled water project would include:

- Design and construct the recommended alternative.
- Receive firm commitments and Agreements from landowners to use recycled water.
- Obtain permits and clearances from applicable regulatory agencies (RWQCB, CDPH, etc). Also includes the RW Policy Salt/Nutrient Management Plan development.
- Conduct environmental process (CEQA) and develop compliance documents.
- Conduct a Proposition 218 process.
- Adopt a resolution for recycled water use.
- Prepare a cost of service rate study.

The City will continue to move forward with implementation of the recycled water project, and will strive to maintain the implementation schedule outlined in the Recycled Water Feasibility Study (Figure 7.3). The City will investigate the funding sources and considerations outlined in Chapter 8 of the study, to maximize use of existing funding sources, leverage existing resources, and develop regional partnerships that benefit numerous stakeholders.



5 Implementation, Monitoring, and CEQA Streamlining

Overview

This chapter shows how successful implementation of the CAP strategies and actions laid out in Chapter 4 will help the City achieve its 2020 GHG reduction target, and outlines how the City will monitor the progress of the strategies and actions to reduce community-wide GHG. Translating strategies and actions into actual emission reductions will require development of programs, City staff time (or interagency regional work-sharing) for promotion activities, and effective management systems for tracking and monitoring program implementation. Coordination between City departments and collaboration with residents, businesses, regional organizations, and other government agencies will be needed to ensure that programs are well-managed and cost-effective.

The Climate Action Plan relies on behavior change to achieve a significant portion of GHG reductions needed to meet the 2020 emissions target. Community involvement is an essential component of the Climate Action Plan implementation process, as many strategies depend on active participation by residents and businesses. The City will be making a concerted effort to develop and strengthen community education and awareness through various promotional programs. These efforts will be monitored for their cost-effectiveness in influencing residents, businesses, and visitors to reduce their personal carbon footprints. The City's web site will also be updated to communicate program development and gauge the success of Climate Action Plan implementation.

This chapter presents an implementation schedule organized into Near-term (2013 – 2014), Medium–term (2015 – 2016), and Long–term (beyond 2016) actions. The schedule also highlights the City department responsible for spearheading implementation efforts, and the quantifiable objectives for each strategy against which successful implementation will be judged. Actual implementation will depend on a variety of factors, including availability of funding and City staff time, community priorities, and changing environmental demands.

Implementation

For the most part, the City will be responsible for initiating the actions to reduce emissions. However, success for many measures will ultimately depend on public participation. Actions that require active City promotion may require updates to the City website, distribution of physical promotional materials, and other active City outreach activities. The City will develop programs to reach the public, including public forums, workshops, and meetings; these programs will be administered with the intent to foster an open public input and commenting process. Collaboration and coordination with transit agencies (e.g., Mendocino Transit Authority) will be essential to improving and increasing transit ridership, and enhancing mobility and transportation efficiency through better planning.

Further, coordination with outside agencies and private entities is critical for the success of many strategies, including PG&E and Mendocino County Energy Watch (MCEW) for natural gas efficiency programs, the local garbage hauler (Ukiah Waste Solutions) for waste reduction actions, the local and regional water purveyors for water saving actions, and other local jurisdictions for work-sharing partnerships designed to take advantage of the common goals across Mendocino County. Partnering with the Mendocino Air Quality Management District, Mendocino College, the Employers Council of Mendocino County, the Mendocino Council of Governments, and the Chamber of Commerce will also leverage existing efforts to develop a valley wide clean/green industry and jobs development strategy. Dependence on outside agency participation and regional partnerships is mentioned explicitly in the strategy descriptions included in Chapter 4, and the City will continue to explore opportunities for collaboration.

Table 5-1 provides a summary of implementation components for all of the strategies described in Chapter 4, including implementation timeframe, the City department tasked with implementing and monitoring each strategy, and objectives (i.e., the monitoring criteria).

Table 5-1
Implementation Summary Table

	2020 Annual GHG Reductions	Implementation Timeframe	Responsible Department	Objectives
Energy				
E.1.1: Promote Commercial Energy Efficiency	646	2013-2014	Planning and Community Development Department	By 2020: 15% of commercial square footage updated By 2030: 25% of commercial square footage updated
E.1.2: Promote Residential Energy Efficiency	567	2013-2014	Planning and Community Development Department	By 2020: 15% of residential square footage updated By 2030: 25% of residential square footage updated
E.1.3: Improve Municipal Energy Efficiency	76	2015-2016	Planning and Community Development Department	25% of public use building square footage updated by 2020 and 2030
E.1.4: Reduce Urban Heat Islands	2	2015-2016	Planning and Community Development Department; City Building Department	By 2020: 17 housing units and 2 commercial units participating By 2030: 35 housing units and 5 commercial units participating
E.1.5: Promote Commercial and Residential Green Building	23	2015-2016	Planning and Community Development Department; City Building Department	10% of new commercial and residential properties achieve CalGreen Tier 1 for energy efficiency (15% improvement over minimum requirement)
E.2.1 : Promote On-site Renewable Energy for Commercial and Industrial Users	247	2013-2014	Planning and Community Development Department	By 2020: 15% participation By 2030: 30% participation
E.2.2: Promote Small-scale On-site Renewable Energy for Homes	130	2013-2014	Planning and Community Development Department	By 2020: 675 new solar PV systems (10% of homes) By 2030: 1,747 new solar PV systems (25% of homes)
E.2.3: Expand Municipal Renewable Energy	<1	2015-2016	Planning and Community Development Department	By 2020: 4 kW solar PV installation By 2030: 12 kW solar PV installation
E.3.1: Increase Local Education and Outreach	Not quantified	2013-2014	Planning and Community Development Department	None identified
E.3.2 : Expand Regional Renewable Energy Partnerships	Not quantified	2015-2016	Planning and Community Development Department	None identified
Transportation and Land Use				
TL.1.1: Local Commute Trip Reduction	88	2015-2016	Planning and Community Development Department	By 2020: 0.5% reduction in VMT By 2030: up to 1.2% reduction in VMT
TL.1.2: Sustainable Growth Patterns	616	2015-2016	Planning and Community Development Department	2020: 1.2% reduction in VMT 2030: up to % reduction in VMT

	2020 Annual GHG Reductions	Implementation Timeframe	Responsible Department	Objectives
Transportation and Land Use (continued)				
TL.1.3: Regional Transportation Management	Not quantified	2015-2016	Planning and Community Development Department	None identified
TL.1.4: Expand/Improve Public Transit	Not quantified	2015-2016	Planning and Community Development Department	None identified
TL.2.1: Improve Bicycle and Pedestrian Infrastructure	22	2015-2016	Planning and Community Development Department	By 2020: 4 miles of bike lanes added By 2030: 8 miles of bike lanes added
TL.2.2: Safe Routes to Schools	173	2013-2014	Planning and Community Development Department	By 2020: 50% of intersections and streets to be improved By 2030: 100% of intersections and streets to be improved
TL.3.1: Improve Fuel Efficiency for Municipal Fleet	45	2015-2016	Planning and Community Development Department	By 2020: 10 City vehicles replaced with electric vehicles By 2030: 30 City vehicles replaced with electric vehicles
Solid Waste				
SW.1.1: Increase Community Landfill Diversion Rate	1,686	2013-2014	Planning and Community Development Department and Public Works Department	By 2020: Community waste diversion 75% or higher By 2030: Community waste diversion 85% or higher
SW.1.2: Increase Municipal Operations Landfill Diversion Rate	17	2013-2014	Planning and Community Development Department and Public Works Department	By 2020: Municipal waste diversion 75% or higher By 2030: Municipal waste diversion 85% or higher
SW.2.1: Explore ways to flare gas or capture the energy content	Not quantified	2016	Planning and Community Development Department and Public Works Department	None identified
Water				
W.1.1: Decrease Community Water Consumption	Not quantified	2016	Planning and Community Development Department; Public Works Department	Community water consumption reduced 20% by 2020
W.1.2: Reduce Municipal Operations Water Consumption	Not quantified	2016	Community Development Department; Public Works Department	Municipal water consumption reduced 20% by 2020
W.1.3: Expand Use of Recycled Water	Not quantified	2015-2016	Community Development Department; Public Works Department	None identified

Plan Monitoring

City staff will annually present memorandums to the City Manager summarizing progress of the implementation of Climate Action Plan strategies. The report will evaluate the successes and challenges in meeting the goals established in Chapter 4, and the City's 15 percent GHG reduction target. City staff will provide the status of implementation (e.g., initiated, ongoing, completed), assess the effectiveness of the strategies and programs included in the Plan against the established objectives, and recommend adjustments to programs or tactics as needed. The annual report will also assess whether the City's actual growth and development is consistent with the forecasts made in this Climate Action Plan. If necessary, the City shall modify the geographic scope of the inventory and emissions targets accordingly.

An update of the City's GHG inventory and comprehensive revision of the Climate Action Plan should occur at least every five years to monitor progress of GHG reductions against the 2020 target.

Transportation and Land Use: Longer Term Considerations

As introduced in Chapter 2, California's Executive Order S-3-05 established aggressive goals to reduce state-wide GHG emissions to 80 percent below 1990 levels by 2050. AB 32 addresses an interim goal to reduce emissions to 1990 levels by 2020, and defines state GHG policy and regulations through the year 2020. Beyond that, only SB 375 mandates additional GHG reductions, assigning reduction targets to the state's 18 Metropolitan Planning Organizations (MPOs) for emissions from on-road transportation vehicles. Other than the state energy policy calling for all new buildings to be zero net energy[1] (ZNE) performers by 2025, regulation of other sources after 2020 is uncertain, but it is likely that future targets will be discussed and proposed as the AB 32 Scoping Plan undergoes its scheduled revision in 2013.

This Climate Action Plan provides a clear roadmap for the City to achieve GHG reductions consistent with the statewide AB 32 target. Achieving the deep reductions needed to help meet the state's longer term goals will be much more challenging. Such reductions are highly dependent on technological development and strong leadership at the federal and state levels, but they will also require extensive changes to local development patterns and transportation systems. It is appropriate for the City to begin thinking and planning for this challenge now, as profound changes to local land use patterns, transportation modes, and community behavior could require decades of planning, public engagement, and policy development.

As a sector, Transportation and Land Use represents perhaps the biggest challenge to the state's 2050 GHG emission target, and to local efforts to reduce emissions. Though the City of Ukiah has authority over local land use authority, wholesale transformation of disparate neighborhoods and commercial zones into integrated, automobile-independent, "new urbanist" type communities is difficult under the best of circumstances, even when there is community consensus to move in that direction. As the state continues to develop its longer term policies and strategies for reducing emissions, the City of Ukiah will begin its longer-term visioning on how future growth can be accommodated while still reducing GHG emissions.

[1] Defined as no net purchases from the electricity or gas grid.

Over the next several years the City will be embarking on its General Plan Update, providing an excellent opportunity to develop this vision.

This Climate Action Plan provides a framework for a more in-depth discussion on ways to accommodate future growth sustainably and reduce local dependence on single-occupancy vehicle (SOV) travel. As described in Chapter 4, Strategy TL.1.2 (Promote Sustainable Growth Patterns) is intended to increase neighborhood density through infilling, mixed-use developments, and pedestrian- and bicycle-friendly design. However, most of the actions under that strategy are currently based on "encouragement" or voluntary measures. GHG emissions over the long term can be greatly reduced over time by increasingly codifying these measures though municipal codes, ordinances and other regulatory means. Table 5-2 illustrates the difference this can make for two Transportation and Land Use Scenarios though just the year 2030. Scenario A represents implementation of strategies TL.1.1 and TL.1.2 as they are presented in Chapter 4 (i.e., voluntary adoption), while Scenario B represents implementing those same strategies with some level of assurance that the desired outcome will be achieved (e.g., modify the municipal code to achieve increased density and mixed use infill development, rather than "encourage" that same outcome by other means).[2] As shown in the table, Scenario B provides emissions reductions 3 to 14 times higher than Scenario A.

Table 5-2
Comparison of 2030 Annual GHG Reductions from Two Implementation Scenarios for Transportation and Land Use Strategies TL1.1 and TL1.2

Strategy	Scenario A (MT CO2e)	Scenario B (MT CO2e)
TL1.1: Local Commute Trip Reduction	88	1,142
TL.1.2: Promote Sustainable Growth Patterns	616	1,903

Funding Sources and Partnerships

The capacity of the City of Ukiah to implement the Climate Action Plan is limited by the small number of staff at the City and available funding. In addition to the program implementation costs to the City, there will be costs borne by residents and businesses to comply with its requirements.

The GHG reduction strategies in this document were formulated with an understanding that the City has limited staff time and financial resources to implement them. Cost estimates are based on the anticipated impact to the City budget, including any upfront capital investment needed to implement a strategy, ongoing annual costs, and City staff time required. The City's costs for implementation may include the creation or promotion of voluntary programs, continuing administration of those programs, coordination and outreach with other government agencies and businesses, and—in some cases—exploration or study of potential regulatory mechanisms not yet codified. Only a few strategies require up-front capital expenditures by the City.

[2] Estimates of GHG reductions are based on the Fehr & Peers memo of July 12, 2013, entitled "City of Ukiah – Quantitative Analysis of Strategies (2020 and 2030)" – included as Appendix B.2.

The City will use a combination of City staff time, grant funding, direct spending, and collaboration with other agencies and organizations to achieve Climate Action Plan goals. The following funding sources are available or potentially available to assist with achieving these goals

Existing Resources

City Staff

City staff time will be required to successfully implement Climate Action Plan measures. As shown in Table 5-1, Planning and Community Development Department staff will implement the majority of the Climate Action Plan strategies and actions. The Public Works Department and the Electric Utility Department will also assist with the implementation of some strategies. Promotional activities are likely to require significant City staff time, and will require updating the City website, public outreach campaigns (e.g. workshops), dissemination of promotional materials (e.g. flyers), and other forms of public awareness outreach and education.

Work Sharing

Given the rural location and size of the City of Ukiah, and the limited financial resources, City officials will explore work-sharing opportunities with other local and regional and jurisdictions. Under these arrangements, "combined" staff would devote a portion of their time to goals and strategies that are similar or consistent across several jurisdictions, such as promotion of existing energy efficiency rebates to reduce total energy use. These collaborations are expected to also promote cross-pollination of ideas and establish relationships that will be beneficial for future discussions with regional agencies regarding efforts to reduce GHG emissions.

Potential Funding and Partnerships

Federal, state, and regional agencies provide grants and loans, as well as planning assistance, for investments in a variety of climate-related projects. Grants and loans can provide short-term funding for program development and program testing, and could help pay for the staff time required to develop programs, and then establish an alternative financial framework for the program's continued operation after the grant expires.

The City will continue existing partnerships with other organizations such as the North Coast Energy Services (NCES), Mendocino County Energy Watch (MCEW), and others to implement, fund, and finance energy and water conservation projects and programs. Some of the specific, available funding programs are listed below.

Federal

Safe Routes to Schools

Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers to doing so. These barriers include a lack of infrastructure, safety, and limited programs that promote walking and bicycling. In California, two separate Safe Routes to School programs are available at both the state and federal level, and both programs fund qualifying infrastructure projects.

TEA-21

Federal funding through the TEA-21 (Transportation Equity Act for the 21st Century) program is administered through the state and regional governments. The City of Ukiah is located in the jurisdiction of the regional Mendocino Council of Governments (MCOG) agency. TEA-21 funding would be administered through MCOG. Most of the funding programs are transportation versus recreation oriented, with an emphasis on reducing auto trips and providing an intermodal connection. In most cases, TEA-21 provides matching grants of 80 to 90 percent.

Energy Efficiency Mortgages

The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program that assists current or future homeowners with lowering their utility bills. This would be accomplished by enabling homeowners to incorporate the cost of adding energy-efficient improvements into their home mortgage. Energy efficient upgrades could be chosen that would allow owners to realize net monthly savings. The goal is to provide owners additional financing for energy efficiency upgrades at a discounted interest rate.

State

California Energy Efficiency Financing

For years, the CEC has provided a loan program that supports local government energy retrofits and some new construction projects. Since 1979, more than $272 million has been allocated to more than 773 recipients, as of March 2012. The program provides low interest loans for feasibility studies and the installation of cost-effective energy projects in schools, hospitals, and local government facilities. The loans are repaid out of the energy cost savings and the program will finance lighting, motors, drives and pumps, building insulation, heating and air conditioning modifications, streetlights and traffic signal efficiency projects, and certain energy generation projects, including renewable energy projects and cogeneration. Loans can cover up to 100% of project costs and there is a maximum loan amount of $3 million.

Strategic Growth Council

In September 2008, California Senate Bill 732 created the Strategic Growth Council, which is a cabinet level committee whose tasks include coordinating the activities of member state agencies to assist state and local entities in the planning of sustainable communities and meeting AB 32 goals, including coordination of Planning Grants and Urban Greening Grants.

Infrastructure State Revolving Fund

The Infrastructure State Revolving Fund Program provides direct low-cost loans for local governmental public infrastructure projects, such as environmental mitigation measures, parks, transit, and solid waste collection and disposal.

Bicycle Transportation Account

The State Bicycle Transportation Account (BTA) is an annual program providing state funds for city and county projects that improve safety and convenience for bicycle commuters. The emphasis is on projects which benefit bicycling for commuting purposes. Funds are allocated to cities and counties on a matching basis that requires the applicant to furnish a minimum of 10 percent of the total project cost, and no applicant shall receive more than 25 percent of the total amount transferred to the BTA in a single fiscal year.

Regional

Continuing existing partnerships with the neighboring jurisdictions within Mendocino County, as well as other regional agencies, will help the City in implementing the CAP strategies.

Mendocino County Energy Watch

Mendocino County Energy Watch (MCEW) provides Mendocino County local governments, special districts, non-profits, small businesses, and residents with energy efficiency, climate and sustainability information and services. A partnership between the Community Development Commission of Mendocino County (CDC) and PG&E, MCEW provides energy assessments, benchmarking for buildings, retrofitting, greenhouse gas emissions inventories, educational classes, and more.[3]

Mendocino Council of Governments

Mendocino Council of Governments (MCOG) is the Regional Transportation Planning Agency (RTPA) for the countywide region. State and federal transportation funds are allocated through Caltrans to MCOG, Mendocino County, and the four incorporated cities within the County, including Ukiah. Most of the federal Economic Stimulus funding programs available for transportation projects in Mendocino County flow through MCOG. MCOG also helps support transportation activities of the Mendocino Transit Authority, North Coast Railroad Authority, local airports, and on state highways, among others. MCOG is responsible for preparing the Regional Transportation Plan, and funded projects are to be consistent with the Plan. Projects involve planning, capital improvements, rehabilitation and maintenance, public transit fleet replacement, and intermodal transit facilities.

MCOG's 2012 Regional Bikeway Plan has been prepared as a countywide document, but is also intended to guide efforts to improve bicycling and walking conditions at the local level. The plan incorporates proposals for bikeway improvements within all jurisdictions of Mendocino County into one document. The Plan identifies funding available for bicycle projects, including the State Bicycle Transportation Account, Transportation Enhancement Program, Regional Improvement Program/STIP Funding, Regional Surface Transportation Program Funds, 2% Local Transportation Fund Bicycle and Pedestrian Program, and Safe Routes to School Program.[4]

Private and Non-Governmental Support

Community-based non-profits, local businesses, and utilities should be considered as resources for direct and indirect support, including funding, for project and program activation and operations. Private investors may provide funding to local governments. For example, energy service companies (ESCOs) can finance the up-front investments in energy efficiency, reimbursed by the local government over a contract period. Private companies may finance solar power installations, and then recoup their investment by selling the resulting power to the building owner.

North Coast Energy Services

North Coast Energy Services (NCES) provides low-income energy assistance and weatherization services to seven California Counties, including Mendocino. NCES customers and clients receive an educational presentation covering general conservation issues, an explanation of the measures installed in the

[3] Mendocino County Energy Watch. Available at: http://mendoenergy.org/

[4] 2012 Mendocino County Regional Bikeway Plan, published June 2012. Available at: http://www.mendocinocog.org/pdf/Bikeway%20Plan/Final_2012_Bike_Plan.pdf

residence or building including future care and maintenance, an analysis of their energy usage, and recommendations for other measures. NCES has provided over 9 million dollars of LiHEAP and Department of Energy funds for home weatherization and rehabilitation and added more than $3.5 million to energy saving improvements to utility sponsored weatherization programs. For the past eight years NCES has been involved with the Housing Preservation program of Rural Development, U.S.D.A. (formerly Farmers Home Administration), providing approximately $1.5 million for major housing rehabilitation to low-income rural residents. This program provides energy reduction measures and a work method that prevents further erosion of the local housing stock.[5]

Renewable Energy Development Institute

The Renewable Energy Development Institute (REDI) is a 501c charitable, educational, and scientific corporation with the primary goal of encouraging widespread use of renewable energy for the public benefit. REDI operates several programs, including: Home Energy Link Program (HELP), provides affordable assistance to install energy-efficient features and reduce energy and heating costs for income-eligible local residents; Small Business Energy Alliance (SBEA), an incentive program that links small businesses and other entities in the region to energy efficiency improvements, funding by California ratepayers and local grants; Economic Localization/Energy Loan Fund (ELF), a micro-loan program to help people with the capital costs of energy-related improvements; Renewable Energy Education, including classes, hands on workshops, conferences and multimedia library archive project; and other programs.[6]

CEQA Project Review

Under the California Environmental Quality Act (CEQA), the effects of GHG emissions should be considered a potentially significant environmental impact. In addressing climate change, CEQA provides a useful mechanism for local agencies to evaluate new development, but may also create inefficiencies for both agency staff and the applicant by assessing routine projects on an individual basis, rather than in the context of city planning. The CEQA Guidelines recognize this, and include a provision for streamlining the analysis of projects that are consistent with a more comprehensive plan for the reduction of GHG emissions (CEQA Guidelines, Section 15183.5). The City of Ukiah Climate Action Plan meets the requirements of CEQA Guidelines Section 15183.5(b)(1) as a plan that analyzes cumulative GHG impacts. The Climate Action Plan uses established protocols, methodologies and forecasts of existing and future land uses to quantify existing and projected future GHG emissions within the plan area. It also establishes a reduction target based on California State law (AB 32), and lays out policies, actions, and performance standards that the City will enact and implement over time to achieve that reduction target.

The Climate Action Plan includes GHG reduction measures that, if fully implemented, would achieve an emissions reduction target that is consistent with and supports the state-mandated reduction target embodied in AB 32. A development project would be consistent with the CAP if it is consistent with the CAP assumptions regarding the amount and type of future development, and is consistent with the GHG reduction measures identified in the CAP. Projects consistent with the CAP, including conformance with

[5] North Coast Energy Services. Available at: http://northcoastenergyservices.com/
[6] Renewable Energy Development Institute website. Available at: http://redinet.org/index.htm .

any performance measures applicable to the project, would not require additional GHG emissions analysis under CEQA Guidelines Sections 15064(h) and 1513.5(b)(2).[7]

In order to assist with determining project consistency with the CAP, a project consistency checklist has been developed, and is included below. The checklist is intended to provide individual projects the opportunity to demonstrate that they are minimizing GHG emissions, while ensuring that new development in the City will achieve its "fair share" of emissions reductions. The CAP provides a range of feasible measures and quantifies their effectiveness to demonstrate that the City's reduction target can be met. The project review checklist screens projects for important GHG reduction measures that, when implemented, will provide the City with confidence the project will not impede the City's ability to meet its 2020 GHG emissions target.

For the checklist to be valid, the City will ensure that total development through 2020 is consistent with the growth assumptions used to develop the GHG emissions forecasts in this plan. 2020 employment is projected to be 13,169 jobs in Ukiah, while 2020 housing units are projected to be 6,762.[8] If a project will result in total jobs or total housing units exceeding these projections, then it must undergo CEQA review for GHG emissions impact.

Table 5-3
Development Project Consistency Checklist

All Projects:
1. Applies to all projects not otherwise exempt under CEQA.
2. Project is consistent with General Plan.
3. Proposed use is consistent with the zoning ordinance.
4. Parking lots include shade trees that provide 50% shade coverage at 15 years of growth (excluding ingress/egress and truck loading/unloading areas).
Residential Projects:
1. Project is consistent with General Plan density.
2. Construction is designed and pre-wired for solar PV (or has solar PV system installed).[9]
3. A project located outside of the Downtown Zoning District shall demonstrate energy efficiency at least 15% beyond Title 24 (CalGreen Tier 1). (E.1.5 and E.1.6) or achieves LEED Silver certification (or higher).
4. Project unit count is consistent with the 2020 emission estimate assumptions, shown in Table 5-4. Note that the yearly number of units can be exceeded if the total number of units in 2020 is equal to or below the 2020 estimate.
Commercial Projects:
1. A project located outside of the Downtown Zoning District shall meet one of the following conditions:
a. Located within ¼ mile of a transit stop;
b. Is served by Class III or better bicycle route, and includes secure bicycle parking and showers/locker;[10]

[7] If there is substantial evidence that the effects of a particular project may be cumulatively considerable, notwithstanding the project's compliance with the CAP, CEQA requires that an EIR be prepared.

[8] From the Mendocino Council of Governments (MCOG) traffic model used to estimate future vehicle miles traveled (see Appendix A, Table A-1)

[9] The added cost is minimal, and can result in big cost savings when solar PV is installed. The primary impact is to the design stage, which must accommodate space for inverters and disconnects near the main service panel. Added material cost is limited to running electrical conduit from the roof to the main service panel, and from the main service panel to the future location of the inverter.

c. Offers incentive (preferred parking, financial reimbursement etc.) for carpool

d. Operates vanpool program;

e. Have electric recharge stations.

2. A project outside of the Downtown Zoning District shall demonstrate energy efficiency at least 15% beyond Title 24 (CalGreen Tier 1). (E.1.5 and E.1.6) or achieves LEED Silver certification (or higher).

3. Landscaping complies with state requirements for water-efficient landscaping.

Table 5-4

Estimated Future Housing Units

Year	Estimated Housing Units[1]	Reported Units Per DOF[2]
2010	6523	6488
2011	6545	6491
2012	6567	6523
2013	6589	6523
2014	6611	
2015	6634	
2016	6657	
2017	6679	
2018	6702	
2019	6724	
2020	6747	

(1) Number of housing units assumed in GHG emissions estimates.
(2) Number of actual units as reported by California Department of Finance, Demographics Research Unit Report E-5, May 10, 2013.

[10] As guidance, the City recommends meeting the minimum criteria for LEED Sustainable Sites (SS) credit 4.2 for bicycle storage and changing rooms: For new commercial buildings, bike racks must be provided for 5% or more of all building occupants measured during peak use, and showering facilities must be provided; For residential buildings, there must be covered facilities for bike racks/storage for 15% of the occupants, and showering facilities are not required.



6 Preparing Ukiah for Climate Change

Overview

This chapter presents an overview of the impacts Ukiah is expected to experience due to projected changes in the climate, and what the City can do to begin preparing for them. Despite serious efforts by Ukiah and the State of California to reduce GHG emissions, changes in our climate cannot be avoided entirely over the long term. Even if GHG emissions were reduced to pre-industrial levels today, the GHG emissions that have already been added to the atmosphere will continue to warm the planet for centuries. While mitigation is still the most cost-effective approach to preventing long-term catastrophic impacts of climate change, adaptation efforts are needed to increase the resilience of communities and natural resources to changes expected over the next few decades.

The State of California's planning priorities have increasingly emphasized climate change as a top priority – both the mitigation of GHG emissions and adaptation to a climate already exhibiting changes. This policy shift is likely to be articulated as a priority in new State guidance and grant programs that will be released in the next six months and beyond.

Expected Local Impacts

In California, anticipated climate change impacts include sea level rise; increased periods of drought; and more frequent extreme weather events, including heat waves and severe storms. Secondary effects include projected inundation of the shoreline; more frequent and severe flooding; more frequent and severe wildfires on the urban fringe; a less reliable water supply; altered agricultural productivity; increased incidence of disease and mortality (both from effects of heat waves and from changing patterns of disease distribution); and disruption of local ecosystems.

The recently published *California Planning Adaptation Planning Guide: Understanding Regional Characteristics (July 2012)*[31] designates climate impact regions based on county boundaries in combination with projected climate impacts, existing environmental setting, socioeconomic factors, and regional designations. The City of Ukiah and Mendocino County are located within the North Coast climate impact region. As discussed in

Chapter 2 of this Climate Action Plan, *Climate Change Background and Regulatory Setting*, the *Adaptation Planning Guide* identifies the following climate change impacts.

Temperature increases. January temperatures are predicted to increase by about 2 degrees Fahrenheit by 2050 and up to 5 degrees Fahrenheit by the year 2100 within the North Coast climate impact region. July increases in average temperatures are anticipated to be 3 degrees Fahrenheit and 6 degrees Fahrenheit by the year 2100.

Reduced precipitation and water supply. The North Coast region is expected to experience a subtle decrease in precipitation in most areas throughout the century. The City of Ukiah is projected to see approximately a 10 % decrease in annual precipitation by 2050, and a 20% decrease by 2011. Reduced precipitation will adversely impact the water supply of the City, region, and State. Moreover, in the eastern, higher-elevation portion of the North Coast region, March snow levels will drop to almost zero by the 2090s, a decrease of 2 to 10 inches from 2010 levels. In areas with currently little snow (less than 3 inches), such as Ukiah, accumulated snowfall is projected to be near zero by 2050.

Increased wildfires. The North Coast region is projected to experience substantial increase in fire risk. By 2050, the region will experience modest increases in annual area burned. By 2100, the projected fire risk increases dramatically, with up to eight times the current annual area burned in parts of Mendocino County. Northern Mendocino County is projected to have up to 2.5 times greater wildfire frequency. Wildfire threatens the forestry industry and the property and safety of residents. The projected wildfire frequency is a considerable change from current conditions, meaning communities are less likely to be accustomed to the risks of fire and the measures required to address them. Air pollution from wildfires is of particular concern for the elderly and children under the age of five, because it results in eye and respiratory illnesses, and can exacerbate asthma, allergies, chronic obstructive pulmonary disease (COPD), and other cardiovascular diseases.

Public health and heat. Ukiah is not projected to see a large increase in the number of heat waves, defined regionally as five consecutive days with temperatures as high as 93°F. Little change is expected by 2050 with possibly one to three more heat waves projected in the region. By 2100, projected heat waves are more variable, with predictions of between two and eight more heat waves per year. However, when heat waves do occur, vulnerable populations in Ukiah may be severely affected because of a current lack of adaptive capacity having to do with historically milder temperatures. Frequent heat waves can have the greatest impact on the elderly and children less than five years of age. Mendocino County is one of the state's counties with the highest proportion of elderly living alone.

Adaptation Planning Approach

Effective adaptation planning and management entails dealing with uncertainty. Adaptation is likely to be a long-term process, including immediate action when necessary and allowing adjustments to changing conditions and new knowledge. Effective public engagement and education is critical, along with an inclusive planning process that ensures the resulting actions are feasible and widely accepted. Adaptation will likely be an ongoing process of planning, prioritization and specific project implementation. It is generally accepted that the next few decades provide a period of opportunity to develop adaptation plans and actions.

Five important steps to effective adaptation planning are summarized below:

- Increase Public Awareness; Engage and Educate the Community

Local outreach campaigns to build awareness of the dangers to public health and the benefits of planning, and to promote low-cost and low-GHG adaptation strategies. It is critical that the public understand the magnitude of the challenge and why action is needed. The planning process should be inclusive of all stakeholders. These efforts should leverage similar efforts undertaken at the regional, state, and federal levels.

- Assess Vulnerability

Perform a detailed vulnerability analysis to assess potential climate change impacts to infrastructure, local economy, and natural systems. Both short-term and long-term adaptation strategies should be identified. Level of risk can be categorized in terms of likelihood of damage within the forecasting period and the severity of the damages. Understanding vulnerability to climate change impacts is critical to developing effective adaptation strategies. The vulnerability assessment can also provide a framework for agency and community education and participation, feed into other planning documents, and identify funding needs.

- Establish Goals, Criteria and Planning Principles

Engage with stakeholders to establish planning priorities, decision criteria, and build community support for taking action. Rank physical and natural assets for preservation efforts. Where possible, look for situations where a mitigation action has adaptation co-benefits (e.g., planting trees to reduce urban heat islands while sequestering carbon and providing habitat).

- Develop Adaptation Plan

Identify specific strategies, develop cost estimates, and prioritize actions to increase local resilience of City infrastructure and critical assets, including natural systems like wetlands and urban forests. Look for synergies between natural processes and engineering solutions. An adaptation plan should include a prioritized list of actions (e.g. projects), with a timeline, capital expenditure plan, and a framework for monitoring and adaptive management.

- Ongoing Monitoring and Adaptive Management

Reassess climate change vulnerabilities on a regular basis and modify actions accordingly. This includes monitoring the effectiveness of current policies, strategies and actions, and keeping up with changing science, funding opportunities, and regulatory actions.

Adaptation Planning Strategies

In lieu of conducting a detailed vulnerability assessment, the City has identified the following strategies and actions to consider implementing as it begins planning for climate change adaptation. These strategies and actions are consistent with those identified in the *California Adaptation Planning Guide: Identifying Adaptation Strategies*. While many of the strategies and actions identified in Chapter 4 of this Climate Action Plan contribute to the global effort to prevent further climate change, the adaptation strategies below prepare Ukiah residents and businesses to deal with future climate change impacts. It should be noted that many GHG reduction measures identified in this document also provide adaptation benefits. For example, water conservation, energy efficiency, and increasing the number of urban trees are all strategies with co-benefits that will help Ukiah prepare for climate change impacts.

Impact: Temperature Increases

Strategy 1: Prepare for increases in average temperatures.

Co-benefits: Lower energy demand and bills; lower operating costs of businesses; improved air quality; a safe and healthy community.

Action 1.1: Continue to plant shade trees in new parking lots and other large, paved areas of the City to reduce heat island effects.

Action 1.2: Educate developers and the public on the use of cool roofs and reflective surfaces to reduce heat island effects.

Action 1.3: Develop a heat response plan, and educate the public on the location of designated "cooling centers."

Impact: Reduced Precipitation and Water Supply

Strategy 2: Preserve existing water sources and prepare for variable water supplies.

Co-benefits: Improve water supply reliability; protect water quality.

Action 2.1: Increase capacity for community water storage.

Action 2.2: Pursue funding to implement water reclamation and reuse projects.

Action 2.3: Protect open space areas that are being used for recharging groundwater or have the potential to be used for recharge.

Impact: Increased Risk of Wildfires

Strategy 3: Prepare for increasing numbers of wildfire events.

Co-benefits: Better protection of human health and property; potentially lower insurance premiums.

Action 3.1: Refine emergency preparedness procedures and response to wildfires.

Action 3.2: Partner with regional agencies to monitor and track forest and rangeland health, and susceptibility to fire.

Action 3.3: Develop, adopt, and implement integrated plans for mitigating wildfire impacts in wildland-urban interface areas.

Action 3.4: Encourage 'Fire Safe Design' of new construction and landscape practices.

Action 3.5: Consider prescribed burning as a fuel-reduction tool and coordinate smoke management with the Mendocino County Air Quality Management District.

Impact: Public Health

Strategy 4: Ensure public health hazards are minimized for all segments of the population.

Co-benefits: Improve public health; improve quality of life.

Action 4.1: Work with Mendocino County and other jurisdictions in the county to establish a climate change adaptation and public outreach and education program.

Action 4.2: Incorporate climate change adaptation into emergency preparedness and response plans such as the Mendocino County Multi-Hazard Mitigation Plan, the Mendocino County Emergency Operations Plan, the Ukiah Fire Department Master Plan, and other emergency operations plans to address public health impacts.

Action 4.3: Identify vulnerable communities to various public health impacts associated with climate change, and ensure that Ukiah emergency operations plans address these communities.

Action 4.4: Work with the Mendocino County Air Quality Management District to improve air quality and minimize negative health effects associated with rising temperatures, such as increased ozone concentrations.

Action 4.5: Continue to educate the public on the benefits of disease vector control to protect the health of Ukiah residents.

Impact: Reduced Agricultural Productivity and Food Supply

Strategy 5: Promote local food production and continue to promote conservation of local and regional agricultural land.

Co-benefits: Support local economy; preservation of natural resources.

Action 5.1: Allow and support community gardens and local farmers markets.

Action 5.2: Allow by right beekeeping and backyard chicken coops

Action 5.3: Work with local water agencies and area farmers to improve agricultural water efficiency.

Impact: Biodiversity and Habitat

Strategy 6: Preserve biodiversity and habitats.

Co-benefits: Conserve natural resources.

Action 6.1: Identify and protect locations where native species may shift or lose habitat due to climate change impacts.

Action 6.2: Collaborate with agencies managing public lands such as the Department of Fish and Wildlife to identify, develop, and maintain corridors and linkages between undeveloped lands.

Impact: Infrastructure

Strategy 7: Respond to potential impacts on public infrastructure.

Co-benefits: Lower energy demand and bills, water conservation, community safety.

Action 7.1: Assess climate change impacts on public infrastructure to determine threats to public health, public safety, and the local economy.

Action 7.2: Integrate climate change impacts into infrastructure planning and operations.

31 California Emergency Management Agency and California Natural Resources Agency. California Adaptation Planning Guide, Understanding Regional Characteristics, July 2012.

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7 Conclusion

This Climate Action Plan represents a significant step towards reducing future GHG emissions in the City of Ukiah. Ukiah is well positioned to reach its 2020 reduction target of 15 percent below baseline levels with implementation of the strategies and actions presented in Chapter 4. Local leadership, in conjunction with community engagement and initiatives, will help reduce energy and water use, reduce waste generation, and result in more efficient mobility and land uses. Implementation of this Climate Action Plan will not only reduce GHG emissions, but it will also save residents and businesses money, promote economic development, and improve the quality of life for Ukiah residents and workers.

Because Ukiah is on track to meet its 2020 reduction target with relative ease, the City is in a strong position to begin planning for deeper GHG reductions further out into the future. In particular, the City will now consider GHG emissions as a key consideration in its long-term land use and transportation planning, anticipating a post-2020 regulatory environment and helping the state toward its long-term GHG reduction goals. Ukiah has the opportunity to be a leader among California cities, utilizing progressive thinking and best practices that include consideration of GHG reductions in all City planning decisions.

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Appendix A
GHG Inventory Methodology

ESA



A GHG Inventory Methodology

This appendix describes the methodology used to develop the City of Ukiah Climate Action Plan (CAP) 2005 baseline and 2010 updated inventory of greenhouse gas (GHG) emissions for the greater community and for municipal (i.e., city government) operations.

The purpose of the GHG inventory is to identify sources, distribution, and overall magnitude of GHG emissions that occur within the City and/or are caused by the community member activities. The inventory will enable policy makers to identify opportunities for GHG emissions reduction in the residential, commercial, industrial, and municipal sectors within the community.

The City of Ukiah GHG Inventory was developed using standards established by the ICLEI U.S. Community Protocol (v1.0)[1] and the Local Government Operations Protocol (LGOP) v.1.1.[2] ICLEI has worked with the California Air Resource Board (CARB), BAAQMD, and other state and regional agencies to develop standardized methods for inventorying community emissions. ICLEI, along with CARB and the Climate Registry (TCR), has also co-developed methods for quantifying and reporting GHG emissions from local government sources, which have been incorporated into the LGOP.

In keeping with these protocols, ESA's process for developing a GHG inventory is:

1. Set organizational boundaries
2. Set operational boundaries
3. Identify sources of emissions
4. Collect data on emissions for a representative period of time
5. Calculate GHG emissions from data using robust emissions factors
6. Create an inventory of CO2e emissions that is complete, transparent, and accurate.

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[1] U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, version 1.0, ICLEI, published October 2012. Available at: http://www.icleiusa.org/tools/ghg-protocol/community-protocol

[2] LGOP version 1.1, published May 2010, available at: http://www.theclimateregistry.org/resources/protocols/local-government-operations-protocol/

Establishing the boundaries of an emissions analysis is an important first step in the GHG inventory process. A city exerts varying levels of control or influence over the activities occurring within its borders. At the minimum, community-wide GHG inventory should be defined broadly enough to include all emissions sources that may be significantly influenced by local government actions. These sources tend to be those that are affected by land use decisions, municipal codes, and General Plan policies, and correspondingly are included in a city's GHG reduction measures. In general, the inventory should encompass sources that are within the purview of the city's discretionary actions and regulatory authority, including sources of indirect emissions that can be influenced by the city policies or programs, such as water conservation or waste reduction.

Ukiah's Organizational Boundary

Setting an organizational boundary for a GHG inventory involves identifying the facilities and operations that are to be included. The ICLEI U.S. Community Protocol (2012) defines the organizational boundary as the boundary that determines the operations owned or controlled by the reporting entity, which depends on the consolidation approach taken.

The City of Ukiah's 2005 and 2010 community-wide inventories encompass the GHG emissions resulting from activities taking place within the City's geopolitical boundary, where the local Ukiah government has significant direct or indirect influence. The 2005 and 2010 municipal operations inventories encompass the GHG emissions resulting from actions governed directly by the local government, such as municipal buildings, vehicle fleets, and streetlights.

Ukiah's Operational Boundary

The operational boundary is the sum of all sources of direct and indirect emissions and associated activities that are included in the organizational boundary. The 2005 and 2010 Ukiah community-wide inventories include GHG emissions (carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) from the following sectors. Other GHGs (e.g., industrial gases including hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulphur hexafluoride [SF_6]) are very difficult to quantify and are typically not significant contributors of emissions within a City like Ukiah, and were therefore not included in this inventory.

Community-wide Inventory

For community-wide emissions, the ICLEI U.S. Community Protocol breaks down emissions into two categories.

- Sources: Physical processes inside the jurisdictional boundary that release GHG emissions into the atmosphere (e.g., combustion of gasoline in transportation; combustion of natural gas in electricity generation; methane emissions from a landfill).
- Activities: The use of energy, materials, and/or services by members of the community that result in the creation of GHG emissions either directly (e.g., use of household furnaces and vehicles with internal combustion engines) or indirectly (e.g., use of electricity created through combustion of fossil fuels at a power plant, consumption of goods and services whose production, transport and/or disposal resulted in GHG emissions).

The community-wide inventory includes emissions from the following sectors. As shown below, emissions from most sectors derive from multiple sources and activities:

- Commercial/Industrial Energy: Direct stationary emissions from combustion of natural gas (source and activity), and indirect emissions from the use of electricity by the community (activity);
- Residential Energy: Direct stationary emissions from natural gas combustion(source and activity), and indirect emissions from purchased electricity (activity);
- On-Road Transportation: Emissions from on-road gasoline- and diesel-powered vehicles (source and activity);
- Off-Road Transportation: Emissions from off-road lawn and garden equipment, construction equipment, industrial equipment, and light commercial equipment (activity);
- Agriculture: Emissions from off-road gasoline- and diesel-powered agricultural vehicles (activity);
- Generated Solid Waste: Indirect methane (CH_4) emissions from the anaerobic decomposition of organic material sent to landfill by the community (source);
- Wastewater Treatment: Total Indirect process emissions and fugitive emissions from wastewater treatment processes at the City-operated Wastewater Treatment Plant (activity);
- Water Conveyance: Emissions generated by electricity used in the transport of water (activity);
- Stationary Sources: Emissions generated by the combustion of fossil fuels other than utility-provided natural gas within the community (source); and
- Landfill: Indirect methane (CH_4) emissions from the anaerobic decomposition of organic material sent to the (now closed) City-operated landfill (activity).

Emissions from sources not subject to significant influence by the community were not included in the inventory, such as the upstream impacts of materials used by the community, since the local government has limited means to influence community material uses. The community inventory also excludes emissions sources that meet the following criteria:

- Very small or insignificant sources: This includes sources such as propane-fired cooking grills or acetylene welding torches that contribute very little in terms of overall emissions, and for which accurate and complete data is difficult to obtain. In general, sources can be excluded from the analysis (e.g., are “de minimis”) if, when combined, the excluded emissions from them total less than 5% of the total emissions inventory.
- Emissions that are prohibitively difficult to track with accuracy or lack necessary data to calculate: This criteria is especially relevant where the science is still evolving or the data may not be available (e.g., non-combustion industrial emissions sources such as the use of hydrofluorocarbons).
- Sources located largely outside the jurisdiction’s boundaries, and outside its control or influence: This includes transportation fuel used by intercity air and rail traffic.

Municipal Operations Inventory

For municipal emissions, the LGOP divides the operational boundary into three different scopes, defined as follows:

- Scope 1 emissions are those that come from sources that are owned or controlled by the reporting entity. Such sources include stationary emitters like furnaces and boilers, and mobile emitters like vehicles and construction equipment.
- Scope 2 emissions are indirect GHG emissions related to the consumption of purchased energy (i.e., electricity) that is produced by third-party entities, such as power utilities.
- Scope 3 emissions are other indirect GHG emissions not covered by Scope 2 that are associated with community activities. For a community inventory this generally includes emissions occurring

upstream or downstream of a community activity, such as the methane emissions resulting from degradation of the community's solid waste deposited at a landfill outside of city limits; or the electricity used to pump water to the City from upstream reservoirs. Quantification and reporting of Scope 3 emissions is generally considered optional, but including them in a community-wide inventory is appropriate where there is local control over an activity that has an indirect emissions reduction impact, such as diverting waste from landfills.

The 2005 and 2010 municipal operations inventories include emissions from the following sectors:

- Natural Gas: Direct stationary emissions from natural gas combustion (Scope 1) from building and facilities, excluding from the Wastewater Treatment Plant;
- Electricity: Indirect emissions from purchased electricity for buildings, facilities (including the airport), streetlights, traffic lights, and water pumps operated by the City (Scope 2);
- Vehicle Fleet: Direct emissions from fuel combustion in municipal fleet vehicles (Scope 1);
- Generated Solid Waste: This sector comprises solid waste sent to landfill from government-owned and/or operated facilities (Scope 3);
- Employee Commute: Emissions from the fuel combustion in employee-owned vehicles used by municipal staff travelling to and from work (Scope 3);
- Stationary Sources: Emissions from combustion in stationary generators and other equipment operated by the City government (Scope 1);
- Wastewater Treatment: Indirect process emissions and fugitive emissions from wastewater treatment processes (Scope 3), and direct stationary emissions from natural gas combustion (Scope 1), at the City-operated Wastewater Treatment Plant; and
- Landfill: Indirect methane (CH_4) emissions from the anaerobic decomposition of organic material sent to the (now closed) City-operated landfill (Scope 1).

Emissions Quantification Methodology

ICLEI and the LGOP identify calculation-based methodologies as the most appropriate technique for quantifying GHG emissions, following the basic formula:

GHG Emissions = Activity Data x Emissions Factor

Activity data are the relevant measurements of energy use or other processes that are associated with the emission of GHGs, such as metered annual energy consumption (kWh of electricity and therms of natural gas).

Emission factors are calculated ratios relating GHG emissions to a proxy measure of activity by emissions source. The inventories focus on the three GHGs most relevant and significant to City Government policymaking: CO_2, CH_4, and N_2O. These gases comprise the majority of GHG emissions from the community and city government operations. Most GHG reporting protocols also include methods for estimating three additional GHGs: HFCs, PFCs, and SF_6. However, these GHGs, largely represent fugitive emissions that leak from equipment, are generally not included in a community or city government inventory because the data needed to quantify them is typically incomplete or difficult to obtain.

Community-wide Inventory

Commercial/Industrial and Residential Energy Emissions

Commercial/industrial and Residential energy activity data for 2005 and 2010 consisted of electricity consumption and metered natural gas use.

PG&E provided community-wide natural gas data, in therms, for both years. Direct emissions from natural gas combustion were calculated using standard emission factors for natural gas published by the LGOP.

The City of Ukiah Finance Department (Department) provided community-wide electricity consumption in megawatt hours (MWh) for both 2005 and 2010. The Department also provided a breakdown (by percentage) of the various sources of electricity that contributed to the City's electricity portfolio for each year. This included electricity generated from the following sources:

- Renewables (Biomass and waste, geothermal, small hydroelectric, solar and wind)
- Coal
- Large Hydroelectric
- Natural Gas
- Nuclear

This mix includes electricity generated by the City-operated Lake Mendocino Hydroelectric plant, as well as electricity purchased from individual suppliers including wholesale power suppliers and PG&E. Renewable energy generation and hydroelectric plants provide approximately 80% of Ukiah's power. Indirect emissions from electricity generation were calculated using energy source-specific emission factors,[3] and were adjusted to include emissions from transmission and distribution. Total electricity use was assumed to reflect a transmission and distribution loss of 3.5 percent, based on correspondence with the City's Electric Utility Director.

Transportation (On-road and Off-road) Emissions

As with many cities, vehicle travel in Ukiah is the City's largest single source of GHG emissions. Most methods for estimating transportation emissions are based on vehicle miles traveled (VMT). Community-wide VMT estimates are highly dependent on the accounting rules and analytical tools used.

For Ukiah, Fehr & Peers provided estimates of VMT for on-road vehicular transportation based on the Mendocino Council of Governments (MCOG) travel demand model and origin-destination calculation methods.[4] VMT data were provided for 2010, and future projections were provided for the years 2020, 2030, and 2035. 2005 VMT was conservatively estimated by assuming VMT was the same in 2005 as it was in 2010. CARB's EMFAC2011 model was used to calculate 2005 base year and 2010 CO_2 emission factors. CH_4 and N_2O emissions were calculated with default vehicle mix values and emission factors from ICLEI's U.S. Community Protocol.

To estimate mobile off-road emissions, non-point source off-road emissions were obtained from CARB's OFFROAD2007 Vehicle Model for all of Mendocino County. Off-road emissions sources include lawn and garden equipment, construction equipment, industrial equipment, and light commercial equipment. Emissions were

[3] For this inventory, renewable sources of electricity were assumed to have an emissions factor of zero.

[4] Quantifying emissions associated with the use of travel by the community involves estimating emissions associated with the entire length of in boundary and trans boundary trips, and allocating a portion of those emissions to the community for which emissions are being reported. See Appendix B for more information about VMT calculations for Ukiah.

apportioned to Ukiah based on the City's population as a percentage of overall County population (note: except for lawn and garden equipment, which was apportioned based on number of households).

Agricultural Equipment

CARB's OFFROAD2007 Vehicle Model provided agriculture off-road vehicle emissions for all of Mendocino County for 2005 and 2010. Emissions were apportioned to Ukiah based on the City's percentage of total County population.

Solid Waste Generated

Calrecycle provided community-wide solid waste in annual tons for 2005 and 2010.[5] CH_4 emissions from solid waste were calculated using EPA's LandGEM software[6] using the following assumptions:

- 100-year timeframe for waste decomposition;
- Landfill gas capture rate = 75%;
- Oxidation Rate = 10%
- LandGEM parameters:
  - Methane generation rate (k) = 0.04
  - Potential methane generation capacity (Lo) = 100
  - NMOC concentration = 4000
  - Methane content = 50%

Water Conveyance

Emissions from water conveyance were estimated based on historical water use and average electricity used to convey water from reservoir to tap. The Ukiah 2010 Urban Water Management Plan provides 2005 and 2010 estimates of annual water use in million gallons (MG) of water consumed. The annual electricity required to transport water was calculated using the Northern California Average Conversion factor of 1,811 kWh/MG.[7] Associated GHG emissions were then calculated using a Ukiah-specific emission factor for local electricity that takes into account the City's diverse mix of electricity sources, and high percentage of renewable electricity.

Stationary Sources

The methodology for estimating emissions from stationary sources followed the U.S. ICLEI Community Protocol (2012). Stationary source emissions may include industrial, residential and commercial emissions sources.

For residential emissions, this inventory includes propane/liquefied petroleum gas (LPG) emissions. County-level energy consumption figures for other residential stationary sources (i.e. wood and fuel oil/kerosene) were unavailable from the U.S. Energy Information Administration (EIA). 2010 propane/LPG emissions were estimated based on EIA energy consumption and U.S. Census household data (number of homes utilizing propane/LPG). Propane/LPG consumption was converted into emissions using the LGOP emission factor for

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5 CRiS: CalRecycle Countywide, Regionwide, and Statewise Jurisdiction Diversion Progress Report

6 EPA's Landfill Gas Emissions Model (LandGEM version 3.02, released May 12, 2005) is available at http://www.epa.gov/lmop/publications-tools/

7 California Energy Commission: Refining Estimates of Water Related Energy Use in California. Available at: http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF

CO_2, CH_4, and N_2O emission. Year 2005 emissions were backcast using an average of population and household growth from 2005 to 2010.

Industrial emissions from stationary sources were determined to be *de minimis* based on correspondence with the Mendocino Air Quality District (Chris Brown), and were thus not calculated. Commercial stationary source emissions were not estimated because local-level building characteristics, which are required for estimates of commercial stationary source emissions, were not attainable.

Wastewater Treatment

Ukiah owns and operates a Wastewater Treatment Plant (WWTP). A WWTP supervisor provided information regarding plant processes, standard cubic feet of gas flared from March to December of 2010, and the fraction of CH_4 in biogas (65%). The Ukiah 2010 Urban Water Management Plan provided the 2005 and 2010 population served by the WWTP.

Wastewater emissions were calculated following ICLEI U.S. Community Protocol (2012) methodology, and were based on process data and WWTP service population within Ukiah City boundaries. The nine months of 2010 gas data were extrapolated to represent the entire calendar year, and 2005 levels were estimated commensurate with local population, housing, and employment levels. GHG emissions from wastewater include stationary CH_4 and N_2O stationary emissions from the combustion of digester gas, process N_2O emissions from plant processes, and fugitive N_2O emissions from effluent discharge.

City-operated Landfill

Emissions were quantified for indirect methane (CH_4) emissions from the anaerobic decomposition of organic waste-in-place at the City-owned landfill, (now closed) for years 2005 and 2010. Although the landfill stopped accepting waste in 2000, waste-in-place continues to generate emissions, at annually decreasing rates. The California Air Resource Board's Landfill Emissions Model was used to calculate emissions. The City of Ukiah provided an estimate for total closure year waste-in-place for emissions model inputs.

Municipal Operations Inventory

Electricity

The City Finance Department provided activity data for electricity that includes electricity used in all buildings and facilities, streetlights, and water supply operated by the City of Ukiah, for both 2005 and 2010. This includes electricity used by City-owned and operated buildings at the Ukiah Municipal Airport. Indirect emissions from electricity generation were calculated using a weighted emission factor based on the breakdown of electricity sources within the City's electricity portfolio in 2005 and 2010.

Natural Gas

PG&E provided activity data for natural gas that includes metered natural gas usage for all buildings and facilities operated by the City, including the Ukiah Municipal Airport and the WWTP, for both 2005 and 2010. Emissions from natural gas consumption were calculated using the PG&E emission factor for CO_2, and the LGOP emission factors for CH_4 and N_2O.

Vehicle Fleet

This sector includes emissions from on-road and off-road fuel consumption from vehicles operated by the City of Ukiah, including the City vehicle fleet. The City provided fuel consumption data for gasoline and diesel vehicles for years 2008 and the first seven months of 2012, which was interpolated to estimate fuel consumption for calendar year 2010. Emissions were calculated using CO_2, CH_4, and N_2O emission factors from the LGOP for gasoline and diesel vehicles. Miles per gallon (MPG) factors for gasoline and diesel vehicles were taken from EMFAC 2011 software Mendocino County model run for year 2010. Year 2005 emissions were backcast using the growth rate in City full-time-equivalent (FTE) workers from 2005 to 2010.

Generated Solid Waste

This sector includes solid waste generated by the City government facilities that is sent to landfill. Emissions for the sector were estimated by apportioning community solid waste emissions based on the proportion of city full-time-equivalent (FTE) employees as a proportion of total City population, for years 2005 and 2010.

Employee Commute

This sector comprises emissions from fuel consumption from City government employee vehicle travel. The City conducted a survey to determine travel mode of City employees in 2012. The City collected data on vehicle type, model, make, and year, as well as annual mileage traveled. 2005 and 2010 emissions were back-cast from 2012 emissions levels based on the number of FTEs in each year.

Stationary Sources

Stationary source emissions include emissions from generators operated by the City government. The City provided recent (year 2011 and/or 2012) fuel consumption data for the five generators that burned fuel in 2005 and/or 2010, which were used as proxy data for calendar year 2010. Emissions were calculated from fuel consumption totals using LGOP emission factors for CO_2, CH_4, and N_2O. Year 2005 emissions were backcast using the growth rate in City full-time-equivalent (FTE) workers from 2005 to 2010.

City-owned Wastewater Treatment Plant

Emissions were quantified as described in the Community Wastewater Treatment sector (see above). However, since the municipal government maintains operational control of the Wastewater Treatment Plant, total Plant service population (rather than City population) was used for calculation purposes for this inventory. Year 2005 emissions were backcast using the growth rate in City full-time-equivalent (FTE) workers from 2005 to 2010.

City-owned Landfill

Emissions were quantified as described in the Community Landfill sector (see above).

2020 and 2030 Business-as-Usual Projections

Table 3 in the Ukiah GHG Inventory shows the growth proxies used project future emissions (for years 2020 and 2030) for community-wide and municipal operations, under business-as-usual conditions. Table A-1 shows the specific projections data used for City-wide population, housing, employment, and municipal staff. Annual

growth rates were derived for the periods 2005 to 2010 (to backtrack 2005 emissions when 2005 data was unavailable), as well as 2010 to 2020 and 2010 to 2030, to project future emissions for 2020 and 2030. The sources of data and numbers used are shown in Table A-1.

Table A-1: City of Ukiah Population, Housing, and Employment Projections Data and Growth Rates

Source	2005	2010	2020	2030	Annual Growth Rate, 2005-2010	Annual Growth Rate, 2010-2020	Annual Growth Rate, 2010-2030
Population (# of people)							
California Department of Finance	16,020	16,042	No data	No data	0.03%	N/A	N/A
Ukiah Urban Water Management Plan (UWMP)	No data	15,682	17,323	19,135	N/A	1.00%	2.01%
Employment (# of jobs)							
2010-2011 Mendocino County Economic & Development Profile[a]	7,080	6,700	No data	No data	-1.10%	N/A	N/A
Mendocino Council of Governments (MCOG) Model[b]	No data	12,007	13,169	13,075	N/A	0.93%	0.86%
Housing (# of households)							
California Department of Finance	6,389	6,482	No data	No data	0.29%	N/A	N/A
Mendocino Council of Governments (MCOG) Model	No data	6,512	6,762	6,752	N/A	0.38%	0.36%
Municipal Government Staff (full-time-equivalent employees)							
City of Ukiah Fiscal Year FTE Data[c]	163	171	183 [d]	195 [d]	0.96%	0.67%[e]	0.67% [e]

[a] Internal City labor force only

[b] Data provided by Fehr & Peers VMT Inventory Memo. See Appendix B1

[c] 2005 reflects fiscal year 2005-2006 data; 2010 reflects fiscal year 2010-2011 data

[d] Projected based on the estimated growth rate (0.67%)

[e] Estimated based on prior City full-time employee growth from the fiscal years 2000-01 to 2010-11

Three sectors did not use growth proxies represented in Table A-1: Agricultural Equipment, On-road Transportation, and Landfill. In boundary emissions from Agricultural Equipment were assumed to experience zero growth between 2010 and 2030. Future emissions for On-road Transportation were estimated using 2020 and 2030 VMT projections provided by Fehr and Peers, and emission factors from the EMFAC 2011 Model that do not include effects of the state-wide Low Carbon Fuel Standard (LCFS) and the Pavley Bill (AB 1493), which will reduce GHG emissions from automobiles. For the City-owned Landfill, the California ARB Landfill Emissions Tool was used to calculate emissions for 2020. Because the tool does not provide emissions out to 2030, 2030 emissions were estimated with the EPA's LandGEM software.

Appendix B1

Fehr & Peers, City of Ukiah Vehicle Miles of Travel Inventory

ESA

FEHR PEERS

MEMORANDUM

Date: November 19, 2012

To: Brian Grattidge, ESA

From: Kathrin Tellez, Tien-Tien Chan, and Dennis Lee, Fehr & Peers

Subject: City of Ukiah – Vehicle Miles of Travel (VMT) Inventory

SF12-0638

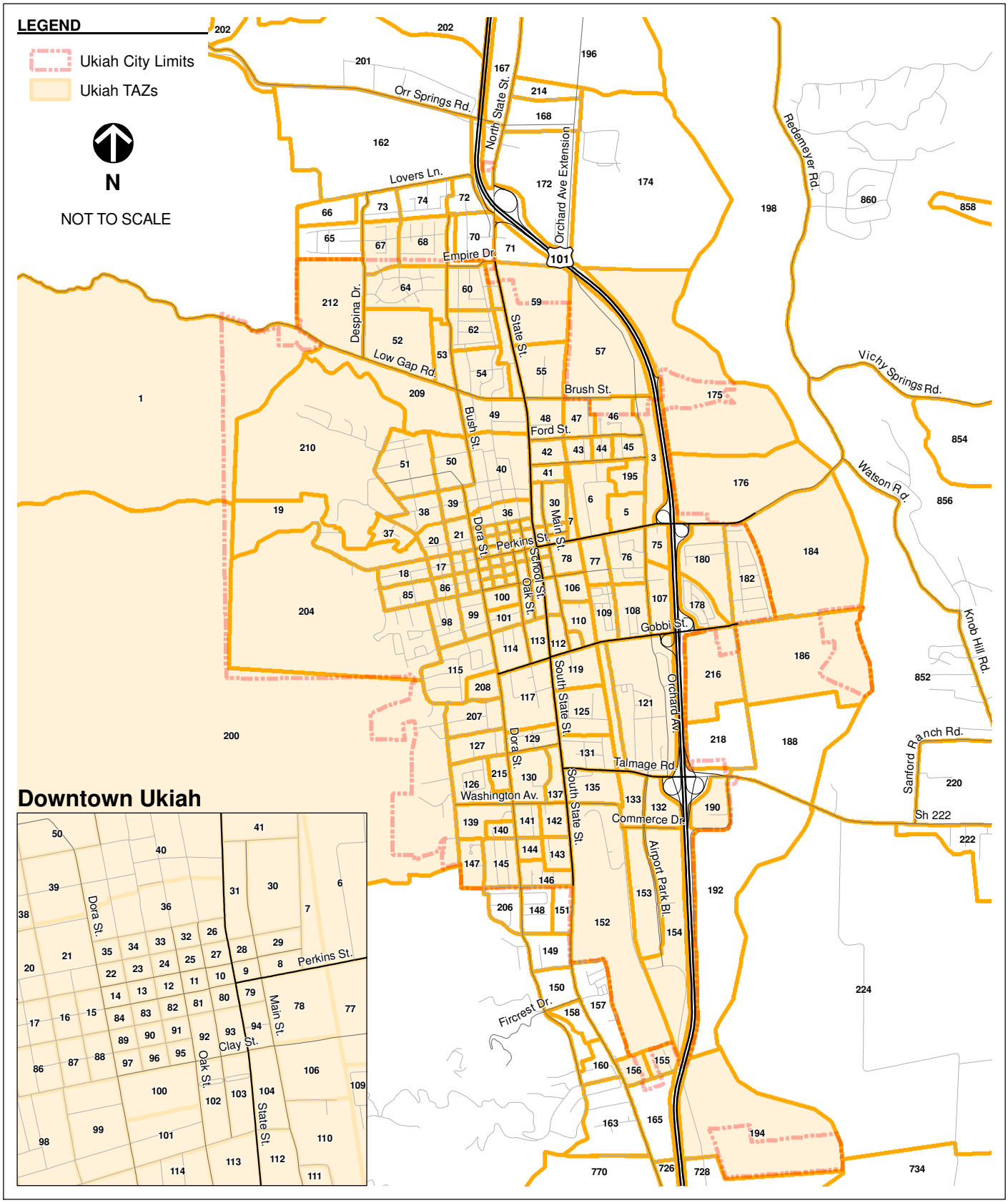
Fehr & Peers has prepared this memorandum describing the technical approach and results of a city-wide inventory of vehicle miles of travel (VMT) for the City of Ukiah Climate Action Plan (CAP) using the Mendocino Council of Governments (MCOG) travel demand model. Estimates of VMT were prepared for the 2009/10 baseline year and the three forecast years of 2020, 2030, and 2035.

MCOG TRAVEL DEMAND MODEL

The Mendocino Council of Governments (MCOG) travel demand model was used to develop VMT estimates. At the time the model was developed, City of Ukiah staff was heavily involved in developing the land use inputs for the model, and particular care was taken to ensure the accuracy of the information and reasonableness of the future forecasts.

LAND USE

Land use information within the MCOG model area is provided at the Traffic Analysis Zone (TAZ) level; the TAZs within the incorporated city boundary of Ukiah from the MCOG model are noted in **Figure 1**. Land use information is provided for a variety of land use types, including seasonal housing (or vacation homes), single and multi-family homes, and employment uses (agricultural, commercial, medical, industrial). Data for the TAZs located in Ukiah are summarized in **Table 1** for 2009/10, 2020 and 2030 for the various land use categories. For 2009/10, the data presented represents the land use total, while the 2020 and 2030 columns show the incremental growth. Land use data, both existing and future, were compiled during the MCOG travel demand model development and confirmed by City of Ukiah staff for this project.



FEHR PEERS

TRAFFIC ANALYSIS ZONES
UKIAH
FIGURE 1

TABLE 1
CITY OF UKIAH LAND USE DATA FROM MCOG MODEL

Land Use Type[1]	2009/10	Growth Increment	
		2020[2]	2030[3]
Seasonal Housing Units	15	0	0
Single Family Units	3,738	49	41
Multi-Family Units	2,759	201	199
K-8 Students	3,139	198	193
High School Students	1,978	125	122
College/University Students	100	0	0
Hotel Rooms	770	25	25
Agricultural and Winery Jobs	81	0	0
Retail Jobs	2,636	388	358
General Office Jobs	2,222	164	150
Medical Jobs	1,610	206	197
Entertainment Jobs	273	4	4
Restaurant Jobs	884	61	53
Industrial Jobs	1,679	43	40
Government Jobs	1,852	296	266

Notes:

1. Housing land uses are represented by the number of dwelling units, educational uses are represented by the number of students, and employment uses are represented by the number of jobs.
2. Represents the increment of growth between 2009/2010 and 2020.
3. Represents the increment of growth between 2021 and 2030.

Source: MCOG Model Land Use Inputs, November 2012.

Roadway Network

The future year models include roadway network improvements that are expected to be in place by 2020 and 2030, as summarized in **Table 2**. Roadway network improvements in the unincorporated areas of the County are noted in Table 2 as those improvements have the potential to affect travel patterns within the City of Ukiah.

TABLE 2
FUTURE ROADWAY IMPROVEMENTS

Roadway	Jurisdiction	Proposed Improvement	Year Built[1]
North State Street	Mendocino County	Widen from 2 to 4 lanes between US 101 and Lake Mendocino Drive	2020
Orr Springs Road	Mendocino County	Extend eastward from North State Street to Orchard Avenue Extension	2020
Orchard Avenue	Mendocino County	Extend northward from Ford Street to Orr Springs Road	2020
Orchard Avenue	Mendocino County	Extend northward from Orr Springs Road to Lake Mendocino Drive	2030
Orchard Avenue	Ukiah	Extend southward from current terminus to Talmage Road	2030
US 101 / Talmage Road (SR-222) Interchange	Ukiah	Reconfigure to partial cloverleaf interchange	2030
Clay Street	Ukiah	Extend eastward from Main Street to Leslie Street	2030
Hensley Creek Road	Mendocino County	Extend eastward from North State Street to Orchard Avenue Extension	2030

Notes:

1. "2020" means the improvement is included in both the 2020 and 2030 roadway networks. Actual year of construction could be any time between 2009/10 and 2020. Similarly, "2030" means the improvement is included only in the 2030 network, and actual year of construction could be any time between 2021 and 2030.

Source: *Final Model Development Report, MCOG Travel Demand Forecasting Model*, October 2010.

Minor changes were made to roadway functional classification in the City of Ukiah as per feedback from City staff. These changes are listed in **Table 3**.

TABLE 3
FUNCTIONAL ROADWAY CLASSIFCATION MODIFICATIONS

Roadway	Description	Previous Functional Class	Updated Functional Class
Dora Street	Firecrest Drive to Grove Avenue	Minor Collector	Urban Arterial
Washington Avenue	Dora Street to Helen Avenue	Major Collector	Local
Observatory Avenue	Dora Street to South State Street	Minor Collector	Local
Dora Avenue	Grove Avenue to Live Oak Avenue	Minor Collector	Local
Standley Street	Main Street to Dora Street	Minor Collector	Urban Arterial
Perkins Street	Main Street to Dora Street	Minor Collector	Urban Arterial
N. Oak Street	Henry Street to Low Gap Road	Local	Major Collector
Empire Drive	Bush Street to State Street	Minor Collector	Local
Brush Street	State Street to US 101	Major Collector	Local
Ford Street	State Street to Orchard Avenue	Minor Collector	Local
Clara Avenue	Mason to Orchard Avenue	Minor Collector	Local
Perkins Street	East of US 101 Ramp	Urban Arterial	Major Collector
Main Street	Gobbi Street to Marshall Street	Major Collector	Local
Clay Street	Main Street to Mason Street	Minor Collector	Local
School Street	Mill Street to Henry Street	Major Collector	Urban Arterial
Hastings Avenue	South State Street to Airport Road	Major Collector	Local
Commerce Drive	East of Airport Road	Major Collector	Local
Airport Park Boulevard	Talmage Frontage Road to Airport Road	Major Collector	Local
Hastings Frontage Road	Talmage Road to end	Major Collector	Local

Source: City of Ukiah Staff, response to data request, October 11, 2012

ANALYSIS PARAMETERS

The following presents the analysis parameters, including methods to calculate the VMT generated by land uses in the City of Ukiah for the base and forecast years.

VEHICLE MILES OF TRAVEL CALCULATIONS

The VMT inventory for Ukiah captures vehicle trips generated by land uses within the City; however, some trips may have an origin or destination outside of the City limits. Per the recommended calculation methods, VMT for Ukiah was calculated from the combination of the following trip lengths:

1. All Internal City-City (I-I) trips: All trips starting and ending in Ukiah.
2. One-half of External-Internal City (X-I) trips: One-half of trips with an origin outside of the City of Ukiah and a destination in Ukiah.
3. One-half of Internal City-External (I-X) trips: One-half of trips with an origin within the City of Ukiah and a destination outside of Ukiah.

Trips without an origin or destination in Ukiah are not included in the VMT estimates associated with activities in Ukiah, as the City has no control over the amount of through traffic on regional roadways such as US 101.

Forecast Years

The MCOG travel demand model was validated to 2009/10 conditions and is able to forecast to 2020 and 2030 conditions. Forecasts of 2035 conditions were made by extrapolating the growth rate between 2009/10 and 2030.

ANALYSIS RESULTS

The results of the VMT estimates using the MCOG travel demand model for the City of Ukiah are presented below.

Vehicle Miles of Travel

A summary of 2009/10, 2020, 2030, and 2035 daily VMT for the City of Ukiah are presented in **Table 4**. This table includes normalization of VMT households and by capita. **Table 5** shows the VMT estimates by 5-mph speed bin for each scenario year.

The results show that VMT is projected to increase between scenario years. This increase is expected as the number of residential units and employment opportunities within the City is planned to increase. VMT per Capita is also expected to increase, which is due to the projection of employment opportunities increasing in Ukiah at a higher rate than residential uses. Over the next 20 years, the number of residential units within the City is expected to increase by approximately 8 percent, while the number of jobs within the City is expected to increase by approximately 20 percent. As there were approximately 1.71 jobs per household in 2009/2010, it is likely that new employment opportunities will draw some workers from residential locations outside the City boundaries.

TABLE 4
CIYT OF UKIAH DAILY VMT CALCULATIONS

Scenario	Daily VMT	Households	Population[1]	Employment	VMT / Capita (Pop + Emp)
Year 2009/10[2]	399,199	6,497	16,113	11,237	14.6
Year 2020[2]	439,657	6,747	16,733	12,399	15.1
Year 2030[2]	488,514	6,987	17,328	13,467	15.9
Year 2035[3]	509,779	7,066	17,524	13,827	16.3

Notes:

1. Population calculated based on average household size from 2010 U.S. Census data.
2. Households and employment based on model land use; VMT based on model.
3. Households, employment, and VMT based on growth rates between 2009/10 and 2030 scenario years.

Source: Profile of General Population and Housing Characteristics: 2010 American FactFinder, U.S. Census Bureau; MCOG Model, as summarized by Fehr & Peers, November 2012.

This completes our VMT inventory for the City of Ukiah CAP. We look forward to working with the Project team to identify strategies that could be effective in reducing VMT growth. If you have any questions, please contact Kathrin Tellez or Tien-Tien Chan.

TABLE 5

CITY OF UKIAH DAILY VEHICLE MILES OF TRAVEL (VMT) DISTRIBUTION BY SPEED BIN

Speed Bin (miles per hour)	Vehicle Miles of Travel Estimates (Daily)							
	2009/10		2020		2030		2035	
	VMT	Percent of Total	VMT	Distribution (%)	VMT	Percent of Total	VMT	Percent of Total
0.0 – 5.00	0	0.0%	0	0.0%	0	0.0%	0	0.0%
5.01 – 10.00	76	0.0%	83	0.0%	87	0.0%	90	0.0%
10.01 – 15.00	18	0.0%	914	0.2%	2,097	0.4%	2,592	0.5%
15.01 – 20.00	2,707	0.7%	3,073	0.7%	4,600	0.9%	5,051	1.0%
20.01 – 25.00	38,552	9.7%	41,505	9.4%	48,146	9.9%	50,430	9.9%
25.01 – 30.00	45,226	11.3%	49,458	11.2%	52,411	10.7%	54,122	10.6%
30.01 – 35.00	85,836	21.5%	91,292	20.8%	95,696	19.6%	98,043	19.2%
35.01 – 40.00	22,057	5.5%	22,054	5.0%	23,429	4.8%	23,756	4.7%
40.01 – 45.00	14,289	3.6%	15,298	3.5%	17,672	3.6%	18,478	3.6%
45.01 – 50.00	2,170	0.5%	3,375	0.8%	12,797	2.6%	15,327	3.0%
50.01 – 55.00	142,864	35.8%	162,098	36.9%	175,524	35.9%	183,300	36.0%
55.01 – 60.00[1]	0	0.0%	0	0.0%	0	0.0%	0	0.0%
60.01 – 65.00	45,404	11.4%	50,506	11.5%	56,055	11.5%	58,591	11.5%
65.01 – 70.00	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	**399,199**	**100.0%**	**439,657**	**100.0%**	**488,514**	**100.0%**	**509,779**	**100.0%**

Notes:

1. Absence of VMT in the 55.01-60.00 mph speed bin is due to network assumptions and congested speed calculations. Congested speeds did not fall in this range.

Source: MCOG Model, as summarized by Fehr & Peers, November 2012.

Appendix B2

Fehr & Peers, City of Ukiah Quantitative Analysis of Strategies (2020 & 2030)

ESA

FEHR PEERS

MEMORANDUM

Date: July 12, 2013

To: Jeff Caton & Lesley Lowe, ESA

From: Kathrin Tellez and Tien-Tien Chan

Subject: City of Ukiah – Quantitative Analysis of Strategies (2020 & 2030)

SF12-0638

This memorandum documents the potential reduction in vehicle miles of travel (VMT) that are expected to occur with implementation of the City of Ukiah Climate Action Plan (CAP) by 2030. Existing and projected future conditions under the future Business as Usual (BAU) scenario were documented in our memorandum dated November 19, 2012 (attached). The Climate Action Plan scenario assumes implementation of candidate measures developed by the consultant team in collaboration with City staff and complied by ESA. The CAP strategies that have the potential to reduce vehicle miles of travel are documented within this memorandum.

CONCLUSIONS

The actual effectiveness of many of the CAP measures is dependent on factors outside the control of the City. To recognize this uncertainty, a range of expected reductions has been calculated. The CAP transportation measures reduce overall daily VMT in year 2020 between 3,500 to 11,000 miles (0.8 to 2.5 percent reduction), as compared to 2020 BAU scenario. In year 2030, the measures reduce overall daily VMT by 5,400 to 15,600 miles (1.1 to 3.2 percent reduction), as compared to the 2030 BAU scenario. In year 2020, CAP VMT per capita is estimated to range between 14.7 and 15.0, compared to a BAU scenario of 15.1. In year 2030, CAP VMT per capita is estimated to range between 15.4 and 15.7, compared to a BAU scenario of 15.9.

ANALYSIS METHODOLOGY

Based on the limitations of the regional MCOG travel demand model to respond to CAP transportation strategies, such as traffic calming and complete streets ordinances, the model was

not used to estimate VMT reductions from transportation strategies. Quantification was conducted using off-model tools and factors.

TDM+ is an off-model spreadsheet tool developed by Fehr & Peers and based on a major report, Quantifying Greenhouse Gas Mitigation Measures. This report, authored by the California Air Pollution Control Officers Association (CAPCOA) and Fehr & Peers, documents a groundbreaking and comprehensive set of guidelines for assessing and quantifying reductions in vehicle miles traveled resulting from a number of common TDM strategies. Fehr & Peers conducted an extensive literature review for the transportation related strategies addressed in that report to provide accurate and reliable quantification methods to be used throughout California. Working with BAAQMD, the evaluation methods were locally validated by comparison to the actual performance of trip reduction strategies in the San Francisco Bay Area. The TDM+ tool was applied to the transportation strategies identified for the City of Ukiah. The calculations were additionally refined to provide more accuracy based on the context of the strategy and environment.

CLIMATE ACTION PLAN VMT CALCULATIONS

The strategies developed by the Project team and listed in **Table 1** were applied to the TDM+ tool to estimate percent VMT reductions for year 2020 and year 2030. Detailed assumptions and calculations are documented in **Table A1**. As the implementation actions are in draft form and strategy detail will be determined in the future, we provided the estimated results using a range of effectiveness for both the 2020 and 2030 CAP scenario years. The low end of the range should be used for strategies that are based on encouragement and the higher range of effectiveness should be used for strategies that have an implementation plan or will be required.

Strategy TL1.1 Local Commute Trip Reduction utilizes a combination of the Commute Trip Program Voluntary and Mandatory from the TDM+ tool to estimate the range of effectiveness. Strategy TL1.2 Sustainable Growth Patterns utilizes a combination of TDM+ tool strategies (Pedestrian Network, Diversity, Parking Supply Limits, and Traffic Calming) to estimate the range of effectiveness. Calculations and assumptions are detailed in **Table A1**.

TABLE 1: TRANSPORTATION AND LAND USE STRATEGIES		
#	**GHG Goal/ Reduction Strategy**	**Implementing Action**
TL1.1	Local Commute Trip Reduction: Support local employer-based trip reduction programs to reduce single-occupancy vehicle travel to and from Ukiah.	Consider implementing local commute trip reduction requirements in the municipal code. Could require larger employers (50+ employees) to establish TDM programs to reduce single-occupancy vehicle trips. Can include 9/80 work weeks, carpooling, telecommuting, car sharing, bike sharing, shuttles, vanpooling, guaranteed ride home.
		Consider a coordinated TDM program with several large employers to share costs and also travel pool (e.g. vanpooling, carpooling and/or shuttles for the Medical Center and other key employment centers)
		As Staff and resources allow, develop a City Program (with incentives) to encourage employers to implement effective voluntary trip reduction programs.
		Promote telecommuting and alternative work schedules for City employees.
TL1.2	Sustainable Growth Patterns: Increase neighborhood density (including infilling), mixed-use developments, and increase community pedestrian-friendly design.	Consider adopting a Complete Streets Ordinance that directs the City to meet the needs of all of its transportation users.
		Continue to consider modifications to the municipal code to achieve smart growth objectives (i.e. increase density and mixed-use infill development)
		Implement SmartCode or form-based code to increase mixed use and pedestrian connectivity in urban core near transit.
		Consider requiring residential subdivision projects to provide for a certain percentage of below market rate housing
		Promote and encourage downtown revitalization and the vitality of small local businesses in the downtown core area.
		"Encourage "smart growth" development by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking."
		Implement traffic calming measures within the downtown core
		Promote and encourage clean energy and green jobs/industries within the City and in its Sphere of Influence.
		Develop a Plan for creating urban open spaces and natural resources enhancement to complement the compact infill development and mixed use growth strategy.

Source: ESA, 2013.

Table 2 presents the results of the transportation strategy reductions calculations. By year 2030, Strategy TL1.1 (Local Commute Trip Reduction) may see a 0.2 to 1.2 percent reduction in VMT and Strategy TL1.2 (Sustainable Growth Patterns) may see a 0.9 to 2.0 percent reduction in VMT. This results in an overall percent reduction in VMT of 1.1 to 3.2 percent. This is equal to a daily reduction of 5,400 to 15,600 vehicle miles.

TABLE 2: TRANSPORTATION STRATEGIES REDUCTION SUMMARY

	Year 2020 % VMT Reduction		Year 2030 % VMT Reduction	
Strategy	**Low**	**High**	**Low**	**High**
TL1.1 Local Commute Trip Reduction	0.1%	0.9%	0.2%	1.2%
TL1.2 Sustainable Growth Patterns	0.7%	1.6%	0.9%	2.0%
Total	0.8%	2.5%	1.1%	3.2%
Daily VMT Reduction	3,517	10,991	5,374	15,632

Source: Fehr & Peers, 2013.

Table 3 compares daily VMT per capita for the BAU scenarios to the CAP scenarios (which assume implementation of the transportation strategies). In year 2030, VMT per capita is estimated to be 15.4 to 15.7, slightly lower than the BAU scenario of 15.9 VMT per capita.

TABLE 3: UKIAH VMT PER CAPITA

Scenario	Daily VMT[1]	Population + Employment	VMT / Capita
Year 2009/10	399,200	27,350	14.6
Year 2020 BAU	439,700	29,132	15.1
Year 2020 CAP	428,700 – 436,100	29,132	14.7 – 15.0
Year 2030 BAU	488,500	30,795	15.9
Year 2030 CAP	472,900 – 483,100	30,795	15.4 – 15.7

Notes:
1. Daily VMT numbers are rounded.

Source: Fehr & Peers, 2013.

TRANSPORTATION STRATEGIES – ADDITIONAL DISCUSSION

Strategy TL1.1 Local Commute Trip Reduction (CTR)

The low and high range estimates of Strategy TL1.1 represent the both the comprehensiveness of the trip reduction program and whether the program is voluntary or mandatory. The CTR program will provide employees with assistance in using alternative modes of travel, and provide both "carrots" and "sticks" to encourage employees. The CTR program should include all of the following to apply the effectiveness reported:

- Carpooling encouragement
- Ride-matching assistance
- Preferential carpool parking
- Flexible work schedules for carpools
- Half time transportation coordinator
- Vanpool assistance
- Bicycle end-trip facilities (parking, showers and lockers)

Other strategies may also be included as part of a CTR program, including: new employee orientation of trip reduction and alternative mode options, event promotions and publications, flexible work schedule for all employees, transit subsidies, parking cash-out or priced parking, shuttles, emergency ride home, and improved on-site amenities.

If a program is mandatory (representing the high end of the reduction estimates), the City should implement a CTR ordinance. The intent of the ordinance will be to reduce drive-alone travel mode share and encourage alternative modes of travel. The critical components of this strategy are:

- Established performance standards (e.g. trip reduction requirements)
- Required implementation
- Regular monitoring and reporting

Regular monitoring and reporting will be required to assess the project's status in meeting the ordinance goals. In addition, in order to apply the high end effectiveness of the VMT reductions, the program should include the following additional strategies:

- Parking cash out
- Employer sponsored shuttles to transit station
- Employer sponsored bus
- Transit subsidies

TABLE A1: TRANSPORTATION STRATEGY CALCULATION DETAIL							
#	**Strategy / Action**	**TDM+ Tool Strategy and CAPCOA Calculation Detail**	**Calculation Reference**	**Input Notes**	**Assumption Notes**	**Low %[1]**	**High %[1]**
TL1.1	Local Commute Trip Reduction: Support local employer-based trip reduction programs to reduce single-occupancy vehicle travel to and from Ukiah.	CTR Program – Voluntary VMT Reduction = A * B Where: A = % reduction in commute VMT (from [1]); B = % employees eligible Detail: A: 5.2% (low density suburb), 5.4% (suburban center), 6.2% (urban) annual reduction in commute VMT (from [1])	[1]Cambridge Systematics. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the Urban Land Institute. (Table 5.13)	Voluntary program will be low end	2020 applicable to new employment growth = (12,399 - 11,237)/12,399 = 10% (growth from 2010 to 2020) (from Inventory Memo) 2030 applicable to new employment growth = (13,467 - 11,237)/13,467 = 17% (growth from 2010 to 2030) (from Inventory Memo)	0.1% [0.2%]	N/A
		CTR Program – Mandatory % VMT Reduction = A * B Where A = % shift in vehicle mode share of commute trips (from [1]); B = % employees eligible; C = Adjustment from vehicle mode share to commute VMT Detail: A: 21% reduction in vehicle mode share (from [1]); C: 1.0	[1]Nelson/Nygaard (2008). South San Francisco Mode Share and Parking Report for Genentech, Inc.	Mandatory program will be high end	2020 applicable to new employment growth (10%) + 10% of existing employment = 20% 2030 applicable to new employment growth (17%) + 10% of existing employment = 27%	N/A	0.9% [1.2%]

TABLE A1: TRANSPORTATION STRATEGY CALCULATION DETAIL							
#	**Strategy / Action**	**TDM+ Tool Strategy and CAPCOA Calculation Detail**	**Calculation Reference**	**Input Notes**	**Assumption Notes**	**Low %[1]**	**High %[1]**
TL1.2	Sustainable Growth Patterns: Increase neighborhood density (including infilling), mixed-use developments, and increase community pedestrian-friendly design.	Aggregation of strategy reductions below.	--	--	--	0.7% [0.9%]	1.6% [2.0%]
	Consider adopting a Complete Streets Ordinance that directs the City to meet the needs of all of its transportation users.	Pedestrian Network 2% reduction (Within Project Site and Connecting Off-Site; Urban/Suburban) 1% reduction (Within Project Site; Urban/Suburban) < 1% reduction (Within Project Site and Connecting Off-Site; Rural)	Center for Clean Air Policy (CCAP) Transportation Emission Guidebook. 1000 Friends of Oregon (1997) "Making the Connections: A Summary of the LUTRAQ Project" (p. 16)	Low = within project site High = within and connecting off-site	Looking at TAZ map (Figure 1 of Inventory Memo) - downtown core is estimated at 10% of City.	0.1% [0.1%]	0.2% [0.2%]

TABLE A1: TRANSPORTATION STRATEGY CALCULATION DETAIL

#	Strategy / Action	TDM+ Tool Strategy and CAPCOA Calculation Detail	Calculation Reference	Input Notes	Assumption Notes	Low %[1]	High %[1]
	Continue to consider modifications to the municipal code to achieve smart growth objectives (i.e. increase density and mixed-use infill development)	Diversity % VMT Reduction = Land Use * B [not to exceed 30%] Where Land Use = Percentage increase in land use index versus single use development = (land use index – 0.15)/0.15 (see CAPCOA report for detail) Land use index = -a / ln(6) (from [2]) a = summation (from i=1 to 6) of ai x ln (ai) ai = building floor area of land use i / total square feet of area considered o a1 = single family residential o a2 = multifamily residential o a3 = commercial o a4 = industrial o a5 = institutional o a6 = park if land use is not present and ai is equal to 0, set ai equal to 0.01 B = elasticity of VMT with respect to land use index (0.09 from [1]) not to exceed 500% increase	[1] Ewing, R., and Cervero, R., "Travel and the Built Environment - A Meta-Analysis." Journal of the American Planning Association, <to be published> (2010). Table 4. [2] Song, Y., and Knaap, G., "Measuring the effects of mixed land uses on housing values." Regional Science and Urban Economics 34 (2004) 663-680. (p. 669) http://urban.csuohio.edu/~sugie/papers/RSUE/RSUE2005_Measuring%20the%20effects%20of%20mixed%20land%20use.pdf	Assumed a 50/40/10 split of multi-fam housing/ commercial/ park	<u>2020</u> new households b/w 2010 and 2020 is 6,747-6,497 = 250 (or 3.7% of total household population in 2020). Source = F&P's inventory memo. Low = 1% (1/4 of all new housing within downtown core and mixed use) High = 2% (or 50% new housing within downtown and mixed use) <u>2030</u> new households b/w 2010 and 2030 is 6,987-6,497 = 490 (or 7% of total household population in 2030). Source = F&P's inventory memo. Low = 2% (1/4 of all new housing within downtown core and mixed use) High = 3.5% (or 50% new housing within downtown and mixed use)	0.3% [0.5%]	0.5% [1.0%]
	Implement SmartCode or form-based code to increase mixed use and pedestrian connectivity in urban core near transit.						

TABLE A1: TRANSPORTATION STRATEGY CALCULATION DETAIL

#	Strategy / Action	TDM+ Tool Strategy and CAPCOA Calculation Detail	Calculation Reference	Input Notes	Assumption Notes	Low %[1]	High %[1]
	Encourage "smart growth" development by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking.	Parking Supply Limits % VMT Reduction =(Actual parking provision ITE parking generation rate) / ITE parking generation rate x 0.5	[1] Nelson\Nygaard, 2005. Crediting Low-Traffic Developments (p. 16) http://www.montgomeryplanning.org/transportation/documents/TripGenerationAnalysisUsingURBEMIS.pdf	Low = 5% reduction of parking High = 15% reduction of parking	Looking at TAZ map (Figure 1 of Inventory Memo) - downtown core is estimated at 10% of City.	0.3% [0.3%]	0.8% [0.8%]
	Implement traffic calming measures within the downtown core	Traffic Calming – see CAPCOA document for calculation detail	[1] Cambridge Systematics. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.(p. B-25) [2] Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions. (p.13)	Low = assumed 50%/50% High = assumed 100%/100%	Looking at TAZ map (Figure 1 of Inventory Memo) - downtown core is estimated at 10% of City.	0.05% [0.05%]	0.1% [0.1%]

Notes:

1. Year 2020 % VMT Reduction [Year 2030 % VMT Reduction]

Source: Fehr & Peers, 2013.

Appendix C
Calculations Quantifying Costs and Emissions Reductions



Energy Strategies

Summary Table

Code	Strategy Name	GHG Reduction in 2020 (MT CO2)	% of Total Reductions in 2020	GHG Reduction in 2030 (MT CO2)	Relative GHG Benefit	Relative Cost	Implementation Priority
Goal E.1: Increase Building Energy Efficiency							
Strategy E.1.1	Promote Commercial Energy Efficiency	646	38.2%	1,085	High	Med	1
Strategy E.1.2	Promote Residential Energy Efficiency	567	33.5%	964	high	med	1
Strategy E.1.3	Improve Municipal Energy Efficiency	76	4.5%	107	med	med	2
Strategy E.1.4	Reduce Urban Heat Islands	2	0.1%	16	low	low	2
Strategy E.1.5	Promote Commercial and Residential Green Building	23	1.4%	53	low	low	2
Goal E.2: Promote On-site Renewable Energy							
Strategy E.2.1	Promote Cost-Effective Renewable Energy for Commercial and Industrial Users	247	14.6%	817	high	low	1
Strategy E.2.2	Promote Cost-Effective Renewable Energy for Homes	130	7.7%	337	high	low	1
Strategy E.2.3	Expand Municipal Renewable Energy	0.2	0.0%	1	low	low	2
Goal E.3: Increase Outreach, Education, and Collaboration							
Strategy E.3.1	Increase Local Education and Outreach	NA		-			
Strategy E.3.2	Establish Regional Renewable Energy Partnerships	NA		-			
	Totals:	**1,692**	**100.0%**	**3,381**			

Prioritization of Community Strategies

		Costs		
		Low	Medium	High
Benefits	High	1	1	2
	Medium	1	2	3
	Low	2	3	3

Energy Strategy Common Factors

Note: Pale Yellow fields denote common factors that are not subject to being tweaked by the City. Green fields denote factors that can be modified based on the City's commitment to an action or set of actions.

	#	Unit	Direct Data Source
Basic Unit Factors			
Hours in a year	8,760		
Hours of daylight in a year	2,920		
Pounds per Metric Ton	2,204.6		
Kwh per Mwh	1,000		
lbs of CO2 emissions from 1 therm of natural gas	11.70		
GHG Emission Factors			
Ukiah Utilities, Electric Services Division 2005 CO2 Electricity emission factor	55.8257	kg CO2/MWh	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2005 CH4 Electricity emission factor	0.0352	kg CH4/MWh	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2005 N2O Electricity emission factor	0.0005	kg N2O/MWh	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.7381	kg CO2/MWh	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2010 CH4 Electricity emission factor	0.0224	kg CH4/MWh	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2010 N2O Electricity emission factor	0.0004	kg N2O/MWh	Derived from City-provided electricity consumption data
CO2 Natural Gas emission factor	53.0200	kg CO2/MMBtu	LGOP, Table G.1, 'Pipeline (US Weighted average)'
CH4 Natural Gas emission factor	0.0050	kg CH4/MMBtu	LGOP, Table G.3, 'Commercial' and 'Residential'
N2O Natural Gas emission factor	0.0001	kg N2O/MMBtu	LGOP, Table G.3, 'Commercial' and 'Residential'
Projected City Growth Factors			
Average Square Feet Per Residential Unit (Existing Housing Stock)	1,448	square ft	See California Statewide Residential Appliance Saturation Study, page 10
Average Square Feet Per Residential Unit (New Housing Stock)	2,061	square ft	See California Statewide Residential Appliance Saturation Study, page 10
2005 Residential Square Feet	9,251,272	square ft	Housing units*Average Sq. Ft. Per Residential Unit
2020 Residential Square Feet	9,989,110	square ft	Housing units*Average Sq. Ft. Per Residential Unit
2030 Residential Square Feet	10,483,750	square ft	Housing units*Average Sq. Ft. Per Residential Unit
2005 Industrial Square Feet	1,679,000		Jobs*ITE Square Feet per Job Figures
2020 Industrial Square Feet	1,743,843		Based on Projected Employment Projections of 2005 figure
2030 Industrial Square Feet	1,924,480		Based on Projected Employment Projections of 2005 figure
2005 Commercial Square Feet	3,254,833		# of Jobs*ITE Square Feet per Job Figures
2020 Commercial Square Feet	3,380,534		Based on Projected Employment Projections of 2005 figure
2030 Commercial Square Feet	3,874,788		Based on Projected Employment Projections of 2005 figure
2005 Public Use Square Feet	617,333		Jobs*ITE Square Feet per Job Figures
2020 Public Use Square Feet	641,175		Based on Projected Employment Projections of 2005 figure
2030 Public Use Square Feet	734,918		Based on Projected Employment Projections of 2005 figure
2005 Total Non-Residential Square Feet	5,551,167	square ft	Source: GP EIR: 435,000 sf of industrial, 237,000 sf of commercial, and 360,000 sf of public uses.
2020 Total Non-Residential Square Feet	5,765,551	square ft	Based on Projected Employment Projections of 2005 figure
2030 Total Non-Residential Square Feet	6,362,779	square ft	Based on Projected Employment Projections of 2005 figure
Total square feet of newly constructed residential space from 2005 to 2020	737,838	square ft	
Total square feet of newly constructed residential space from 2005 to 2030	1,232,478	square ft	
Total sq. feet of newly constructed commercial space from 2005 to 2020	214,385	square ft	
Total sq. feet of newly constructed commercial space from 2005 to 2030	811,613	square ft	
Total # of housing units in 2005	6,389	Housing Units	Source: California Department of Finance
Total # of housing units in 2020	6,747	Housing Units	Based on Projected Housing Growth from 2005 to 2020, with data from the MCOG Model Data (See Fehr & Peers VMT Inventory Memo, Table 1)
Total # of housing units in 2030	6,987	Housing Units	Based on Projected Housing Growth from 2005 to 2020, with data from the MCOG Model Data (See Fehr & Peers VMT Inventory Memo, Table 1)
Total # of commerical units in 2005	914	units	US Economic Census, Average of 2002 and 2007 totals (936 in 2002; 891 in 2007)
Total # of commercial units in 2020	949	units	Population growth increase from 2005
Total # of commercial units in 2030	1,047	units	
City of Ukiah Square Mileage	4.72	sq. mile	Source: City of Ukiah MSR (for year 2011)
City of Ukiah Acres in 2005	3,021	Acres	Assumes City does not grow in size from 2005 by 2020
City of Ukiah Acres in 2020	3,021	Acres	Assumes City does not grow in size from 2005 by 2030
City of Ukiah Acres in 2030	3,021	Acres	
Housing Units per Acre in 2005	2.12	units per acre	
Housing Units per Acre in 2020	2.23	units per acre	
Housing Units per Acre in 2030	2.31	units per acre	
City of Ukiah (Derived) Energy Intensity Factors			
Ukiah electric use intensity factor for res. buildings in kWh/sq ft.	4.10	kwh/square foot	Data Provided by the City (2010 kWh data)
Ukiah natural gas intensity factor for res. buildings in therms/sq ft.	0.29	therms/square feet	Data provided by PG&E (2010 therms data)
Ukiah electric use intensity factor for non-residential buildings in kWh/sq ft.	13.05	kwh/square foot	Data Provided by the City (2010 kWh data)
Ukiah natural gas use intensity factor for non-residential buildings in therms/sq ft.	0.31	therms/square feet	Data provided by PG&E (2010 therms data)
Cost Factors			
BLS U.S. Department of Labor: Average Mendocino County Salary	$ 40,768.00	Salary	based on Bureau of Labor Statistics U.S. Department of Labor, County Employement and Wages (News Release). Released on March 28, 2012.
BLS U.S. Department of Labor: Average Mendocino County Hourly Rate	$ 20.22	Hourly Rate	based on Bureau of Labor Statistics U.S. Department of Labor, County Employement and Wages (News Release). Released on March 28, 2012.

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Strategy GHG and Cost Analysis Worksheet: E.1.1

Strategy Name	**Promote Commercial Energy Efficiency**
Emissions Category	Energy
Strategy Description	**Action E-1.1a:** Promote existing energy audits, rebates, energy efficiency programs offered by City of Ukiah Electric Department to improve energy efficiency in commercial buildings. **Action E-1.1b:** Develop a low-cost local education campaign to promote benchmarking and cost-effective commercial energy efficiency improvements. **Action E-1.1c:** Outreach to the business community to encourage energy audits and point of sale energy use disclosure, and energy efficiency upgrades; As Staff and resources allow, develop a local "Green Business" program to promote energy efficiency actions. **Note:** Electricity savings below are calculated by using actual kWh saved through City energy efficiency efforts from 2007-2012; natural gas savings below are calculated conversion factors and assumptions on commercial square footage affected in accordance with this strategy.

2020 GHG Reduction Potential	High	[low = <20 ; med = 20 to 100; high = >100]	#REF!
Annual cost by 2020 (to City)	Med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff tim	

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable	
(Existing as of year 2005) Commercial Square Feet Upgraded by 2020[1]	832,675	square ft.	Csf_{2020}	Assumed 15% of 2005 existing commercial square footage
(Existing as of year 2005) Commercial Square Feet Upgraded by 2030[2]	1,387,792	square ft.	Csf_{2030}	Assumed 25% of 2005 existing commercial square footage
Post-2005 Commercial Square Feet Upgraded by 2020	18,855	square ft.	Csg_{2020}	Assumed 15% of new post-2005 commercial square footage
Post-2005 Commercial Square Feet Upgraded by 2030	154,989	square ft.	Csg_{2030}	Assumed 25% of new post-2005 commercial square footage
Target Percentage of Natural Gas Energy Savings for Existing Businesses[3]	25.0%	%	N	
Target Percentage of Natural Gas Energy Savings for Post-2005 Businesses[4]	10.0%	%	M	
Ukiah natural gas use intensity factor for non-residential buildings in therms/sq ft.	0.31	therms/square feet	Cn	
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	kg CO2/MWh	Efa	Derived from City-provided electricity consumption data
CO2 Natural Gas emission factor	53.02	kg CO2/MMBtu	Efb	
Annual Non-residential kWh Savings by 2020[5]	6,820,462	kWh	K_{2020}	
Annual Non-residential kWh Savings by 2030[6]	11,083,250	kWh	K_{2030}	

[1] Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[2] Extrapolated from City-provided 2007-2012 non-residential energy consumption data.

[3] Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[4] Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[5] Figures from City-provided 2007-2012 non-residential energy consumption data.

[6] Figures from City-provided 2007-2012 non-residential energy consumption data.

1. Resource Savings:

Commercial Energy Efficiency Rebates, Programs, and Benchmarking for Existing Buildings:

Electricity Energy Savings (kWh)= K

Commercial Natural Gas Savings (therms)= (N × Csf × Cn)+(M x Csg x Cn) x F

Total commercial electricity savings by 2020=	6,820,462	kwh/year
Total commercial natural gas savings by 2020=	65,612	therms /year
Total commercial electricity savings by 2030=	11,083,250	kwh/year
Total commercial natural gas savings by 2030=	113,213	therms /year

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)+(Sg/10*Efb/1000)

Se = total electricity savings (kWh)

Sg= total natural gas savings (therms)

1000 kWh/MWh

1000 kg/MT

GHG Emissions Savings by 2020=	646	metric tons CO2
GHG Emissions Savings by 2030=	1,085	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.1.2

Strategy Name	**Promote Residential Energy Efficiency**
Emissions Category	Energy
Strategy Description	**Action E-1.2a:** Promote existing energy audits, rebates, energy efficiency programs offered by City of Ukiah Electric and Water Departments to improve energy efficiency in commercial buildings. **Action E-1.2b:** Develop a low-cost local education campaign for cost-effective residential energy efficiency improvements. **Action E-1.2c:** Outreach to residential property owners to encourage energy audits, benchmarking, and energy efficiency upgrades. **Action E-1.2d:** Outreach to local realtors to help communicate the value of energy improvements to prospective home buyers and sellers. **Note:** Electricity savings below are calculated by using actual kWh saved through City energy efficiency efforts from 2007-2012; natural gas savings below are calculated conversion factors and assumptions on commercial square footage affected in accordance with this strategy.

2020 GHG Reduction Potential	high	[low = <20 ; med = 20 to 100; high = >100]	#DIV/0!
Annual cost by 2020 (to City)	med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff tim	

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable	
(Existing as of year 2005) Commercial Square Feet Upgraded by 2020[2]	1,387,691	square ft.	Csf_{2020}	Assumed 15% of 2005 existing commercial square footage
(Existing as of year 2005) Commercial Square Feet Upgraded by 2030[2]	2,312,818	square ft.	Csf_{2030}	Assumed 25% of 2005 existing commercial square footage
Post-2005 Commercial Square Feet Upgraded by 2020	110,676	square ft.	Csg_{2020}	Assumed 15% of new post-2005 commercial square footage
Post-2005 Commercial Square Feet Upgraded by 2030	308,120	square ft.	Csg_{2030}	Assumed 25% of new post-2005 commercial square footage
Target Percentage of Natural Gas Energy Savings for Existing Residences[1]	25.0%	%	N	
Target Percentage of Natural Gas Energy Savings for Post-2005 Residences[1]	10.0%	%	M	
Ukiah natural gas intensity factor for res. buildings in therms/sq ft.	0.29	feet	Cn	Derived from utility-provided natural gas consumption data
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	kg CO2/MWh	Efa	Derived from City-provided electricity consumption data
CO2 Natural Gas emission factor	53.02	kg CO2/MMBtu	Efb	
Annual Residential kWh Savings by 2020[3]	202,659.91	kWh	K_{2020}	
Annual Residential kWh Savings by 2030[4]	329,322.35	kWh	K_{2030}	

[1]Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[2]Extrapolated from City-provided 2007-2012 residential energy consumption data

[3]Extrapolated from City-provided 2007-2012 residential energy consumption data

[4]Extrapolated from City-provided 2007-2012 residential energy consumption data

2020 GHG Reduction Potential	[low = <20 ; med = 20 to 100; high = >100]
Cost by 2020 (to City)	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider first cost, annual cost, staff tim

1. Resource Savings:

Residential Energy Efficiency Rebates, Programs, and Benchmarking for Existing Buildings:
Electricity Energy Savings (kWh)= K
residential Natural Gas Savings (therms)= (N × Csf × Cn)+(M x Csg x Cn) x F

Total residential electricity savings by 2020=	202,660	kwh/year
Total residential natural gas savings by 2020=	105,322	therms /year
Total residential electricity savings by 2030=	329,322	kwh/year
Total residential natural gas savings by 2030=	179,176	therms /year

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)+(Sg/10*Efb/1000)

Se = total electricity savings (kWh)		
Sg= total natural gas savings (therms)		
1000 kWh/MWh		
1000 kg/MT		
Annual GHG Emissions Savings by 2020=	567	metric tons CO2
Annual GHG Emissions Savings by 2030=	964	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.1.3

Strategy Name	**Improve Municipal Energy Efficiency**
Emissions Category	Energy
Strategy Description	**Action E-1.3a:** Perform energy audits of existing municipal buildings; **Action E-1.3b:** As funding allows, install more energy efficient street lighting, such as LEDs; **Action E-1.3c:** Consider requiring that all new municipal construction achieve 15% above 2013 Title 24 Standards. **Note:** Resource savings calculations below take into account an interpretation of the impact of Action E-3.1a (within the*Total Square feet of Upgraded Municipal Space* figures and *Proportion of Buildings that are assumed to be 15% more energy efficient than existing Title 24* figure that make up the Increase Municipal Energy Efficiency equation).

2020 GHG Reduction Potential	med	[low = <20 ; med = 20 to 100; high = >100]	#DIV/0!
Annual cost by 2020 (to City)	med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff tim

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable	
Total square feet of upgraded municipal space from 2005 to 2020	160,294	square ft	NCa	Assume 25% of Public Use Buildings
Total square feet of upgraded municipal space from 2005 to 2030	183,730	square ft	NCb	Assume 25% of Public Buildings
% Electricity Savings (by 2020)[1]	10.0%	percent	Sb_{2020}	Average % electricity savings by 2020
% Electricity Savings (by 2030)[2]	15.0%	percent	Sb_{2030}	Average % electricity savings by 2030
% Natural Gas Savings (by 2020)[3]	25.0%	percent	Sa_{2020}	Average % natural gas savings by 2020
% Natural Gas Savings (by 2030)[4]	30.0%	percent	Sa_{2030}	Average % natural gas savings by 2030
Ukiah electric use intensity factor for non-residential buildings in kWh/sq ft.	13.05	kwh/square foot	E	
Ukiah natural gas use intensity factor for non-residential buildings in therms/sq ft.	0.31	therms/square foot	N	
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	Metric Tons/MWh	Efa	
CO2 Natural Gas emission factor	53.02	kg CO2/MMBtu	Efb	

[1]Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[2]Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[3]Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

[4]Based on NRDC estimates of the long-term, annual energy reduction impact of individual performance benchmarking: http://www.pmcworld.com/client/sunnyvale/documents/meetings/2011/101911/Horizon%2010-19-11%20Appendix%20B%20Technical%20Appendix.pdf

1. Resource Savings:

Increase Municipal Energy Efficiency:
Total Electricity Savings (kWh) = Nca x E x Sb x F
Total Natural Gas Savings (therms)= Ncb x N x Sa x F

Total annual residential electricity savings by 2020=	209,256	kwh/year
Total annual residential natural gas savings by 2020=	12,517	therms /year
Total annual residential electricity savings by 2030=	359,776	kwh/year
Total annual residential natural gas savings by 2030=	17,217	therms /year

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)+(Sg/10*Efb/1000)

Se = total electricity savings (kWh)
Sg= total natural gas savings (therms)
1000 kWh/MWh
1000 kg/MT

Total GHG Emissions Savings by 2020=	76	metric tons CO2
Total GHG Emissions Savings by 2030=	107	metric tons CO2

Strategy GHG and Cost Analysis Worksheet E.1.4

Strategy Name	**Reduce Urban Heat Islands**
Emissions Category	Energy
Strategy Description	**Action E-1.4a:** Implement the existing Master Tree list; consider establishing and monitoring a voluntary shade tree program. Strongly encourage the protection of mature trees on private property and in the community, **Action E-1.4b:** Promote light-colored paving material for roads and parking areas, cool roofs, and shade trees for parking lots and buildings. **Action E-1.4c:** Implement City policy and zoning ordinance promoting shading of parking lots using trees; promote installation of parking canopies (preferable with solar PV panels) to shade parking lots. **Action E-1.4d:** Consider setting up a fund to subsidize the purchase of shade trees for homeowners. Continue to support the efforts of Releaf and the Ukiah Tree Advisory Group. **Note:** Resource savings calculations below take into account an interpretation of the impact of all of the above actions (within the *Number of Housing Units Participating in Program* figures that make up the Voluntary Shade Tree Program equation). GHG savings calculations also take into account the *total number of trees planted per year* to determine carbon biomass sequestration savings.

2020 GHG Reduction Potential	low	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
Projected Residential Electricity Use in 2020	40,914,088	kwh/year	Re_{2020}
Projected Residential Natural Gas Use in 2020	2,938,843	therms/year	Rg_{2020}
Number of Housing Units in 2020	6,747	housing units	H_{2020}
Number of Housing Units participating in program by 2020[1]	17	housing units	Hp_{2020}
Projected Commercial Electricity Use in 2020	75,266,697	kwh/year	Ce_{2020}
Projected Commercial Natural Gas Use in 2020	1,800,915	therms/year	Cg_{2020}
Number of Commercial Units in 2020	949	comm. units	C_{2020}
Number of Commercial Units participating in program by 2020[2]	2	comm. units	Cp_{2020}
3% Reduction in energy use for residences (based on SMUD Calculator)	3%		0.03
Projected Residential Electricity Use in 2030	42,940,069	kwh/year	Re_{2030}
Projected Residential Natural Gas Use in 2030	3,084,369	therms/year	Rg_{2030}
Number of Housing Units in 2030	6,987	housing units	H_{2030}
Number of Housing Units participating in program by 2030[3]	35	housing units	HP_{2030}
Projected Commercial Electricity Use in 2030	83,063,241		Ce_{2030}
Projected Commercial Natural Gas Use in 2030	1,987,464	therms/year	Cg_{2030}
Number of Commercial Units in 2030	1,047	comm. units	C_{2020}
Number of Commercial Units participating in program by 2030[4]	5	comm. units	CP_{2030}
10% Reduction in energy use for offices/retail (based on SMUD Calculator)	10%		0.1
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	44	Metric Tons/MWh	Efa
CO2 Natural Gas emission factor	53	kg CO2/MMBtu	Efb

[1]Assumed 1/4 of 1 percent of all housing units conservative estimate
[2]Assumed 1/4 of 1 percent of all commercial units conservative estimate
[3]Assumed 1/2 of 1 percent of all housing units conservative estimate
[4]Assumed 1/2 of 1 percent of all commercial units conservative estimate

Data Sources for Resource Savings and GHG Calculations

SMUD Shade Tree Benefit Calculator https://usage.smud.org/treebenefit/iDefault.aspx
"The simulations predicted annual total energy savings of about 3–5% from combined direct and indirect effects for old and new gas-heated single-family and rowhouse residences. This number increased to 10% for offices (SIC) and 12% for retail stores (sic)"

LBNL 2001 - Shade trees reduce building energy use and CO2 emissions from power plants
"We estimate that a tree planted in Los Angeles avoids the combustion of 18 kg of carbon per tree annually"

EPA http://www.epa.gov/heatisland/resources/pdf/toronto_energysavings.pdf

Strategy GHG and Cost Analysis Worksheet E.1.4 (continued)

1. Resource Savings:

Voluntary Shade Tree Program:

Electricity savings residential by 2020 = Re_{2020}/H_{2020} x HP_{2020} x 0.95 x F
Natural gas savings residential by 2020 = Rg_{2020}/H_{2020} x HP_{2020} x 0.95
Electricity savings commercial by 2020 = Ce_{2020}/C_{2020} x CP_{2020} x 0.95 x F
Natural gas savings commercial by 2020 = Cg_{2020}/C_{2020} x CP_{2020} x 0.95
Electricity savings residential by 2030 = Re_{2030}/H_{2030} x HP_{2030} x 0.90 x F
Natural gas savings residential by 2030 = Rg_{2030}/H_{2030} x HP_{2030} x 0.90
Electricity savings commercial by 2030 = Ce_{2030}/C_{2030} x CP_{2030} x 0.90 x F
Natural gas savings commercial by 2030 = Cg_{2030}/C_{2030} x CP_{2030} x 0.90

Total residential electricity savings by 2020=	3,069	kwh/year	Total electricity savings by 2020=	8,714	kwh/year
Total residential natural gas savings by 2020=	220	therms/year	Total natural gas savings by 2020=	355	therms/year
Total commercial electricity savings by 2020=	5,645	kwh/year			
Total commercial natural gas savings by 2020=	135	therms/year			
Total residential electricity savings by 2030=	21,470	kwh/year	Total electricity savings by 2030=	63,002	kwh/year
Total residential natural gas savings by 2030=	1,542	therms/year	Total natural gas savings by 2030=	2,536	therms/year
Total commercial electricity savings by 2030=	41,532	kwh/year			
Total commercial natural gas savings by 2030=	994	therms/year			

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)+(Sg/10*Efb/1000)		
Se = total electricity savings (kWh)		
Sg= total natural gas savings (therms)		
1000 kWh/MWh		
1000 kg/MT		
Total GHG Emissions Savings by 2020=	2	metric tons CO2
Total GHG Emissions Savings by 2030=	16	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.1.5a

Strategy Name	**Promote Commercial and Residential Green Building**
Emissions Category	Energy
Strategy Description	**Action E-1.5a:** Provide incentives, such as permit streamlining and increased outreach, to expand green building and energy efficient design for new commercial and residential development. **Note:** Resource savings calculations below take into account an interpretation of the overall impact of the strategy (within the *Proportion of commercial properties that are assumed to be affected by this strategy* percentage that make up the Promote Commercial Green Building Policy equation).

Key Assumptions for Resource Savings and GHG Calculations			
Description	**#**	**Unit**	**Equation Variable**
Total square feet of new residential space from 2005 to 2020	125,701	square ft	Nc_{2020}
Total square feet of new residential commercial space from 2005 to	619,955	square ft	Nc_{2030}
Average % Natural Gas Savings per building by 2020*	15.0%	percent	Sa
Average % Electricity Savings per building by 2020	15.0%	percent	Sb
Proportion of new commercial properties assumed to be affected by the strategy	10.0%	percent	B
Ukiah electric use intensity factor for non-residential buildings in	13.05	kwh/square foot	E
Ukiah natural gas use intensity factor for non-residential buildings in therms/sq ft.	0.31	therms/square feet	N
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission	43.74	Metric Tons/MWh	Efa
CO2 Natural Gas emission factor	53.02	kg CO2/MMBtu	Efb

*Assuming 15% improvement based on achieving Tier 1 Calgreen status (15% below), on average.

2020 GHG Reduction Potential	low	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

1. Resource Savings:

Promote Commercial Green Building Policy:

Total Electricity Savings by 2020 (kWh) = (Nc_{2020} × E x Sb x B) x F

Total Natural Gas Savings by 2020 (therms)= (Nc_{2020} x N x Sa x B) x F

Total Electricity Savings by 2030 (kWh) = (Nc_{2030} × E x Sb x B) x F

Total Natural Gas Savings by 2030: (therms) = (Nc_{2030} x N x Sa x B) x F

Total electricity savings by 2020=	24,615	kwh
Total natural gas savings by 2020=	589	therms
Total electricity savings by 2030=	121,398	kwh
Total natural gas savings by 2030=	2,905	therms

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)+(Sg/10*Efb/1000)

Se =	total electricity savings (kWh)
Sg=	total natural gas savings (therms)
1000	kWh/MWh
1000	kg/MT

Total GHG Emissions Savings by 2020=	4	metric tons CO2
Total GHG Emissions Savings by 2030=	21	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.1.5b

Strategy Name	**Promote Residential Green Building Policy**
Emissions Category	Energy
Strategy Description	**Action E-1.5b:** Provide incentives, such as permit streamlining and increased outreach, to expand green building and energy efficient design for new commercial and residential development. **Note:** Resource savings calculations below take into account an interpretation of the overall impact of the strategy (within the *Proportion of residential properties that are assumed to be affected by this strategy* percentage that make up the Promote Residential Green Building Policy equation).

2020 GHG Reduction Potential	low	[low = <20 ; med = 20 to 100; high = >100]	#DIV/0!
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time	

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
Total square feet of new construction commercial space from 2005 to	737,838	square ft	Nc_{2020}
Total square feet of new construction commercial space from 2005 to	1,232,478	square ft	Nc_{2030}
Average % Natural Gas Savings per building by 2020*	15.0%	percent	Sa
Average % Electricity Savings per building by 2020*	15.0%	percent	Sb
Proportion of new commercial properties that are assumed to be affected by the strategy	10.0%	percent	B
Ukiah electric use intensity factor for res. buildings in kWh/sq ft.	4.10	kwh/square foot	E
Ukiah natural gas intensity factor for res. buildings in therms/sq ft.	0.29	therms/square feet	N
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	Metric Tons/MWh	Efa
CO2 Natural Gas emission factor	53.02	kg CO2/MMBtu	Efb

*Assuming 15% improvement based on achieving Tier 1 Calgreen status (15% below), on average.

1. Resource Savings:

Promote Commercial Green Building Policy:

Total Electricity Savings by 2020 (kWh) = (Nc_{2020} × E x Sb x B) x F

Total Natural Gas Savings by 2020 (therms)= (Nc_{2020} x N x Sa x B) x F

Total Electricity Savings by 2030 (kWh) = (Nc_{2030} × E x Sb x B) x F

Total Natural Gas Savings by 2030: (therms) = (Nc_{2030} x N x Sa x B) x F

Total electricity savings by 2020=	45,331	kwh
Total natural gas savings by 2020=	3,256	therms
Total electricity savings by 2030=	75,721	kwh
Total natural gas savings by 2030=	5,439	therms

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)+(Sg/10*Efb/1000)

Se =	total electricity savings (kWh)
Sg=	total natural gas savings (therms)
1000	kWh/MWh
1000	kg/MT

Total GHG Emissions Savings by 2020=	19	metric tons CO2
Total GHG Emissions Savings by 2030=	32	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.2.1

Strategy Name	**Promote Small-scale On-site Renewable Energy for Commercial and Industrial Users**
Emissions Category	Energy
Strategy Description	**Action E-2.1a:** Continue the City Utility's PV Buy-Down Program (rebates for PV systems) for commercial and industrial customers. **Action E-2.1b:** Support streamlined permit procedures and/or establish minimum PV installation requirements for new commercial facilities of a certain size (e.g., for facilities larger than 3,000 square feet). **Note:** Resource savings calculations below take into account an interpretation of the impact of all of the above actions (within the *Building participation rate* and *% of Total electricity savings* factors that makes up the Promote On-site Renewable Energy for Commercial and Industrial Users equation).

2020 GHG Reduction Potential	high	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable	
Non-residential Space by 2020	5,765,551	square ft	NC_a	
Non-residential Space by 2030	6,362,779	square ft	NC_b	
Building participation Rate in 2020	15.0%		P	
Building participation Rate in 2030	30.0%		P	
% Total Electricity Savings by 2020	50%	percent	S_a	Assumed proportion of electricity reduced in participating buildings.
% Total Electricity Savings by 2030	75%	percent	S_b	Assumed proportion of electricity reduced in participating buildings.
Ukiah electric use intensity factor for non-residential buildings in kWh/sq ft.	13.05	kwh/square foot	N	
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	Metric Tons/MWh	Efa	

1. Resource Savings:

Promote On-site Renewable Energy for Commercial and Industrial Users:
Energy Savings (kWh): Nca x P x S x N x F

Total electricity savings by 2020=	5,645,002	kwh
Total electricity savings by 2030=	18,689,229	

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)

Se = total electricity savings (kWh)

1000 kWh/MWh

1000 kg/MT

Total GHG Emissions Savings by 2020=	247	metric tons CO2
Total GHG Emissions Savings by 2030=	817	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.2.2

Strategy Name	**Promote Small-scale On-site Renewable Energy for Homes**
Emissions Category	Energy
Strategy Description	**Action E-2.2a:** Continue the City Utility's PV Buy-Down Program (rebates for PV systems) for residential customers. **Action E-2.2b:** Require pre-wiring for solar systems in new building development. **Action E-2.2c:** Streamline permit processes, and promote existing financial incentives for renewable systems. **Action E-2.2d:** Provide public education about various options (including power purchasing agreements - PPAs), **Note:** Resource savings calculations below take into account an interpretation of the impact of all of the above actions (within the *Number of New Solar PV Systems* that make up the Promote Small-scale On-site Renewable Energy for Homes equation).

2020 GHG Reduction Potential	high	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
Average solar installation size[1]	4	kW	P
Number of New Solar PV Systems by 2020[2]	675	systems	S_{2020}
Number of New Solar PV Systems by 2030[3]	1,747	systems	S_{2020}
Hours of daylight in a year (assume six hours of sunlight per day)	1,380	hrs/yr	H
Performance Ratio	80%		R
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	Metric Tons/MWh	Efa

[1]California Solar Initiative Average Solar Installation Size: http://www.pge.com/includes/docs/pdfs/myhome/saveenergymoney/solarenergy/solar_consumer_guide.pdf (pg. 8)

[2]Assumed 10% of homes

[3]Assumed 25% of homes

Data Sources for Resource Savings and GHG Calculations

Residential and commercial electric and natural gas rates. http://www.pge.com/about/news/topics/ratereduction.shtml

Solar capacity factor. http://en.wikipedia.org/wiki/Solar_power_in_California

1. Resource Savings:

Promote Small-scale On-site Renewable Energy for Homes:

Energy Savings (kWh): P x S x H x R x F

Total electricity savings by 2020=	2,979,475	kwh
Total commercial electricity savings by 2030=	7,713,648	kwh

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)

Se = total electricity savings (kWh)

1000 kWh/MWh

1000 kg/MT

Total GHG Emissions Savings by 2020=	130	metric tons CO2
Total GHG Emissions Savings by 2030=	337	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.2.3

Strategy Name	**Expand Municipal Renewable Energy**
Emissions Category	Energy
Strategy Description	**Action E-2.3a:** Evaluate existing installed renewable energy capacity and set future installed goal. **Note: R**esource savings calculations below take into account impact of Action E-3.2a (within the *Aggregate Solar Installation Size* figure that makes up the Increase Municipal Renewable Energy equation).

2020 GHG Reduction Potential	low	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
Aggregate Solar Installation Size by 2020	4	kW	P
Aggregate Solar Installation Size by 2030	12	kW	P
Hours of daylight in a year (assume six hours of sunlight per day)	1,380	hrs/yr	H
Performance Ratio	80%		R
Ukiah Utilities, Electric Services Division 2010 CO2 Electricity emission factor	43.74	Metric Tons/MWh	Efa

Data Sources for Resource Savings and GHG Calculations

New Oakdale development square footage projections: Oakdale General Plan Update 2012

Projection of GHG Emissions for California Utilities: http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/GHG_Emission_Factor_Guidance.pdf

Residential and commercial electric and natural gas rates. http://www.pge.com/about/news/topics/ratereduction.shtml

1. Resource Savings:

Increase Municipal Renewable Energy:

Electricity Savings (kWh): P x H x R x F

Total electricity savings by 2020=	4,416	kwh
Total electricity savings by 2030=	13,248	kwh

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000*Efa/1000)

Se = total electricity savings (kWh)

1000 kWh/MWh

1000 kg/MT

Total GHG Emissions Savings by 2020=	0.2	metric tons CO2
Total GHG Emissions Savings by 2030=	1	metric tons CO2

Strategy GHG and Cost Analysis Worksheet: E.3.1

Strategy Name	**Increase Local Education and Outreach**
Emissions Category	Energy
Strategy Description	**Action E-3.1a:** Promote existing residential and nonresidential energy efficiency programs, and rebates for solar PV; consider establishing a Committee on Energy and the Environment to assist in promotion activities and/or develop and operate a local public education and/or a direct financing program. **Action E-3.1b:** Increase City staff knowledge and training opportunities related to energy efficiency and renewable energy, and dedicate staff time to outreach and education regarding existing programs and financing mechanisms. **Action E-3.1c:** Collaborate with local groups and interested organizations to facilitate community outreach and education. **Action E-3.1d:** Develop a low-cost local education campaign to promote nonresidential energy efficiency improvements, and conduct at least two events per year to educate the community about energy efficiency options.

Note: No emissions quantified for this strategy.

Strategy GHG and Cost Analysis Worksheet: E.3.2

Strategy Name	Establish Regional Renewable Energy Partnerships
Emissions Category	Energy
Strategy Description	**Action E-3.2a:** Promote existing residential and nonresidential energy efficiency programs and rebates for solar PV; consider establishing a Committee on Energy and the Environment to assist in promotion activities and/or develop and operate a local public education. **Action E-3.2b:** Work with the County and other cities in the region, Mendocino College, and other organizations, to explore strategies for developing renewable energy resources and to develop a valley-wide clean/green industry and jobs development strategy. ***Note:*** *Resource savings calculations below take into account an interpretation of the impact of Action E-2.3a (within the Average Solar Installation Size and Number of New Solar PV Systems* that make up the Establish Regional Renewable Energy Partnerships equation).

Key Assumptions for Resource Savings and GHG Calculations			
Description	**#**	**Unit**	**Equation Variable**
Average solar installation size[1]	4	kW	P
Number of new solar systems by 2020	0	systems	S_{2020}
Number of new solar systems by 2030	0	systems	S_{2020}
Performance Ratio	80%		R
Hours of daylight in a year (assume six hours of sunlight per day)	2,920	hrs/yr	H

[1]California Solar Initiative Average Solar Installation Size: http://www.pge.com/includes/docs/pdfs/myhome/saveenergymoney/solarenergy/solar_consumer_guide.pdf (pg. 8

Data Sources for Resource Savings and GHG Calculations
Residential and commercial electric and natural gas rates. http://www.pge.com/about/news/topics/ratereduction.shtml
Solar capacity factor. http://en.wikipedia.org/wiki/Solar_power_in_California

1. Resource Savings:

Establish Regional Renewable Energy Partnerships:		
Energy Savings (kWh): S x P x R x E x H		
Total electricity savings by 2020=	0	
Total commercial electricity savings by 2030=	0	kwh

2. GHG Calculations:

Total Emissions Savings (MT)= (Se/1000×0.13)		
Se = total electricity savings (kWh)		
1000 = conversion factor for kWh to MWh (electricity equation) or from kg to metric tons (natural gas equation)		
55.83 projected PG&E emission factor in 2020		
Total GHG Emissions Savings by 2020=	0	metric tons CO2
Total GHG Emissions Savings by 2030=	0	metric tons CO2

Transportation and Land Use

Summary Table

Code	Strategy Name	GHG Reduction in 2020 (MT CO2)	% of Total Reductions in 2020	GHG Reduction in 2030 (MT CO2)	Relative GHG Benefit	Relative Cost	Implementation Priority
1. Reduce Single-Occupancy Vehicle Travel							
Strategy TL.1.1	Local Commute Trip Reduction	88	9.3%	190	med	med	2
Strategy TL.1.2	Sustainable Growth Patterns	616	65.2%	857	high	high	2
Strategy TL.1.3	Regional Transportation Management	-	0.0%	-			
Strategy TL.1.4	Public Transit Expansion	-	0.0%	-			
2. Increase Non-motorized Travel							
Strategy TL.2.1	Improve Bicycle and Pedestrian Infrastructure	22	2.3%	37	med	med	2
Strategy TL.2.2	Establish Safe Routes to School	173	18.4%	375	high	med	1
3. Increase Motor Vehicle Efficiency							
Strategy TL.3.1	Improve Municipal Fleet Fuel Efficiency	45	4.7%	131	med	low	2
	Totals:	**944**	**100%**	**1,590**			

Prioritization of Community Strategies

		Costs		
		Low	Medium	High
Benefits	High	1	1	2
	Medium	1	2	3
	Low	2	3	3

Transportation Common Factors

Note: Pale Yellow fields denote common factors that are not subject to being tweaked by the City. Green fields denote factors that can be modified based on the City's commitment to an action or set of actions.

	#	Unit	Direct Data Source
Basic Unit Factors			
Hours in a year	8,760	hrs/yr	
Elasticity of VMT with respect to density (from: Boarnet and Handy, 2010)	0.07		Boarnet and Handy, 2010 (See CAPCOA guidance - CAPCOA: Quantifying Greenhouse Gas Mitigation Measures).
Mendocino County Annual Tons CO2/day (EMFAC 2011) for 2020	2,017	Tons CO2/day	EMFAC 2011
Mendocino County Annual VMT/day (EMFAC 2011) for 2020	3,173,549	VMT/day	EMFAC 2011
Mendocino County Annual Tons CO2/day (EMFAC 2011) for 2030	2,174	Tons CO2/day	EMFAC 2011
Mendocino County Annual VMT/day (EMFAC 2011) for 2030	3,513,109	VMT/day	EMFAC 2011
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2020	0.0005766	MT CO2/VMT	Derived from Annual VMT/day and Annual Tons/day (from EMFAC); multipled by MT/short ton.
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2030	0.0005614	MT CO2/VMT	
Metric Tons per Short Ton	0.91	MT/Ton	
VMT			
Total Annual VMT in 2005	140,333,086	VMT/year	Reverse projected based on an averge of population, housing, and employment growth factors.
Total Annual VMT in 2010	138,522,053	VMT/year	Source: Fehr & Peers
Total Annual VMT in 2020	152,560,979	VMT/year	Source: Fehr & Peers
Total Annual VMT in 2030	169,514,358	VMT/year	Source: Fehr & Peers
Total Annual VMT in 2035	176,893,313	VMT/year	Source: Fehr & Peers
Total Commute VMT in 2005	38,872,265	VMT/year	Nationwide, 27.7% of all VMT are commute trips (USDOT, Summary of Travel Trends 2009, Table 24, p. 44
Total Commute VMT in 2020	42,259,391	VMT/year	Nationwide, 27.7% of all VMT are commute trips (USDOT, Summary of Travel Trends 2009, Table 24, p. 44
Total Commute VMT in 2030	46,955,477	VMT/year	Nationwide, 27.7% of all VMT are commute trips (USDOT, Summary of Travel Trends 2009, Table 24, p. 44
Total Commute VMT in 2035	48,999,448	VMT/year	Nationwide, 27.7% of all VMT are commute trips (USDOT, Summary of Travel Trends 2009, Table 24, p. 44
Total Highway VMT in 2005	85,055,883	VMT/year	In 2005, 60.61 percent of all VMT in Stanislaus was on state highways (Caltrans MVSTAFF05, Appendix B
Total Highway VMT in 2020	92,467,209	VMT/year	In 2005, 60.61 percent of all VMT in Stanislaus was on state highways (Caltrans MVSTAFF05, Appendix B
Total Highway VMT in 2030	102,742,652	VMT/year	In 2005, 60.61 percent of all VMT in Stanislaus was on state highways (Caltrans MVSTAFF05, Appendix B
Total Highway VMT in 2035	107,215,037	VMT/year	In 2005, 60.61 percent of all VMT in Stanislaus was on state highways (Caltrans MVSTAFF05, Appendix B
GHG Emission Factors			
Ukiah Utilities, Electric Services Division 2005 Electricity emission factor (lbs/kWh)	16.3601	kg CO2/MMBtu	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2005 Electricity emission factor (MT/MWh)	0.0103	kg CH4/MMBTU	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2005 Electricity emission factor (lbs/MWh)	0.0002	kg N2O/MMBTU	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2010 Electricity emission factor (lbs/kWh)	12.8178	kg CO2/MMBtu	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2010 Electricity emission factor (MT/MWh)	0.0066	kg CH4/MMBTU	Derived from City-provided electricity consumption data
Ukiah Utilities, Electric Services Division 2010 Electricity emission factor (lbs/MWh)	0.0001	kg N2O/MMBTU	Derived from City-provided electricity consumption data
Natural Gas emission factor (kg/MMBtu)	53.0200	kg CO2/MMBtu	LGOP, Table G.1, 'Pipeline (US Weighted average)'
Natural Gas emission factor (kg/MMBtu)	0.0050	kg CH4/MMBTU	LGOP, Table G.3, 'Commercial' and 'Residential'
Natural Gas emission factor (kg/MMBtu)	0.0001	kg N2O/MMBTu	LGOP, Table G.3, 'Commercial' and 'Residential'
Projected City Growth Factors			
City of Ukiah Square Mileage	4.72	sq. mile	Source: City of Ukiah MSR (Year 2011)
City of Ukiah Acres in 2005	3,021	Acres	Assumes City does not grow in size from 2005 by 2020
City of Ukiah Acres in 2020	3,021	Acres	Assumes City does not grow in size from 2005 by 2030
City of Ukiah Acres in 2030	3,021	Acres	
Total # of housing units in 2005	6,389	Housing Units	Source: California Department of Finance
Total # of housing units in 2020	6,747	Housing Units	Based on Projected Housing Growth from 2005 to 2020, with data from the MCOG Model Data (See Fehr & Peers VMT Inventory Memo, Table 1
Total # of housing units in 2030	6,987	Housing Units	Based on Projected Housing Growth from 2005 to 2020, with data from the MCOG Model Data (See Fehr & Peers VMT Inventory Memo, Table 1
Housing Units per Acre in 2005	2.12	units per acre	Housing/City Acreage
Housing Units per Acre in 2020	2.23	units per acre	Housing/City Acreage
Housing Units per Acre in 2030	2.31	units per acre	Housing/City Acreage
2005 Residential Square Feet	9,251,272	square ft	Number of Housing Units*Average Sq. Ft. Per Residential Unit
2020 Residential Square Feet	9,989,110	square ft	Number of Housing Units*Average Sq. Ft. Per Residential Unit
2030 Residential Square Feet	10,483,750	square ft	Number of Housing Units*Average Sq. Ft. Per Residential Unit
Cost Factors			
BLS U.S. Department of Labor: Average Mendocino County Salary	$ 40,768.00	Salary	based on Bureau of Labor Statistics U.S. Department of Labor, County Employement and Wages (News Release). Released on March 28, 2012.
BLS U.S. Department of Labor: Average Mendocino County Hourly Rate	$ 20.22	Hourly Rate	based on Bureau of Labor Statistics U.S. Department of Labor, County Employement and Wages (News Release). Released on March 28, 2012.
Other			
Year 2005 Ukiah Average Gasoline Vehicle Fleet Fuel Economy (MPG)	19.44		Source: EMFAC 2011
Year 2005 Ukiah Average Diesel Vehicle Fleet Fuel Economy (MPG)	6.99		Source: EMFAC 2011
Year 2005 Ukiah Average Overall Vehicle Fleet Fuel Economy (MPG)	18.57		Source: EMFAC 2011. Note: Assuming 93% gasoline, 7% diesel, per the ICLEI 2012 U.S. Community Protocol, Appendix D, Table TR.1.3: Default Vehicle mix values
Year 2020 Ukiah Average Gasoline Vehicle Fleet Fuel Economy (MPG)	18.88		Source: EMFAC 2011
Year 2020 Ukiah Average Diesel Vehicle Fleet Fuel Economy (MPG)	8.00		Source: EMFAC 2011
Year 2020 Ukiah Average Overall Vehicle Fleet Fuel Economy (MPG)	18.12		Source: EMFAC 2011. Note: Assuming 93% gasoline, 7% diesel, per the ICLEI 2012 U.S. Community Protocol, Appendix D, Table TR.1.3: Default Vehicle mix values
Year 2005 Ukiah Annual Average VMT per Vehicle	12,082		See U.S. DOT Federal Highway Administration, Highway Statistics 2005 Table: http://www.fhwa.dot.gov/policy/ohim/hs05/htm/vm1.htm
Year 2020 Ukiah Annual Average VMT per Vehicle	12,082		Assuming same as in 2005

GHG and Cost Analysis Worksheet: TL.1.1

Strategy Name	**Local Commute Trip Reduction**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-1.1a:** Consider implementing local commute trip reduction requirements in the municipal code. This could require larger employers (50+ employees) to establish TDM programs to reduce single-occupancy vehicle trips, which may include 9/80 work weeks, carpooling, telecommuting, car sharing, bike sharing, shuttles, vanpooling, guaranteed rides home, etc. **Action TL-1.1b:** Consider a coordinated TDM program covering large employers and concentrations of smaller employers (e.g., shopping malls) to share costs and also travel pool (e.g. vanpooling, carpooling and/or shuttles for the Medical Center and other key employers). **Action TL-1.1c:** As staff and resources allow, develop a City Program (with incentives) to encourage private sector employers to implement effective voluntary trip reduction programs. **Action TL-1.1d:** Promote telecommuting and alternative work schedules for City employees. **Note:** Fehr & Peers Calculated VMT Reduction.

2020 GHG Reduction Potential	med	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Based on the limitations of the regional MCOG travel demand model to respond to CAP transportation strategies, such as traffic calming and complete streets ordinances, the model was not used to estimate VMT reductions from transportation strategies. Quantification was conducted using off-model tools and factors, including CAPCOA guidelines and TDM+, a spreadsheet tool developed by Fehr & Peers. See Fehr & Peers memo of 6/28/13, entitle "City of Ukiah – Quantitative Analysis of Strategies," for details.

A range of efectiveness for this strategy was considered; The low end of the range should be used if the strategy is based on prmotion & encouragement while the higher range of effectiveness should be used if the strategy has an implementation plan or will be required.

Description	#	Unit	Equation Variable	
Year 2020 'Low' VMT Reduction	0.1%	%	Y	Source: Fehr & Peers Transportation Strategies Memo
Year 2020 'High' VMT Reduction	0.9%	%	Z	Source: Fehr & Peers Transportation Strategies Memo
Year 2035 'Low' VMT Reduction	0.2%	%	Y	Source: Fehr & Peers Transportation Strategies Memo
Year 2035 'High' VMT Reduction	1.3%	%	Z	Source: Fehr & Peers Transportation Strategies Memo
Total Annual VMT in 2020	152,560,979		T	
Total Annual VMT in 2030	169,514,358		T	
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2020	0.000577	MT CO2/VMT	Cef	
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2030	0.000561	MT CO2/VMT	Cef	

Assuming an average of Fehr & Peers 'Low' and 'High' scenarios for VMT reduction

1. Resource Savings:

Sustainable Growth Patterns: VMT Reduction = Average(Y, Z) x T		
Low VMT Reduction by 2020=	152,561	VMT
Low VMT Reduction by 2035=	339,029	VMT
High VMT Reduction by 2020=	1,373,049	VMT
High VMT Reduction by 2035=	2,203,687	VMT
Average VMT Reduction by 2020=	762,805	VMT
Average VMT Reduction by 2035=	1,271,358	VMT

2. GHG Calculations:

Total Emissions Savings (MT)= VMT Reduction x Cef		
Low GHG Savings by 2020=	88	metric tons CO2
Low GHG Savings by 2035=	190	metric tons CO2
High GHG Savings by 2020=	792	metric tons CO2
High GHG Savings by 2035=	1237	metric tons CO2
Average GHG Savings by 2020=	440	metric tons CO2
Average GHG Savings by 2035=	714	metric tons CO2

GHG and Cost Analysis Worksheet: TL.1.2

Strategy Name	**Sustainable Growth Patterns**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-1.2a:** Consider adopting a Complete Streets Ordinance that directs the City to meet the needs of all of its transportation users. **Action TL-1.2b:** Continue to consider modifications to the municipal code to achieve smart growth objectives (i.e., increase density and mixed-use infill development). **Action TL-1.2c:** Implement SmartCode or form-based code to increase mixed use and pedestrian connectivity in urban core near transit. **Action TL-1.2d:** Promote and encourage downtown revitalization and the vitality of small local businesses in the downtown core area. **Action TL-1.2e:** Encourage smart growth development by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking. **Action TL-1.2f:** Implement traffic calming measures within the downtown core, such as curb extensions (bulb-outs) and rumble strips. **Action TL-1.2g**: Promote and encourage clean energy and green jobs/industries with within the City and in its Sphere of Influence. **Action TL-1.2h:** Develop a plan for creating urban open spaces and natural resources enhancement to complement the compact infill development and mixed use growth strategy. Note: Fehr & Peers Calculated VMT Reduction.
2020 GHG Reduction Potential high	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City) high	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Based on the limitations of the regional MCOG travel demand model to respond to CAP transportation strategies, such as traffic calming and complete streets ordinances, the model was not used to estimate VMT reductions from transportation strategies. Quantification was conducted using off-model tools and factors, including CAPCOA guidelines and TDM+, a spreadsheet tool developed by Fehr & Peers. See Fehr & Peers memo of 6/28/13, entitle "City of Ukiah – Quantitative Analysis of Strategies," for details.

A range of efectiveness for this strategy was considered; The low end of the range should be used if the strategy is based on prmotion & encouragement while the higher range of effectiveness should be used if the strategy has an implementation plan or will be required.

Description	#	Unit	Equation Variable	
Year 2020 'Low' VMT Reduction	0.7%	%	Y	Source: Fehr & Peers Transportation Strategies Memo
Year 2020 'High' VMT Reduction	1.6%	%	Z	Source: Fehr & Peers Transportation Strategies Memo
Year 2035 'Low' VMT Reduction	0.9%	%	Y	Source: Fehr & Peers Transportation Strategies Memo
Year 2035 'High' VMT Reduction	2.1%	%	Z	Source: Fehr & Peers Transportation Strategies Memo
Total Annual VMT in 2020	152,560,979		T	
Total Annual VMT in 2030	169,514,358		T	
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2020	0.000577	MT CO2/VMT	Cef	
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2035	0.000561	MT CO2/VMT	Cef	

Assuming an average of Fehr & Peers 'Low' and 'High' scenarios for VMT reduction

1. Resource Savings:

Sustainable Growth Patterns: VMT Reduction = Average(Y, Z) x T		
Low VMT Reduction by 2020=	1,067,927	VMT
Low VMT Reduction by 2035=	1,525,629	VMT
High VMT Reduction by 2020=	2,440,976	VMT
High VMT Reduction by 2035=	3,559,802	VMT
Average VMT Reduction by 2020=	1,754,451	VMT
Average VMT Reduction by 2035=	2,542,715	VMT

2. GHG Calculations:

Total Emissions Savings (MT)= VMT Reduction x Cef		
Low GHG Savings by 2020=	616	metric tons CO2
Low GHG Savings by 2035=	857	metric tons CO2
High GHG Savings by 2020=	1408	metric tons CO2
High GHG Savings by 2035=	1999	metric tons CO2
Average GHG Savings by 2020=	1012	metric tons CO2
Average GHG Savings by 2035=	1428	metric tons CO2

GHG and Cost Analysis Worksheet: T.1.3

Strategy Name	**Regional Transportation Management**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-1.3a:** Coordinate with Mendocino County and cities within the County to encourage alternatives to SOV travel.

Note: Supporting Strategy - not quantified.

GHG and Cost Analysis Worksheet: T.1.4

Strategy Name	**Public Transit Expansion**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-1.4a:** Coordinate with Mendocino Transit Authority (and/or other transit agencies) to increase transit system ridership with incentives, safety and technology improvements, improved bus stop amenities, partnerships, and investments (e.g., coordinate to increase bus frequency and the number of pick-up locations in Ukiah). **Action TL-1.4b:** Promote existing and/or additional "Reduced Fares" for residents (i.e., school children, elderly). **Action TL-1.4c:** Encourage residents to use the existing Dial-A-Ride transit.

Note: Supporting Strategy - not quantified.

GHG and Cost Analysis Worksheet: TL.2.1

Strategy Name	**Improve Bicycle and Pedestrian Infrastructure**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-2.1a:** Install bicycle support facilities at public locations, transit hubs, and the downtown core. **Action TL-2.1b:** Improve the bicycle network to make it friendlier for cyclists (i.e., update and implement the Bicycle and Pedestrian Master Plan). **Action TL-2.1c:** Identify street right-of-way reconstruction projects and costs for developing bike paths and lanes. **Action TL-2.1d:** Consider a variety of strategies for funding bicycle and pedestrian improvements, such as development density bonuses, expedited planning permits review, development impact fees, etc. **Action TL-2.1e:** Evaluate opportunities to encourage walkable/bikable corridors. **Action TL-2.1f:** Actively promote walking and biking as safe and healthy modes of travel. **Action TL-2.1g:** Consider the use of "sharrows" on selected key street corridors. **Action TL-2.1h:** Support and encourage local bicycle special events that promote bicycle use and healthy living, and contribute to the local economy, particularly those that include young people and that contribute to local economic development. **Note:** The Resource savings calculation below takes into account an interpretation of the impact of all of the above actions (within the *Miles of Bike Lanes Added* figure in the Bike Lane Expansion equation).

2020 GHG Reduction Potential	med	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable	
Commute VMT in 2020	42,259,391	VMT/year	V_{2020}	
Commute VMT in 2030	46,955,477	VMT/year	V_{2030}	
Miles of Bike Lanes Added between 2005 and 2020	4			Estimate based on current City of Ukiah bike network expansion trends a
Miles of Bike Lanes Added between 2005 and 2030	8			Estimate based on current City of Ukiah bike network expansion trends a
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2020	0.000577	MT CO2/VMT	Cef	
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2030	0.000561	MT CO2/VMT	Cef	

Data Sources for Resource Savings and GHG Calculations

CAPCOA Quantifying Greenhouse Gas Mitigation Measures (Measure TRT-4 and SDT-6).

EMFAC 2011 model run, Mendocino County.

1. Resource Savings:

Bike Lane Expansion:
VMT Reduction =
For 2 miles of added bike lane: 0.05% GHG reduction
For 4 miles of added bike lane: 0.09 GHG reduction
For 8 miles of added bike lane: 0.14% GHG reduction
[Equation provided by CAPCOA (SDT-6)]

Assume maximum number of bike lanes added, yielding 0.14% VMT Reduction

VMT Reduction by 2020=	38,033	VMT
VMT Reduction by 2030=	65,738	VMT

2. GHG Calculations:

Total Emissions Savings (MT)= VMT Reduction x Cef

Total GHG Emissions Savings by 2020=	22	metric tons CO2
Total GHG Emissions Savings by 2030=	37	metric tons CO2

GHG and Cost Analysis Worksheet: TL.2.2

Strategy Name	**Establish Safe Routes to Schools**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-2.2a:** Enhance pedestrian and bicycle facilities around schools. **Action TL-2.2b:** Utilize City resources to encourage and educate parents and students about the benefits of walking and biking to school. **Action TL-2.2c**: Implement traffic calming measures on identified Safe Routes to School routes. **Action TL-2.2d:** Add safety improvements to City transportation infrastructure along applicable routes. **Action TL-2.2e:** Continue to work closely with the Mendocino County Public Health Department to promote walking and biking and healthy alternatives for school children **Note:** The Resource savings calculation below takes into account an interpretation of the impact of Action T-2.2a (within the *Intersections with New Improvements* percentage and the *Streets with New Improvements* percentage that make up the Street Improvements equation).

2020 GHG Reduction Potential	high	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
Total VMT in 2020 minus Highway VMT in 2020	60,093,770	VMT/year	V_{2020}
Total VMT in 2030 minus Highway VMT in 2030	66,771,706	VMT/year	V_{2030}
% of intersections w/ new improvements in 2020 from 2005*	50%	%	See Table
% of Streets w/ new improvements in 2020 from 2005*	50%	%	See Table
% of intersections w/ new improvements in 2030 from 2005*	100%	%	See Table
% of Streets w/ new improvements in 2030 from 2005*	100%	%	See Table
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2020	0.000577	MT CO2/VMT	Cef_{2020}
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2035	0.000561	MT CO2/VMT	Cef_{2030}

*Note: new improvements could include (but are not limited to) enhanced striping, bike lane additions, and inexpensive improvements to instrastructure safety (for example, by adding cones to dangerous streets or intersections).

Data Sources for Resource Savings and GHG Calculations

CAPCOA Quantifying Greenhouse Gas Mitigation Measures (Measure SDT-2).

EMFAC 2011 model run, Mendocino County.

1. Resource Savings:

Street Improvements: VMT Reduction = VMT x % Reduction in VMT
(see CAPCOA SDT-2)

		% of Streets w/ Improvements			
		25%	**50%**	**75%**	**100%**
		% Reduction in Commute VMT			
% of intersections w/ improvements	**25%**	0.25%	0.25%	0.50%	0.50%
	50%	0.25%	0.50%	0.50%	0.75%
	75%		0.50%	0.75%	0.75%
	100%	0.50%	0.75%	0.75%	1.00%

VMT Reduction by 2020=	300,469	VMT
VMT Reduction by 2030=	667,717	VMT

2. GHG Calculations:

Total Emissions Savings (MT)= VMT Reduction x Cef

Total GHG Emissions Savings by 2020=	173	metric tons CO2
Total GHG Emissions Savings by 2030=	375	metric tons CO2

GHG and Cost Analysis Worksheet: Strategy TL.3.1

Strategy Name	**Improve Fuel Efficiency for Municipal Fleet**
Emissions Category	Transportation and Land Use
Strategy Description	**Action TL-3.1a:** Participate in City-wide marketing efforts for Clean Air Days, Bike-to-Work Days, Sunday Streets/Car-Free Sundays, etc. **Action TL-3.1b:** Consider setting aside funding and/or pursuing grant funding to replace the City fleet vehicles with additional electric, hybrid-electric, and alternative fuel vehicles. **Note:** Resource savings calculations below take into account an interpretation of the impact of all of the above actions (with the *Degree of Implementation* figures and the *Expected Average New Alternative/Hybrid Vehicle Fuel Economy* figure that make up the Improve Fuel Efficiency for Municipal Fleet equation).

2020 GHG Reduction Potential	med	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
Degree of Implementation (# of City vehicles replaced w/ an electric powered model) between 2005 and 2020	10		D_a
Degree of Implementation (# of vehicles replaced w/ an electric powered model) between 2005 and 2030	30		D_b
Average Annual VMT per vehicle	12,082		A
Existing Fuel Economy	19.4		E
Expected Average New Alternative/Hybrid Vehicle Fuel Economy	54.5		F
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2020	0.000577	MT CO2/VMT	Cef
Emission Factor; Annual MT CO2 per VMT (EMFAC 2011) for 2030	0.000561	MT CO2/VMT	Cef

Data Sources for Resource Savings and GHG Calculations

SEEC Community Inventory Tool, Reduction Measure: Transportation - Hybrid Vehicles. Available at: https://c.na5.visual.force.com/apex/ForecastMeasure

EMFAC 2011 model run, Mendocino County.

1. Resource Savings:

Improve Fuel Efficiency for Municipal Fleet:
VMT Reduction = D x A x (1-(E/F)) x R

VMT Reduction by 2020=	77,717	VMT
VMT Reduction by 2030=	233,151	VMT

2. GHG Calculations:

Total Emissions Savings (MT)= VMT Reduction x Cef

Total GHG Emissions Savings by 2020=	45	metric tons CO2
Total GHG Emissions Savings by 2030=	131	metric tons CO2

Solid Waste Strategies

Summary Table

Code	Strategy Name	GHG Reduction by 2020 (CO2 (MT))	% of Total Reductions in 2020	GHG Reduction by 2030 (CO2 (MT))	Relative GHG Benefit	Relative Cost	Implementation Priority
Goal SW.1: Reduce Solid Waste Sent to Landfill							
Strategy SW.1.1	Increase Community Landfill Diversion Rate	1,686	99.0%	2,320	high	med	1
Strategy SW.1.2	Increase Municipal Operations Landfill Diversion Rate	17	1.0%	24	low	low	2
Goal SW.2: Reduce Municipal Operations Solid Waste Sent to Landfill							
	Explore Potential of Flaring Landfill Gas	NA		NA	NA	NA	
	Totals:	**1,703**	**100%**	**2,343**			

Prioritization of Community Strategies

		Costs		
		Low	Medium	High
Benefits	High	1	1	2
	Medium	1	2	3
	Low	2	3	3

Strategy GHG and Cost Analysis Worksheet: SW.1.1

Solid Waste Strategies

Strategy Name	**Increase Community Landfill Diversion Rate**
Emissions Category	Solid Waste
Strategy Description	**Action SW1.1a:** Develop a Community Waste Reduction Plan (i.e., Zero Waste Plan). **Action SW1.1b:** Work with the local hauler to increase curbside recycling rate and divert organics (food and/or green waste) from landfill. **Action SW1.1c:** Work with the local hauler and/or solid waste agency to ensure that services for solid waste collection, recycling and disposal meet the needs of the community. Improve composting programs. **Action SW1.1d:** Launch outreach campaigns to increase participation in residential and commercial recycling and composting programs, and to promote waste reduction. Work with the Mendocino Solid Waste Management Authority and the solid waste local hauler to distribute public education materials on solid waste source reduction, recycling and composting, and the proper handling of household hazardous waste. **Note:** Resource savings calculations below take into account an interpretation of all of the above actions (*within the Goal Diversion Rate factors)* in the Increase Community Landfill Diversion Rate equation.

2020 GHG Reduction Potential	high	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	med	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
2005 Community Diversion Rate[1]	42%	%	
2005 Community Waste Generation Total (all waste, landfilled and not)[2]	30,686	Tons	
2005-2020 Estimate Growth in Waste Generation[3]	0.58%		
2020 Community Goal Diversion Rate	75%	%	
2020 Community Waste Generation Estimate (all waste, landfilled and not)	32,403	Tons	
2005-2020 Estimate Growth in Waste Generation[4]	0.55%		
2030 Community Goal Diversion Rate	85%	%	
2030 Community Waste Generation Total (all waste, landfilled and not)	34,216	Tons	
Factor: MT CO2e per ton of waste sent to landfill[5]	0.158		

[1]Note: 2006 used as a proxy year for 2005, since year 2005 diversion rate data was not available from CalRecycle)

[2]Source: http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionDetail.aspx?JurisdictionID=548&Year=2007

[3]An average of expected population, employment, and household growth.

[4]An average of expected population, employment, and household growth.

[5]See Community Inventory Solid Waste sector for more detail. Based on Landgem run with Ukiah-specific parameters.

Increase Community Landfill Diversion Rate:

1. Landfill tons Savings:	1. Total Solid Waste Savings between (tons) =		
	Solid Waste saved between 2005 and 2020 (tons) =	10,693	tons
	Solid Waste saved between 2005 and 2030 (tons) =	14,713	tons
2. GHG Savings:	2. Total Solid Waste Savings in terms of MT CO2e =		
	Solid Waste saved between 2005 and 2020 (MT CO2e)	1,686	metric tons CO2e
	Solid Waste saved between 2005 and 2030 (MT CO2e) =	2,320	metric tons CO2e

Strategy GHG and Cost Analysis Worksheet: SW.1.2

Solid Waste Strategies

Strategy Name	**Increase Municipal Operations Landfill Diversion Rate**
Emissions Category	Solid Waste
Strategy Description	**Action SW1.2a:** Include municipal operations in the Community Waste Reduction Plan or Zero Waste Plan. **Action SW1.2b:** Work with the local hauler to expand recycling and organics diversion at City facilities. **Action SW1.2c:** Consider adopting an environmentally friendly purchasing policy for municipal operations. **Note:** Resource savings calculations below take into account an interpretation of all of the above actions (*within the Goal Diversion Rate factors)* in the Increase Municipal Operations Landfill Diversion Rate equation.

2020 GHG Reduction Potential	low	[low = <20 ; med = 20 to 100; high = >100]
Annual cost by 2020 (to City)	low	[low - <$10K ; med = $10K - $50K; high = >$50K] - Consider cost to CIty budget (first cost, annual cost) and staff time

Key Assumptions for Resource Savings and GHG Calculations

Description	#	Unit	Equation Variable
2006 Community Diversion Rate (used a proxy for municipal operations)[1]	42%	%	
2005 Estimated Municipal Operations Emissions from Solid Waste	48.04	MT CO2e	
2005-2020 Estimate Growth in Waste Generation[2]	0.7%		
2020 Estimated Municipal Operations Emissions from Solid Waste	51.34		
2005-2030 Estimate Growth in Waste Generation[3]	0.7%		
2020 Estimated Municipal Operations Emissions from Solid Waste	54.87		
2020 Goal Community Diversion Rate (used a proxy for municipal operations)	75%	%	
2030 Goal Community Diversion Rate (used a proxy for municipal operations)	85%	%	

[1]2006 used as a proxy year for 2005, since year 2005 diversion rate data was not available from CalRecycle)

[2]An average of expected population, employment, and household growth; same as used to project community solid waste emissions from 2010-2020 in the community inventory.

[3]An average of expected population, employment, and household growth; same as used to project community solid waste emissions from 2010-2020 in the community inventory.

Increase Municipal Operations Landfill Diversion Rate:

1. GHG Savings:

Solid Waste saved between 2005 and 2020 (MT CO2e) =	17	metric tons CO2e
Solid Waste saved between 2005 and 2030 (MT CO2e) =	24	metric tons CO2e

Appendix D

City of Ukiah Climate Action Plan Workshop, Public Survey and Results

ESA

City of Ukiah - Climate Action Plan Workshop (4/24/13)

Public Survey *(and Results)*

Help us understand how Ukiah can best accomplish its greenhouse gas reduction and climate change resilience goals!

Please complete the following survey (~10 minutes), and return it by May 23rd to:

City of Ukiah Climate Action Plan Project
c/o Jeff Caton, Environmental Science Associates
550 Kearny Street, Suite 800
San Francisco, CA 94108

You can also complete this survey online at: https://www.surveymonkey.com/s/RM9X6GP. Pass it on!

City of Ukiah Strategy	**Do you support this strategy?**			**Add Your Ideas and Feedback** *(e.g., What is missing; What is preventing you from currently using this strategy?)*
KINDS OF STRATEGIES	**Yes**	**Unsure**	**No**	**Comments**
Provide **outreach and education** to the community to encourage sustainable behaviors, and connect residents to existing resources and programs.	58	8	36	
Use **incentives** (financial, permit streamlining, public recognition, etc.) to foster beneficial actions and encourage sustainable practices.	50	12	38	
Develop **guidelines and programs** to encourage change (for example, a City program that expands bike lanes or secure bike parking).	44	9	48	
Change **City ordinances or municipal codes** (for example, an update to the building code that would require more efficient new buildings).	31	18	52	
TRANSPORTATION AND LAND USE	**Yes**	**Unsure**	**No**	**Comments**
Improve or expand alternative commute options:				
Carpooling	36	15		
Public Transit	48	6	40	
Bike-sharing	20	20	53	
Telecommuting	37	15	43	
Guaranteed Ride Home Program	22	28	43	
Improve Bicycle and Pedestrian Infrastructure:				
Add safety improvements and traffic calming measures.	36	15	41	
Implement city-wide bike share program.	18	18	56	
Add additional bike routes and strategically placed bike racks.	45	11	36	

City of Ukiah Strategy	Do you support this strategy?			Add Your Ideas and Feedback *(e.g., What is missing; What is preventing you from currently using this strategy?)*
TRANSPORTATION AND LAND USE	**Yes**	**Unsure**	**No**	**Comments**
Safe Routes to Schools: Increase opportunities for walking and cycling by schoolchildren to and from school.	65	8	22	
More public transit and/or better access to transit.	41	9	45	
More smart growth: higher density, mixed-use developments located near transit and city center; minimize development in outlying areas.	35	19	43	
Support and promote local businesses and local food to reduce goods transport.	53	9	34	
Increase City investment in alternative vehicle infrastructure (for example, electric vehicle charging stations).	26	14	56	
ENERGY	**Yes**	**Unsure**	**No**	**Comments**
Incentivize higher energy efficiency in new buildings (commercial and residential) through permit fast-tracking and local recognition/awards.	50	11	29	
Increase outreach and promotion of Ukiah Public Utilities' existing financing and rebate programs for renewable energy and residential and commercial energy efficiency.	58	8	23	
Revise municipal code for new commercial buildings to require higher energy efficiency standards than the state building code.	19	13	57	
Revise municipal code for new residential buildings to require higher energy efficiency standards than the state building code.	14	15	61	
Develop a local "Green Business" program or outreach campaign to promote energy efficiency in commercial buildings.	39	13	38	
Use point-of-sale energy use disclosure or energy efficiency audit to motivate efficiency upgrades, for residential and commercial buildings.	18	17	54	
Reduce urban heat island effects through municipal ordinance for light covered pavements and shade tree coverage.	34	12	44	
Promote small-scale on-site solar energy systems for homes.	43	9	38	
Promote small-scale on-site solar energy systems for commercial and industrial sites.	45	9	34	
Promote clean energy economy and associated "green collar" job development.	37	16	37	
Join Mendocino County's residential Property Assessed Clean Energy (PACE) program that allows home owners to finance energy improvements through loans that are paid back as a surcharge on property tax bill.	39	14	37	

City of Ukiah Strategy	Do you support this strategy?			Add Your Ideas and Feedback *(e.g., What is missing; What is preventing you from currently using this strategy?)*
SOLID WASTE	**Yes**	**Unsure**	**No**	**Comments**
Develop and implement a Zero Waste Plan to divert as much solid waste as possible from landfill. (City Zero Waste Resolution No. 2013-06 was adopted March 6, 2013.)	41	14	31	
Work with the local hauler and/or solid waste agency to ensure the right mix of services is available to maximize recycling and the collection & processing of food waste and other organics.	61	9	17	
Improve and/or expand composting programs.	54	11	23	
Improve diversion and reuse of construction waste.	54	11	23	
Expand collection of organics and food waste for beneficial use (e.g., energy or compost).	55	12	21	
Assess the feasibility of flaring the landfill gas (methane) currently extracted at the City-owned landfill (now closed) to reduce the global warming potential of the gas.	35	23	28	
Adopt an environmentally friendly purchasing policy for municipal operations, to maximize recycled content and minimize materials sent to landfill.	42	13	32	
WATER	**Yes**	**Unsure**	**No**	**Comments**
Increase public education and outreach on the need for water conservation, and ways to conserve water.	45	6	35	
Promote rebates for water efficient plumbing fixtures for commercial and residential buildings.	53	8	23	
Adopt a water efficient landscaping ordinance.	27	16	43	
Promote installation of purple (i.e., recycled water) pipes for public and private projects.	45	21	20	
Expand use of recycled water.	57	18	11	
PREPARING FOR CLIMATE CHANGE	**Yes**	**Unsure**	**No**	**Comments**
Increase Public Awareness: engage and educate the community about the expected impacts and need for better planning.	40	9	34	
Partner or collaborate with State and regional agencies, and other communities to assess climate change vulnerabilities and develop strategies and funding mechanisms for adaptation.	28	16	40	
Perform a detailed vulnerability analysis to assess potential local climate change impacts to infrastructure, economy, vulnerable communities and natural systems.	20	17	48	
Develop a standalone Climate Change Adaptation Plan that contains vulnerability analysis and adaptation strategies appropriate for Ukiah. Include cost estimates and prioritize actions to increase local resilience of City infrastructure and critical assets, including natural systems like wetlands and urban forests.	18	15	51	

City of Ukiah Strategy	Do you support this strategy?			Add Your Ideas and Feedback *(e.g., What is missing; What is preventing you from currently using this strategy?)*
PREPARING FOR CLIMATE CHANGE (cont.)	**Yes**	**Unsure**	**No**	**Comments**
Amend Ukiah General Plan to codify goals, objectives, and polices related to climate change adaptation.	19	15	49	
Amend the Mendocino County Multi-Hazard Mitigation Plan to include climate change hazards and adaptation strategies for Ukiah related to wildfires, flooding, coastal storms and erosion, drought, and heat emergencies.	28	13	43	
Participate in the North Coast Integrated Regional Water Management (IRWM) process to further adaptation strategy development and implementation. IRWM is potential source of funding.	28	23	33	
Take specific actions now, including:				
Provide water recycling education programs for residences and commercial buildings, including grey-water systems and water efficient landscaping.	48	8	29	
Support water reclamation and reuse projects, and increase capacity for community water storage.	60	6	19	
Establish cooling centers, especially for vulnerable populations.	21	13	51	
Reduce urban heat islands through use of cool roofs and lightly colored pavements (energy efficiency co-benefit), and targeted tree planting in large paved areas.	33	8	44	
Implement measures to reduce risk of urban fires and wildfires.	46	10	29	
Build communications and public warning system and response plans for extreme heat and weather events.	26	14	44	
Integrate local flood management plans with adaptation planning.	35	17	33	
Promote conservation of local and nearby agricultural land.	44	11	30	
Evaluate existing energy efficiency and demand-response programs for their effectiveness at reducing peak electricity demand during extreme heat events.	40	15	29	
Additional	**Yes**	**Unsure**	**No**	
I am a Ukiah Resident	59			
I am a Ukiah Business Owner	30			
I work in Ukiah	61			
Skipped Question	24			

Appendix N: County of Mendocino Multi-Jurisdiction Hazard Mitigation Plan

City of Ukiah 2020 Urban Water Management Plan

MENDOCINO COUNTY

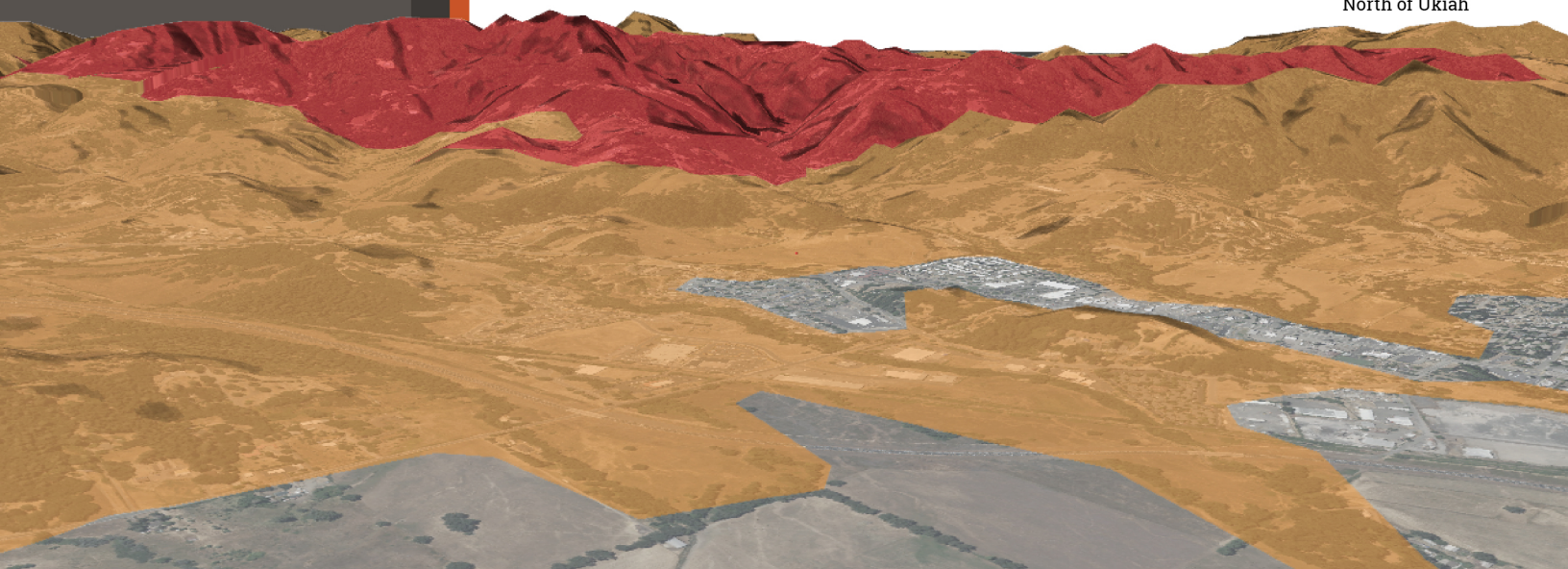
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN

VOLUME 2

CONTENTS

CLICK TO JUMPT TO ANNEX

City of Ukiah
City of Fort Bragg
City of Point Arena
City of Willits
Mendocino County Office of Education



DEPICTED BELOW:
Composite Wildfire Layer
North of Ukiah

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MENDOCINO COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

City of Ukiah

JURISDICTIONAL ANNEX

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Mendocino County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF UKIAH (UK)

Municipal Participating Jurisdiction Annex

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Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Mendocino County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.

City of Ukiah - Adoption Resolution

RESOLUTION NO. 2020-65

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF UKIAH ADOPTING THE 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR MENDOCINO COUNTY

WHEREAS:

1. The City of Ukiah is a political subdivision of the State of California and an official participating jurisdiction in the "2020 Mendocino County Multi-Jurisdictional Hazard Mitigation Plan" (MJHMP); and

2. The MJHMP is set forth in Exhibit A, attached hereto and by reference incorporated herein; and

3. The City of Ukiah recognizes the MJHMP as the official hazard mitigation plan for the County and participating jurisdictions; and

4. The City of Ukiah, with the assistance from the County, has gathered information and prepared the MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements pursuant to 44 C.F.R. § 201.6; and

5. The City of Ukiah Jurisdictional Annex set forth in Volume 2 of the MJHMP recognizes the threat that natural hazards pose to people and property within our community; and

6. The City of Ukiah has reviewed the MJHMP and affirms that the hazard mitigation plan actions in the City of Ukiah's Jurisdictional Annex will reduce the potential for harm to people and property from future hazard occurrences with our community; and

7. Congress passed the Disaster Mitigation Act of 2000 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

8. The Disaster Mitigation Act made available mitigation grants to state and local governments; and

9. An adopted multi-hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

10. The City Council fully participated in the FEMA-prescribed mitigation planning process to prepare this MJHMP; and

11. Citizens residing within the City's jurisdiction were afforded opportunities to comment and provide input in the MJHMP and the actions in the Plan; and

12. The City of Ukiah, as a fully participating jurisdiction of the MJHMP, is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

13. The California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

14. The City Council desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the MJHMP; and

15. Adoption by the City Council for the City of Ukiah demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this MJHMP; and

16. Adoption of this Plan helps to coordinate the responsible agencies to carry out their responsibilities under the MJHMP.

NOW, THEREFORE, BE IT RESOLVED that:

1. That the City of Ukiah adopts the 2020 Multi-Jurisdictional Hazard Mitigation Plan Vol. 1 for Mendocino County and the City of Ukiah Jurisdictional Annex in Vol. 2, as approved by FEMA and Cal OES, as the hazard mitigation plan for the City of Ukiah.

2. That the City Council orders the City Manager to submit an approved and signed copy of this resolution to the Cal OES and FEMA Region IX officials to enable the plan's final approval.

PASSED AND ADOPTED this 18th day of November, 2020, by the following roll call vote:

AYES: Councilmembers Mulheren, Brown, Scalmanini, Orozco, and Mayor Crane
NOES: None
ABSENT: None
ABSTAIN: None

Douglas F. Crane, Mayor

ATTEST:

Kristine Lawler, City Clerk

Section 1. City of Ukiah

1.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Ukiah. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the City of Ukiah. This Annex provides additional information specific to the City of Ukiah, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

Tami Bartolomei, Office of Emergency Management Coordinator
City of Ukiah
300 Seminary Avenue,
Ukiah, CA 95482
Telephone: (707) 467-5765
e-mail Address: tbartolemei@cityofukiah.com

Alternate Point of Contact

Craig Schlatter, Community Development Director
City of Ukiah
300 Seminary Avenue,
Ukiah, CA 95482
Telephone: (707) 463-6219
e-mail Address: cschlatter@cityofukiah.com

1.2 Planning Methodology

The City of Ukiah followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 1-1.

Table 1-1: Planning Committee Members

Planning Committee Members	Department
Tami Bartolomei	Office of Emergency Management
Craig Schlatter	Community Development
Douglas Hutchison	Ukiah Valley Fire Authority
Greg Owen	Ukiah Municipal Airport Manager
Justin Wyatt	Police Department
Sage Sangiacomo	City Manager
Tim Eriksen	Public Works

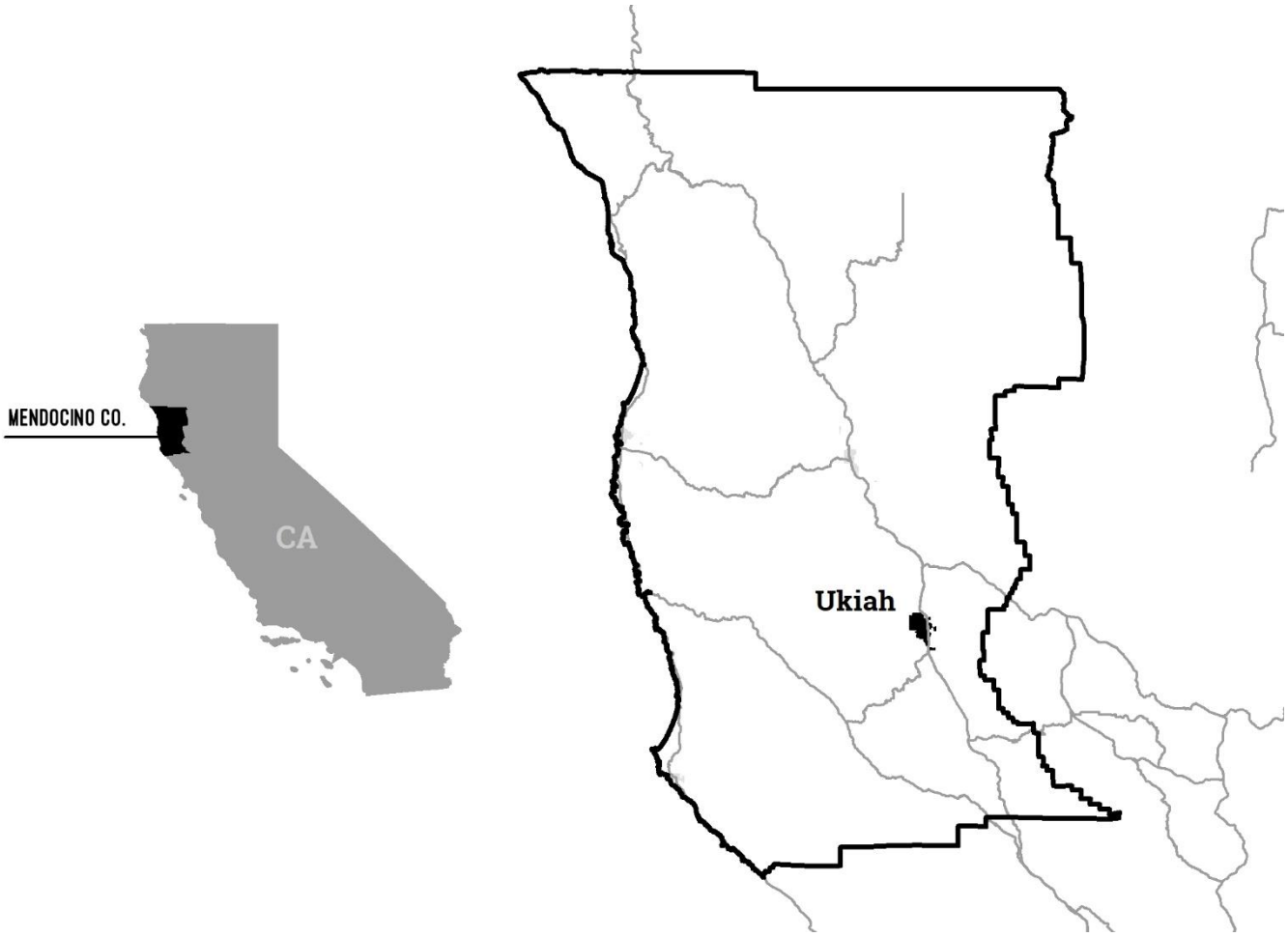


Figure 1-1: City of Ukiah Location

1.3 What's New

The City of Ukiah has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 1-3. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Table 1-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 1-12.

Table 1-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled
ma-AH-UK-72	All Hazard	Cancelled	2014	City of Ukiah	Integrate the Mendocino County HMP, in particular the hazard analysis and mitigation strategy sections, into local planning documents, including general plans, emergency operations plans, and capital improvement plans.	Ongoing work, opportunities for integration reflected in capabilities assessment.
ma-FL-UN-192	Flood	Cancelled	2008	City of Ukiah	Carry out minor flood and stormwater management projects that would reduce damage to infrastructure and residential buildings due to flooding. These projects include the modifying or replacing existing culverts and bridges, upgrading capacity of storm drains, stabilizing streambanks, clearing streambanks of debris and vegetation, and creating of debris or flood/stormwater retention basins in small watersheds.	Covered under 2014 MA #ma-FL-UK-78
ma-HM-UK-63	HazMat	Cancelled	2014	City of Ukiah	Conduct a public awareness and educational campaign to raise awareness about the presence of hazardous materials throughout the County, including naturally occurring asbestos.	Best addressed in other plans, not a priority
ma-IN-UK-71	Insects	Cancelled	2014	City of Ukiah	Implement an infestation public awareness and educational campaign.	While this in an ongoing effort, it is best addressed in other plans
ma-WF-UK-68	Wildfire	Cancelled	2014	City of Ukiah	Implement a fuel reduction program, such as the collection and disposal of dead fuel, within open spaces and around critical facilities and residential structures located within a high and very high wildfire zones.	covered under ma-WF-UK-289

1.3.1 Mitigation Successes

Table 1-3 displays multiple important mitigation actions that have been completed by the City of Ukiah. The success story below further documents Ukiah's successful mitigation efforts to date. Some of the City's success stories are described in more detail herein.

Table 1-3: Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description
ma-EQ-UK-80	Earthquake	Completed	2008	City of Ukiah	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by Mendocino County or incorporated communities that do not meet the California Building Code (CBC) requirements for seismic safety or the California Codes Essential Services Building Act.
ma-FL-UK-79	Flood	Completed	2008	City of Ukiah	Public Works has a long-term maintenance plan in place and routinely conducts storm culvert, creek and vegetation management.

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description
ma-FL-UK-81	Flood	Completed	2008	City of Ukiah	Public Works has upgraded both the Water treatment and Wastewater treatment facilities and has letters of modified flood correction on file with FEMA.
ma-WF-UK-61	Wildfire	Completed	2014	City of Ukiah	Develop a community wildfire mitigation plan that identifies and prioritizes areas for hazard fuel reduction treatments and recommend the types of methods of treatments.
ma-WF-UK-82	Wildfire	Completed	2008	City of Ukiah	The Fire Marshall provides regular public outreach on wild land interface dangers, and the City Council adopted new building standards for the High Fire Hazard Severity Zone.



SUCCESS STORY 1: *Ukiah Wildfire Prevention Initiative*

In 2019, the City of Ukiah began an effort to increase wildfire mitigation capabilities. The City began conducting inspections in the region to identify any fire prone areas. They also conducted outreach by consulting local homeowners about their knowledge of fire safety issues and experiences with wildfire in the area.

During the same period, the City began creating a number of Fire Safe Councils in and around the city. These Fire Safe Councils mapped non-ambulatory neighborhood residences. The Mendocino County Fire Safe Council, in particular, is managing the Ukiah Valley Fire Fuels Reduction Project. The Projects objective is to reduce fire fuels by performing roadside clearing, creating shaded fuel breaks, and holding neighborhood chipper days.

An additional collaboration between the County, the City, Ukiah Valley Fire Authority, Mendocino County Fire Safe Council and CalFire included vegetation management, shaded fuel breaks at the base of the western hills and ridgetop fire breaks in critical locations to reduce wildfire intensity and rate of spread around the City of Ukiah and surrounding communities.

1.4 Risk Assessment

The intent of this section is to profile the City of Ukiah's hazards and assess the City's vulnerabilities, distinct from that of the County-wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

1.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 1-4. Detailed hazard profiles of the most significant County-wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect City of Ukiah. Table 1-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, City of Ukiah General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to City of Ukiah and which ones were not. Section 0 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to City of Ukiah.

Table 1-4: County Hazard Prioritization (Vol. 1)

Hazard Type	Explanation
Climate Change	**High priority county-wide, profiled hazard.**
Dam/ Levee failure	**High priority county-wide, profiled hazard.**
Drought	**High priority county-wide, profiled hazard.**
Earthquake/ Geologic Hazards	**High priority county-wide, profiled hazard.**
Flood	**High priority county-wide, profiled hazard.**
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	**High priority county-wide, profiled as part of Severe Weather.**
Insect Hazards	While hazardous insects exist in Mendocino County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	**High priority county-wide, profiled hazard.**
Severe Weather, including:	**High priority county-wide for heavy wind and heavy rain.**
Extreme Heat	Not a priority as extreme weather event, discussed as climate change impact.
Hail	Hail events are rare in Mendocino County and not profiled in this plan.
High Wind	**Profiled as part of Severe Weather hazard.**
Heavy Rain	**Profiled as part of Severe Weather hazard.**
Fog	While fog events do occur within Mendocino County, they are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	While winter storms are present in Mendocino County, they were not identified as a priority for this plan.
Slope Failure	**High priority county-wide, profiled hazard.**
Soil Hazards	**High priority county-wide, profiled hazard (includes erosion and naturally-occurring asbestos).**
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	**High priority county-wide, profiled hazard.**

Table 1-5: Document Review Crosswalk

Hazards	2014 Mendocino County MJHMP	1995 City of Ukiah General Plan	2009 Mendocino County General Plan	2018 California State HMP
Agricultural Pests	■			■
Climate Change			■	■
Dam Failure	■		■	■
Drought	■	■	■	■
Earthquake	■	■	■	■
Flood	■	■	■	■
Insect Hazards	■			
Landslide		■	■	■
Levee Failure	■*			■
Manmade Hazards			■	■
Pandemic Disease	■			■
Sea Level Rise				■
Severe Weather				■
Soil Hazards	■**	■		
Terrorism & Tech Hazards				■
Tsunami	■		■	■
Volcano				■
Wildfire	■***	■	■	■

** included as part of dam failure*
*** included naturally occurring asbestos*
**** included urban conflagration*

1.4.2 Hazard Risk Ranking

The City of Ukiah's Planning Team used the same hazard prioritization process as the Mendocino County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 1-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess City of Ukiah's vulnerability to following hazards:

- Dam Failure
- Climate Change
- Earthquake
- Pandemic
- Flood
- Wildfire
- Drought

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address City of Ukiah's vulnerability to these specifically-identified hazards.

1.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within City of Ukiah are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

1.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 1-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Mendocino County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to City of Ukiah. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

1.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 1-3 through Figure 1-9, illustrate City of Ukiah's vulnerability to specific hazards. Figures include:

- Figure 1-3: City of Ukiah Dam Inundation
- Figure 1-4: City of Ukiah M7.4 Maacama Garberville Scenario Earthquake Exposure Summary
- Figure 1-5: City of Ukiah M7.8 N. San Andreas -N. Coast -Peninsula – SC MTN
- Figure 1-6: City of Ukiah FEMA Flood Risk Exposure
- Figure 1-7: City of Ukiah Mean Fire Return Interval
- Figure 1-8: City of Ukiah Wildfire Risk Exposure Snapshot
- Figure 1-9: Drought Timeline for Russian Watershed

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

Highly Likely	**Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
Likely	**Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
Possible	**Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
Unlikely	**Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate Change impacts will be addressed at the end of each hazard section within the 2020 plan update and as a stand alone section for each jurisdiction...
For County and Municipal governments you will be required to address climate change impacts in the Safety Element of your General Plan. Climate change may change the frequency, duration and intensity of hazards listed above.



Pandemic will be profiled for every jurisdiction.

City of Ukiah Risk Matrix

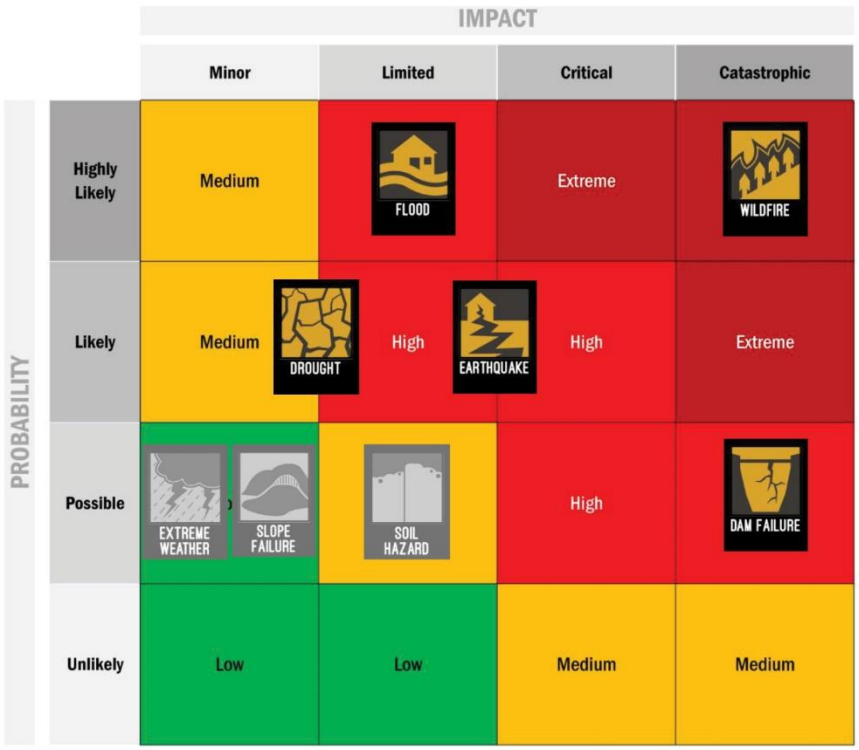
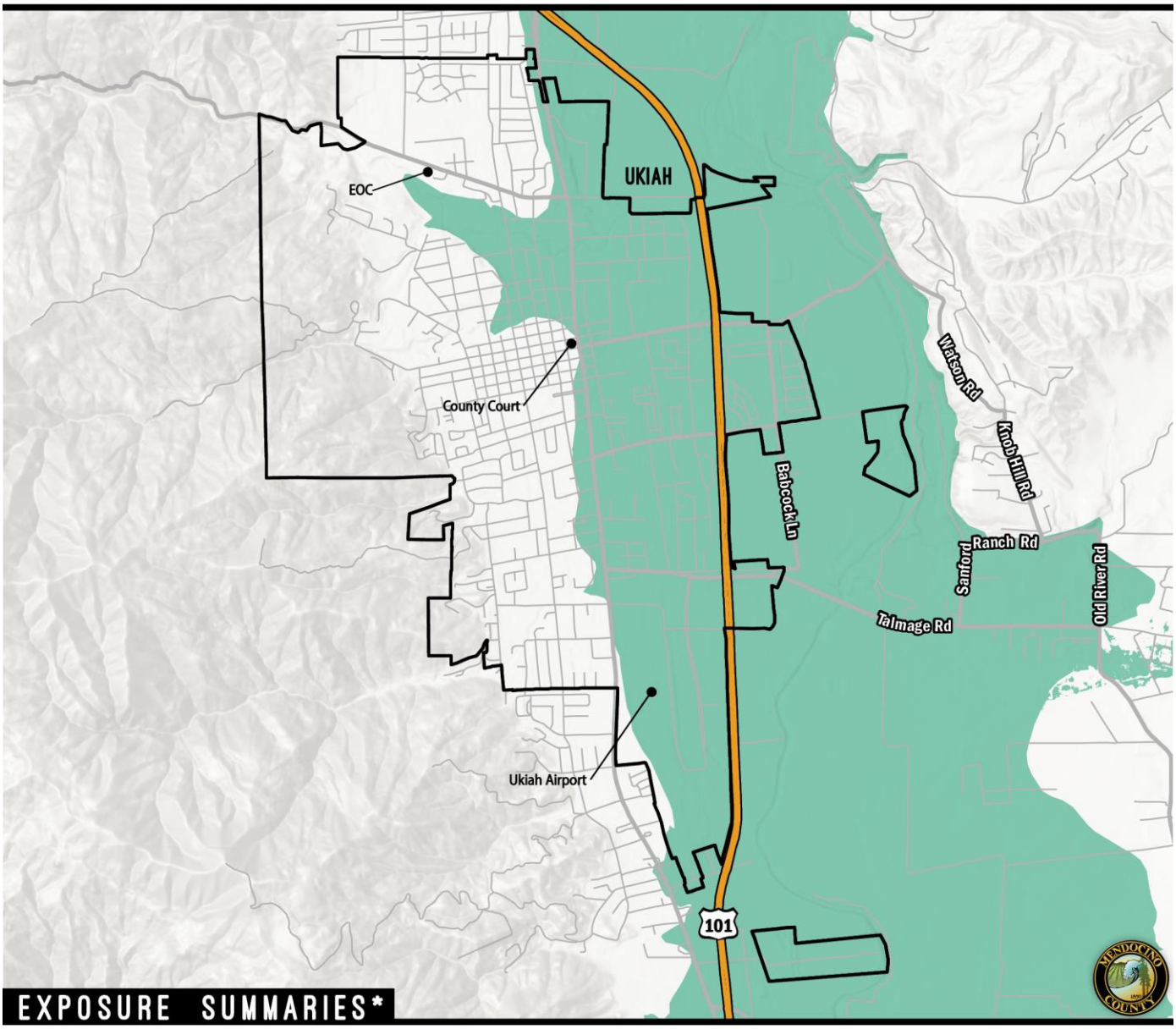


Figure 1-2: City of Ukiah Risk Assessment

DAM INUNDATION EXPOSURE SNAPSHOT

UKIAH



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
7,364	46%	INUNDATION

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
1,766	39%	INUNDATION

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**	Count Includes:
Sum of Improvement Value $544,418,689	49%	
Sum of Content Value $385,162,189	54%	INUNDATION

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	5	50%	INUNDATION
High Potential Loss	84	44%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	19	100%	82 53%

MAP LEGEND

INUNDATION ZONE

*Exposure summaries include dam inundation boundaries. Hazard data source: CGS, DWR.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science for Mendocino County, 2020

Figure 1-3: City of Ukiah Dam Inundation

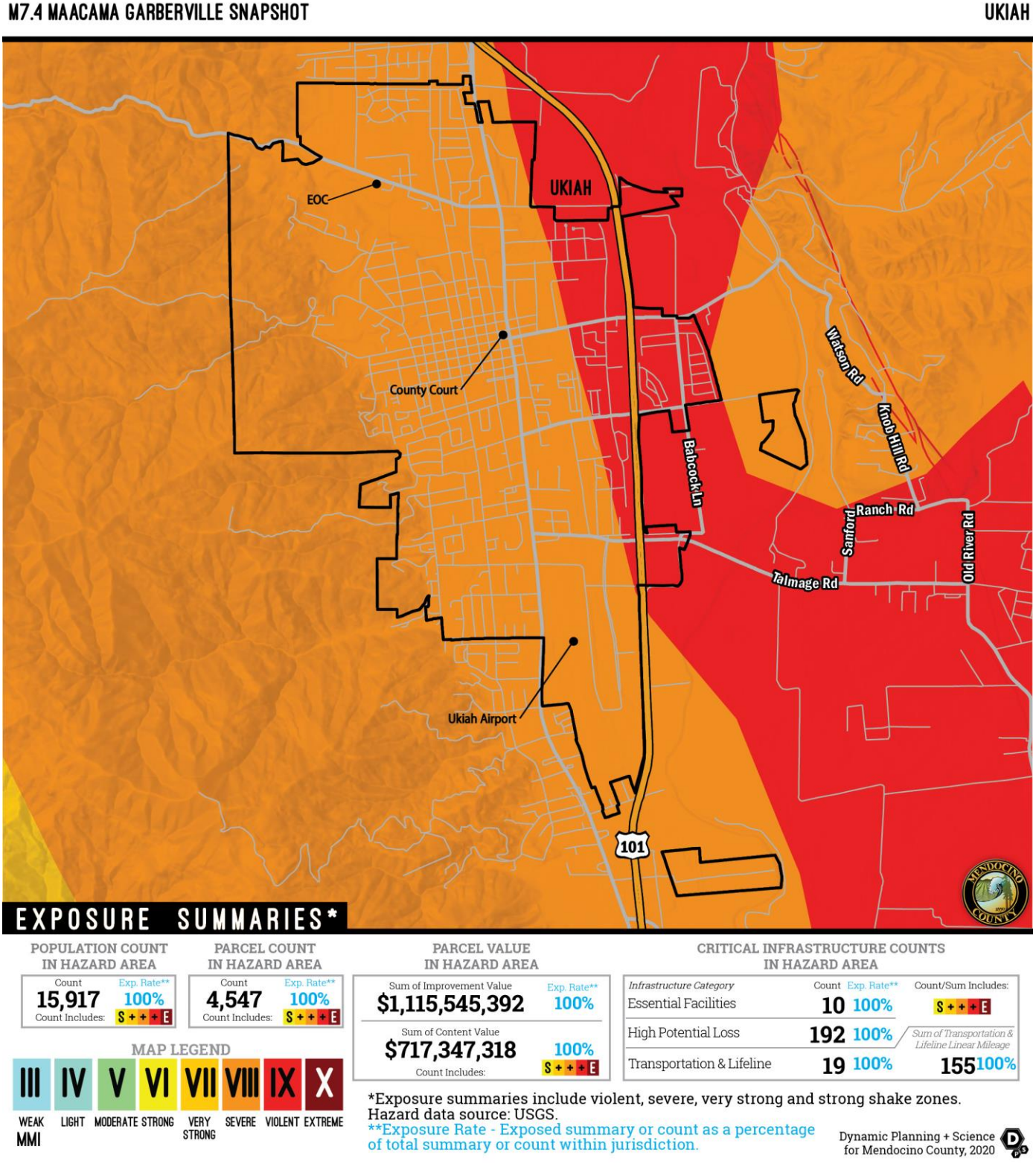


Figure 1-4: City of Ukiah M7.4 Maacama Garberville Scenario Earthquake Exposure Summary

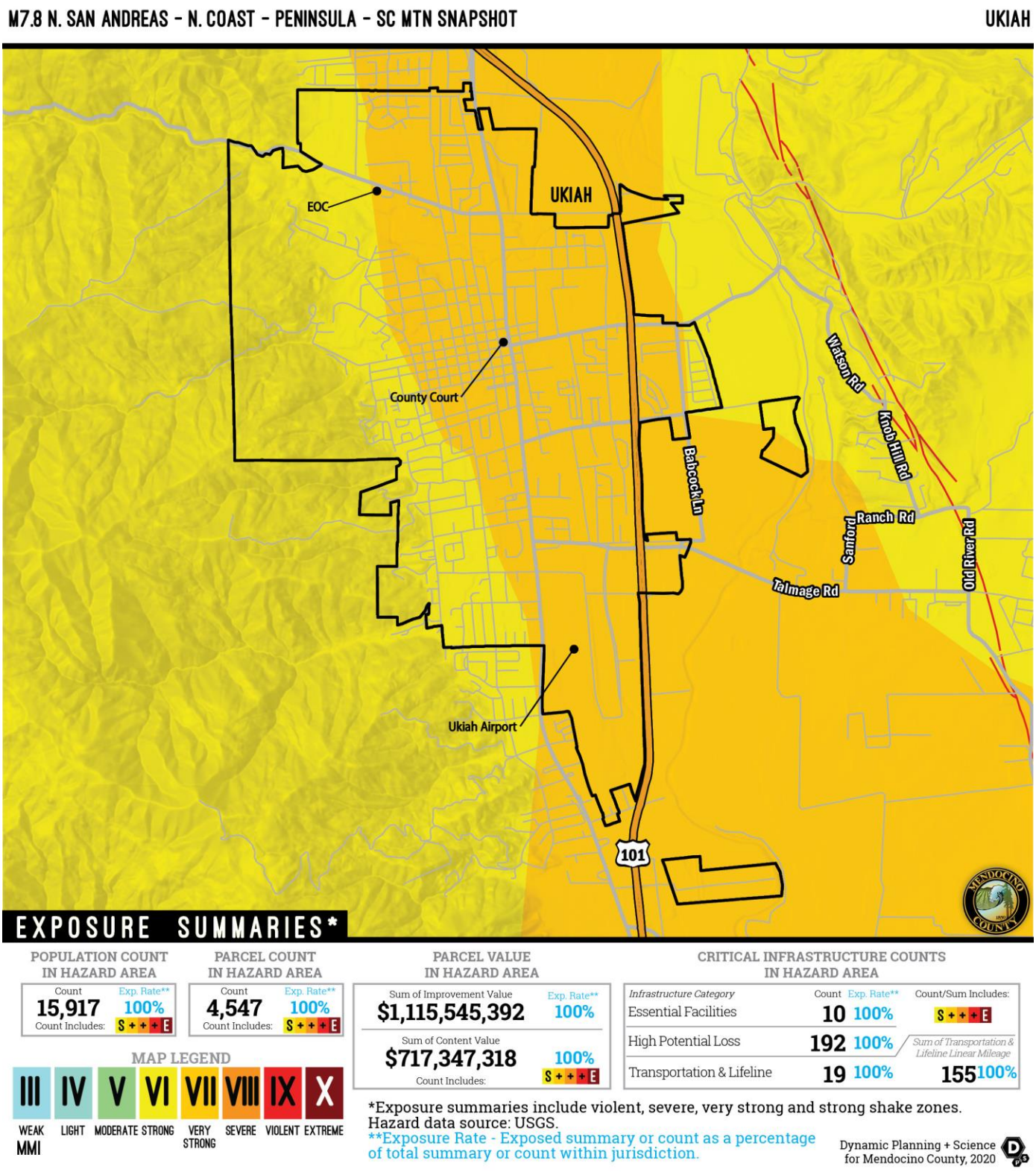


Figure 1-5: City of Ukiah M7.8 N. San Andreas -N. Coast -Peninsula – SC MTN

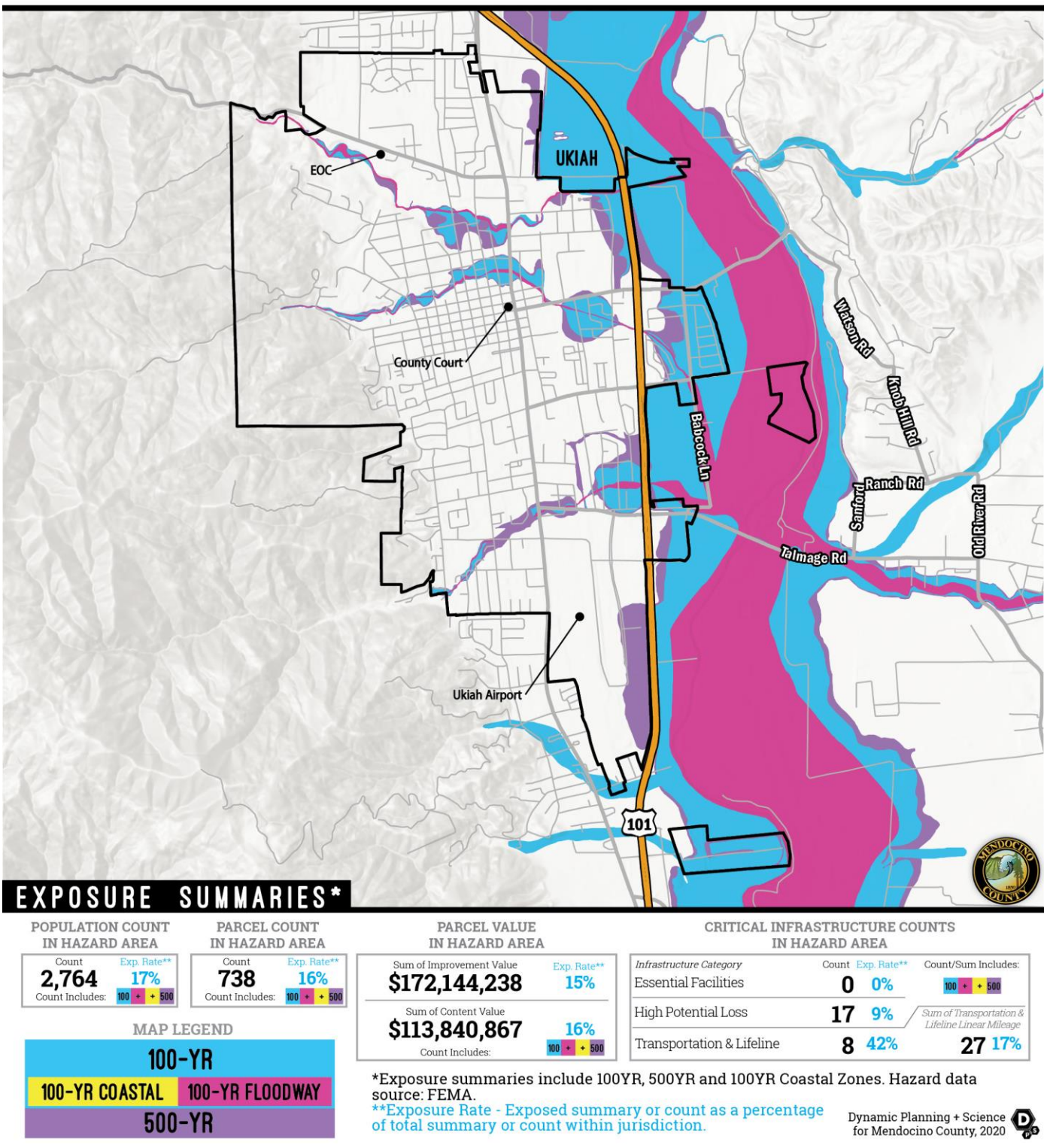


Figure 1-6: City of Ukiah FEMA Flood Risk Exposure

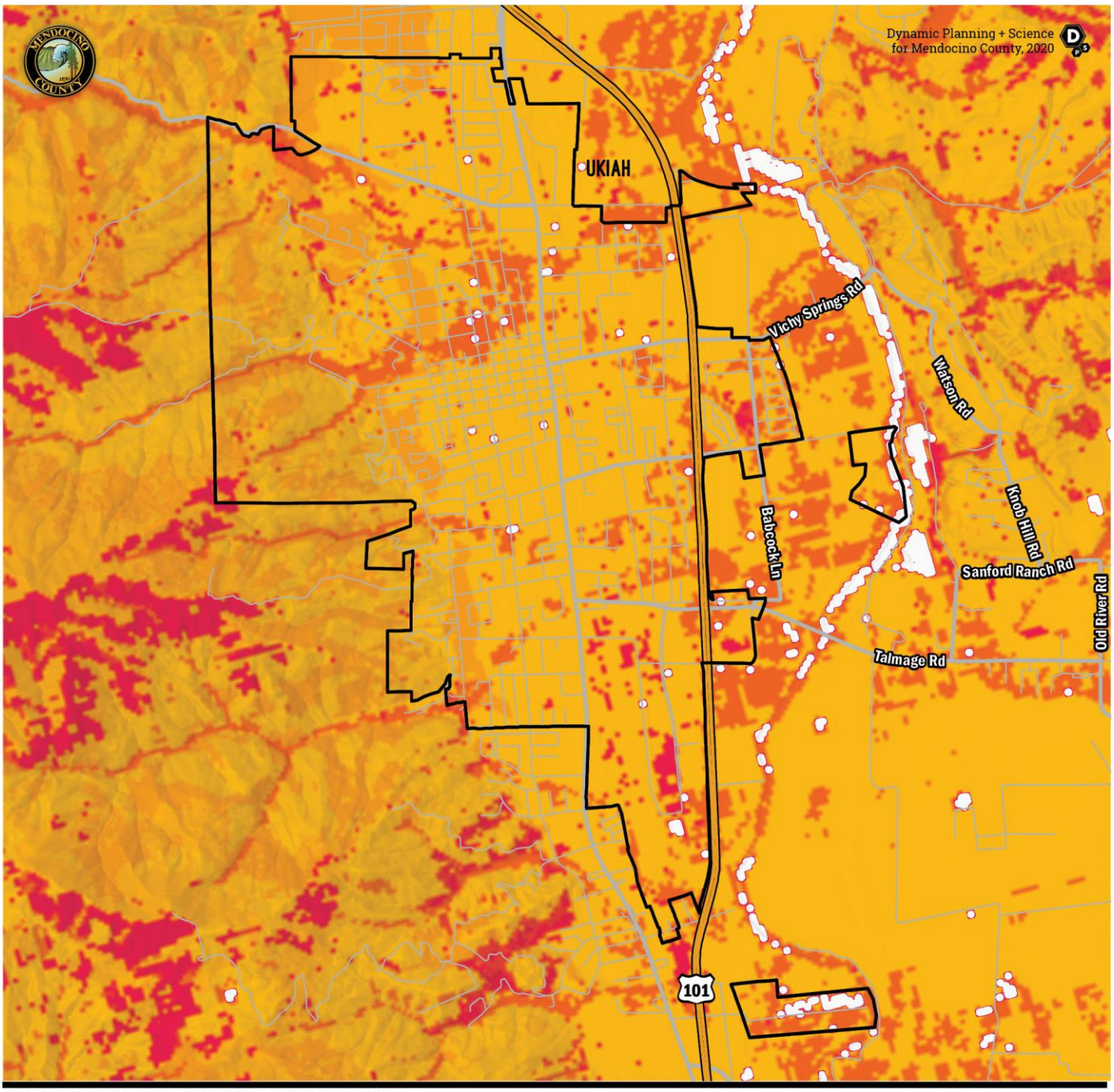


Figure 1-7: City of Ukiah Mean Fire Return Interval

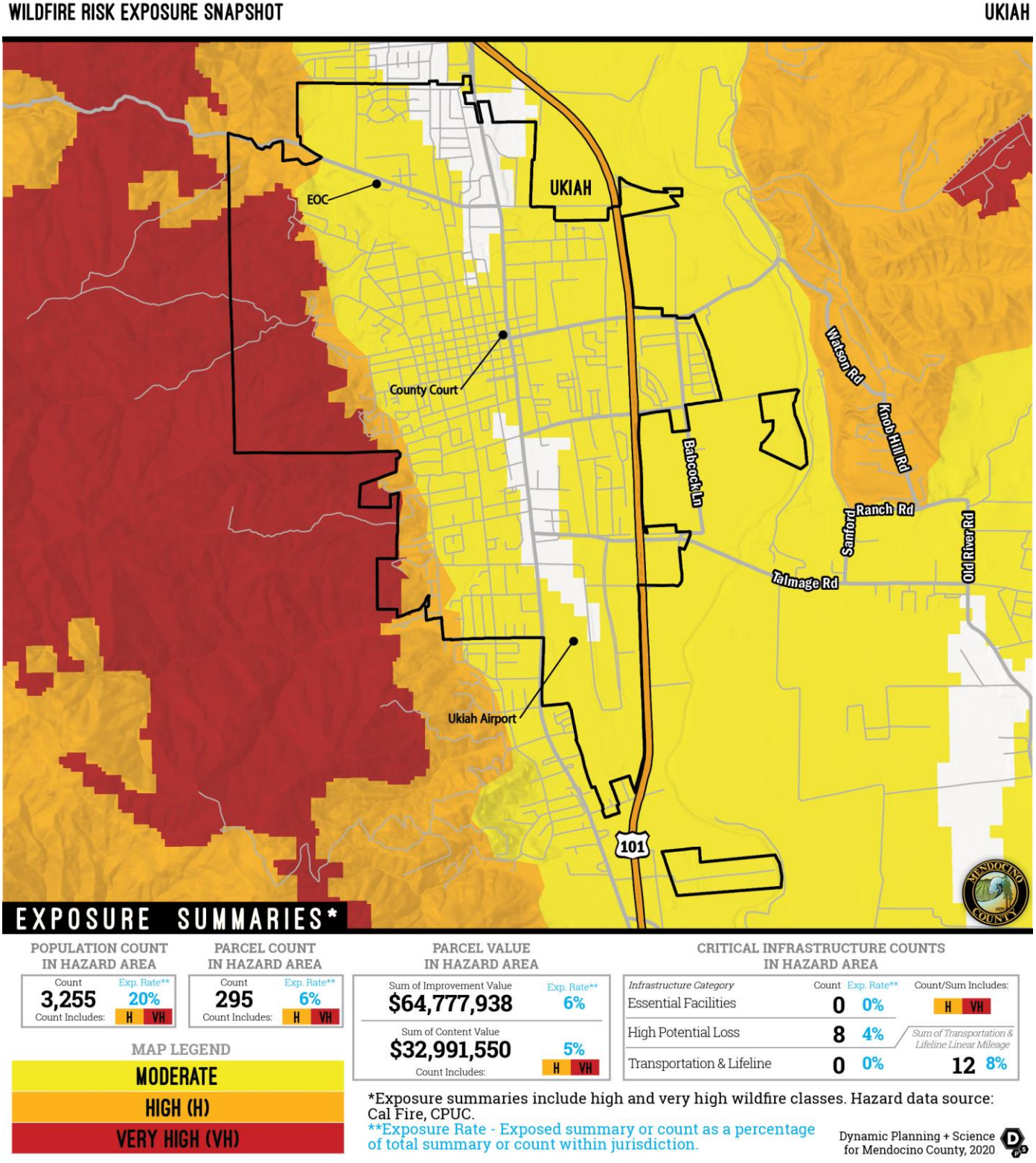


Figure 1-8: City of Ukiah Wildfire Risk Exposure Snapshot

Table 1-6: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Going into drought, short term dryness, slowing planting, growth of crops or pastures. ▪ Coming out of drought, some lingering water deficits and pasture or crops not fully recovered.
D1	Moderate Drought	▪ Some damage to crops, pastures ▪ Streams, reservoirs, or wells low, some water shortages developing or imminent ▪ Voluntary water-use restrictions requested
D2	Severe Drought	▪ Crop or pasture losses likely ▪ Water shortages common ▪ Water restrictions imposed
D3	Extreme Drought	▪ Major crop/ pasture losses ▪ Widespread water shortages or restrictions
D4	Exceptional Drought	▪ Exceptional and widespread crop/ pasture losses ▪ Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

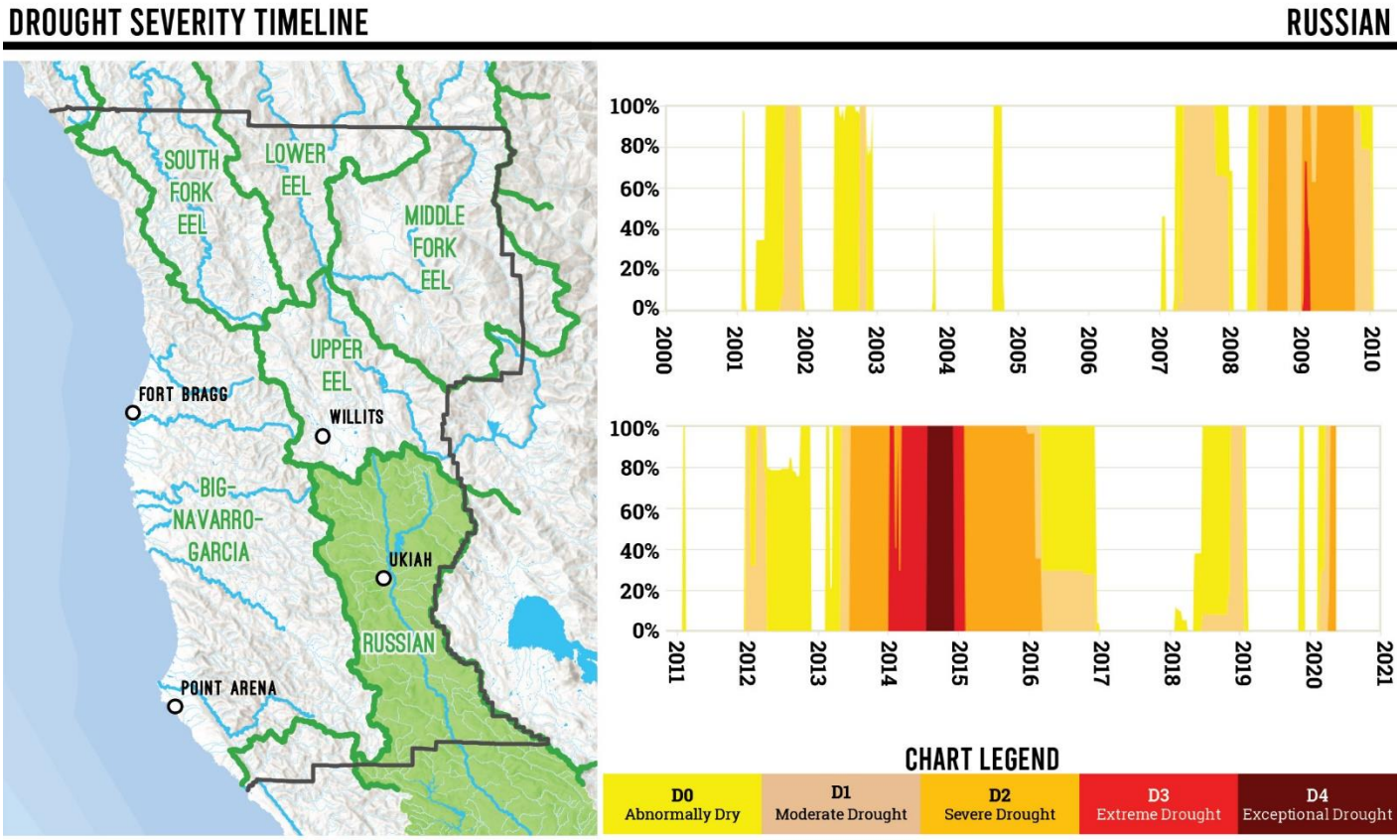


Figure 1-9: Drought Timeline for Russian Watershed

1.4.3.3 Past and Future Development

The City of Ukiah is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with State of California planning, zoning, subdivision, and architecture laws.

The GP established long-rang development policies and is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

While growth has occurred in hazard areas in the past, increasing hazard risks to some degree, those risks are also decreased by development standards and plan requirements that serve to mitigate or avoid those risks. Problematic development generally occurred many decades ago, and thus much of this HMP focuses on retrofits or replacements from that older construction.

The City of Ukiah is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum develop standards, all jurisdictions belong to the NFIP, as such, all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Mendocino County.

As the General Plan is updated and incorporates information from this HMP, City of Ukiah staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Ukiah reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan in Section 1.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.

The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,

- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

The City of Ukiah is largely already built out and development is severely limited and regulated in hazard areas. Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The City has seen an uptick in development activity since 2015, as measured by the number of building permits issued. This could reflect an increased rate of growth but is also premature to mark a clear trend. The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

1.4.3.3.1 National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Mendocino County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Ukiah has participated in the NFIP since 1982. City of Ukiah is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 1-7 for more information on the City's policies and historic flood insurance claims.

Table 1-7: NFIP Status Table

NFIP Status	Participating since 07/19/82
Policies in Force	257
Policies in SFHA	227
Policies in non-SFHA	30
Total Claims Paid	61
Paid Losses	$1,126,463.00
Repetitive Loss Properties	1
Severe Repetitive Loss Properties	0
Repetitive Loss Payment by NFIP on Building	$1,755.30
Repetitive Loss Payment by NFIP on Contents	N/D

See Volume 1, Section 4.5 for more information on the NFIP.

1.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 1-10. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 1-8.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 1-13 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 1-8 and Table 1-13.



IMPACT

Casualties

Property Damage

Business Interruption

Financial Loss

Environmental Contamination



VICTIM

School Children in Hazard High Hazard Areas

Care Facilities in High Hazard Area

Vulnerable Population Exposed to hazards



THREAT

Increased Fuels due to drought

Hotter, drier climates

More Intense Storms

Impervious surfaces = greater runoff

Increases of Invasive Species

Figure 1-10: Guidance for Problem Statements

Table 1-8: Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-UK-147	All Hazard	Impact	ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Only 1 fire station (Central) has backup power	ma-AH-UK-276
ps-AH-UK-165	All Hazard	Victim	PRV - Prevention , ES - Emergency Services	**City of Ukiah**	Adventist Health Ukiah Valley may not have enough generators for amount of ventilators needed to respond to pandemic.	ma-AH-UK-276
ps-AH-UK-166	All Hazard	Impact	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Loss of power from a second hazard event (flood, wildfire, earthquake), hospitals and critical elderly care facilities need back up generators.	ma-AH-UK-276
ps-CC-UK-170	Climate Change	Impact	PRV - Prevention	**City of Ukiah**	City parks and golf courses currently use treated drinking water for irrigation (also drought)	ma-DR-UK-64, ma-CC-UK-297
ps-CC-UK-171	Climate Change	Impact	PRV - Prevention	**City of Ukiah**	Loss of hydroelectric power during drought (hydro = 35% of City's supply). City could use additional energy storage and local electric production to address this power loss. (also drought)	ma-DR-UK-64

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-DF-UK-172	Dam Failure	Impact	PRV - Prevention , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	PGE and City of Ukiah Electric Utility substations in dam inundation zone. Critical facilities in dam inundation include water and wastewater treatment plants.	ma-AH-UK-276, ma-AH-UK-70
ps-DF-UK-173	Dam Failure	Victim	PE&A - Public Education & Awareness , ES - Emergency Services	**City of Ukiah**	Reverse 911 capabilities needed to improve critical response times to prevent loss of human life.	ma-DF-UK-73, ma-DF-MC-199
ps-DF-UK-174	Dam Failure	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	Like flood, loss of power from dam inundation as transformers need to shut down with 8' of water covering ground.	ma-AH-UK-276
ps-DR-UK-175	Drought	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Ukiah**	City parks and golf courses currently use treated drinking water for irrigation (also climate change)	ma-DR-UK-64, ma-CC-UK-297
ps-EQ-UK-144	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	Critical facilities in the violent shake zone for Maacama/ Garberville include water and wastewater treatment plants, statefairgrounds, and the fire stations. May not be properly retrofitted or with inside bracing.	ma-EQ-UK-77, ma-EQ-UK-278
ps-EQ-UK-145	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	At least 3 groundwater pumping wells may not function post-earthquake.	ma-EQ-UK-77
ps-EQ-UK-146	Earthquake	Impact	PPRO - Property Protection , ES - Emergency Services	**City of Ukiah**	Fire Stations do not meet seismic req's for emergency/ essential facilties. Talmage Fire Station at high risk and is a converted warehouse/ commercial facility that does not likely have any earthquake bracing or retrofitting	ma-EQ-UK-77, ma-EQ-UK-278
ps-EQ-UK-148	Earthquake	Victim	PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	Downtown Ukiah has many unreinforced masonry (URM) buildings	ma-EQ-UK-277, ma-EQ-UK-280, ma-AH-UK-70
ps-EQ-UK-149	Earthquake	Victim	PE&A - Public Education & Awareness	**City of Ukiah**	Residential renters in upstairs apartments in older URM buildings may not be aware of earthquake vulnerability	ma-EQ-UK-280

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-UK-150	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Ukiah**	Many residential and commercial buildings in Ukiah are likely soft floor construction.	ma-EQ-UK-277
ps-FL-UK-157	Flood	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	Recent flooding destroyed water treatment storage bays, damaged perc ponds for water treatment.	ma-FL-UK-75
ps-FL-UK-158	Flood	Impact	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Loss of access to neighborhoods during flood events (Vichy Springs, Talmadge).	ma-WS-UK-62, ma-FL-UK-78, ma-FL-UK-275, ma-AH-UK-70
ps-FL-UK-159	Flood	Victim	PPRO - Property Protection , NRP - Natural Resource Protection	**City of Ukiah**	Residents in the Oak Manor region currently experience repetitive losses and regular flooding and power losses	ma-WS-UK-62, ma-FL-UK-76, ma-FL-UK-275
ps-FL-UK-160	Flood	Impact	PPRO - Property Protection , NRP - Natural Resource Protection	**City of Ukiah**	PG&E substation and a number of City of Ukiah Electric Utility pad mount facilities located in floodplain (near Oak Manor neighborhood).	ma-WS-UK-62
ps-FL-UK-161	Flood	Victim	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Ukiah**	Residents along tributaries to the Russian River on west side of town regularly experience loss of power due to inundation of transformers and necessary "powering down."	ma-WS-UK-62
ps-FL-UK-162	Flood	Threat	PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	Mudflows from tributaries west of town regularly create debris piles and block stormwater drainage, exacerbating impact from flood events.	ma-WS-UK-62
ps-PN-UK-167	Pandemic	Victim	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Need for additional sheltering locations in event of pandemic social distancing needs paired with another hazard event (flood, wildfire, earthquake).	ma-PN-UK-282, ma-PN-UK-283

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-PN-UK-168	Pandemic	Victim	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Utilities and critical facilities may not have adequate fresh air/ ventilation to be appropriate for essential work during pandemic.	ma-PN-UK-281
ps-PN-UK-169	Pandemic	Threat	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Community center/ evacuation center does not have adequate staffing space or structural barriers from public interaction to be used safely during pandemic.	ma-PN-UK-282
ps-WF-UK-151	Wildfire	Victim	PPRO - Property Protection , NRP - Natural Resource Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	Limited access exists to get above the residences if wildfire starts west of town.	ma-AH-UK-70, ma-WF-UK-289
ps-WF-UK-152	Wildfire	Victim	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Ukiah**	City has limited fire department staffing and response ability	ma-WF-UK-60, ma-WF-UK-74, ma-AH-UK-70, ma-WF-UK-289, ma-WF-UK-296
ps-WF-UK-153	Wildfire	Victim	PRV - Prevention , PPRO - Property Protection , SP - Structural Projects	**City of Ukiah**	Sparks from wildfire can enter westside where many older wooden construction home are located, creating urban conflagration.	ma-WF-UK-74, ma-WF-UK-296
ps-WF-UK-154	Wildfire	Victim	PE&A - Public Education & Awareness , ES - Emergency Services	**City of Ukiah**	Current hazard shelters are located within City limits; in major fire event evacuees would need to leave City limits.	ma-WF-UK-285
ps-WF-UK-155	Wildfire	Threat	PRV - Prevention , NRP - Natural Resource Protection	**City of Ukiah**	Capacity to enforce and conduct inspections of debris and weed abatement limited within City limits.	ma-WF-UK-60, ma-WF-UK-74, ma-AH-UK-70, ma-WF-UK-289

1.4.3.5 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through https://mitigatehazards.com/mendocino-county/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.

1.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

1.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity. (Cal. Adaptation Planning Guide, 2020, p. 94)

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

Table 1-9: City of Ukiah Planning and Regulatory Mitigation Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
BCEGS Rating				Not provided
Public Protection (ISO Class)				Not provided
Hazard Related Development Standards				Erosion and Sediment Control (Ch. 7); Construction Site Control Measures (§9704).
Zoning Ordinance				
Hazard-Specific Ordinance				Fire Prevention Code (Div. 6, Ch. 3); Emergency Services (Div. 6, Ch. 2); State of Emergency (§5128)
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				City of Ukiah Five Year CIP Plan.
Erosion/Sediment Control Program				The City includes erosion and sediment control practices in their 2006 Storm Water Management Plan.
Hazard-Related Public Outreach Program				See education and outreach capabilities below. The City hosts "Building Together" Training Sessions for disaster preparedness outreach efforts.
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural)				
Earthquake Modernization Plan (Building Safety)				
Hazard Plans				
General Plan Safety Element				Adopted 1995.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Community Wildfire Protection Plan (CWPP)				2016 County-wide CWPP in existence.
Floodplain Management Plan				
Stormwater Management Plan				
Emergency Operations Plan				Mendocino County Operational Area Emergency Operations Plan (2016)
Climate Action Plan				Drafted in 2014, not adopted, future opportunity
Ground Water Management Planning / Plans				Ukiah Valley Basin Grounwater Sustainability Agency is in the process of developing a groundwater sustainability plan for the basin.
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				
Community Rating System (CRS)				

1.5.1.1 Administrative and Technical Capabilities

Table 1-10: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Community Development Department, Planning Services.
Civil Engineer				Department of Public Works.
Building Code Official (Full time or Augmented)				
Floodplain Administrator				Tim Eriksen, Director of Public Works
Fire Marshal				Ukiah Valley Fire Department.
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Emergency Manager				Office of Emergency Management.
Full-Time Building Official				Building and Code Enforcement Services.
Grant Manager, Writer, or Specialist				
Other				
Warning Systems/Services				
General				MendoAlert and Nixle Alerts.
Flood				MendoAlert and Nixle Alerts.
Wildfire				MendoAlert and Nixle Alerts.
Geological Hazards				MendoAlert and Nixle Alerts.

1.5.1.2 Financial Capabilities

Table 1-11: Fiscal Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				
Benefit assessments				
System Development Fee				
General Obligation Bonds to Incur Debt				
Special Tax Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				
Capital Improvement Project Funding				City of Ukiah Five Year CIP Plan.

1.5.1.3 Education and Outreach

Table 1-12: Education / Outreach Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				The Ukiah Valley Fire Authority and Office of Emergency Managment host community awareness and safety programs.
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				The Mendocino County Fire Safe Council assists local Councils a variety of needs. These Councils include: the Caspar Community and Island Cove Estates (south of Point Arena) on the coast; Pine Mountain, Ridgewood Park, and Willowbrook/Sherwood Forest Hills (past Brooktrails) in the Willits area; and Deerwood, Oak Knoll Road, Upper Parducci Road, Black Bart Trail and Robinson Creek Road in the Ukiah area.
Resource Conservation Districts				The Mendocino County Resource Conservation District has implemented a wide range of programs across the County.
Other				

1.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 1-13 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

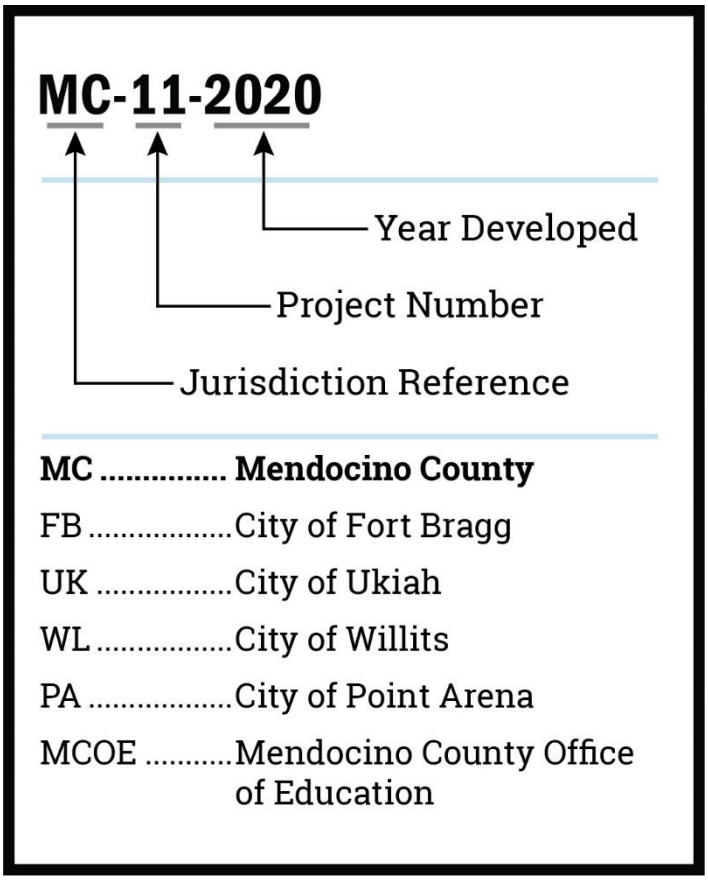


Figure 1-11: Mitigation Action Key

Each participating jurisdiction, including the City of Ukiah, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. City of Ukiah has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County-wide mitigation actions, the status, and additional notes for each action.

Table 1-13 lists each mitigation action for City of Ukiah. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 1-13 meets the regulatory requirements of FEMA and DMA 2000.

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Table 1-13. City of Ukiah Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-DR-UK-64	All Hazard	PRV - Prevention	Pending	2014	City of Ukiah	Develop a climate action plan and/or drought contingency plan to provide an effective and systematic means of assessing drought conditions, develop mitigation actions and programs to reduce risks of climate change and drought, and develop response options that minimize hardships	City Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	ps-DR-UK-175, ps-CC-UK-171, ps-CC-UK-170
ma-AH-UK-70	All Hazard	PPRO - Property Protection	Pending	2014	City of Ukiah	Create a GIS-based pre-application review for new construction and major remodels of residential and/or non-residential structures in hazard areas, such high and/or very high wildfire areas.	Planning	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	5%	HMGP / BRIC	Medium	ps-FL-UK-158, ps-WF-UK-152, ps-WF-UK-151, ps-WF-UK-155, ps-DF-UK-172, ps-EQ-UK-148
ma-AH-UK-276	All Hazard	ES - Emergency Services	Pending	2020	City of Ukiah	Construct backup generators at critical facilities (fire stations, Adventist Health Ukiah Valley) and pump stations to respond to hazard events in loss of power.	Fire, Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	Extreme	ps-AH-UK-147, ps-AH-UK-165, ps-AH-UK-166, ps-DF-UK-172, ps-DF-UK-174
ma-CC-UK-297	Climate Change	PRV - Prevention	Ongoing	2020	City of Ukiah	Continue the installation of purple pipes throughout the City to supply untreated irrigation water to City landscaping	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Funding Dependent	Project	HMGP / BRIC	Medium	ps-DR-UK-175, ps-CC-UK-170
ma-DF-UK-73	Dam Failure	PE&A - Public Education & Awareness	Pending	2014	City of Ukiah	Develop a public outreach program that informs property owners located in the dam or levee inundation areas about voluntary flood insurance.	Office of Emergency Management	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	HMGP / BRIC	Medium	ps-DF-UK-173
ma-EQ-UK-77	Earthquake	PPRO - Property Protection	Ongoing	2014	City of Ukiah	Seismically retrofit or replace public works and/or emergency response facilities that are necessary during and/or immediately after a disaster or emergency.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , CDBG DRI	Extreme	ps-EQ-UK-144, ps-EQ-UK-145, ps-EQ-UK-146

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EQ-UK-277	Earthquake	PE&A - Public Education & Awareness	Ongoing	2020	City of Ukiah	Encourage privately owned critical facilities (e.g. churches, hotels, other gathering facilities) to evaluate the ability of the buildings to withstand earthquakes and to address any deficiencies identified.	Planning & Comm. Dev.	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC	High	ps-EQ-UK-148, ps-EQ-UK-150
ma-EQ-UK-278	Earthquake	SP - Structural Projects	Pending	2020	City of Ukiah	Install seismic gas shut-off valves on County buildings to prevent the flow of gas into buildings during a seismic event	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	Medium	ps-EQ-UK-144, ps-EQ-UK-146
ma-EQ-UK-280	Earthquake	PE&A - Public Education & Awareness	Ongoing	2020	City of Ukiah	Develop and outreach and education program for owners and tenants in downtown unreinforced masonry buildings to understand earthquake risks and precautions and, for owners, to understand retrofitting options and available funding mechanisms	Public Information	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC , CDBG DRI	High	ps-EQ-UK-149, ps-EQ-UK-148
ma-FL-UK-62	Flood	PPRO - Property Protection	Pending	2014	City of Ukiah	Manage vegetation in areas within and adjacent to rights- of-way and in close proximity to critical facilities in order to reduce the risk of tree failure and property damage and avoid creation of wind acceleration corridors within vegetated areas.	City Fire	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-5 years	N/A	Internal Funding	Medium	ps-FL-UK-158, ps-FL-UK-159, ps-FL-UK-160, ps-FL-UK-161, ps-FL-UK-162
ma-FL-UK-75	Flood	PPRO - Property Protection	Pending	2014	City of Ukiah	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.	Planning and Community Development and Fire	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , CDBG DRI	Extreme	ps-FL-UK-157

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-FL-UK-76	Flood	PPRO - Property Protection	Pending	2014	City of Ukiah	Acquire, relocate, or elevate residential structures, in particular those that have been identified as Repetitive Loss (RL) properties that are located within the 100-year floodplain.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , FMA , CDBG DRI	High	ps-FL-UK-159
ma-FL-UK-78	Flood	PPRO - Property Protection	Pending	2014	City of Ukiah	Reinforce County and local ramps, bridges, and roads from flooding through protection activities, including elevating the road and installing culverts beneath the road or building a higher bridge across the area that experiences regular flooding.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-FL-UK-158
ma-PN-UK-281	Pandemic	SP - Structural Projects	Pending	2020	City of Ukiah	Assess and institute necessary upgrades to critical facilities to allow for usage during pandemic, including adequate ventilation and physical barriers	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-UK-168
ma-PN-UK-282	Pandemic	SP - Structural Projects	Pending	2020	City of Ukiah	Institute necessary structural improvements to evacuation centers/sheltering locations to allow for proper ventilation, space for staff, and structural barriers to be used during pandemic and hazard event.	Fire/ Office of Emergency Management	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-PN-UK-169, ps-PN-UK-167
ma-PN-UK-283	Pandemic	ES - Emergency Services	Pending	2020	City of Ukiah	Develop alternative sheltering/ evacuation locations for social distancing required during pandemic and other hazard event	Office of Emergency Management	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-PN-UK-167
ma-WF-UK-60	Wildfire	PPRO - Property Protection	Pending	2014	City of Ukiah	Implement a fuel modification program and code requirements.	City Fire	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-5 years	Planning	HMGP / BRIC , AFG , FP&S	High	ps-WF-UK-155, ps-WF-UK-152

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-WF-UK-74	Wildfire	PPRO - Property Protection	Pending	2014	City of Ukiah	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Planning and Community Development and Fire	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	5%	HMGP / BRIC	Medium	ps-WF-UK-155, ps-WF-UK-153, ps-WF-UK-152
ma-WF-UK-285	Wildfire	PE&A - Public Education & Awareness	Ongoing	2020	City of Ukiah	Coordinate with County on designated shelters outside of City limits in event of wildfire; integrate shelter location information into community outreach	Office of Emergency Management	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	Internal Funding	Extreme	ps-WF-UK-154
ma-WF-UK-289	Wildfire	PPRO - Property Protection	Ongoing	2020	City of Ukiah	Implement CWPP projects in partnership with County, Fire Safe Council, and CAL FIRE	City Fire	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC , AFG , FP&S	Medium	ps-WF-UK-151, ps-WF-UK-152, ps-WF-UK-155
ma-WF-UK-296	Wildfire	PE&A - Public Education & Awareness	Pending	2020	City of Ukiah	Develop a cost share program for residential mitigation and retrofits to be more fireproof	Community Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-WF-UK-153, ps-WF-UK-152

MENDOCINO COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

City of Fort Bragg

JURISDICTIONAL ANNEX

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Mendocino County

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Table 2-12: City of Fort Bragg Mitigation Actions 2-31

Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Mendocino County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.

RESOLUTION NO. 4338-*2020*

RESOLUTION OF THE FORT BRAGG CITY COUNCIL ADOPTING THE 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR MENDOCINO COUNTY AS THE CITY OF FORT BRAGG'S OFFICIAL PLAN

WHEREAS, the City of Fort Bragg is a political subdivision of the State of California and an official participating jurisdiction of the "2020 Mendocino County Multi-Jurisdictional Hazard Mitigation Plan" (MJHMP); and

WHEREAS, the City of Fort Bragg recognizes the MJHMP as the official hazard mitigation plan for the County and participating jurisdictions; and

WHEREAS, the City of Fort Bragg, with the assistance from Mendocino County, has gathered information and prepared the MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 C.F.R. § 201.6; and

WHEREAS, the City of Fort Bragg Annex in Volume 2 of the MJHMP recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, the City of Fort Bragg has reviewed the MJHMP and affirms that the plan actions in the City of Fort Bragg's Annex will reduce the potential for harm to people and property from future hazard occurrences with our community; and

WHEREAS, Congress passed the Disaster Mitigation Act of 2000 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted multi-hazard plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City Council fully participated in the FEMA-prescribed mitigation planning process to prepare this MJHMP; and

WHEREAS, the citizens were afforded opportunities to comment and provide input in the MJHMP and the actions in the Plan; and

WHEREAS, the City of Fort Bragg, as a fully participating jurisdiction of the MJHMP is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City Council desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the MJHMP; and

WHEREAS, adoption by the City Council for the City of Fort Bragg demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the MJHMP;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Fort Bragg:

1. That the City of Fort Bragg adopts the 2020 Multi-Jurisdictional Hazard Mitigation Plan Vol. 1 for Mendocino County and the City of Fort Bragg Annex in Vol. 2, as approved by FEMA and Cal OES, as the mitigation plan for the City of Fort Bragg.

2. That the City Council authorizes the City Manager to submit an approved and signed copy of this resolution to the Cal OES and FEMA Region IX officials to enable the plan's final approval.

The above and foregoing Resolution was introduced by Councilmember Albin-Smith, seconded by Councilmember Peters, and passed and adopted at a regular meeting of the City Council of the City of Fort Bragg held on the 14th day of December, 2020, by the following vote:

AYES:	**Councilmembers Albin-Smith, Morsell-Haye, Norvell, Peters and Mayor Lee.**
NOES:	**None.**
ABSENT:	**None.**
ABSTAIN:	**None.**
RECUSED:	**None.**

Bernie Norvell
Mayor

ATTEST:

Cristal Munoz

for **June Lemos, CMC**
City Clerk

Section 2. City of Fort Bragg

2.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Fort Bragg. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the City of Fort Bragg. This Annex provides additional information specific to the City of Fort Bragg, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

John Smith, Public Works Director
City of Fort Bragg
416 North Franklin Street,
Fort Bragg, CA 9437
Telephone: (707) 961-2823, ext. 136
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Alternate Point of Contact

John Naulty, Interim Chief
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416 North Franklin Street,
Fort Bragg, CA 9437
Telephone: (707) 961-2800 Ext. 105
e-mail Address: jnaulty@fortbragg.com

2.2 Planning Methodology

The City of Fort Bragg followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 2-1.

Table 2-1: Planning Committee Members

Planning Committee Members	Department
John Smith	Public Works
John Naulty	Police Department
Tabatha Miller	City Manager's Office

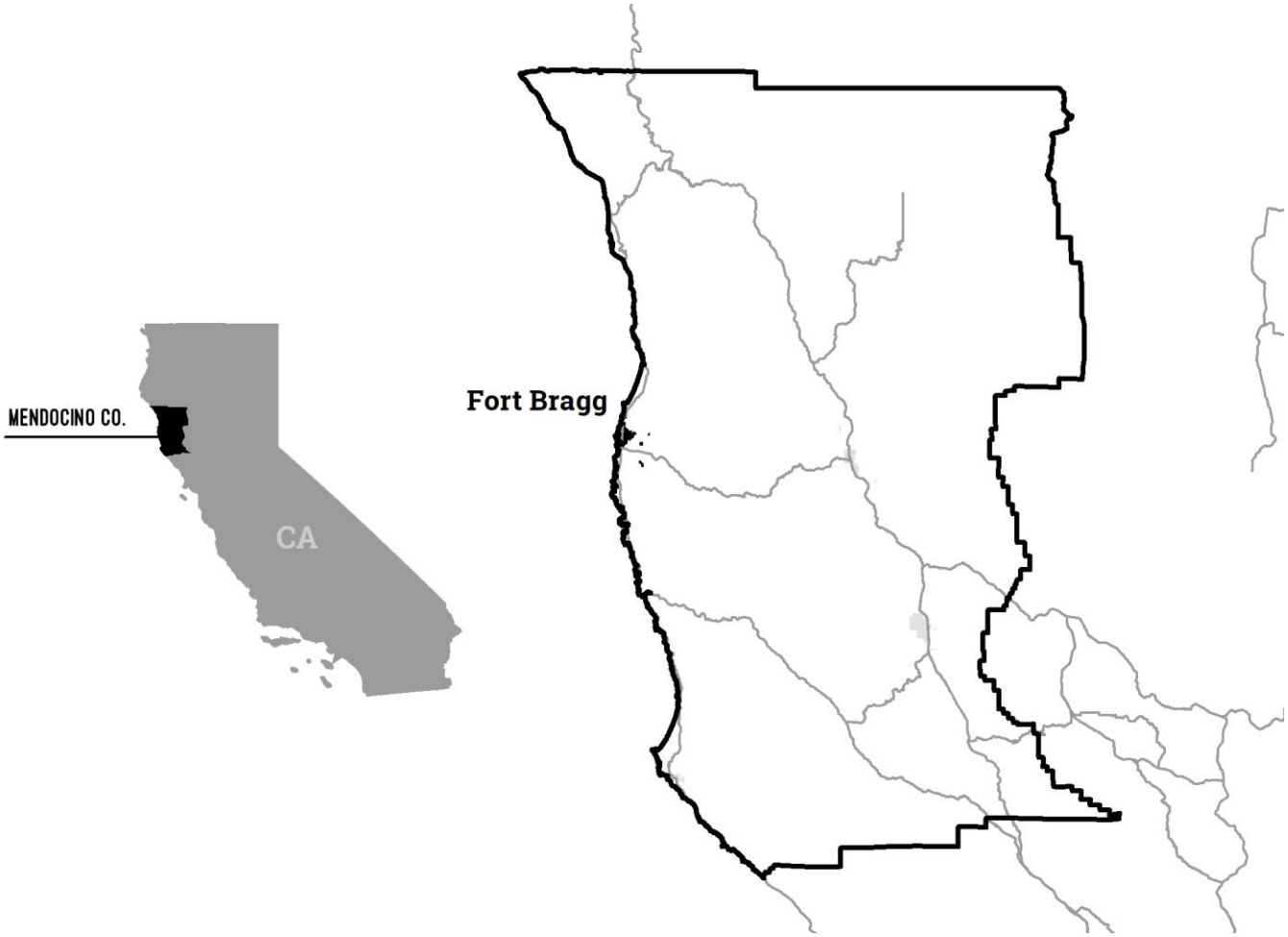


Figure 2-1: City of Fort Bragg Location

2.3 What's New

The City of Fort Bragg has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 2-3. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Table 2-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 2-13.

Table 2-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled
ma-AH-FB-4	All Hazard	Cancelled	2014	City of Fort Bragg	Integrate the Mendocino County HMP, in particular the hazard analysis and mitigation strategy sections, into local planning documents, including general plans, emergency operations plans, and capital improvement plans.	Ongoing work, opportunities for integration reflected in capabilities assessment.
ma-EQ-UN-186	Earthquake	Cancelled	2008	City of Fort Bragg	Develop a voluntary building inspection program in which homes and/or businesses are inspected by a building official for weak or poorly anchored parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if they were to fall or break during an earthquake.	No longer a priority
ma-WF-FB-24	Wildfire	Cancelled	2014	City of Fort Bragg	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Covered under ma-WF-FB-290
ma-WF-FB-29	Wildfire	Cancelled	2014	City of Fort Bragg	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Covered under new ma-WF-FB-290

2.3.1 Mitigation Successes

The City has successfully completed multiple mitigation actions, listed in Table 2-3.

Table 2-3: Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description
ma-FL-FB-11	Flood	Completed	2008	City of Fort Bragg	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.
ma-WF-FB-7	Wildfire	Completed	2014	City of Fort Bragg	Develop a community wildfire mitigation plan that identifies and prioritizes areas for hazard fuel reduction treatments, and recommend the types of methods of treatments.

2.4 Risk Assessment

The intent of this section is to profile the City of Fort Bragg's hazards and assess the City's vulnerabilities, distinct from that of the County-wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

2.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 2-4. Detailed hazard profiles of the most significant County-wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect City of Fort Bragg. Table 2-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, City of Fort Bragg General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to City of Fort Bragg and which ones were not. Section 0 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to City of Fort Bragg.

Table 2-4: County Hazard Prioritization (Vol. 1)

Hazard Type	Explanation
Climate Change	**High priority county-wide, profiled hazard.**
Dam/ Levee failure	**High priority county-wide, profiled hazard.**
Drought	**High priority county-wide, profiled hazard.**
Earthquake/ Geologic Hazards	**High priority county-wide, profiled hazard.**
Flood	**High priority county-wide, profiled hazard.**
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	**High priority county-wide, profiled as part of Severe Weather.**
Insect Hazards	While hazardous insects exist in Mendocino County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	**High priority county-wide, profiled hazard.**
Severe Weather, including:	**High priority county-wide for heavy wind and heavy rain.**
Extreme Heat	Not a priority as extreme weather event, discussed as climate change impact.
Hail	Hail events are rare in Mendocino County and not profiled in this plan.
High Wind	**Profiled as part of Severe Weather hazard.**
Heavy Rain	**Profiled as part of Severe Weather hazard.**
Fog	While fog events do occur within Mendocino County, they are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	While winter storms are present in Mendocino County, they were not identified as a priority for this plan.
Slope Failure	**High priority county-wide, profiled hazard.**
Soil Hazards	**High priority county-wide, profiled hazard (includes erosion and naturally-occurring asbestos).**
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	**High priority county-wide, profiled hazard.**

Table 2-5: Document Review Crosswalk

Hazards	2014 Mendocino County MJHMP	2012 City of Fort Bragg Inland General Plan	2008 City of Fort Bragg Coastal General Plan	2009 Mendocino County General Plan	2018 California State HMP
Agricultural Pests	■				■
Climate Change		■		■	■
Dam Failure	■			■	■
Drought	■	■	■	■	■
Earthquake	■	■	■	■	■
Flood	■	■	■	■	■
Insect Hazards	■				
Landslide		■	■	■	■
Levee Failure	■*				■
Manmade Hazards				■	■
Pandemic Disease	■				■
Sea Level Rise		■	■		■
Severe Weather					■
Soil Hazards	■**	■	■		
Terrorism & Tech Hazards					■
Tsunami	■	■	■	■	■
Volcano					■
Wildfire	■***	■		■	■

** included as part of dam failure*
*** included naturally occurring asbestos*
**** included urban conflagration*

2.4.2 Hazard Risk Ranking

The City of Fort Bragg's Planning Team used the same hazard prioritization process as the Mendocino County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 2-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess City of Fort Bragg's vulnerability to following hazards:

- Climate Change
- Earthquake
- Pandemic
- Flood
- Extreme Weather
- Slope Failure
- Wildfire
- Drought

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address City of Fort Bragg's vulnerability to these specifically-identified hazards.

2.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within City of Fort Bragg are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

2.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 2-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Mendocino County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to City of Fort Bragg. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

2.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 2-3 through Figure 2-11, illustrate City of Fort Bragg's vulnerability to specific hazards. Figures include:

- Figure 2-3: City of Fort Bragg M7.4 Maacama Garberville Snapshot
- Figure 2-4: City of Fort Bragg M7.8 N. San Andreas -N. Coast -Peninsula – SC MTN Snapshot
- Figure 2-5: City of Fort Bragg FEMA Flood Risk Exposure Snapshot
- Figure 2-6: City of Fort Bragg Average Annual Precipitation (1981-2010. Inches)
- Figure 2-7: City of Fort Bragg Annual Average Wind Speed (Power Class)
- Figure 2-8: City of Fort Bragg Landslide Risk Exposure Snapshot
- Figure 2-9: City of Fort Bragg Mean Fire Return Intervals
- Figure 2-10: City of Fort Bragg Wildfire Risk Exposure Snapshot
- Figure 2-11: Drought Timeline for Big Navarro-Garcia Watershed

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - **Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate Change impacts will be addressed at the end of each hazard section within the 2020 plan update and as a stand alone section for each jurisdiction...
For County and Municipal governments you will be required to address climate change impacts in the Safety Element of your General Plan. Climate change may change the frequency, duration and intensity of hazards listed above.



Pandemic will be profiled for every jurisdiction.

City of Fort Bragg Risk Matrix

IMPACT

PROBABILITY

	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	EXTREME WEATHER	SLOPE FAILURE, WILDFIRE	Extreme
Likely	SOIL HAZARD	FLOOD	DROUGHT	Extreme
Possible	Low	Medium	High	EARTHQUAKE
Unlikely	DAM FAILURE	Low	Medium	Medium

Figure 2-2: City of Fort Bragg Risk Assessment

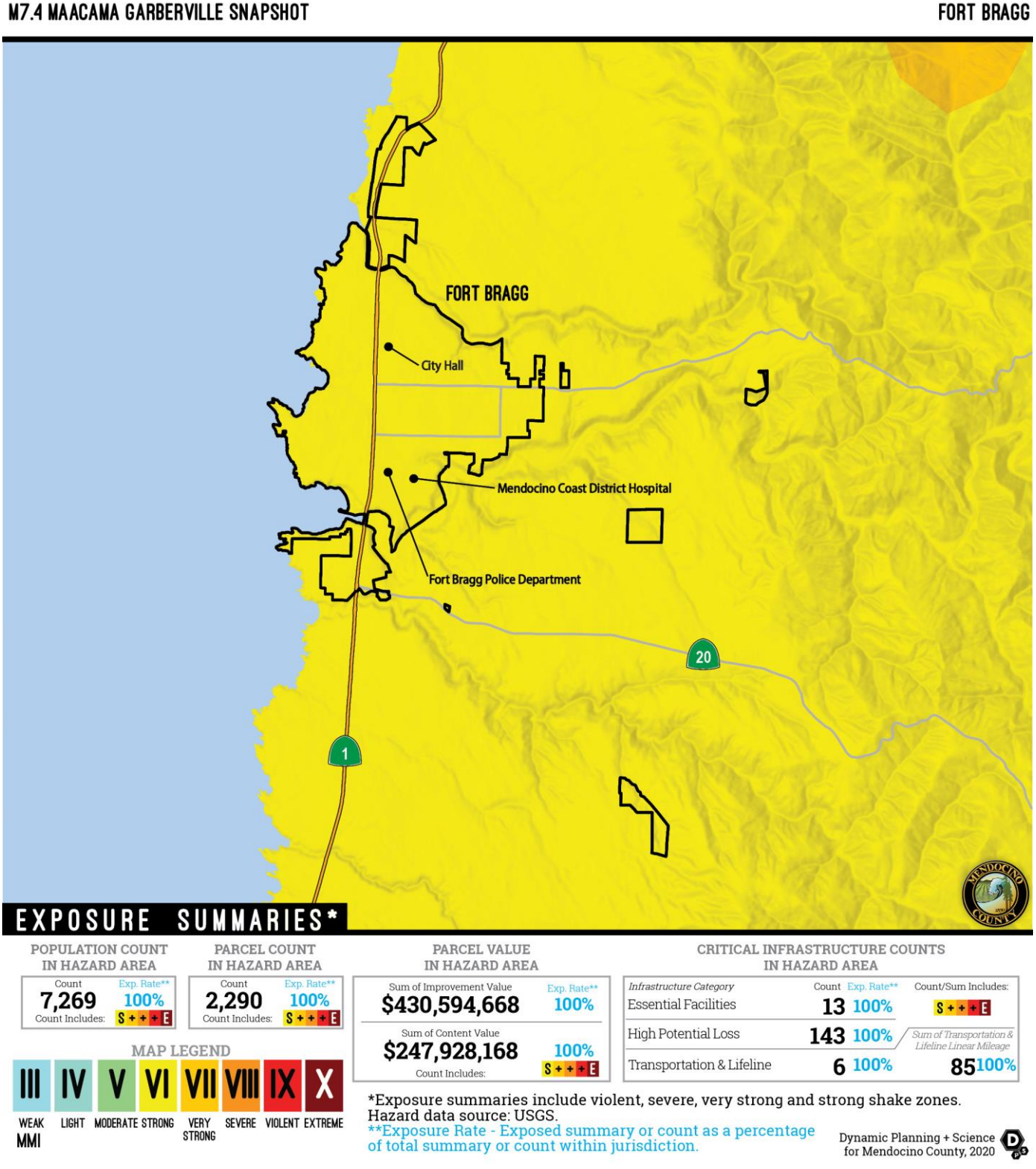


Figure 2-3: City of Fort Bragg M7.4 Maacama Garberville Snapshot

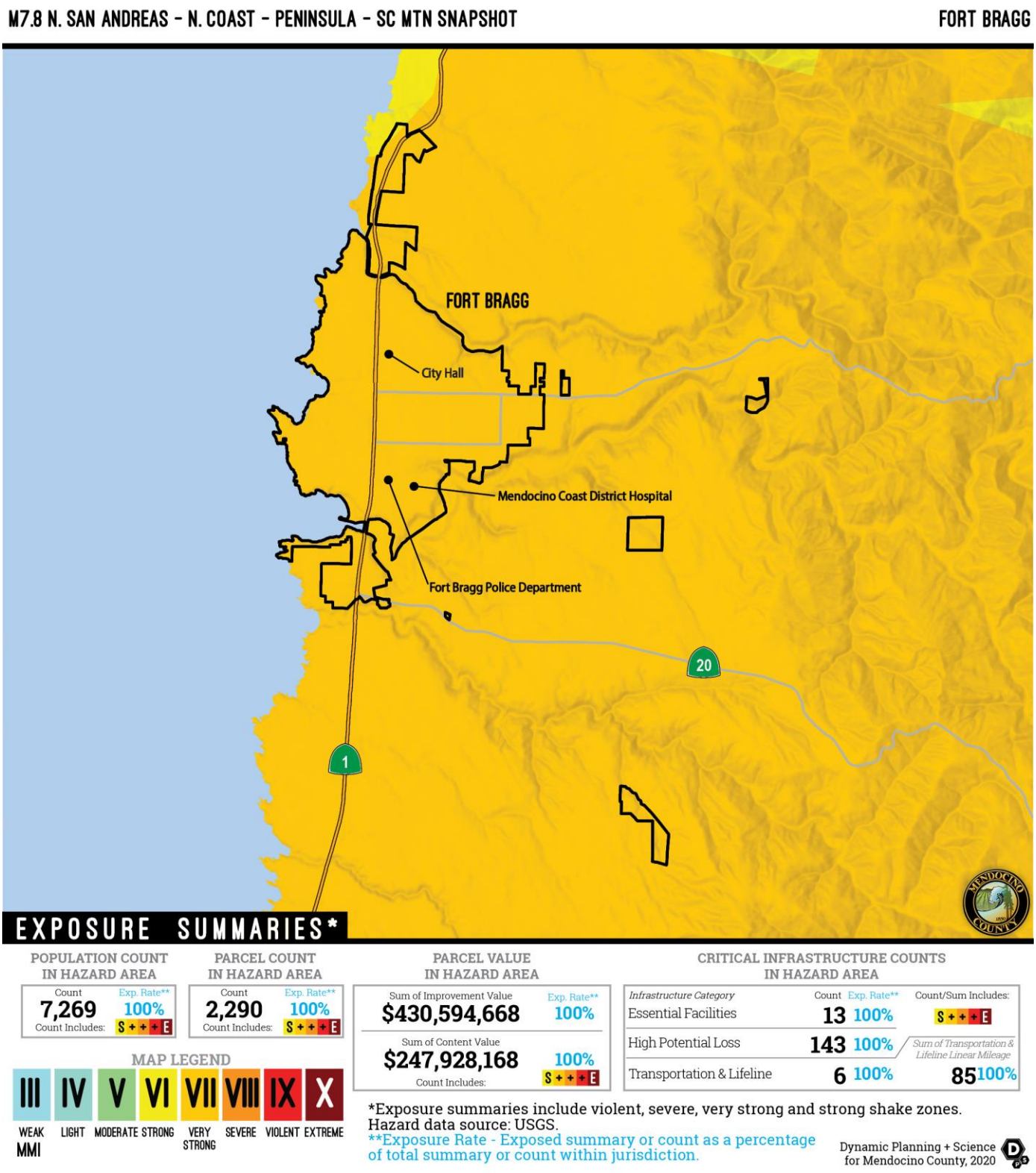


Figure 2-4: City of Fort Bragg M7.8 N. San Andreas -N. Coast -Peninsula – SC MTN Snapshot

FEMA FLOOD RISK EXPOSURE SNAPSHOT

FORT BRAGG



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
348	5%

Count Includes: 100 + 500

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
2	0%

Count Includes: 100 + 500

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
$1,797,784	0%

Sum of Content Value	
$898,892	0%

Count Includes: 100 + 500

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes: 100 + 500
Essential Facilities	0	0%	
High Potential Loss	2	1%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	1 1%

MAP LEGEND

100-YR
100-YR COASTAL
100-YR FLOODWAY
500-YR

*Exposure summaries include 100YR, 500YR and 100YR Coastal Zones. Hazard data source: FEMA.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science for Mendocino County, 2020

Figure 2-5: City of Fort Bragg FEMA Flood Risk Exposure Snapshot

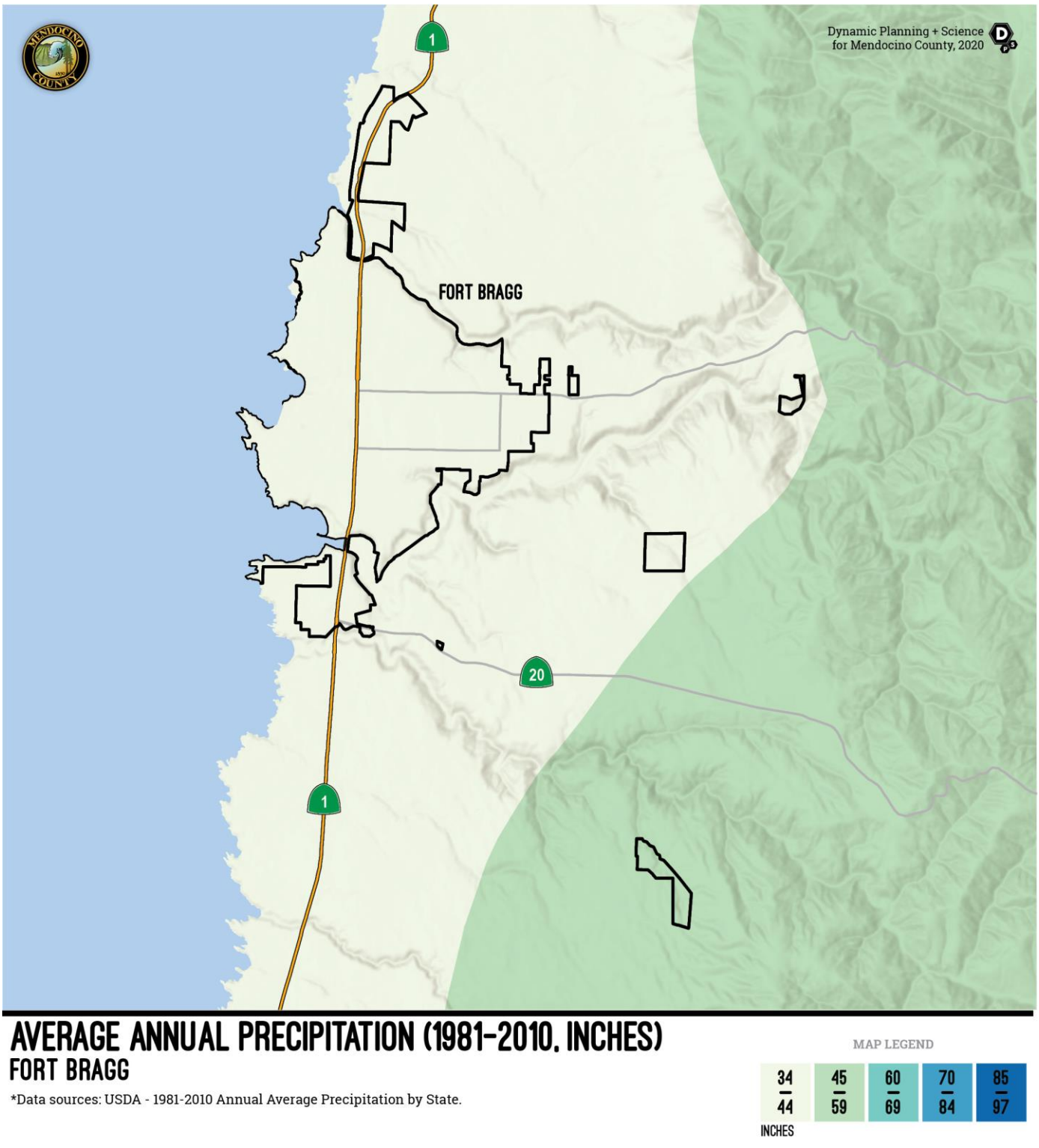


Figure 2-6: City of Fort Bragg Average Annual Precipitation (1981-2010. Inches)

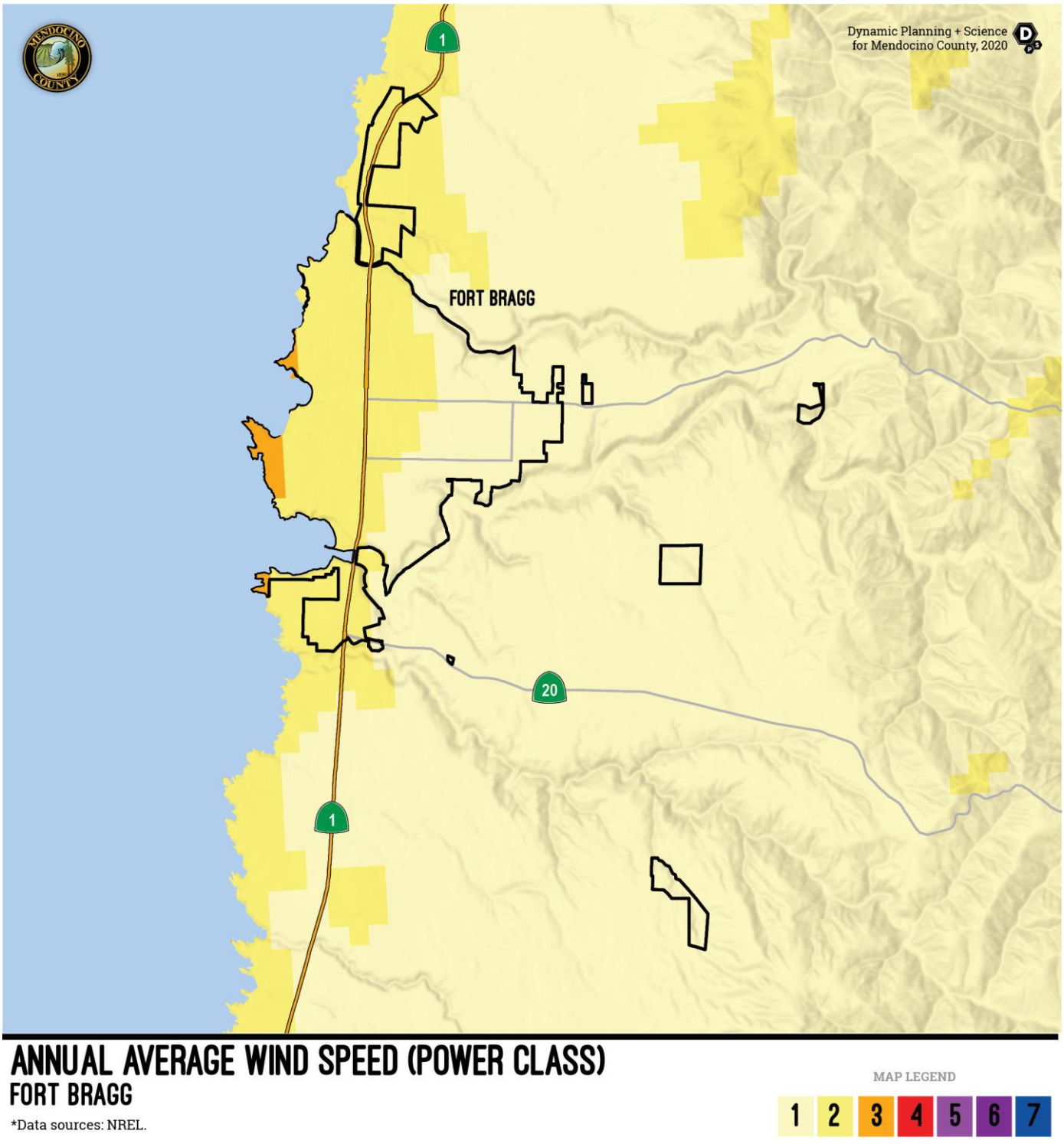
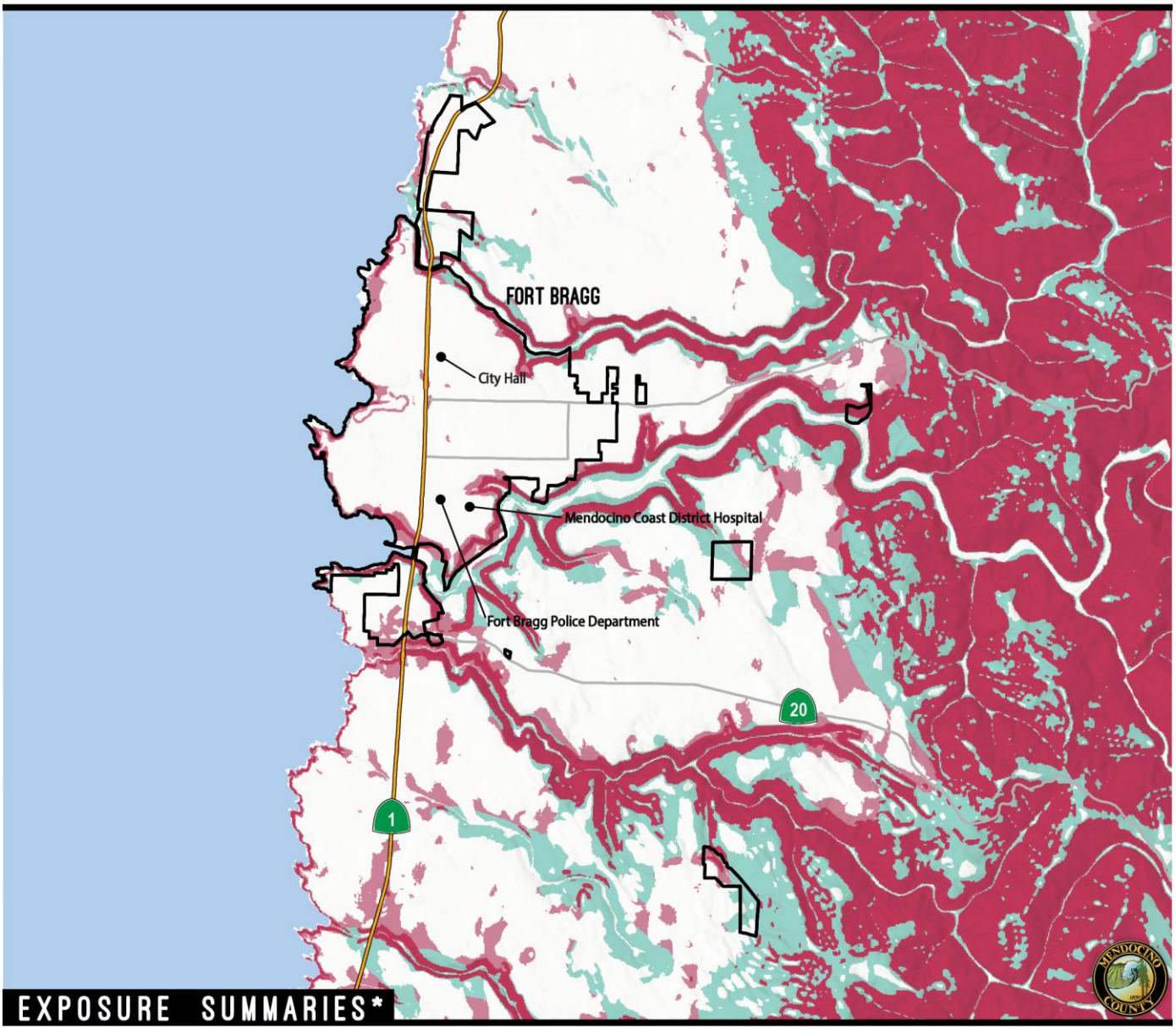


Figure 2-7: City of Fort Bragg Annual Average Wind Speed (Power Class)

LANDSLIDE RISK EXPOSURE SNAPSHOT

FORT BRAGG



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
544	7%	HIGH

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
52	2%	HIGH

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**	Count Includes:
Sum of Improvement Value $11,329,907	3%	
Sum of Content Value $5,941,677	2%	HIGH

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	HIGH
High Potential Loss	1	1%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	2	33%	3 3%

MAP LEGEND

LOW
MODERATE
HIGH

*Exposure summaries include high landslide risk exposure areas. Hazard data source: CGS.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science for Mendocino County, 2020

Figure 2-8: City of Fort Bragg Landslide Risk Exposure Snapshot

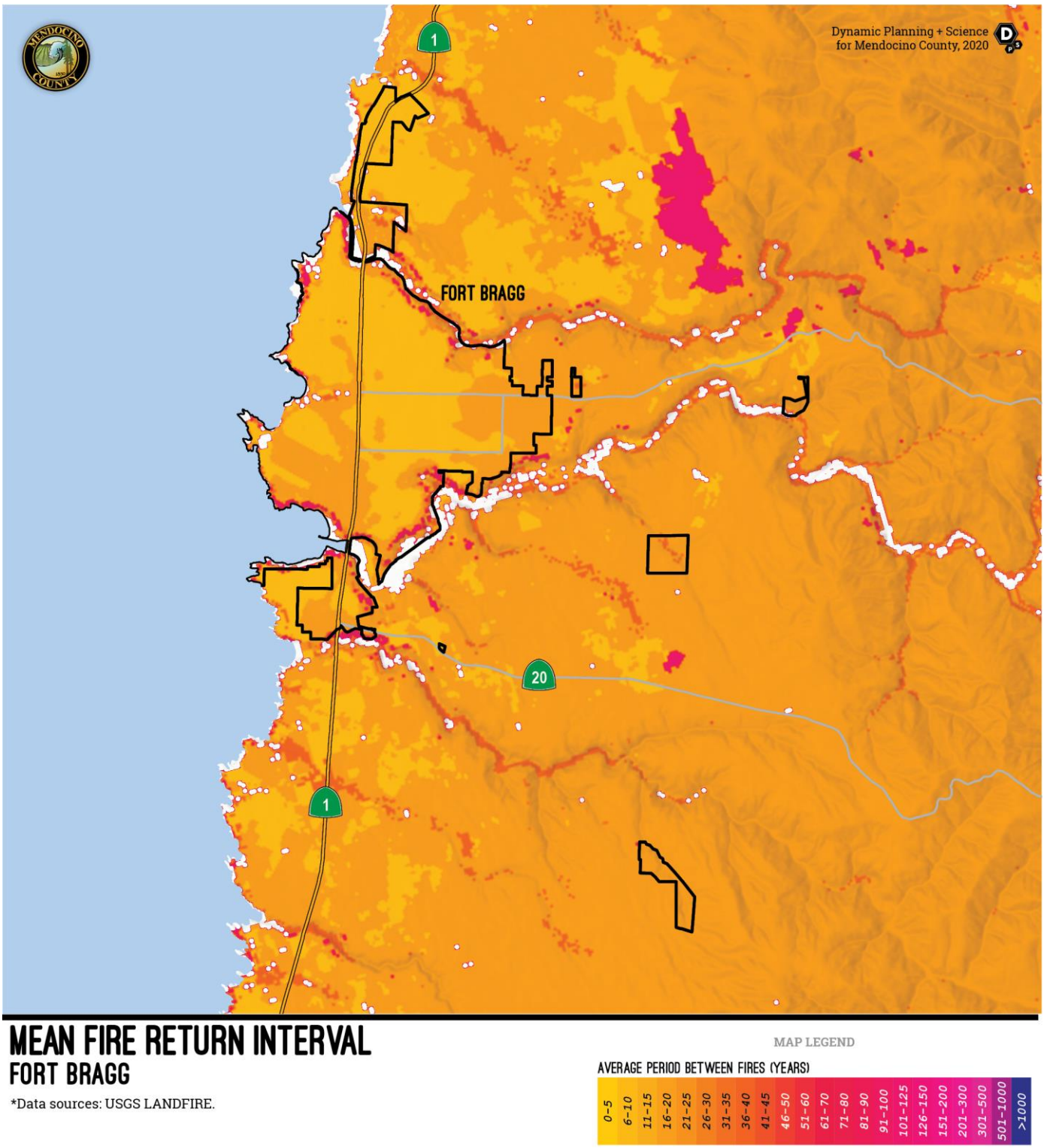


Figure 2-9: City of Fort Bragg Mean Fire Return Intervals

WILDFIRE RISK EXPOSURE SNAPSHOT

FORT BRAGG

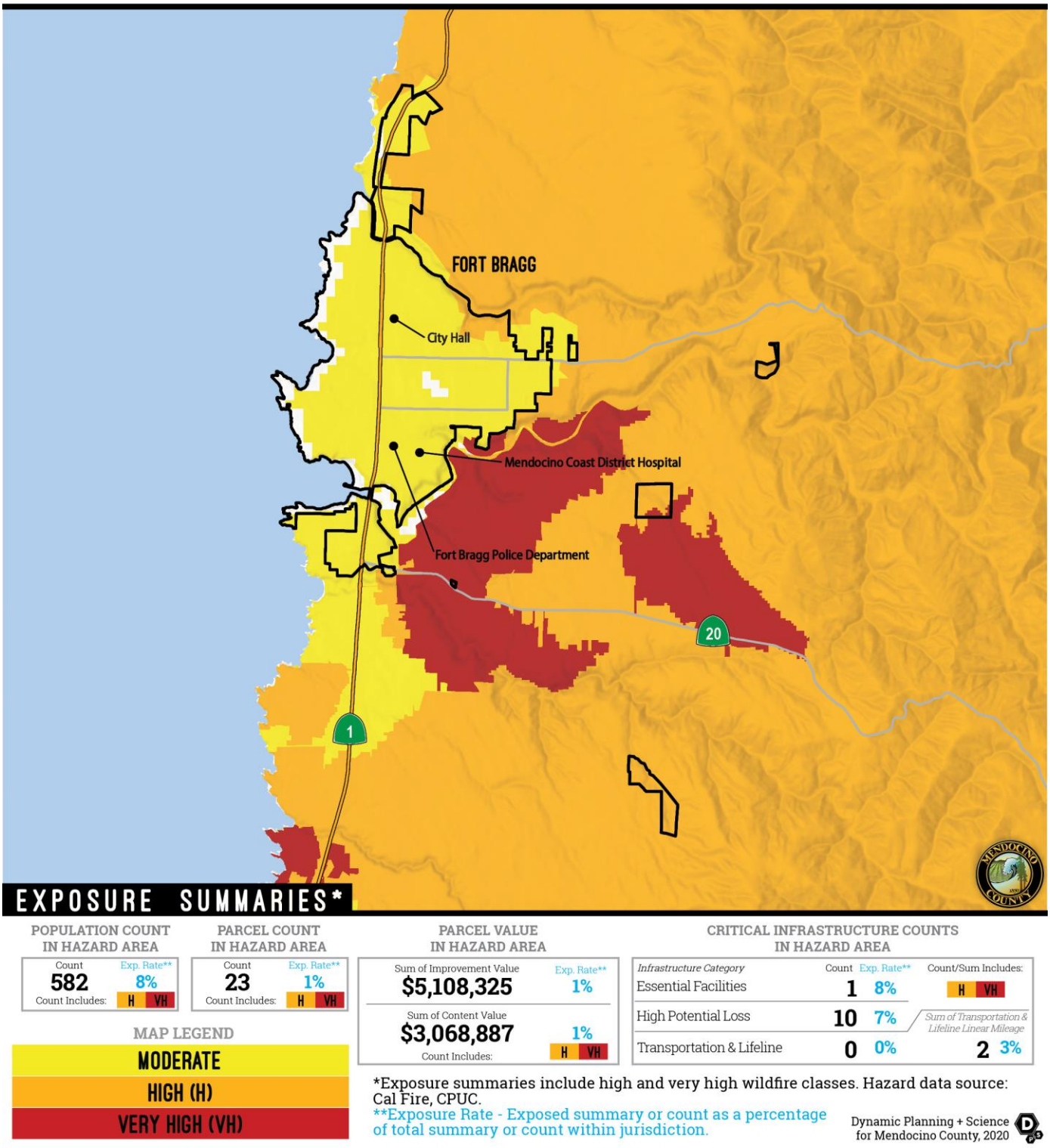


Figure 2-10: City of Fort Bragg Wildfire Risk Exposure Snapshot

Table 2-6: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Going into drought, short term dryness, slowing planting, growth of crops or pastures. ▪ Coming out of drought, some lingering water deficits and pasture or crops not fully recovered.
D1	Moderate Drought	▪ Some damage to crops, pastures ▪ Streams, reservoirs, or wells low, some water shortages developing or imminent ▪ Voluntary water-use restrictions requested
D2	Severe Drought	▪ Crop or pasture losses likely ▪ Water shortages common ▪ Water restrictions imposed
D3	Extreme Drought	▪ Major crop/ pasture losses ▪ Widespread water shortages or restrictions
D4	Exceptional Drought	▪ Exceptional and widespread crop/ pasture losses ▪ Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

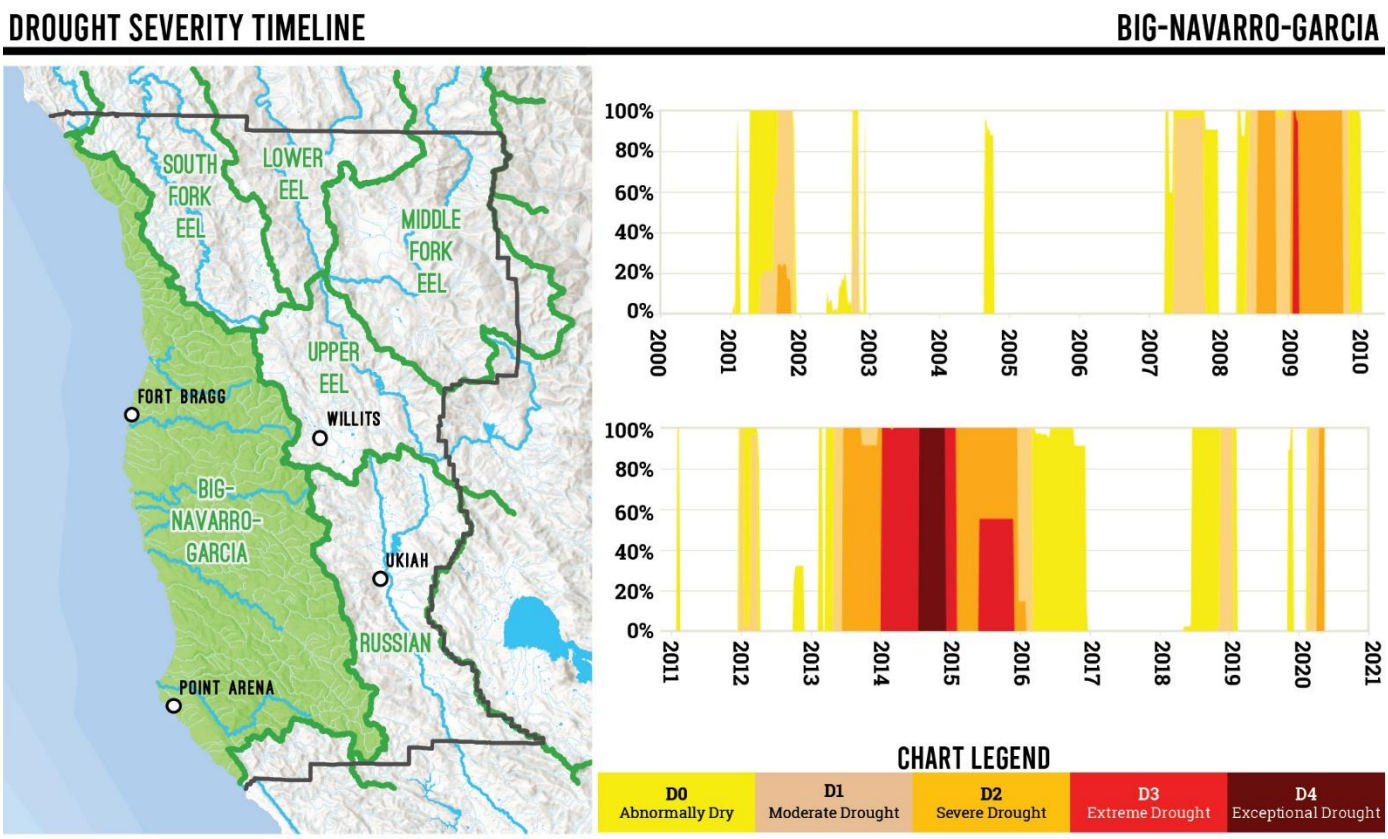


Figure 2-11: Drought Timeline for Big Navarro-Garcia Watershed

2.4.3.3 Past and Future Development

The City of Fort Bragg is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with State of California planning, zoning, subdivision, and architecture laws.

The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

While growth has occurred in hazard areas in the past, increasing hazard risks to some degree, those risks are also decreased by development standards and plan requirements that serve to mitigate or avoid those risks. Problematic development generally occurred many decades ago, and thus much of this HMP focuses on retrofits or replacements from that older construction.

City of Fort Bragg is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum develop standards, all jurisdictions belong to the NFIP, as such, all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Mendocino County.

As the General Plan is updated and incorporates information from this HMP, City of Fort Bragg staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Fort Bragg reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan in Section 2.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.

The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,

- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access. The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

2.4.3.3.1 National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Mendocino County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Fort Bragg has participated in the NFIP since 1982. City of Fort Bragg is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 2-7 for more information on the City's policies and historic flood insurance claims. ***See Volume 1, Section 4.5 for more information on the NFIP.***

Table 2-7: NFIP Status Table

NFIP Status	Participating since 12/07/1982
Policies in Force	5
Policies in SFHA	0
Policies in non-SFHA	5
Total Claims Paid	0
Paid Losses	$0
Repetitive Loss Properties	0
Severe Repetitive Loss Properties	0
Repetitive Loss Payment by NFIP on Building	N/D
Repetitive Loss Payment by NFIP on Contents	N/D

2.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 2-12. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 2-8.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 2-13 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 2-8 and Table 2-13.



Figure 2-12: Guidance for Problem Statements

Table 2-8: Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-CC-FB-19	Climate Change	Impact	PPRO - Property Protection , NRP - Natural Resource Protection	**City of Fort Bragg**	Drought along with sea level rise or coastal flooding could cause the river intake to be infiltrated by salt. (Also drought)	ma-CC-FB-204
ps-DR-FB-2	Drought	Impact	PRV - Prevention , PE&A - Public Education & Awareness	**City of Fort Bragg**	City sees increased tourist populations and increased water use in summers, which poses additional challenges in drought years.	ma-DR-FB-231
ps-DR-FB-3	Drought	Impact	PRV - Prevention , SP - Structural Projects	**City of Fort Bragg**	Limited water storage means drought has significant effect on City's water supply. Additional storage or alternative water supplies, including desalinization, are needed.	ma-DR-FB-231
ps-FL-FB-11	Drought	Impact	PPRO - Property Protection , NRP - Natural Resource Protection	**City of Fort Bragg**	Drought along with sea level rise or coastal flooding could cause the river intake to be infiltrated by salt	ma-CC-FB-204, ma-DR-FB-231
ps-EQ-FB-4	Earthquake	Impact	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	**City of Fort Bragg**	Fort Bragg's hospital needs significant seismic upgrades by 2035 to remain safe during a strong earthquake.	ma-EQ-FB-9
ps-EQ-FB-5	Earthquake	Impact	SP - Structural Projects	**City of Fort Bragg**	Fort Bragg's fire department needs significant seismic upgrades to remain safe during a strong earthquake.	ma-EQ-FB-9
ps-EQ-FB-6	Earthquake	Impact	PRV - Prevention , PPRO - Property Protection , SP - Structural Projects	**City of Fort Bragg**	Fort Bragg's corporation yard needs significant seismic upgrades to remain safe during a strong earthquake.	ma-EQ-FB-9

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-FB-7	Earthquake	Impact	PRV - Prevention , PPRO - Property Protection , SP - Structural Projects	**City of Fort Bragg**	A significant number of residential homes and commercial buildings in Fort Bragg are older construction, pre-1974, and may require additional retrofitting.	ma-EQ-FB-12
ps-EW-FB-8	Extreme Weather	Impact	PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	**City of Fort Bragg**	City experiences power loss from extreme weather approximately three times a year for a day or two.	ma-EW-FB-13
ps-EW-FB-9	Extreme Weather	Victim	ES - Emergency Services	**City of Fort Bragg**	Loss of power for medical baseline customers may cause additional health effects.	ma-EW-FB-13
ps-FL-FB-10	Flood	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Fort Bragg**	Ocean Lake Adult Mobile Home Park is particularly susceptible to flooding, tsunamis, and sea level rise.	ma-FL-FB-10, ma-FL-FB-232
ps-PN-FB-12	Pandemic	Victim	PRV - Prevention , PE&A - Public Education & Awareness	**City of Fort Bragg**	EOC is not designed for possible social distancing guidelines to be in place during a hazard event (flood, wildfire, earthquake), nor does it have adequate fresh air ventilation	ma-PN-FB-233
ps-PN-FB-13	Pandemic	Impact	PRV - Prevention , ES - Emergency Services	**City of Fort Bragg**	Evacuation center does not have adequate staffing space or structural barriers from public interaction to be used safely during pandemic.	ma-PN-FB-235
ps-PN-FB-14	Pandemic	Impact	ES - Emergency Services , SP - Structural Projects	**City of Fort Bragg**	Need for additional sheltering locations in event of pandemic social distancing needs paired with another hazard event (flood, wildfire, earthquake)	ma-PN-FB-236
ps-SF-FB-15	Slope Failure	Impact	SP - Structural Projects	**City of Fort Bragg**	Water delivery system traverses steep slopes in multiple points, and landslides can take out pipes in steep areas.	ma-SF-FB-237

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-SF-FB-16	Slope Failure	Impact	PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	**City of Fort Bragg**	Landslides affect important access routes to and from the City, both on Hwy 20 inland and along Hwy 1 (this is a particular secondary concern in seismic hazards too)	ma-SF-FB-245
ps-WF-FB-17	Wildfire	Threat	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Fort Bragg**	Development on the east side of the City approaches the WUI and causes some concern. In general, the City boundaries only have moderate wildfire concerns with portions of the City without any wildfire concern.	ma-WF-FB-14
ps-WF-FB-18	Wildfire	Impact	PRV - Prevention , PE&A - Public Education & Awareness , ES - Emergency Services	**City of Fort Bragg**	City can be designated as an evacuation center for inland wildfires. Concerns about compounding other hazards like drought or pandemic.	ma-PN-FB-233, ma-PN-FB-235, ma-PN-FB-236

2.4.3.5 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through https://mitigatehazards.com/mendocino-county/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.

2.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

2.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity. (Cal. Adaptation Planning Guide, 2020, p. 94)

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

2.5.1.1 Planning and Regulatory Capabilities

Table 2-9: Planning and Regulatory Mitigation Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code.
BCEGS Rating				
Public Protection (ISO Class)				Class 3
Hazard Related Development Standards				Floodplain Management (Ch.15.32.170-200)
Zoning Ordinance				
Hazard-Specific Ordinance				Flood-Related Erosion-Prone areas (Ch. 15.32.200)
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				City of Fort Bragg Budget Fiscal Year 2020/2021.
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural)				
Earthquake Modernization Plan (Building Safety)				
Hazard Plans				
General Plan Safety Element				
Community Wildfire Protection Plan (CWPP)				2016 County-wide CWPP in existence.
Floodplain Management Plan				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Stormwater Management Plan				Coastal Mendocino Co Storm Water Resource Plan, 2019 Update
Emergency Operations Plan				Mendocino County Operational Area Emergency Operations Plan (2016)
Climate Action Plan				Draft Climate Action Plan 2012
Ground Water Management Planning / Plans				Ukiah Valley is the only groundwater basin required to have a groundwater sustainability plan in the County.
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Floodplain Management (Ch.15.32.190-200)
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				
Community Rating System (CRS)				

2.5.1.2 Administrative and Technical Capabilities

Table 2-10: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Administrative and Technical				
Community Planning and Development Services				
Community Planner				The Community Development Department has a Senior Planner as dedicated staff.
Civil Engineer				The Public Works has two or more staff dedicated to engineering.
Building Code Official (Full time or Augmented)				
Floodplain Administrator				
Fire Marshal				The Fort Bragg Fire Department includes a full-time Fire Chief and a Fire Prevention Officer.
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Emergency Manager				City Manager is the emergency services director for the City.
Full-Time Building Official				
Grant Manager, Writer, or Specialist				
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				MendoAlert. The City uses local radio stations (KOZT FM 95.3 / 95.9), the county web site, as well as the city web site to post information about emegency or disaster situation that affects the city.
Flood				
Wildfire				
Geological Hazards				

2.5.1.3 Financial Capabilities

Table 2-11: Fiscal Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				
Benefit assessments				
System Development Fee				
General Obligation Bonds to Incur Debt				
Special Tax Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				
Capital Improvement Project Funding				Recent examples are the 2020 Maple Street Storm Drain and Alley Project and the Wastewater Treatment Facility Upgrade.

2.5.1.4 Education and Outreach

Table 2-12: Education / Outreach Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				The Mendocino County Fire Safe Council assists local Councils with a variety of needs.
Resource Conservation Districts				The Mendocino County Resource Conservation District has implemented a wide range of programs across the County.
Other	N/A	N/A	N/A	

2.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 2-13 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

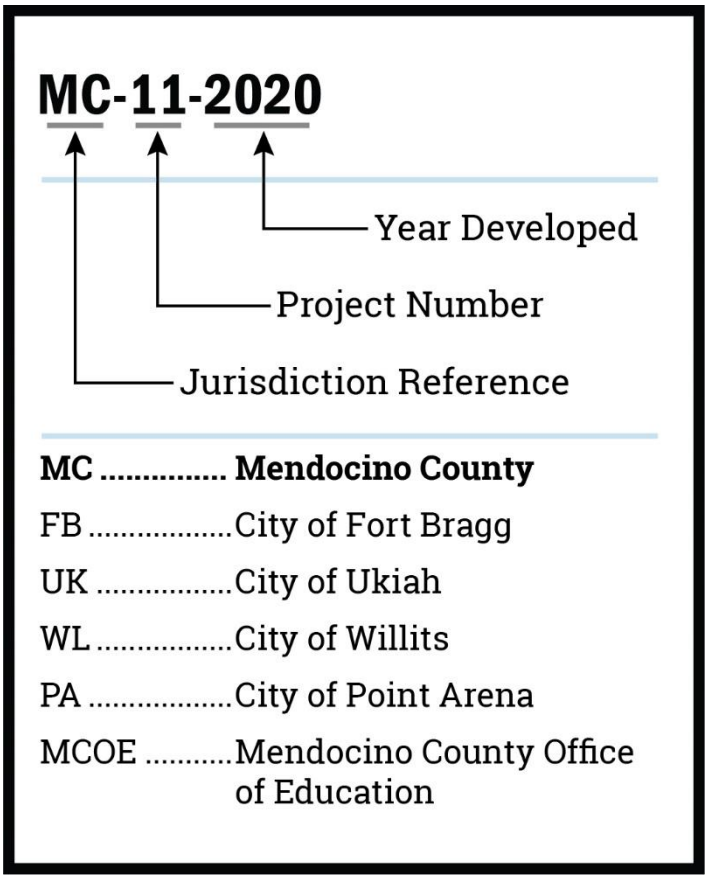


Figure 2-13: Mitigation Action Key

Each participating jurisdiction, including the City of Fort Bragg, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. City of Fort Bragg has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County-wide mitigation actions, the status, and additional notes for each action.

Table 2-13 lists each mitigation action for City of Fort Bragg. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 2-13 meets the regulatory requirements of FEMA and DMA 2000.

Table 2-13: City of Fort Bragg Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-CC-FB-204	Climate Change	PRV - Prevention	Pending	2020	City of Fort Bragg	Develop project to address increased salinity in drinking water intakes due to reduced river levels (drought) paired with sea level rise or tsunami effects	Public Works/ Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-CC-FB-19, ps-FL-FB-11
ma-DR-FB-231	Drought	PPRO - Property Protection	Pending	2020	City of Fort Bragg	Explore water supply contingency and alternative water supplies to improve water supply and delivery and wastewater treatment capacity in times of drought	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Planning	HMGP / BRIC	Medium	ps-DR-FB-2, ps-DR-FB-3, ps-FL-FB-11
ma-EQ-FB-9	Earthquake	PPRO - Property Protection	Pending	2014	City of Fort Bragg	Seismically retrofit or replace public works and/or emergency response facilities that are necessary during and/or immediately after a disaster or emergency. Specific needs for fire department, corporation yard, and hospital.	Public Works Department/ Engineering Division	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , AFG , FP&S	High	ps-EQ-FB-4, ps-EQ-FB-5, ps-EQ-FB-6
ma-EQ-FB-12	Earthquake	PE&A - Public Education & Awareness	Ongoing	2008	City of Fort Bragg	Develop an unreinforced masonry grant program to correct problems, such as bracing chimneys, on residential and nonresidential buildings.		High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC	High	ps-EQ-FB-7
ma-EW-FB-13	Extreme Weather	PPRO - Property Protection	Ongoing	2008	City of Fort Bragg	Install underground utilities or clear right-of-way for utilities that provide power and communication to critical facilities and are at-risk to failure during a winter storm event.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , FP&S , CDBG DRI	High	ps-EW-FB-8, ps-EW-FB-9
ma-FL-FB-10	Flood	PPRO - Property Protection	Pending	2014	City of Fort Bragg	Reinforce County and local ramps, bridges, and roads from flooding through protection activities, including elevating the road and installing culverts beneath the road or building a higher bridge across the area that experiences regular flooding.	Public Works Department/ Engineering Division	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-FL-FB-10
ma-FL-FB-232	Flood	PE&A - Public Education & Awareness	Ongoing	2020	City of Fort Bragg	Develop a public outreach program that informs property owners located in areas of concern for flood but not necessarily in flood zone, such as Ocean Lake Mobile Home Park, about voluntary flood insurance.	City Manager initially	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	5%	HMGP / BRIC	High	ps-FL-FB-10

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-PN-FB-233	Pandemic	ES - Emergency Services	Pending	2020	City of Fort Bragg	Install additional barriers and proper ventilation in Emergency Operations Center (EOC, City Hall) to allow for operation of EOC during pandemic and hazard event	Directorate of Emergency Services	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , AFG , FP&S , CDBG DRI	High	ps-PN-FB-12, ps-WF-FB-18
ma-PN-FB-235	Pandemic	ES - Emergency Services	Pending	2020	City of Fort Bragg	Institute necessary structural improvements to evacuation centers/ sheltering locations to allow for proper ventilation, space for staff, and structural barriers to be used during pandemic and hazard event.	Directorate of Emergency Services	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , AFG , FP&S , CDBG DRI	High	ps-PN-FB-13, ps-WF-FB-18
ma-PN-FB-236	Pandemic	ES - Emergency Services	Pending	2020	City of Fort Bragg	Develop alternative sheltering/ evacuation locations for distancing required during pandemic and other hazard event	Directorate of Emergency Services	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-FB-14, ps-WF-FB-18
ma-SF-FB-237	Slope Failure	PPRO - Property Protection	Ongoing	2020	City of Fort Bragg	Retrofit well and water delivery pipes frequently subjected to landslides.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , CDBG DRI	High	ps-SF-FB-15
ma-SF-FB-245	Slope Failure	PPRO - Property Protection	Ongoing	2020	City of Fort Bragg	Initiate process to understand landslide susceptibility for emergency egress, including land ownership and CalTrans funding opportunities, both north and west of Fort Bragg (Hwy 1 and Hwy 20).	Admin, Public Works	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Planning	HMGP / BRIC	Medium	ps-SF-FB-16
ma-WF-FB-14	Wildfire	PPRO - Property Protection	Ongoing	2008	City of Fort Bragg	Develop an urban fire prevention program that provides grant funding for property owners to update structures that currently not meet the CBC and California Fire Code, focusing on areas in eastern portion of City.	City Admin	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Planning	AFG , FP&S	Medium	ps-WF-FB-17

MENDOCINO COUNTY
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN

City of Point Arena

JURISDICTIONAL ANNEX

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Mendocino County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF POINT ARENA (PA)

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Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Mendocino County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.

City of Point Arena - Adoption Resolution

RESOLUTION NO. 2020-32

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POINT ARENA ADOPTING THE 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR MENDOCINO COUNTY AS ITS OFFICIAL PLAN

WHEREAS, the City of Point Arena is a political subdivision of the State of California and an official participating jurisdiction of the "2020 Mendocino County Multi-Jurisdictional Hazard Mitigation Plan" (MJHMP); and

WHEREAS, the City of Point Arena recognizes the MJHMP as the official hazard mitigation plan for the County and participating jurisdictions; and

WHEREAS, the City of Point Arena, with the assistance from Mendocino County, has gathered information and prepared the MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 C.F.R. § 201.6; and

WHEREAS, the City of Point Arena Annex in Volume 2 of the MJHMP recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, the City of Point Arena has reviewed the MJHMP and affirms that the plan actions in the City of Point Arena's Annex will reduce the potential for harm to people and property from future hazard occurrences with our community; and

WHEREAS, Congress passed the Disaster Mitigation Act of 2000 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted multi-hazard plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City Council fully participated in the FEMA-prescribed mitigation planning process to prepare this MJHMP; and

WHEREAS, the citizens were afforded opportunities to comment and provide input in the MJHMP and the actions in the Plan; and

WHEREAS, the City of Point Arena, as a fully participating jurisdiction of the MJHMP is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City Council desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the MJHMP; and

WHEREAS, adoption by the City Council for the City of Point Arena demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the MJHMP;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Point Arena:

1. That the City of Point Arena adopts the 2020 Multi-Jurisdictional Hazard Mitigation Plan Vol. 1 for Mendocino County and the City of Point Arena Annex in Vol. 2, as approved by FEMA and Cal OES, as the mitigation plan for the City of Point Arena.

2. That the City Council directs the City Manager to submit an approved and signed copy of this resolution to the Cal OES and FEMA Region IX officials to enable the plan's final approval.

PASSED AND ADOPTED The foregoing Resolution No. 2020-32 was passed and adopted at a Regular meeting of the Point Arena City Council on the 15th day of December 2020 by the following vote. Motion by Vice Mayor Burkey, Seconded by Councilmember Dobbins.

AYES: Ignacio, Burkey, Dobbins, Ford, Dahlhoff

SCOTT IGNACIO
Mayor

ATTEST:

Richard Shoemaker, City Clerk

Section 3. City of Point Arena

3.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Point Arena. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the City of Point Arena. This Annex provides additional information specific to the City of Point Arena, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

Paul Andersen, Administrative Assistant
City of Point Arena
451 School Street,
24000 S. Highway 1
Point Arena, CA 95468
Telephone: 707-882-2122
e-mail Address: admin@pointarena.ca.gov

Alternate Point of Contact

Richard Shoemaker, City Manager
City of Point Arena
451 School Street,
24000 S. Highway 1
Point Arena, CA 95468
Telephone: 707-882-2122
e-mail Address: cm@pointarena.ca.gov

3.2 Planning Methodology

The City of Point Arena followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 3-1.

Table 3-1: Planning Committee Members

Planning Committee Members	Department
Paul Andersen	City of Point Arena
Richard Shoemaker	City Manager

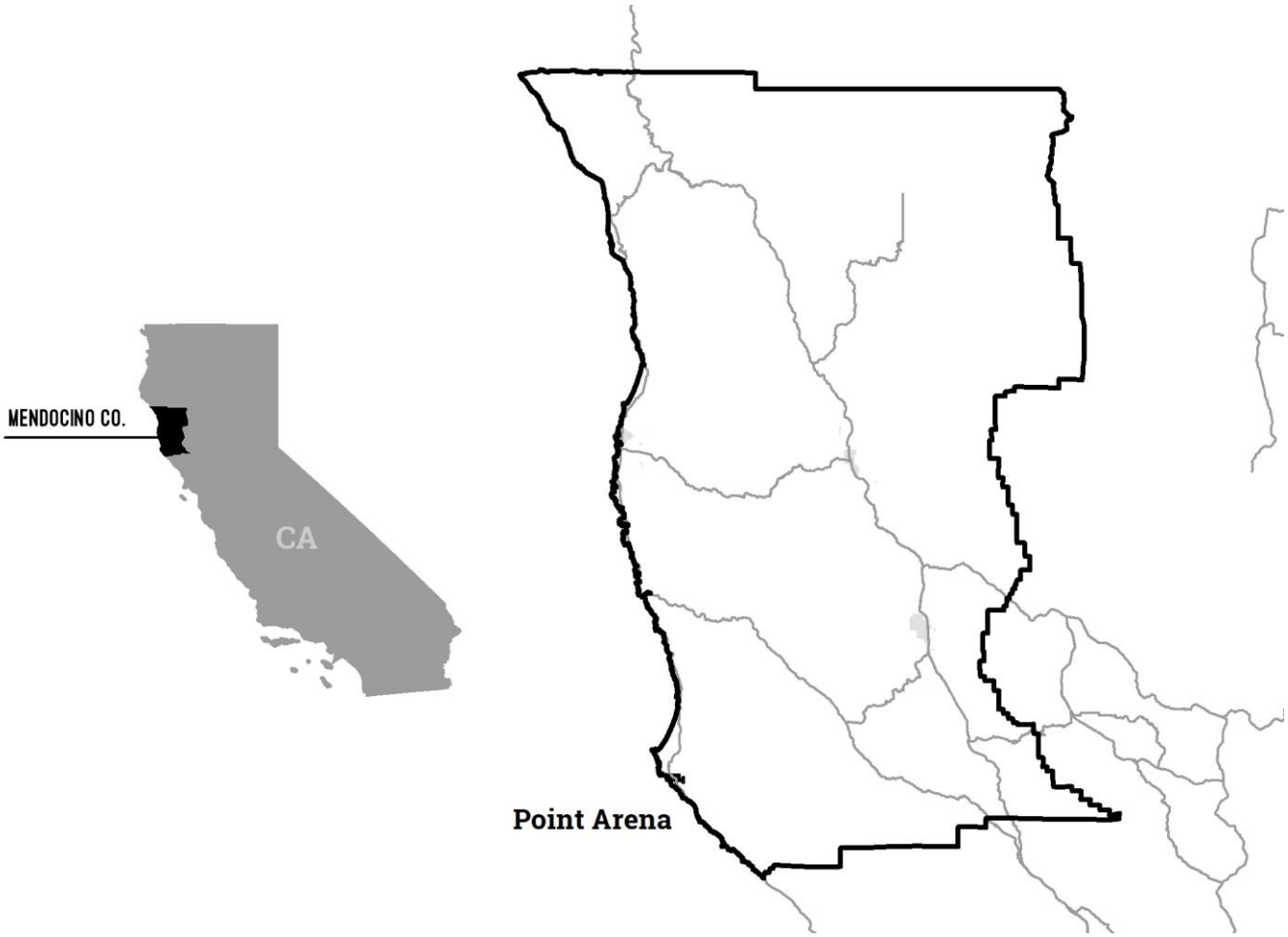


Figure 3-1: City of Point Arena Location

3.3 What's New

The City of Point Arena has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 3-3. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Table 3-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 3-12.

Table 3-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled
ma-AH-PA-38	All Hazard	Cancelled	2014	City of Point Arena	Integrate the Mendocino County HMP, in particular the hazard analysis and mitigation strategy sections, into local planning documents, including general plans, emergency operations plans, and capital improvement plans.	Ongoing work, opportunities for integration reflected in capabilities assessment.
ma-SF-PA-42	Slope Failure	Cancelled	2008	City of Point Arena	Retrofit critical infrastructure or mitigate land (e.g., slope stabilization, vegetation management) around critical infrastructure so that the infrastructure provides safe ingress for emergency response vehicles and safe egress for community members before or during a disaster.	No longer a priority
ma-WF-PA-54	Wildfire	Cancelled	2014	City of Point Arena	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Better covered by MA-WF-PA-43 from 2008 plan
ma-WF-PA-59	Wildfire	Cancelled	2014	City of Point Arena	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Covered by new, more detailed ma-WF-PA-43

3.3.1 Mitigation Successes

Table 3-3 displays multiple important mitigation actions that have been completed by the City of Point Arena. Some of the City's success stories are described in more detail below.

Table 3-3: Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description
ma-WF-PA-40	Wildfire	Completed	2014	City of Point Arena	Develop a community wildfire mitigation plan that identifies and prioritizes areas for hazard fuel reduction treatments and recommend the types of methods of treatments.

SUCCESS STORY: *Arena Cove Restoration*

The City is working with the Federal Emergency Management Agency and the California Office of Economic Services to obtain funding to mitigate the yearly damage at the Point Arena Pier and the adjacent Arena Cove parking lot by winter storms. In January of 2017, a strong storm caused significant damage to pilings on the Point Arena Pier as well rip-rap that provides a buffer against storm surge invading the Arena Cove parking lot. Yearly storm surges have resulted in the moving of significant debris and flooding of the parking lot which affects local businesses and the ability of the commercial and sport fishing communities utilizing the Cove. Funding will be used to engineer and replace damaged and missing wooden pilings on the Pier and to raise the parking lot and provide a seawall buffer to prevent storm surges from causing further erosion of the parking lot.



Figure 3-2: Damage to Arena Cover Parking Lot in 2017

3.4 Risk Assessment

The intent of this section is to profile the City of Point Arena's hazards and assess the City's vulnerabilities, distinct from that of the County-wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

3.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 3-4. Detailed hazard profiles of the most significant County-wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect City of Point Arena. Table 3-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, City of Point Arena General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to City of Point Arena and which ones were not. Section 0 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to City of Point Arena.

Table 3-4: County Hazard Prioritization (Vol. 1)

Hazard Type	Explanation
Climate Change	**High priority county-wide, profiled hazard.**
Dam/ Levee failure	**High priority county-wide, profiled hazard.**
Drought	**High priority county-wide, profiled hazard.**
Earthquake/ Geologic Hazards	**High priority county-wide, profiled hazard.**
Flood	**High priority county-wide, profiled hazard.**
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	**High priority county-wide, profiled as part of Severe Weather.**
Insect Hazards	While hazardous insects exist in Mendocino County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	**High priority county-wide, profiled hazard.**
Severe Weather, including:	**High priority county-wide for heavy wind and heavy rain.**
Extreme Heat	Not a priority as extreme weather event, discussed as climate change impact.
Hail	Hail events are rare in Mendocino County and not profiled in this plan.
High Wind	**Profiled as part of Severe Weather hazard.**
Heavy Rain	**Profiled as part of Severe Weather hazard.**
Fog	While fog events do occur within Mendocino County, they are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	While winter storms are present in Mendocino County, they were not identified as a priority for this plan.
Slope Failure	**High priority county-wide, profiled hazard.**
Soil Hazards	**High priority county-wide, profiled hazard (includes erosion and naturally-occurring asbestos).**
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	**High priority county-wide, profiled hazard.**

Table 3-5: Document Review Crosswalk

Hazards	2014 Mendocino County MJHMP	2006 City of Point Arena General Plan /Local Coastal Plan	2009 Mendocino County General Plan	2018 California State HMP
Agricultural Pests	■			■
Climate Change			■	■
Dam Failure	■		■	■
Drought	■	■	■	■
Earthquake	■	■	■	■
Flood	■	■	■	■
Insect Hazards	■			
Landslide		■	■	■
Levee Failure	■*			■
Manmade Hazards			■	■
Pandemic Disease	■			■
Sea Level Rise		■		■
Severe Weather				■
Soil Hazards	■**			
Terrorism & Tech Hazards				■
Tsunami	■	■	■	■
Volcano				■
Wildfire	■***	■	■	■

** included as part of dam failure*
*** included naturally occurring asbestos*
**** included urban conflagration*

3.4.2 Hazard Risk Ranking

The City of Point Arena's Planning Team used the same hazard prioritization process as the Mendocino County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 3-3 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess City of Point Arena's vulnerability to following hazards:

- Climate Change
- Pandemic
- Extreme Weather
- Earthquake
- Flood
- Wildfire

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address City of Point Arena's vulnerability to these specifically-identified hazards.

3.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within City of Point Arena are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

3.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 3-3 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Mendocino County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to City of Point Arena. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

3.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 3-4 through Figure 3-10, illustrate City of Point Arena's vulnerability to specific hazards. Figures include:

- Figure 3-4: City of Point Arena M7.4 Maacama Garberville Snapshot
- Figure 3-5: City of Point Arena M7.8 N. San Andreas -N. Coast – Peninsula – SC MTN Snapshot
- Figure 3-6: City of Point Arena FEMA Flood Risk Exposure Snapshot
- Figure 3-7: City of Point Arena Average Annual Precipitation (1981-2010. Inches)
- Figure 3-8: City of Point Arena Annual Average Wind Speed (Power Class)
- Figure 3-9: City of Point Arena Mean Fire Return Interval
- Figure 3-10: City of Point Arena Wildfire Risk Exposure Snapshot

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - **Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate Change impacts will be addressed at the end of each hazard section within the 2020 plan update and as a stand alone section for each jurisdiction...
For County and Municipal governments you will be required to address climate change impacts in the Safety Element of your General Plan. Climate change may change the frequency, duration and intensity of hazards listed above.



Pandemic will be profiled for every jurisdiction.

City of Point Arena Risk Matrix

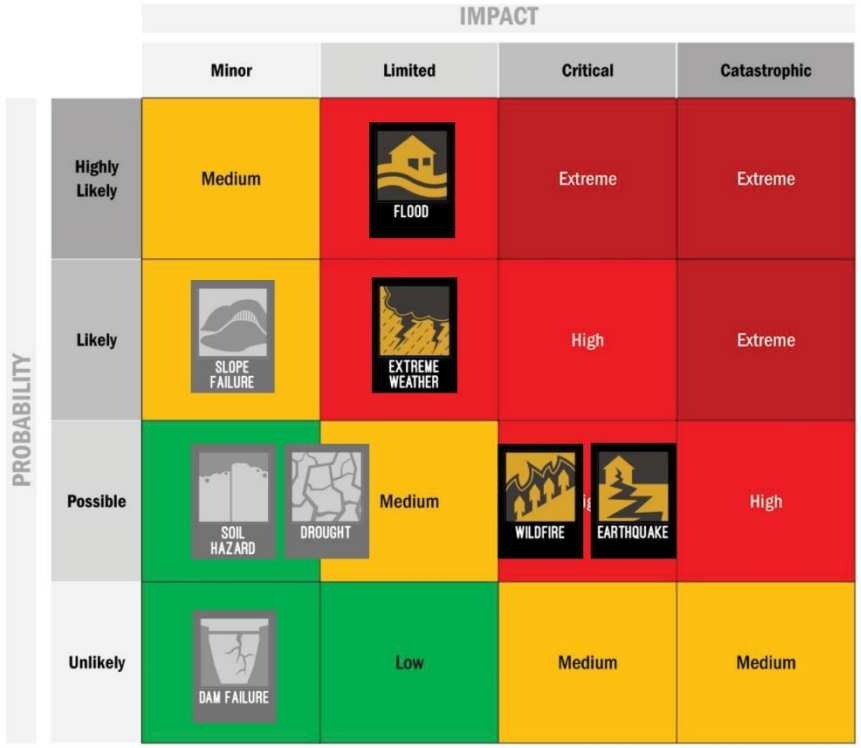


Figure 3-3: City of Point Arena Risk Assessment

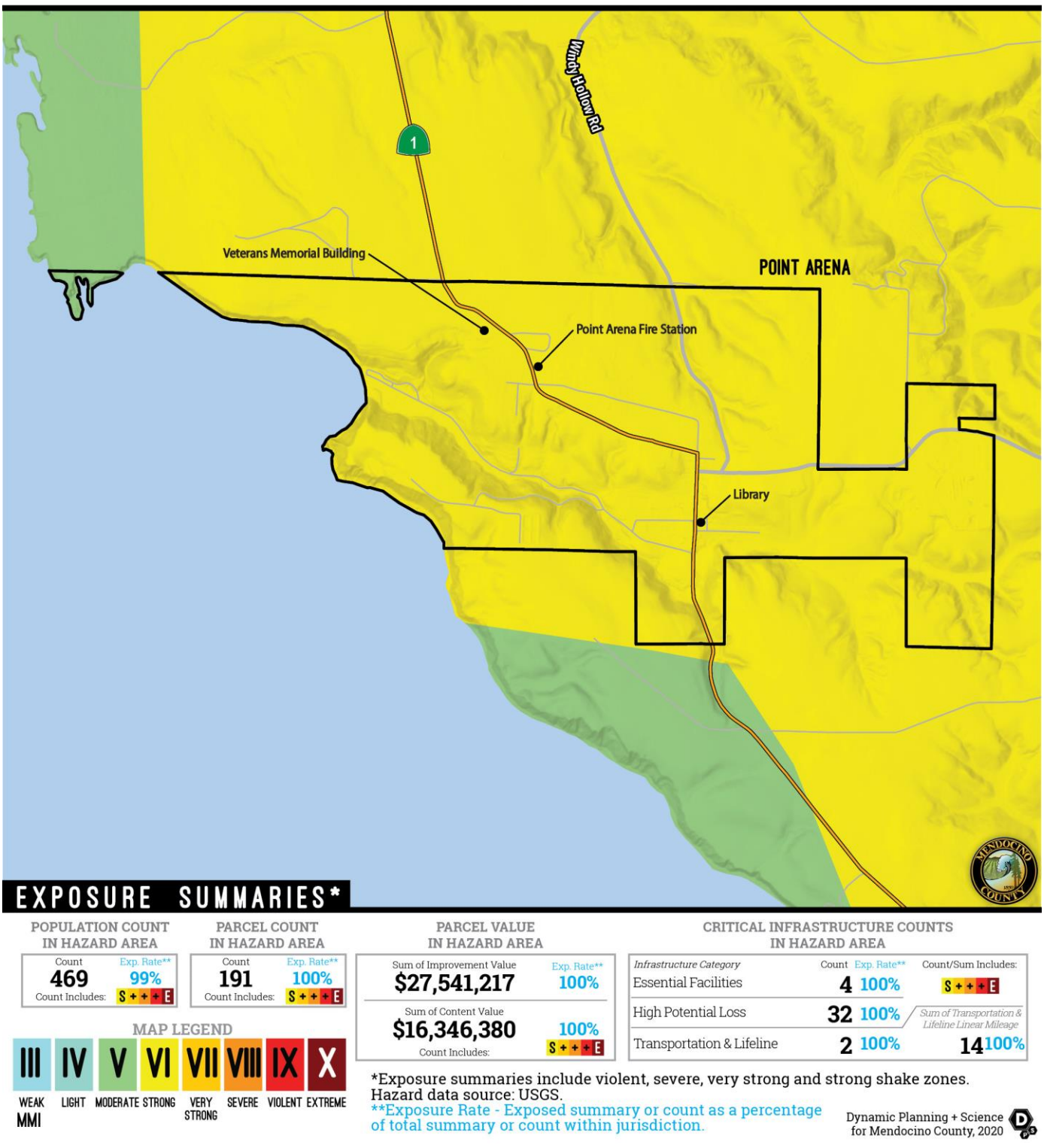


Figure 3-4: City of Point Arena M7.4 Maacama Garberville Snapshot

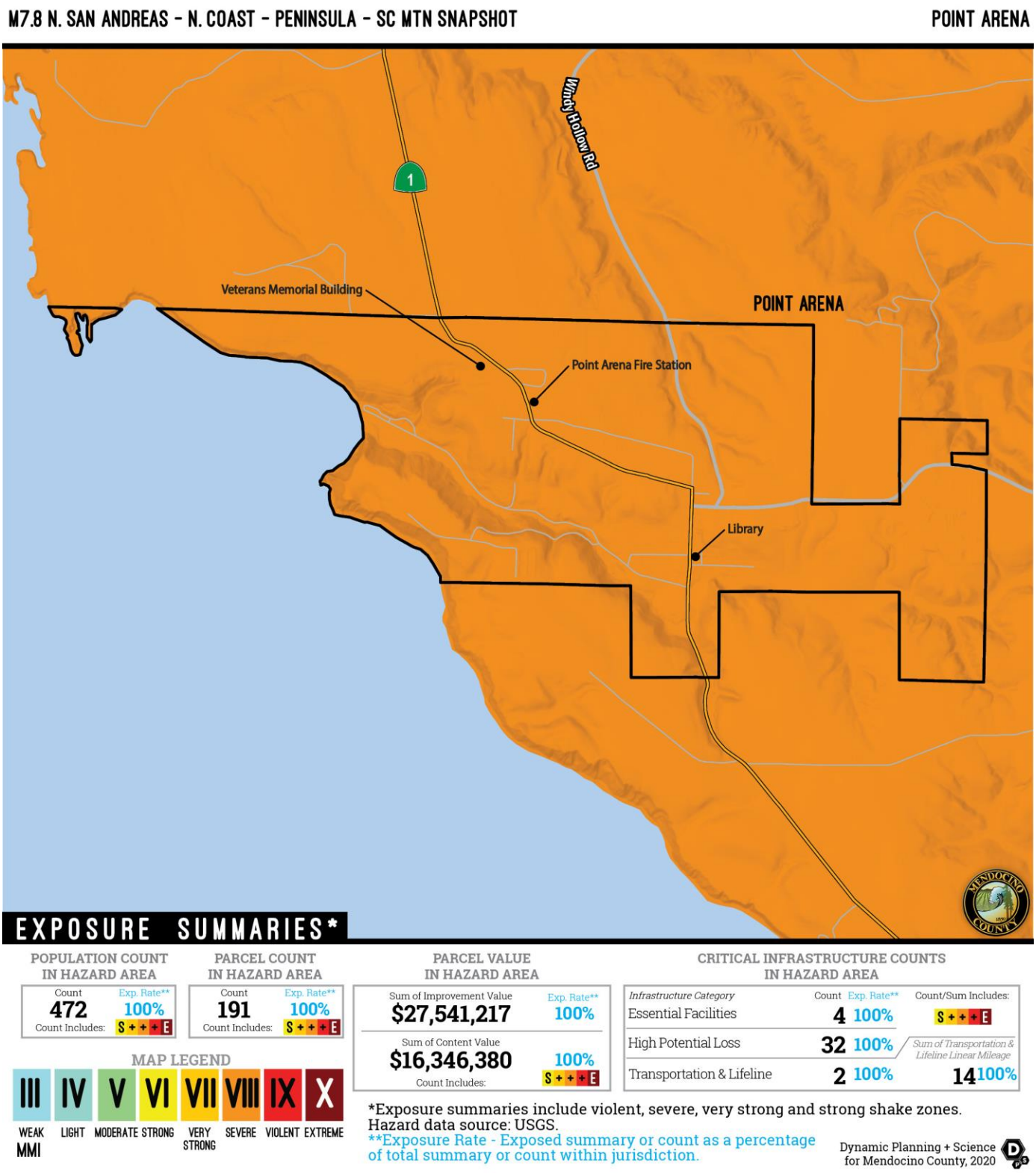
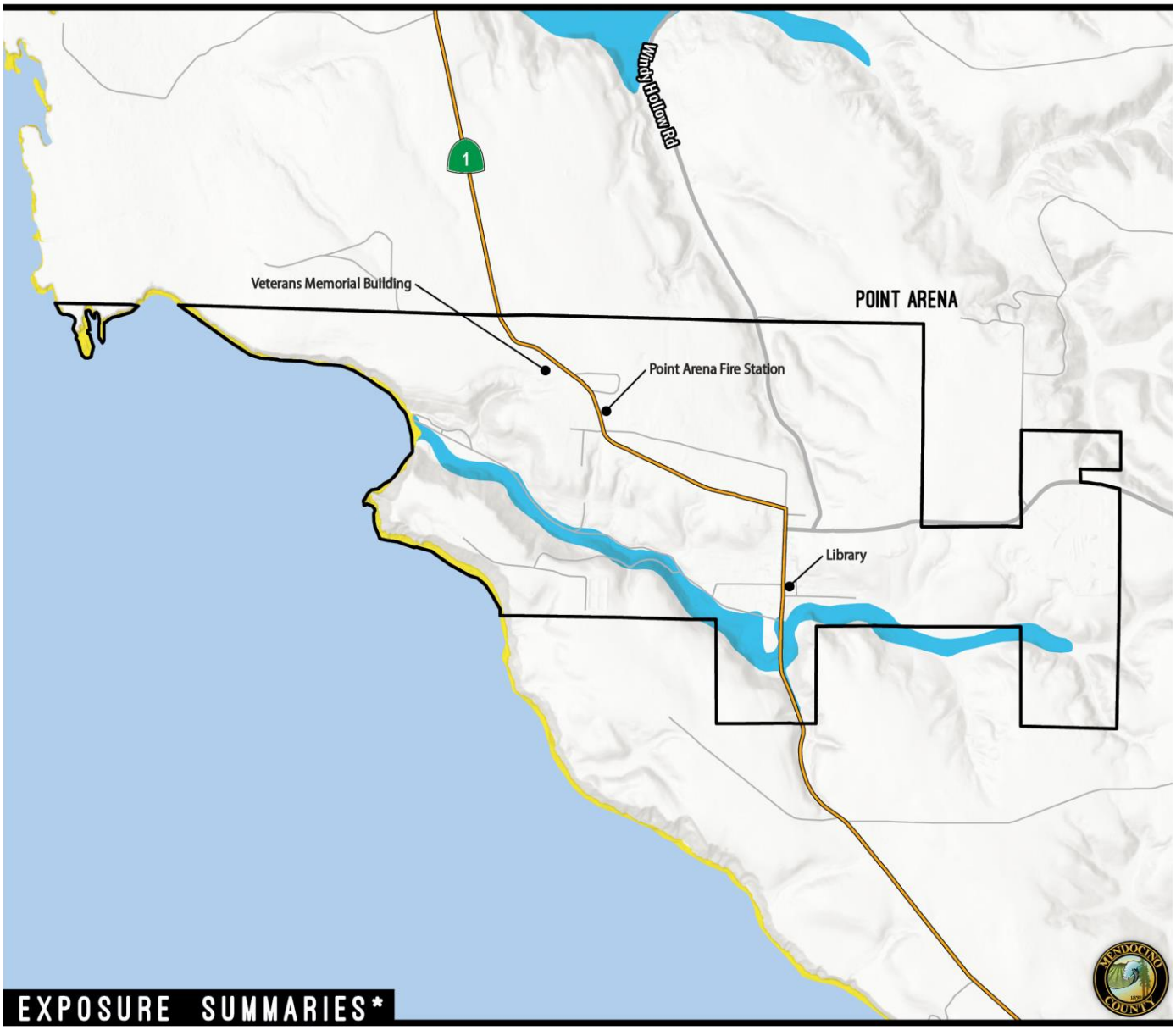


Figure 3-5: City of Point Arena M7.8 N. San Andreas -N. Coast – Peninsula – SC MTN Snapshot

FEMA FLOOD RISK EXPOSURE SNAPSHOT

POINT ARENA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
36	8%	100 + + 500

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
11	6%	100 + + 500

PARCEL VALUE IN HAZARD AREA

		Exp. Rate**	Count Includes:
Sum of Improvement Value	$619,454	2%	
Sum of Content Value	$321,621	2%	100 + + 500

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	100 + + 500
High Potential Loss	4	13%	*Sum of Transportation & Lifeline Linear Mileage*
Transportation & Lifeline	0	0%	2 13%

MAP LEGEND

100-YR
100-YR COASTAL
100-YR FLOODWAY
500-YR

*Exposure summaries include 100YR, 500YR and 100YR Coastal Zones. Hazard data source: FEMA.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 3-6: City of Point Arena FEMA Flood Risk Exposure Snapshot

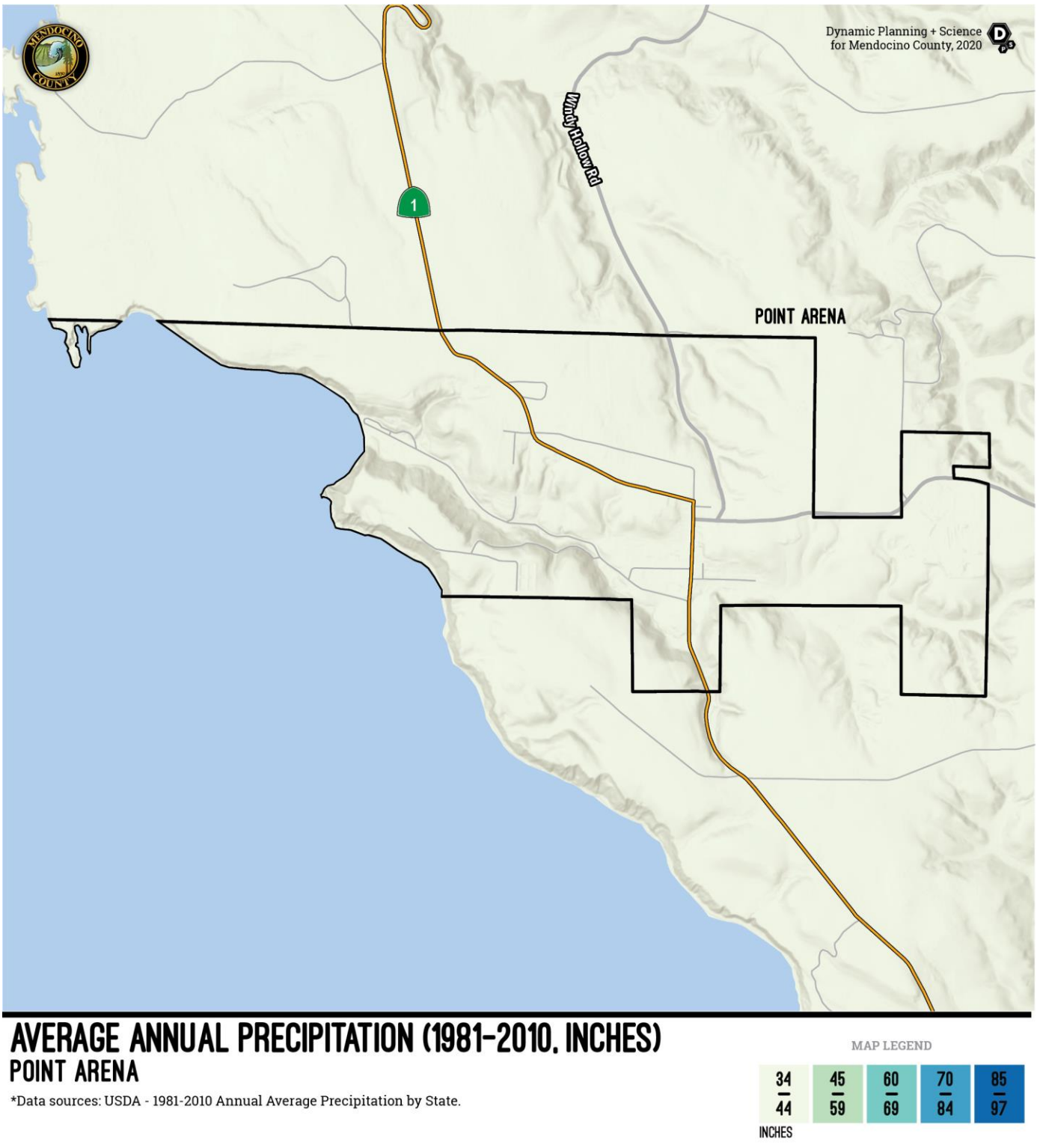


Figure 3-7: City of Point Arena Average Annual Precipitation (1981-2010. Inches)

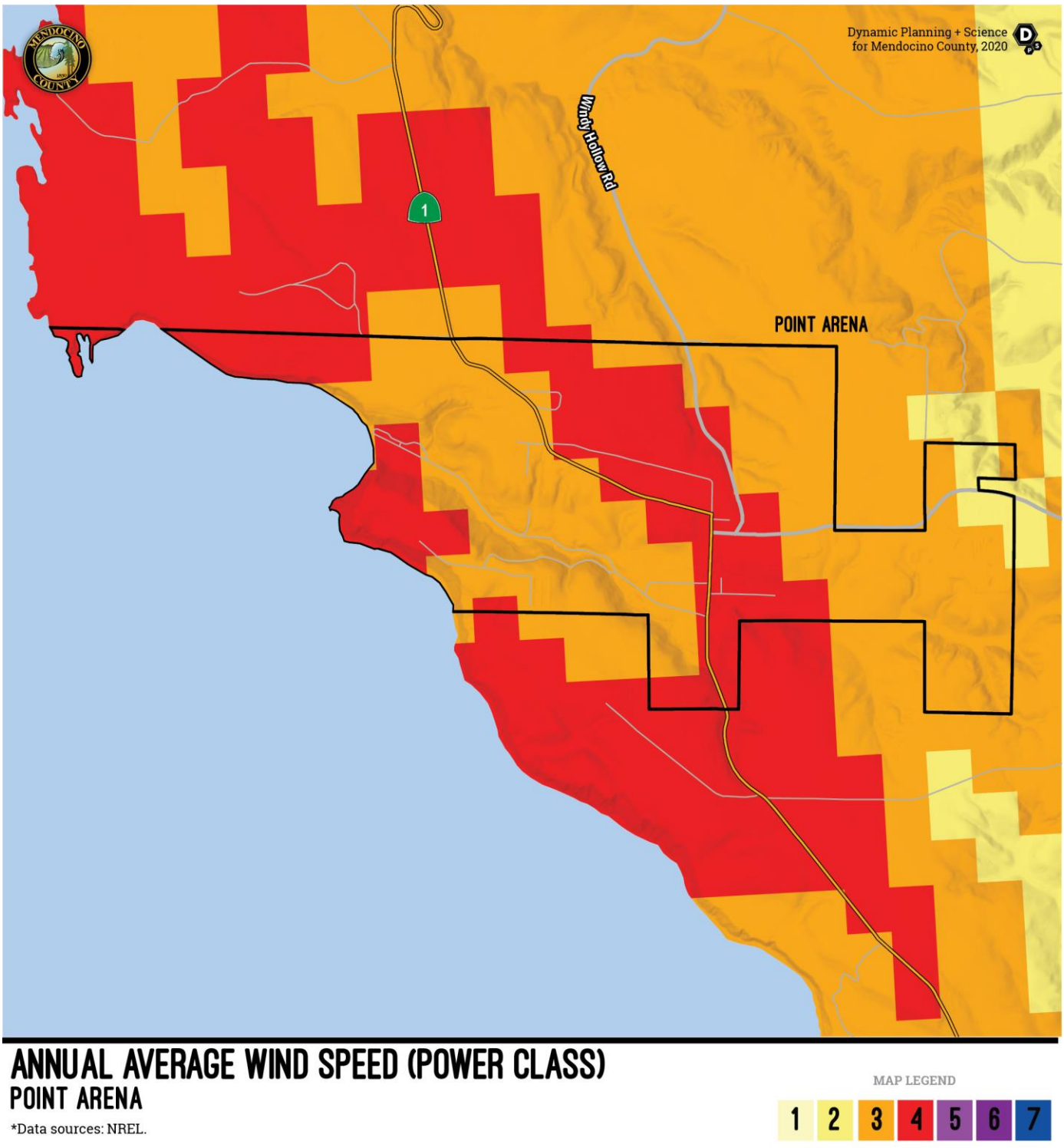


Figure 3-8: City of Point Arena Annual Average Wind Speed (Power Class)

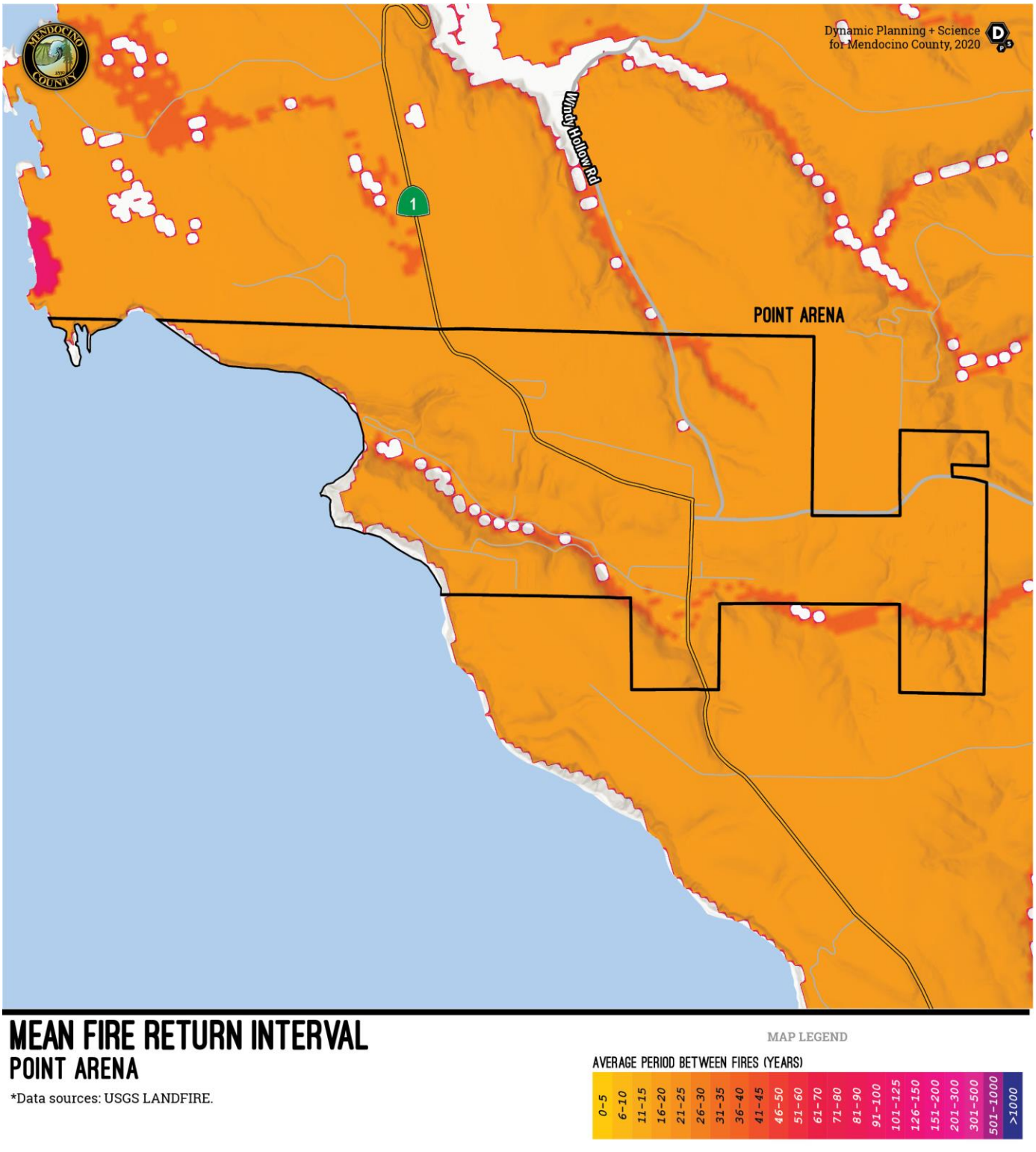
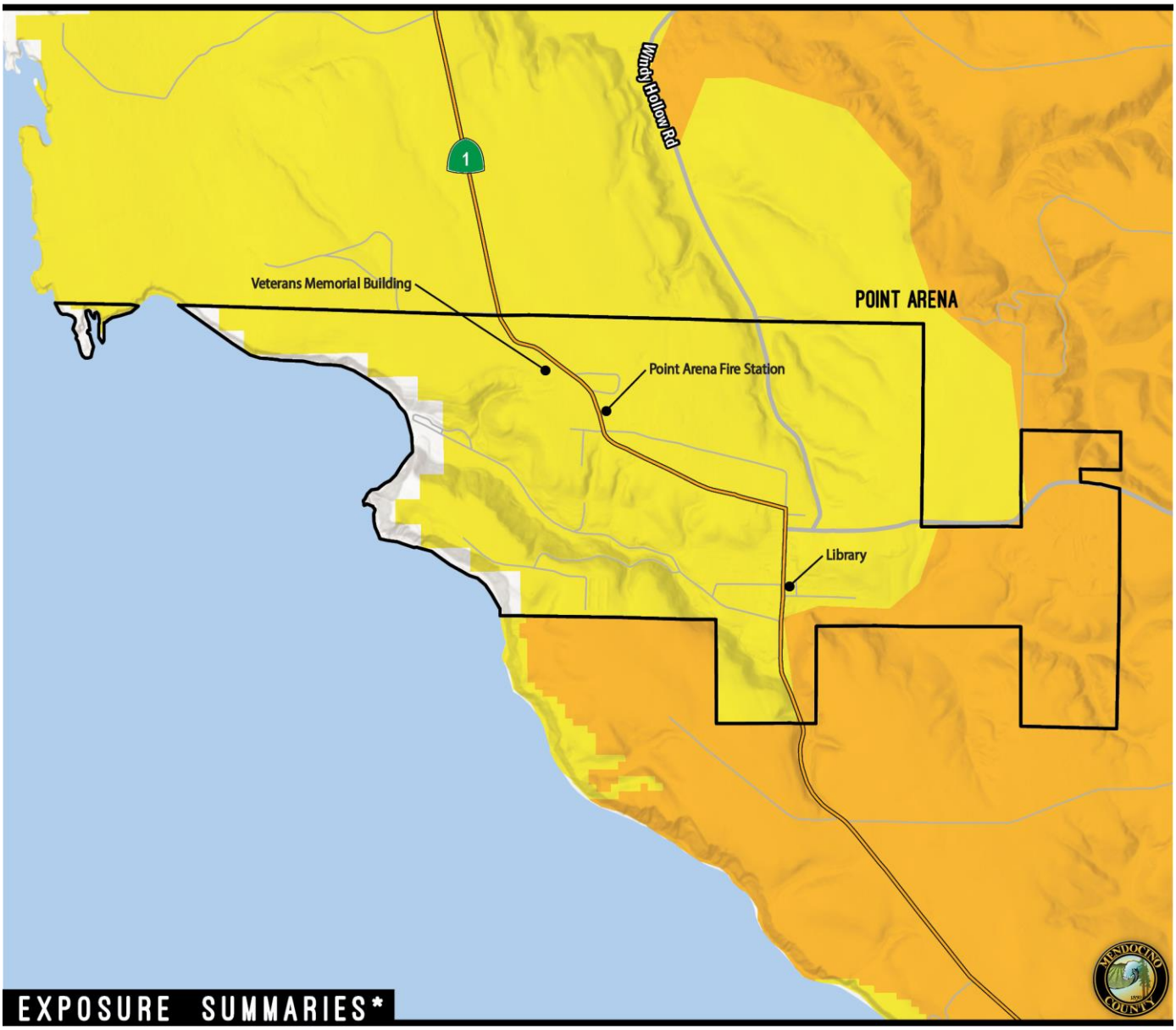


Figure 3-9: City of Point Arena Mean Fire Return Interval

WILDFIRE RISK EXPOSURE SNAPSHOT

POINT ARENA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
95	20%	H VH

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
5	3%	H VH

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**	
Sum of Improvement Value $211,026	1%	
Sum of Content Value $117,407	1%	Count Includes: H VH

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	H VH
High Potential Loss	0	0%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	2	100%	1 7%

MAP LEGEND

MODERATE
HIGH (H)
VERY HIGH (VH)

*Exposure summaries include high and very high wildfire classes. Hazard data source: Cal Fire, CPUC.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 3-10: City of Point Arena Wildfire Risk Exposure Snapshot

3.4.3.3 Past and Future Development

The City of Point Arena is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with State of California planning, zoning, subdivision, and architecture laws.

The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

While growth has occurred in hazard areas in the past, increasing hazard risks to some degree, those risks are also decreased by development standards and plan requirements that serve to mitigate or avoid those risks. Problematic development generally occurred many decades ago, and thus much of this HMP focuses on retrofits or replacements from that older construction.

City of Point Arena is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum develop standards, all jurisdictions belong to the NFIP, as such, all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Mendocino County.

As the General Plan is updated and incorporates information from this HMP, City of Point Arena staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Point Arena reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan in Section 3.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.

The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

3.4.3.3.1 National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Mendocino County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Point Arena has participated in the NFIP since 1984. City of Point Arena is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 3-6 for more information on the City's policies and historic flood insurance claims.

Table 3-6: NFIP Status Table

NFIP Status	Participating since 08/03/84
Policies in Force	3
Policies in SFHA	1
Policies in non-SFHA	2
Total Claims Paid	2
Paid Losses	$0
Repetitive Loss Properties	0
Severe Repetitive Loss Properties	0
Repetitive Loss Payment by NFIP on Building	N/D
Repetitive Loss Payment by NFIP on Contents	N/D

See Volume 1, Section 4.5 for more information on the NFIP.

3.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 3-11. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 3-7.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 3-12 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 3-7 and Table 3-12.



IMPACT

Casualties

Property Damage

Business Interruption

Financial Loss

Environmental Contamination



VICTIM

School Children in Hazard High Hazard Areas

Care Facilities in High Hazard Area

Vulnerable Population Exposed to hazards



THREAT

Increased Fuels due to drought

Hotter, drier climates

More Intense Storms

Impervious surfaces = greater runoff

Increases of Invasive Species

Figure 3-11: Guidance for Problem Statements

Table 3-7: Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-CC-PA-98	Climate Change	Impact	PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Point Arena**	Extreme rain events, one of the biggest issues for the City, are projected to worsen along with flood and wildfire.	ma-EW-PA-213; ma-FL-PA-39; ma-AH-PA-214
ps-EQ-PA-109	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	WWTP and water treatment are both blocked from Arena Creek by berming that could be compromised during earthquake. Could cause creek pollution.	ma-AH-PA-211
ps-EQ-PA-110	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	City Firehouse is unreinforced masonry, currently houses public works vehicles, other storage. Needs significant repairs to be utilized for public use. Recent study identifies recommended repairs.	ma-EQ-PA-41
ps-EQ-PA-111	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	WWTP and water treatment facilities have not been inspected for seismic structural or non-structural repairs in many years.	ma-AH-PA-211

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-PA-112	Earthquake	Victim	PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	The City Hall (which includes law enforcement, EOP) has not had recent seismic upgrades or even assessment in many years. There is an upcoming assessment of general repairs needed for facility that will capture many hazard-related upgrades needed.	ma-EQ-PA-41
ps-EQ-PA-113	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	A large water tank is located immediately upstream of town and thus could create significant damage if fails during EQ	ma-EQ-PA-212
ps-EW-PA-99	Extreme Weather	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	**City of Point Arena**	Primary impact is from severe rainfall for Point Arena, not really any other severe weather issues.	ma-AH-PA-211
ps-EW-PA-100	Extreme Weather	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Point Arena**	Arena Cove experiences localized flooding from severe rain events, can be compounded by high tide and coastal erosion.	ma-AH-PA-211
ps-EW-PA-101	Extreme Weather	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Point Arena**	Extreme rain events can create landslides that block access to the wastewater treatment plant.	ma-AH-PA-211
ps-EW-PA-102	Extreme Weather	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	Mill Road experiences significant sheet flow from north to south, through homeowners' properties and into Arena Creek. The City has undertaken design work to address this issue and needs funding to complete project.	ma-EW-PA-213
ps-EW-PA-103	Extreme Weather	Threat	NRP - Natural Resource Protection , SP - Structural Projects	**City of Point Arena**	Historic cattle grazing and over-vegetation along Arena Creek create flooding on Port Rd, important economically to access Arena Cove.	ma-AH-PA-214
ps-FL-PA-91	Flood	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Point Arena**	Arena Cove experiences localized flooding from severe rain events, including parking lot, and can be compounded by high tide and coastal erosion.	ma-AH-PA-214

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-FL-PA-92	Flood	Impact	PPRO - Property Protection, SP - Structural Projects	**City of Point Arena**	WWTP and pump station are in close proximity to Arena Creek and subject to flooding, loss of power which could impede water service.	ma-AH-PA-211
ps-FL-PA-93	Flood	Impact	NRP - Natural Resource Protection, SP - Structural Projects	**City of Point Arena**	Historic cattle grazing historically prevented over-vegetation along Arena Creek, lack of grazing now creates flooding on Port Rd, important economically to access Arena Cove.	ma-AH-PA-214
ps-FL-PA-105	Flood	Victim	PRV - Prevention, PE&A - Public Education & Awareness, ES - Emergency Services	**City of Point Arena**	Hwy 1 north of town regularly floods for periods of up to three days, blocking northerly access to Ft Bragg hospital	ma-FL-PA-39
ps-PN-PA-94	Pandemic	Victim	PRV - Prevention, ES - Emergency Services, SP - Structural Projects	**City of Point Arena**	City EOP facility (City Hall) does not have proper social distancing facilities needs (plastic barriers for public interaction on desks, adequate ventilation).	ma-PN-PA-217
ps-PN-PA-95	Pandemic	Victim	PRV - Prevention, SP - Structural Projects	**City of Point Arena**	Need for additional sheltering locations in event of pandemic social distancing needs paired with another hazard event (flood, wildfire, earthquake)	ma-PN-PA-218
ps-PN-PA-96	Pandemic	Victim	PRV - Prevention, ES - Emergency Services, SP - Structural Projects	**City of Point Arena**	Utilities and critical facilities may not have adequate fresh air/ ventilation to be appropriate for essential work during pandemic.	ma-PN-PA-219
ps-PN-PA-97	Pandemic	Threat	PRV - Prevention, PPRO - Property Protection, ES - Emergency Services, SP - Structural Projects	**City of Point Arena**	Community center/ evacuation center may not have adequate staffing space, structural barriers, or ventilation to be used safely during pandemic.	ma-PN-PA-220
ps-WF-PA-104	Wildfire	Impact	PRV - Prevention, PPRO - Property Protection, NRP - Natural Resource Protection	**City of Point Arena**	BLM land abuts northwest end of town (west of Hwy 1) with significant dead trees. A fire is in line with prevailing winds to bring fire towards town.	ma-WF-PA-35, ma-WF-PA-43

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-PA-106	Wildfire	Victim	PRV - Prevention, PPRO - Property Protection, SP - Structural Projects	**City of Point Arena**	City Hall is close to the concerning wildfire area northwest of City.	ma-WF-PA-43
ps-WF-PA-107	Wildfire	Victim	PRV - Prevention, ES - Emergency Services	**City of Point Arena**	Wildfires cause PSPS.	ma-AH-PA-286
ps-WF-PA-108	Wildfire	Victim	PRV - Prevention, PPRO - Property Protection , SP - Structural Projects	**City of Point Arena**	Because PG&E failed to designate a community resource center within Point Area at the Veteran's Bldg, the City does not have financial support to provide needed sheltering during PSPS events.	ma-AH-PA-286

3.4.3.5 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through https://mitigatehazards.com/mendocino-county/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.

3.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

3.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity. (Cal. Adaptation Planning Guide, 2020, p. 94)

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

3.5.1.1 Planning and Regulatory Capabilities

Table 3-8: Planning and Regulatory Mitigation Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code.
BCEGS Rating				
Public Protection (ISO Class)				Class 8. (Mendocino County Community Wildfire Protection Plan, 2005).
Hazard Related Development Standards				Floodplain Management (Ch.16.10.170-200, 220).
Zoning Ordinance				
Hazard-Specific Ordinance				Health and Safety (Ch. 8.20); Fire Regulations (8.20.010).
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural)				
Earthquake Modernization Plan (Building Safety)				
Hazard Plans				
General Plan Safety Element				Adopted in 1995, updated in 2006.
Community Wildfire Protection Plan (CWPP)				2016 County-wide CWPP in existence.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Floodplain Management Plan				
Stormwater Management Plan				
Emergency Operations Plan				Mendocino County Operational Area Emergency Operations Plan (2016).
Climate Action Plan				
Ground Water Management Planning / Plans				Ukiah Valley is the only groundwater basin required to have a groundwater sustainability plan in the County.
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Floodplain Management (Ch.16.10); Updated in 2017.
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				
Community Rating System (CRS)				

3.5.1.2 Administrative and Technical Capabilities

Table 3-9: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Administrative and Technical				
Community Planning and Development Services				
Community Planner				The City has one staff dedicated to planning.
Civil Engineer				No on staff, regular relationship with a civil engineer through SHN.
Building Code Official (Full time or Augmented)				The City's building procedures are handled by the County of Mendocino Planning & Building Department.
Floodplain Administrator				
Fire Marshal				Mike Suddith of Redwood Coast Fire Protection District.
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				Utilize County GIS expertise
Emergency Manager				The City Managers for Fort Bragg, Point Arena, Ukiah, and Willits are members of the Mendocino County Disaster Council.
Full-Time Building Official				
Grant Manager, Writer, or Specialist				
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				The City uses MendoAlert for all general emergencies.
Flood				
Wildfire				
Geological Hazards				

3.5.1.3 Financial Capabilities

Table 3-10: Fiscal Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				
Benefit assessments				
System Development Fee				
General Obligation Bonds to Incur Debt				
Special Tax Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				
Capital Improvement Project Funding				

3.5.1.4 Education and Outreach

Table 3-11: Education / Outreach Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				
Dedicated Social Media				use Facebook, Twitter and an email list for emergencies or impending issues.
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				The Mendocino County Fire Safe Council assists local Councils a variety of needs, including the Caspar Community and Island Cove Estates (south of Point Arena).
Resource Conservation Districts				The Mendocino County Resource Conservation District has implemented a wide range of programs across the County.
Other	N/A	N/A	N/A	

3.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 3-12 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

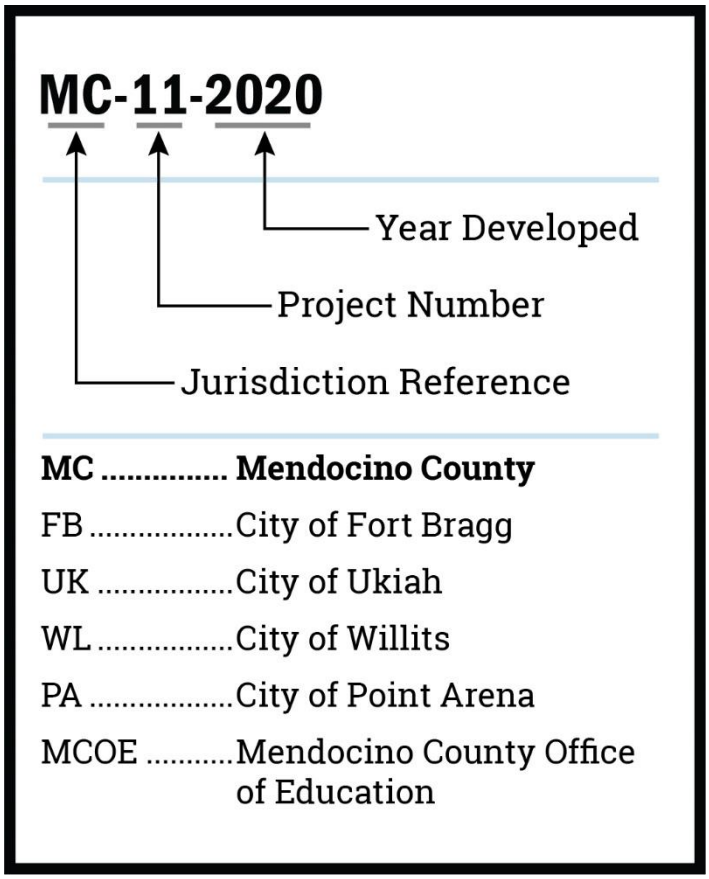


Figure 3-12: Mitigation Action Key

Each participating jurisdiction, including the City of Point Arena, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. City of Point Arena has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County-wide mitigation actions, the status, and additional notes for each action.

Table 3-12 lists each mitigation action for City of Point Arena. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 3-12 meets the regulatory requirements of FEMA and DMA 2000.

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Table 3-12: City of Point Arena Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-PA-211	All Hazard	PPRO - Property Protection	Pending	2020	City of Point Arena	Assess and retrofit as needed wastewater treatment plan, including for berming that separates wastewater treatment facility from Arena Creek and could be subject to breach in earthquake or with extreme weather events and for other necessary seismic retrofits.	City Admin	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC CDBG DRI	High	ps-EQ-PA-109, ps-EW-PA-100, ps-EW-PA-101, ps-EQ-PA-111, ps-EW-PA-99, ps-FL-PA-92
ma-AH-PA-214	All Hazard	NRP - Natural Resource Protection	Pending	2020	City of Point Arena	Conduct rechannelization and habitat restoration for Arena Creek along Port Road, where the stream channel has been clogged due to the discontinuation of historic meadows along the creek causing flooding and blocking egress from Arena Cove.	City staff, consultant support	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Planning	HMGP / BRIC	High	ps-EW-PA-103, ps-FL-PA-93, ps-CC-PA-98
ma-AH-PA-286	All Hazard	ES - Emergency Services	Pending	2020	City of Point Arena	Construct backup generators at critical facilities (fire stations, hospital) and sheltering locations to respond to hazard events in loss of power.	City Admin	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-WF-PA-108, ps-WF-PA-107
ma-EQ-PA-41	Earthquake	PPRO - Property Protection	Pending	2014	City of Point Arena	Seismically retrofit or replace public works and/or emergency response facilities, in particular City Firehouse and City Hall/Law Enforcement/EOC, that are necessary during and/or immediately after a disaster or emergency	City staff, consultant support	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Extreme	ps-EQ-PA-110, ps-EQ-PA-112
ma-EQ-PA-212	Earthquake	PPRO - Property Protection	Pending	2020	City of Point Arena	Assess need for and conduct as needed seismic retrofitting of large water tank upstream of town	City Staff, consultant support	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-EQ-PA-113

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EW-PA-213	Extreme Weather	PPRO - Property Protection	Pending	2020	City of Point Arena	Implement Mill Street rain/ flooding projects identified in recent design study	City staff, consultant support	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Extreme	ps-EW-PA-102, ps-CC-PA-98
ma-FL-PA-39	Flood	SP - Structural Projects	Pending	2014	City of Point Arena	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.	City Admin	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 years, ongoing	Project	HMGP / BRIC	High	ps-FL-PA-92; ps-FL-PA-105, ps-CC-PA-98
ma-PN-PA-217	Pandemic	ES - Emergency Services	Pending	2020	City of Point Arena	Install additional barriers and proper ventilation in Emergency Operations Center (EOC, City Hall) to allow for operation of EOC during pandemic and hazard event		High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-PA-94
ma-PN-PA-218	Pandemic	ES - Emergency Services	Ongoing	2020	City of Point Arena	Develop alternative sheltering/ evacuation locations for distancing required during pandemic and other hazard event	City admin, local NGO and County coord	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	ps-PN-PA-95
ma-PN-PA-219	Pandemic	SP - Structural Projects	Pending	2020	City of Point Arena	Assess and institute necessary upgrades to critical facilities to allow for usage during pandemic, including adequate ventilation and physical barriers	City staff	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-PA-96

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-PN-PA-220	Pandemic	ES - Emergency Services	Pending	2020	City of Point Arena	Institute necessary structural improvements to evacuation centers/ sheltering locations to allow for proper ventilation, space for staff, and structural barriers to be used during pandemic and hazard event.	City staff, local NGO and County coord	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-PA-97
ma-WF-PA-43	Wildfire	PRV - Prevention	Ongoing	2008	City of Point Arena	Develop a fire road access/roadside vegetation removal program or fuel break program in which live native vegetation should be thinned and/or moved and dead vegetation should be removed within a 50-foot distance of each side of a road. Roads to be included in this program include those located in high or very high areas of this MHMP or defined by Mendocino County Fire Safe Council.	City Admin, consultant support	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , AFG , FP&S	Medium	ps-WF-PA-104

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MENDOCINO COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

City of Willits

JURISDICTIONAL ANNEX

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Mendocino County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF WILLITS (WL)

Municipal Participating Jurisdiction Annex

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Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Mendocino County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.

City of Willits - Adoption Resolution

RESOLUTION 2020-67

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF WILLITS TO ADOPT THE 2020 MENDOCINO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City of Willits is a political subdivision of the State of California and an official participating jurisdiction of the "2020 Mendocino County Multi-Jurisdictional Hazard Mitigation Plan" (MJHMP); and

WHEREAS, the City of Willits recognizes the MJHMP as the official hazard mitigation plan for the County and participating jurisdictions; and

WHEREAS, the City of Willits, with the assistance from Mendocino County, has gathered information and prepared the MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 C.F.R. § 201.6; and

WHEREAS, the City of Willits Annex in Volume 2 of the MJHMP recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, the City of Willits has reviewed the MJHMP and affirms that the plan actions in the City of Willits's Annex will reduce the potential for harm to people and property from future hazard occurrences with our community; and

WHEREAS, Congress passed the Disaster Mitigation Act of 2000 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted multi-hazard plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City Council fully participated in the FEMA-prescribed mitigation planning process to prepare this MJHMP; and

WHEREAS, the citizens were afforded opportunities to comment and provide input in the MJHMP and the actions in the Plan; and

WHEREAS, the City of Willits, as a fully participating jurisdiction of the MJHMP is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City Council desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the MJHMP; and

WHEREAS, adoption by the City Council for the City of Willits demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the MJHMP;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Willits hereby adopts the 2020 Multi-Jurisdictional Hazard Mitigation Plan Vol. 1 for Mendocino County and the City of Willits Annex in Vol. 2, as approved by FEMA and Cal OES, as the mitigation plan for the City of Willits.

AND BE IT FURTHER RESOLVED that the City Council authorizes the City Manager to submit an approved and signed copy of this resolution to the Cal OES and FEMA Region IX officials to enable the plan's final approval.

The above and foregoing Resolution was introduced by Councilmember Gonzalez seconded by Councilmember Stranske, and passed and adopted at a regular meeting of the City Council of the City of Willits held on the 9th day of December 2020, by the following vote:

AYES:	Stranske, Gonzalez, Kanne, Rodriguez, and Strong
NOES:	None.
ABSENT:	None.

MADGE STRONG, Mayor
City Council of the City of Willits

ATTEST:

CATHY MOORHEAD
Deputy City Manager/City Clerk

Section 4. City of Willits

4.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Willits. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the City of Willits. This Annex provides additional information specific to the City of Willits, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

Dusty Duley, Community Development Director
City of Willits
111 E. Commercial Street,
Willits, CA 95490
Telephone: 707-459-7124
e-mail Address: dduley@cityofwillits.org

Alternate Point of Contact

Cathy Moorhead, Deputy City Manager/City Clerk
City of Willits
111 E. Commercial Street,
Willits, CA 95490
Telephone: 707-459-7121
e-mail Address: cmoorhead@cityofwillits.org

4.2 Planning Methodology

The City of Willits followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 4-1.

Table 4-1: Planning Committee Members

Planning Committee Members	Department
Dusty Duley	Community Development
Cathy Moorhead	City Clerk
Gregory Allen	City of Willits Police
Stephanie Garrabrant-Sierra	City Manager
Scott Herman	Water/Wastewater Utilities
Kenan O'Shea	Public Works
Chris Wilkes	Little Lake Fire
Davey Bowles	Community Development

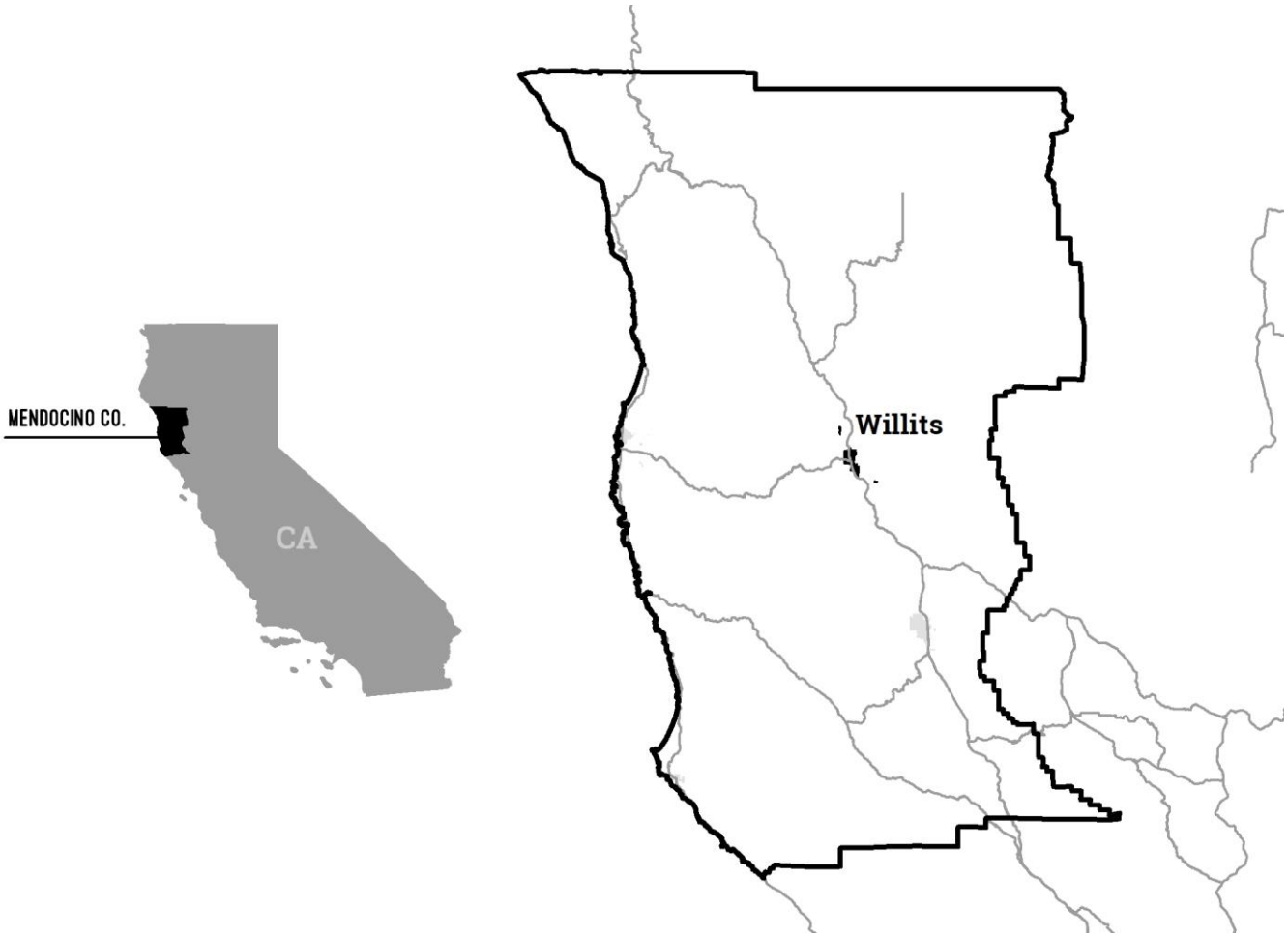


Figure 4-1: City of Willits Location

4.3 What's New

The City of Willits has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Currently there are no previous mitigation actions designated completed. Table 4-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 4-12.

Table 4-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled
ma-AH-WL-90	All Hazard	Cancelled	2014	City of Willits	Integrate the Mendocino County HMP, in particular the hazard analysis and mitigation strategy sections, into local planning documents, including general plans, emergency operations plans, and capital improvement plans.	Ongoing work, opportunities for integration reflected in capabilities assessment.
ma-DF-WL-91	Dam Failure	Cancelled	2014	City of Willits	Develop a public outreach program that informs property owners located in the dam or levee inundation areas about voluntary flood insurance.	Covered under ma-AH-WL-260; ma-AH-WL-261
ma-FL-WL-102	Flood	Cancelled	2014	City of Willits	Reinforce County and local ramps, bridges, and roads from flooding through protection activities, including elevating the road and installing culverts beneath the road or building a higher bridge across the area that experiences regular flooding.	Specific to the County and not City of Willits
ma-WF-WL-99	Wildfire	Cancelled	2014	City of Willits	Implement a fuel reduction program, such as the collection and disposal of dead fuel, within open spaces and around critical facilities and residential structures located within a high and very high wildfire zones.	Covered under new ma-WF-WL-288
ma-WF-WL-113	Wildfire	Cancelled	2014	City of Willits	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Covered under new ma-WF-WL-288

4.3.1 Mitigation Successes

The City of Willits has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted. The City has instituted several mitigation actions from the existing MJHMP. See Vol. 1 for a listing of historic mitigation actions. Listed below is a success story where the City of Willits successfully implemented a hazard mitigation project or planning process.

SUCCESS STORY: *Little Lake Valley Groundwater Management Plan*

The City of Willits adopted the Little Lake Valley Groundwater Management Plan in August of 2020. The Little Lake Valley Groundwater Management Plan describes existing local groundwater management policies and recommends a range of actions that the City of Willits may take within the boundaries of its legal authority, to monitor, analyze, and interpret characteristics of the Little Lake Valley groundwater basin (Basin). The plan intended to identify and develop potential, effective management practices for utilizing and protecting valuable groundwater resources within the Basin. The plan is limited to the jurisdictional boundaries of the City of Willits and seeks to improve the understanding and sustainable management of groundwater resources in the Little Lake Valley.

This Little Lake Valley Groundwater Management Plan (GWMP) represents the initial effort on the part of the City of Willits (City) to develop a plan for sustainable management of groundwater in the Little Lake Valley. This GWMP seeks to provide a framework for advancing the level of understanding and coordinating the management of groundwater resources in the Little Lake Valley. This voluntary, non-regulatory GWMP identifies a range of local groundwater management actions to sustain groundwater resources into the future. This GWMP is intended to provide guidance for groundwater management throughout the Little Lake Valley; however, the City recognizes that City's authority to take any recommended actions is only valid within the jurisdictional boundaries of the City of Willits. The purpose of this GWMP is to provide a framework for monitoring, analyzing, and interpreting Basin characteristics and identifying for implementation effective management practices to utilize and protect valuable groundwater resources within the Basin. The GWMP serves to improve the understanding and management of the groundwater resources in the Little Lake Valley, providing preliminary guidelines and recommendations for the City of Willits and other water users to implement effective and sustainable groundwater management programs. The GWMP will provide guidance on managing the groundwater resources of the City of Willits and documenting objectives for proper management of the Basin, where mismanagement can impact residents and business owners within the City Limits along with those that live and/or work outside of the City Limits in the valley and surrounding hills. The GWMP documents groundwater conditions, management goals and objectives, and proposed implementation activities to achieve the GWMP purpose. In addition, the GWMP will allow for the City of Willits and some other stakeholders within the Basin to be eligible for grant funding administered through the Department of Water Resources (DWR) for projects related to groundwater.

SUCCESS STORY: ***Willits Municipal Airport Tree Removal***

The Willits Municipal Airport serves as critical infrastructure during wildfire events and has been used in the past as a temporary base for Federal and State agencies charged with fighting wildfires. Further, the airport is identified as an evacuation meeting point for thousands of residents residing in the Brooktrails community and Sherwood Road area. The City worked with the California Conservation Corps and California Department of Corrections and Rehabilitation inmate crews to remove trees and brush to create defensible space around the Airport and reduce potential wildfire threats to our Airport facilities.

SUCCESS STORY: ***Construction of Water Wells and Groundwater Treatment Plant***

In response to the severe drought conditions in 2013-2014, the City was forced to construct a groundwater treatment plant and develop two additional wells to offset surface water usage. The first well, Elias Replacement well, was put into service in late 2014 after being approved by the Division of Drinking Water as a public water source. The groundwater treatment plant was designed to take and treat raw water from three different wells with mixing to dilute constituents of concern and allow for treatment to meet California drinking water standards. The City is in the process of bringing the Long 20 Test well into service and expects that second well will likely be sufficient to meet current surface water offset goals. The City of Willits intends to increase their groundwater pumping capacity to improve water system resiliency and reliability during times of drought or other disaster.

4.4 Risk Assessment

The intent of this section is to profile the City of Willits's hazards and assess the City's vulnerabilities, distinct from that of the County-wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

4.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 4-3. Detailed hazard profiles of the most significant County-wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect City of Willits. Table 4-4 provides a crosswalk of hazards identified in Vol. 1 of this plan, City of Willits General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to City of Willits and which ones were not. Section 0 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to City of Willits.

Table 4-3: County Hazard Prioritization (Vol. 1)

Hazard Type	Explanation
Climate Change	**High priority county-wide, profiled hazard.**
Dam/ Levee failure	**High priority county-wide, profiled hazard.**
Drought	**High priority county-wide, profiled hazard.**
Earthquake/ Geologic Hazards	**High priority county-wide, profiled hazard.**
Flood	**High priority county-wide, profiled hazard.**
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	**High priority county-wide, profiled as part of Severe Weather.**
Insect Hazards	While hazardous insects exist in Mendocino County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	**High priority county-wide, profiled hazard.**
Severe Weather, including:	**High priority county-wide for heavy wind and heavy rain.**
Extreme Heat	Not a priority as extreme weather event, discussed as climate change impact.
Hail	Hail events are rare in Mendocino County and not profiled in this plan.
High Wind	**Profiled as part of Severe Weather hazard.**
Heavy Rain	**Profiled as part of Severe Weather hazard.**
Fog	While fog events do occur within Mendocino County, they are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	While winter storms are present in Mendocino County, they were not identified as a priority for this plan.
Slope Failure	**High priority county-wide, profiled hazard.**
Soil Hazards	**High priority county-wide, profiled hazard (includes erosion and naturally-occurring asbestos).**
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	**High priority county-wide, profiled hazard.**

Table 4-4: Document Review Crosswalk

Hazards	2014 Mendocino County MJHMP	1992 City of Willits General Plan	2009 Mendocino County General Plan	2018 California State HMP
Agricultural Pests	■			■
Climate Change			■	■
Dam Failure	■		■	■
Drought	■	■	■	■
Earthquake	■	■	■	■
Flood	■	■	■	■
Insect Hazards	■			
Landslide		■	■	■
Levee Failure	■*			■
Manmade Hazards			■	■
Pandemic Disease	■			■
Sea Level Rise				■
Severe Weather				■
Soil Hazards	■**	■		
Terrorism & Tech Hazards				■
Tsunami	■		■	■
Volcano				■
Wildfire	■***	■	■	■

** included as part of dam failure*
*** included naturally occurring asbestos*
**** included urban conflagration*

4.4.2 Hazard Risk Ranking

The City of Willits's Planning Team used the same hazard prioritization process as the Mendocino County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 4-4-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess City of Willits's vulnerability to following hazards:

- Climate Change
- Earthquake
- Pandemic
- Flood
- Extreme Weather
- Wildfire
- Drought

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address City of Willits's vulnerability to these specifically-identified hazards.

4.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within City of Willits are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

4.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 4-4-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Mendocino County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to City of Willits. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

4.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 4-3 through Figure 4-11 illustrate the City of Willits's vulnerability to specific hazards. Figures include:

- Figure 4-3: City of Willits M7.4 Maacama Garberville Snapshot
- Figure 4-4: City of Willits M7.8 N. San Andreas -N. Coast – Peninsula -SC MTN Snapshot
- Figure 4-5: City of Willits FEMA Flood Risk Exposure Snapshot
- Figure 4-6: City of Willits Average Annual Precipitation (1981-2010. Inches)
- Figure 4-7: City of Willits Annual Average Wind Speed (Power Class)
- Figure 4-8: City of Willits Mean Fire Return Interval
- Figure 4-9: City of Willits Wildfire Risk Exposure Snapshot
- Figure 4-10: City of Willits Landslide Risk Exposure Snapshot. *Note: Landslide is not a profiled hazard for the City of Willits; this figure has been included as a reference.*
- Figure 4-11: Drought Timeline for Upper Eel Watershed

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction, other than Figure 4-10: City of Willits Landslide Risk Exposure Snapshot which is only included as a reference. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

Highly Likely	**Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
Likely	**Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
Possible	**Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
Unlikely	**Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate Change impacts will be addressed at the end of each hazard section within the 2020 plan update and as a stand alone section for each jurisdiction...



For County and Municipal governments you will be required to address climate change impacts in the Safety Element of your General Plan. Climate change may change the frequency, duration and intensity of hazards listed above.

Pandemic will be profiled for every jurisdiction.

City of Willits Risk Matrix

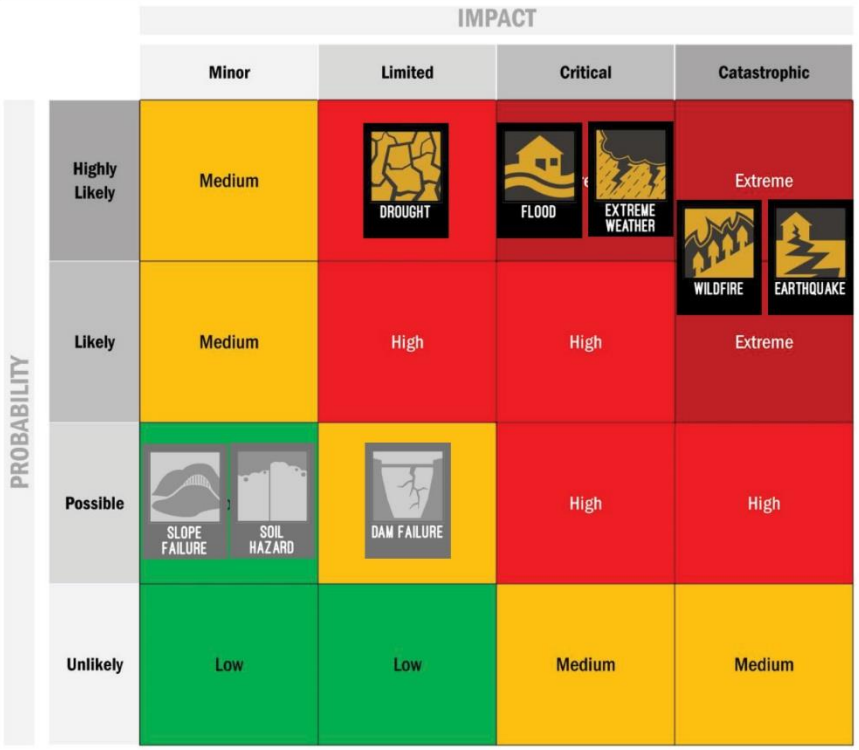


Figure 4-4-2: City of Willits Risk Assessment

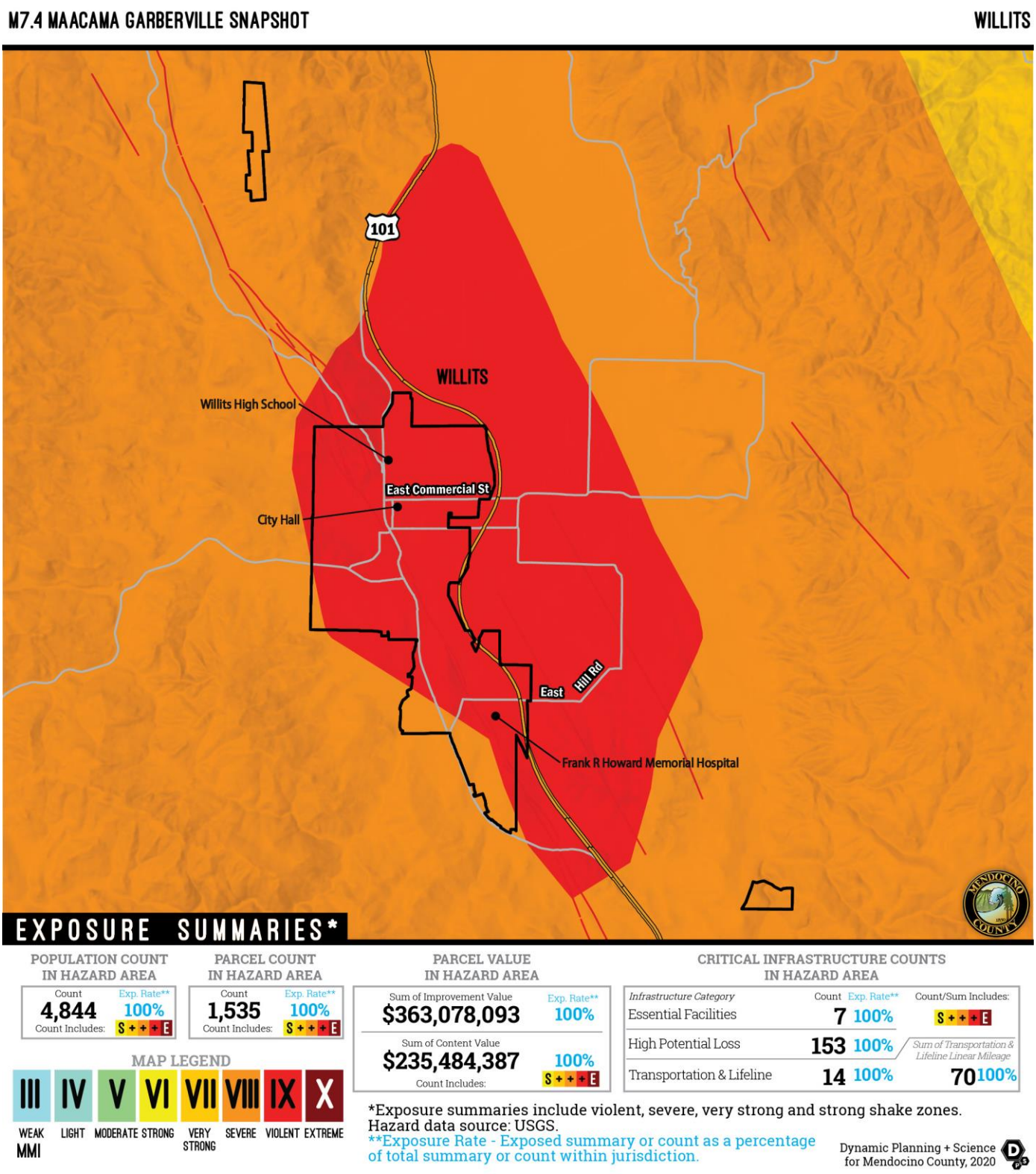


Figure 4-3: City of Willits M7.4 Maacama Garberville Snapshot

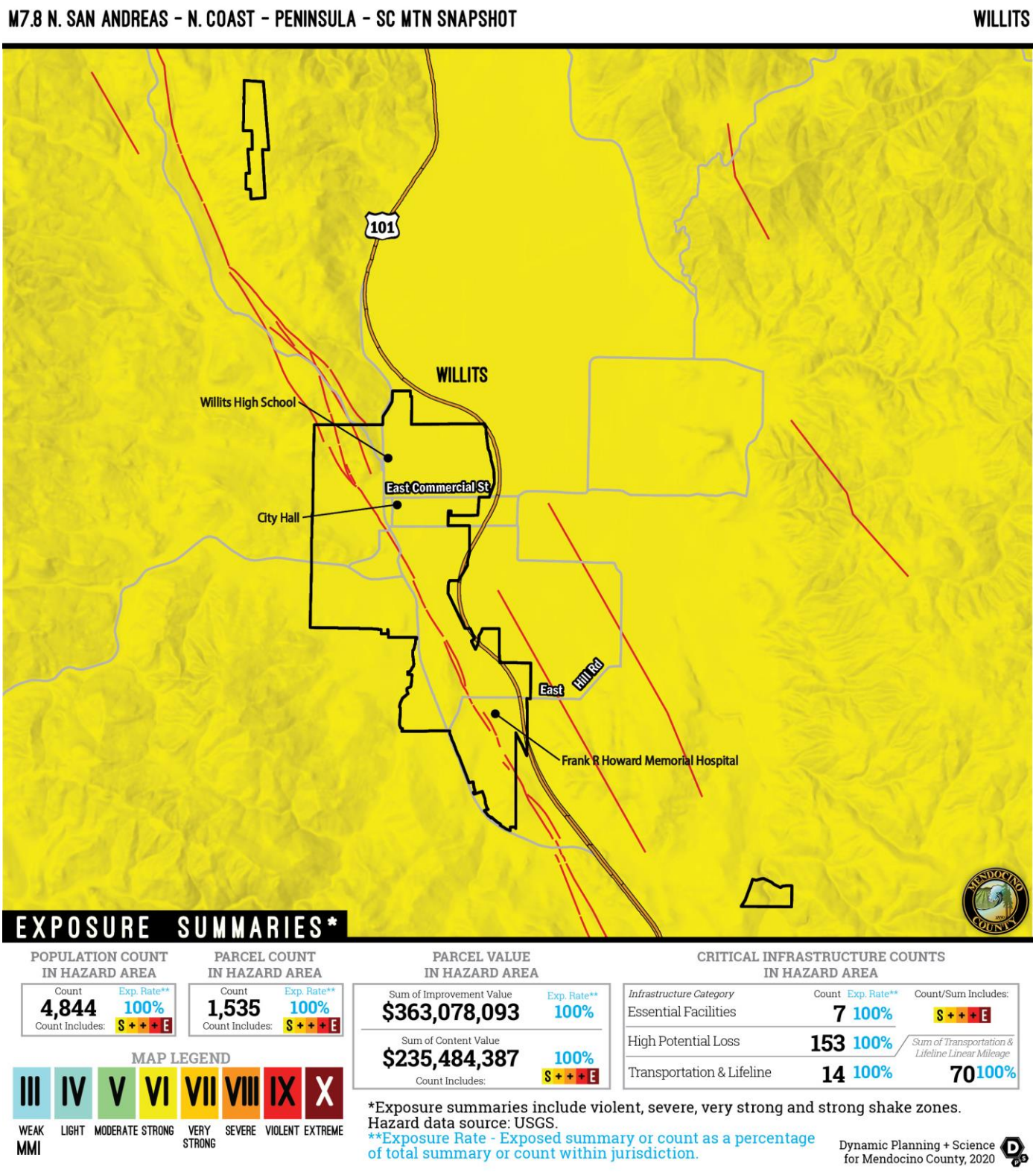


Figure 4-4: City of Willits M7.8 N. San Andreas -N. Coast – Peninsula -SC MTN Snapshot

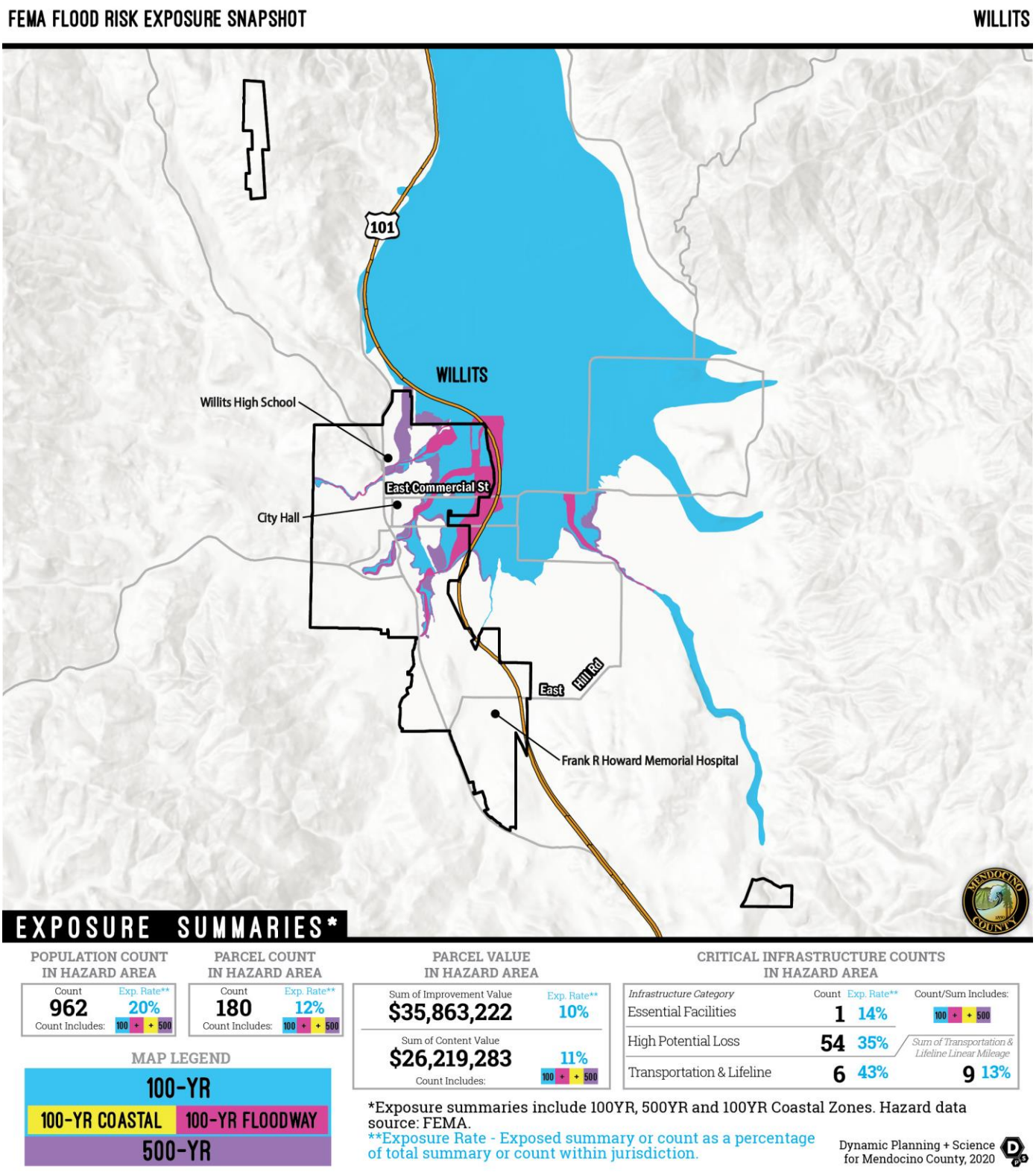


Figure 4-5: City of Willits FEMA Flood Risk Exposure Snapshot

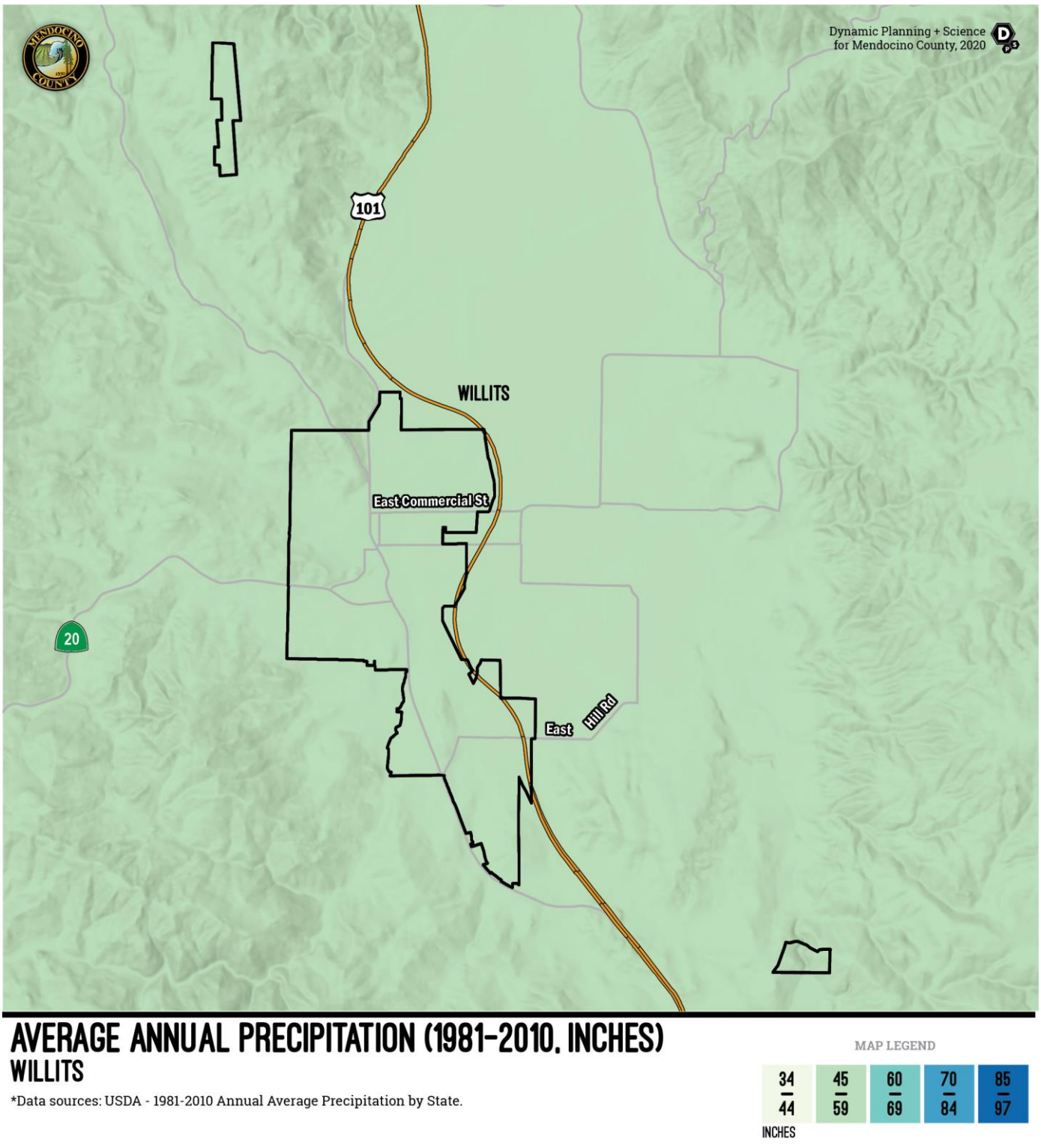


Figure 4-6: City of Willits Average Annual Precipitation (1981-2010. Inches)

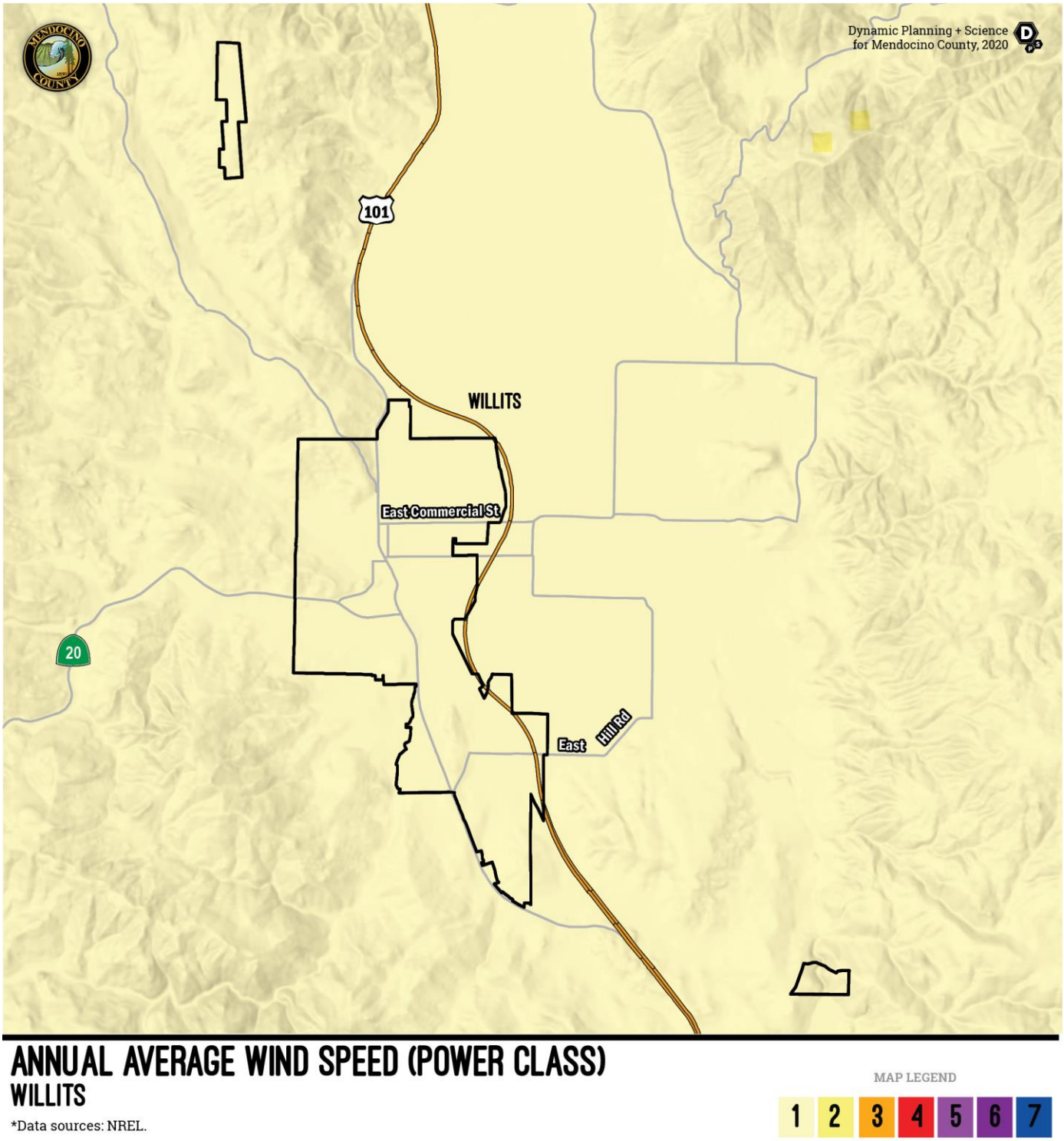


Figure 4-7: City of Willits Annual Average Wind Speed (Power Class)

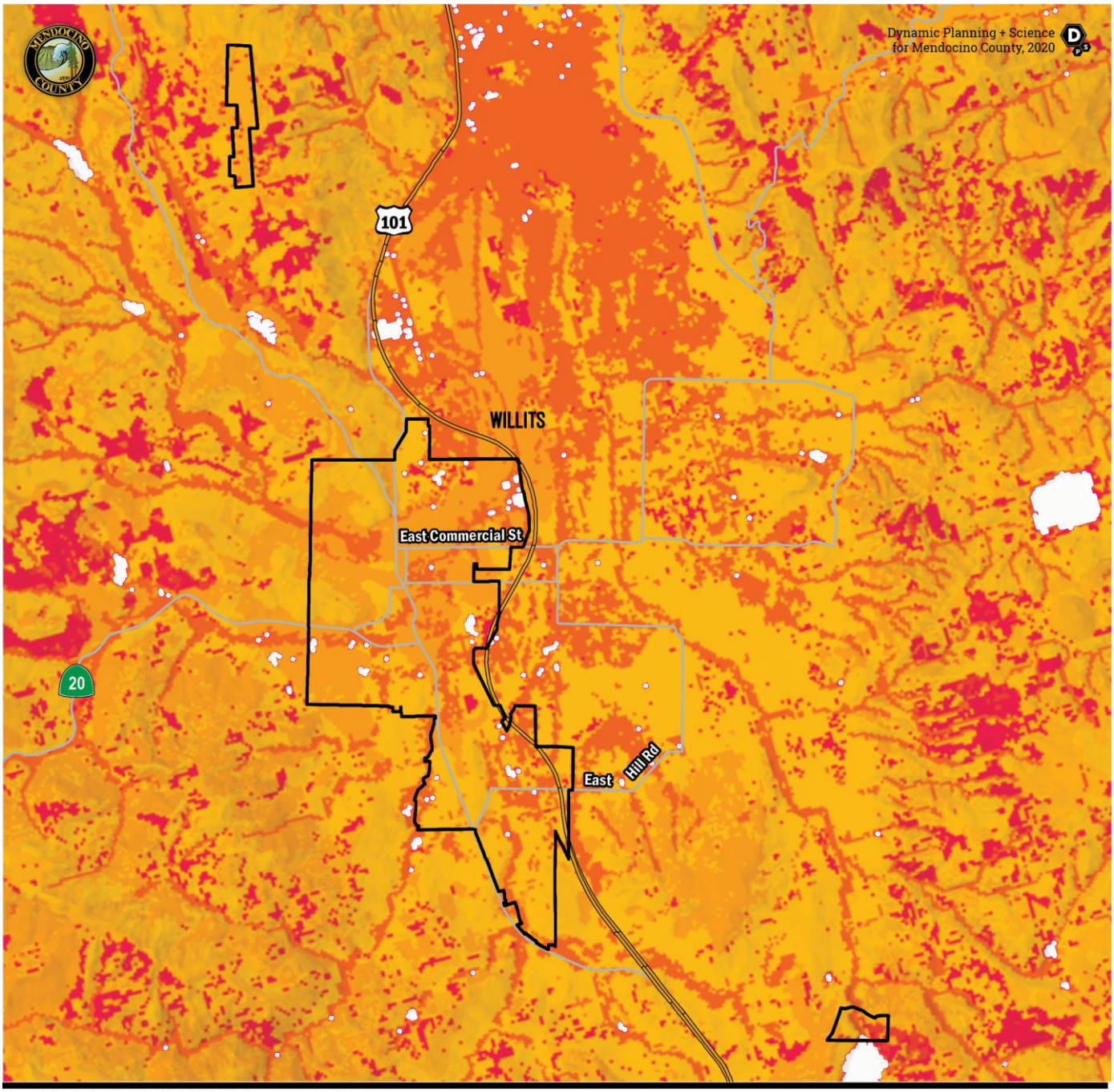


Figure 4-8: City of Willits Mean Fire Return Interval

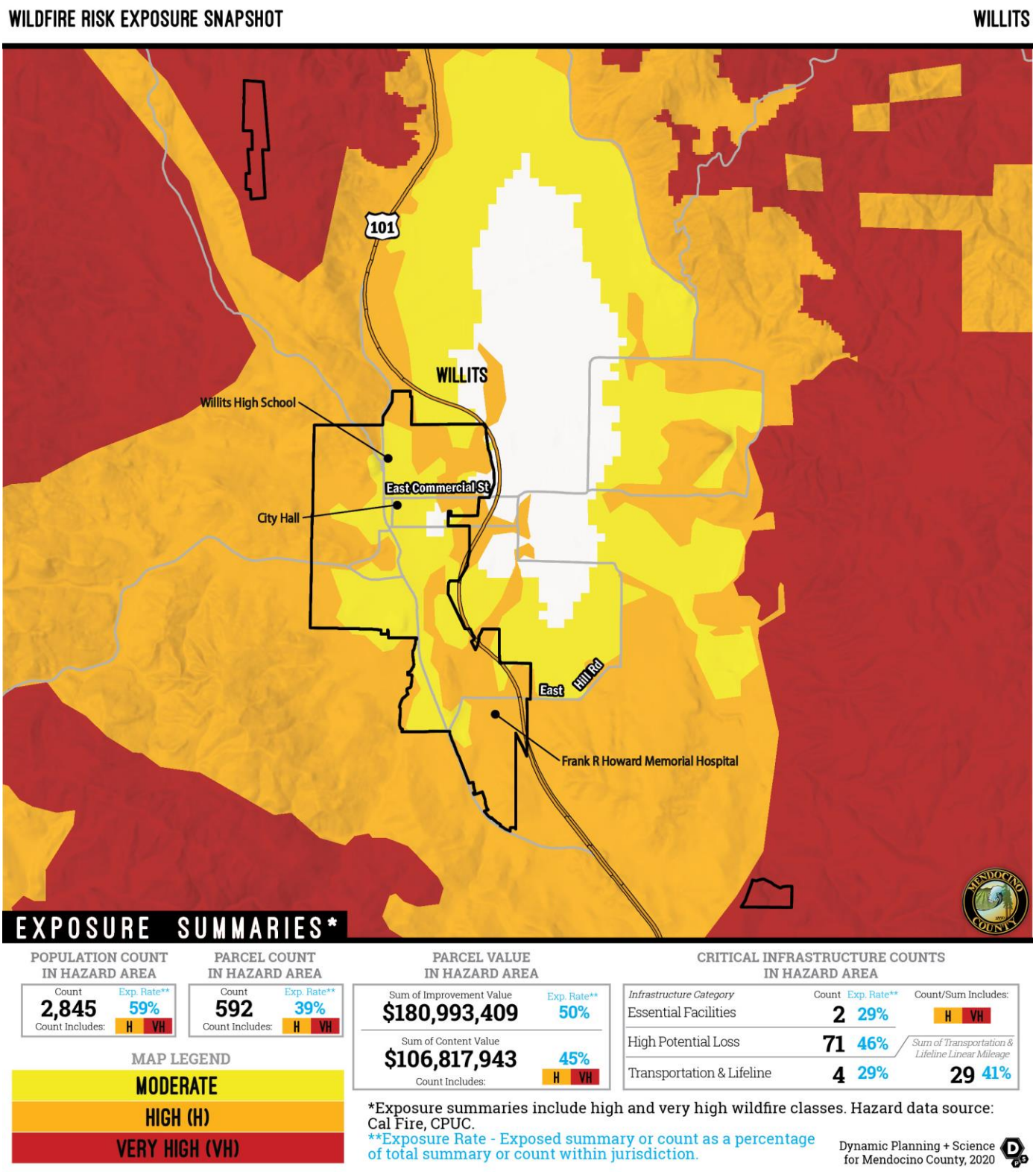
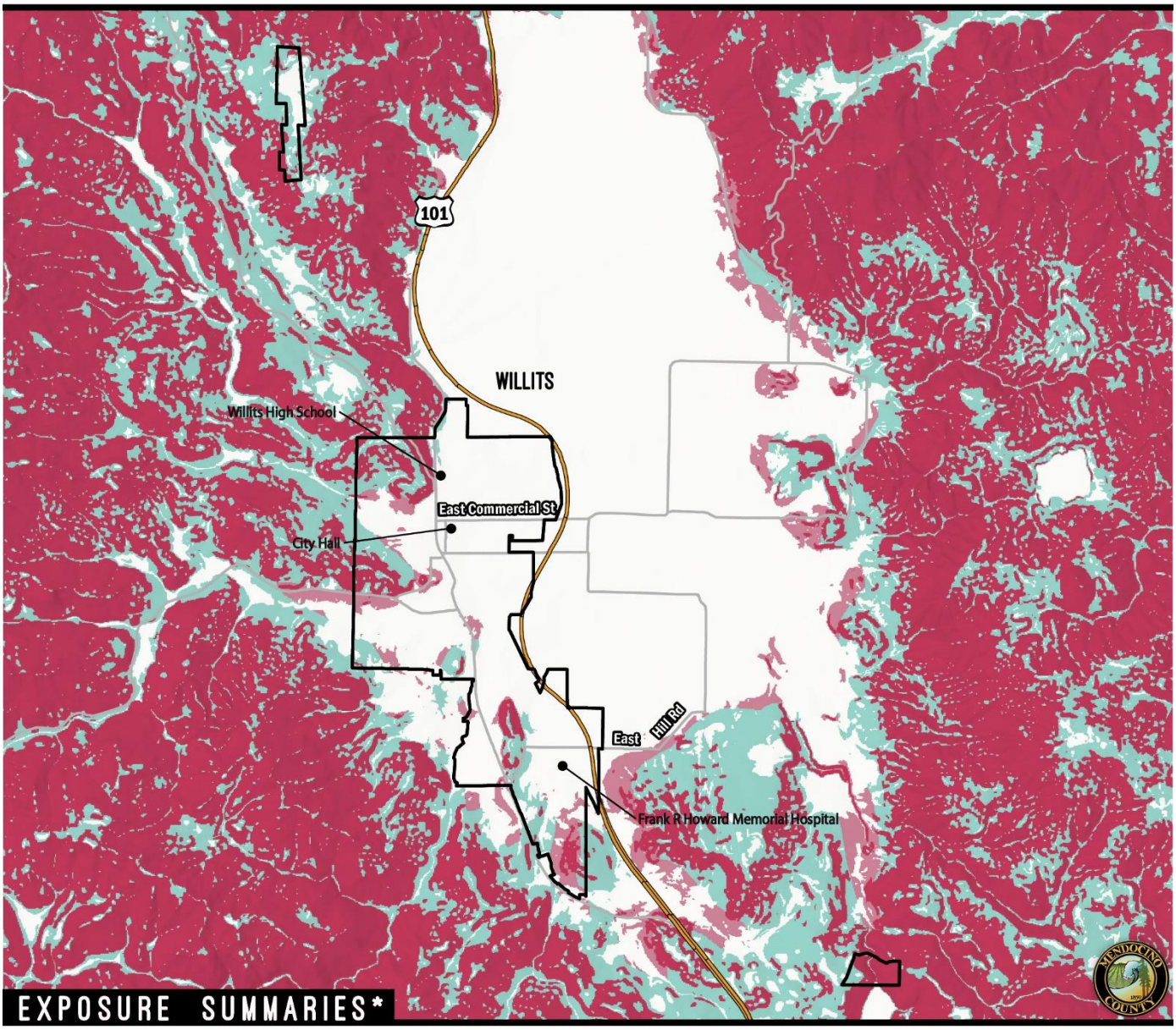


Figure 4-9: City of Willits Wildfire Risk Exposure Snapshot

LANDSLIDE RISK EXPOSURE SNAPSHOT

WILLITS



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
491	10%	HIGH

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
63	4%	HIGH

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**	Count Includes:
Sum of Improvement Value $11,611,141	3%	
Sum of Content Value $6,524,166	3%	HIGH

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	HIGH
High Potential Loss	15	10%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	3 4%

MAP LEGEND

LOW
MODERATE
HIGH

*Exposure summaries include high landslide risk exposure areas. Hazard data source: CGS.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science for Mendocino County, 2020

Figure 4-10: City of Willits Landslide Risk Exposure Snapshot

Table 4-5: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Going into drought, short term dryness, slowing planting, growth of crops or pastures. ▪ Coming out of drought, some lingering water deficits and pasture or crops not fully recovered.
D1	Moderate Drought	▪ Some damage to crops, pastures ▪ Streams, reservoirs, or wells low, some water shortages developing or imminent ▪ Voluntary water-use restrictions requested
D2	Severe Drought	▪ Crop or pasture losses likely ▪ Water shortages common ▪ Water restrictions imposed
D3	Extreme Drought	▪ Major crop/ pasture losses ▪ Widespread water shortages or restrictions
D4	Exceptional Drought	▪ Exceptional and widespread crop/ pasture losses ▪ Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

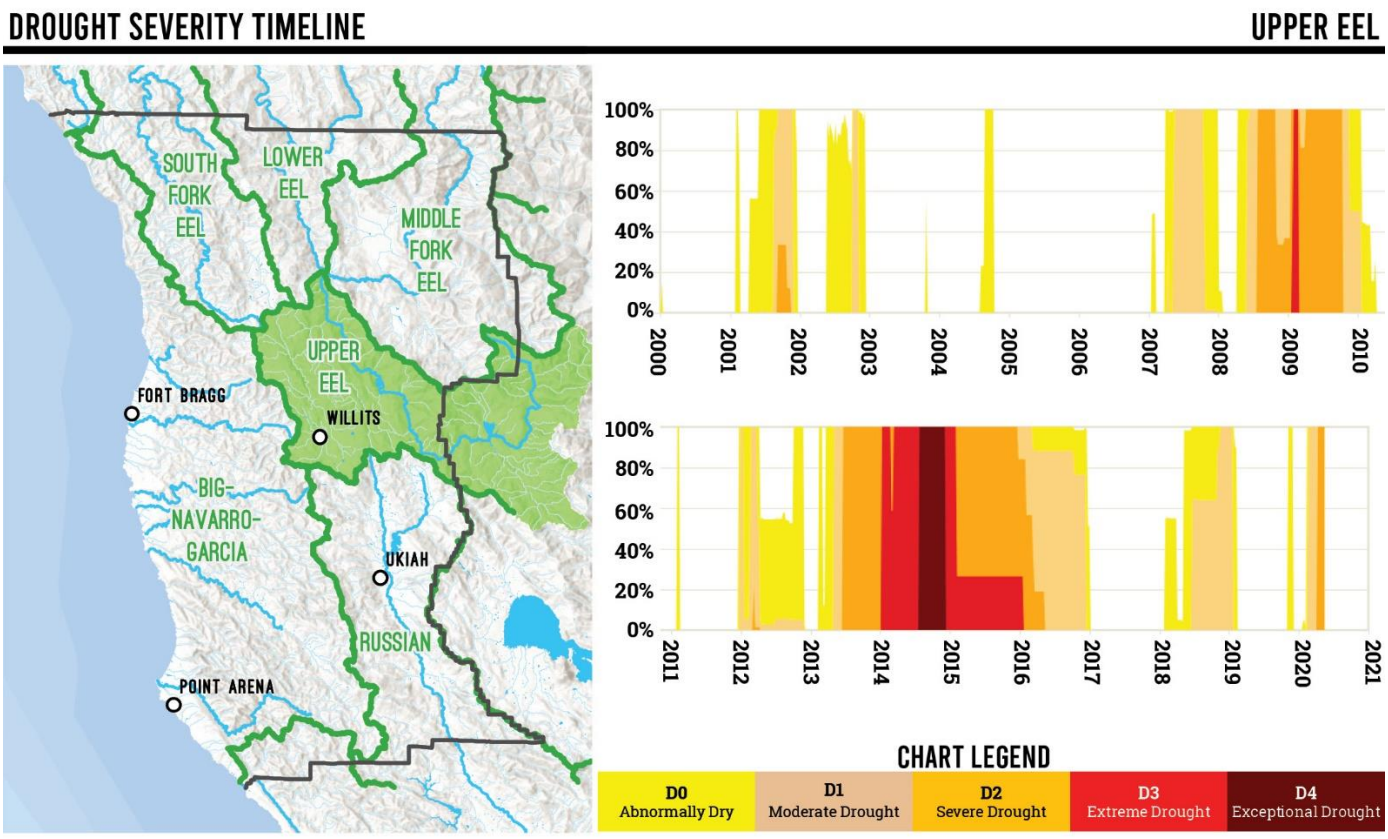


Figure 4-11: Drought Timeline for Upper Eel Watershed

4.4.3.3 Past and Future Development

The City of Willits is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with State of California planning, zoning, subdivision, and architecture laws.

The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

While growth has occurred in hazard areas in the past, increasing hazard risks to some degree, those risks are also decreased by development standards and plan requirements that serve to mitigate or avoid those risks. Problematic development generally occurred many decades ago, and thus much of this HMP focuses on retrofits or replacements from that older construction.

City of Willits is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum develop standards, all jurisdictions belong to the NFIP, as such, all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Mendocino County.

As the General Plan is updated and incorporates information from this HMP, City of Willits staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Willits reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan in Section 4.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.

The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,

- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

4.4.3.3.1 National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Mendocino County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Willits has participated in the NFIP since 1982. City of Willits is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 4-6 for more information on the City's policies and historic flood insurance claims.

Table 4-6: NFIP Status Table

NFIP Status	Participating since 07/19/1982
Policies in Force	66
Policies in SFHA	56
Policies in non-SFHA	10
Total Claims Paid	11
Paid Losses	$40,298
Repetitive Loss Properties	2
Severe Repetitive Loss Properties	0
Repetitive Loss Payment by NFIP on Building	$35,315.59
Repetitive Loss Payment by NFIP on Contents	N/D

See Volume 1, Section 4.5 for more information on the NFIP.

4.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 4-12. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 4-7.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 4-12 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 4-7 and Table 4-12.



IMPACT

Casualties

Property Damage

Business Interruption

Financial Loss

Environmental Contamination



VICTIM

School Children in Hazard High Hazard Areas

Care Facilities in High Hazard Area

Vulnerable Population Exposed to hazards



THREAT

Increased Fuels due to drought

Hotter, drier climates

More Intense Storms

Impervious surfaces = greater runoff

Increases of Invasive Species

Figure 4-12: Guidance for Problem Statements

Table 4-7: Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-WL-137	All Hazard	Impact	PE&A - Public Education & Awareness , ES - Emergency Services	**City of Willits**	Many cell towers lack backup power generation, which is deemed a critical life/safety threat for people without landlines.	ma-AH-WL-258
ps-AH-WL-138	All Hazard	Impact	PE&A - Public Education & Awareness , ES - Emergency Services	**City of Willits**	The City of Willits does not have a functioning redundant communications system.	ma-AH-WL-263
ps-AH-WL-139	All Hazard	Impact	PE&A - Public Education & Awareness , SP - Structural Projects	**City of Willits**	Many critical local businesses (grocery stores, gas stations) lack backup power generation.	ma-AH-WL-258

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-WL-140	All Hazard	Impact	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Willits**	Many property owners lack funding to retrofit their homes and businesses to be more resilient to natural disasters.	ma-AH-WL-259
ps-AH-WL-141	All Hazard	Victim	PE&A - Public Education & Awareness , ES - Emergency Services	**City of Willits**	The City does not know where vulnerable populations live, making hazard related outreach difficult.	ma-AH-WL-260
ps-AH-WL-142	All Hazard	Impact	PRV - Prevention , PE&A - Public Education & Awareness , ES - Emergency Services	**City of Willits**	The City lacks an alternative north/south evacuation route through the City should Main St. be compromised during an emergency.	ma-AH-WL-261
ps-DR-WL-115	Drought	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , SP - Structural Projects	**City of Willits**	Drought can lead to water supply issues for the City.	ma-DR-WL-262
ps-DR-WL-116	Drought	Impact	NRP - Natural Resource Protection , SP - Structural Projects	**City of Willits**	The City lacks a backup water supply should the primary surface water supply be impacted by a natural disaster.	ma-DR-WL-262
ps-DR-WL-117	Drought	Threat	PRV - Prevention , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	**City of Willits**	Public facilities may use more water than needed for basic function such as parks and landscaping.	ma-DR-WL-265

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-DR-WL-118	Drought	Threat	PRV - Prevention , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	**City of Willits**	There is an opportunity for City land use code to include more requirements for developers to install drought tolerant landscaping.	ma-DR-WL-266
ps-EQ-WL-131	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Willits**	City facilities lack seismic shut-off valves to prevent gas leaking in a seismic event .	ma-EQ-WL-267
ps-EQ-WL-132	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Willits**	Older construction and particularly un-reinforced masonry (URM) are at a higher risk of experiencing damage during earthquakes.	ma-EQ-WL-268
ps-WF-WL-133	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Willits**	Historic buildings can be more susceptible to ground shaking since many of these buildings have weakened with age and were built before the use of building codes.	ma-AH-WL-259
ps-EQ-WL-134	Earthquake	Victim	PPRO - Property Protection , ES - Emergency Services	**City of Willits**	The City lacks staff to handle the volume life/safety building inspections after major disasters.	ma-EQ--269
ps-WF-WL-135	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Willits**	There are approximately 4,047 people living in a violent shake zone for the Maacama Garberville EQ scenario.	ma-AH-WL-259
ps-EQ-WL-136	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Willits**	The following facilities are located in a violent shake zone for the Maacama Garberville EQ scenario: 11 child care centers, 4 residential elder care facilities, 2 family child care homes, 1 community center, and 3 medical facilities.	ma-EQ-WL-270

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-WL-178	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Willits**	City facilities have not been inspected for seismic safety in many years.	ma-EQ-WL-294
ps-EW-WL-121	Extreme Weather	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Willits**	The City's wastewater treatment facility is susceptible to flooding during heavy rain events.	ma-FL-WL-96
ps-EW-WL-122	Extreme Weather	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Willits**	City buildings and roads are impacted by localized flooding including pooling of water after heavy rain events.	ma-EW-WL-271
ps-EW-WL-123	Extreme Weather	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**City of Willits**	Heavy rain events lead to natural drainage channels becoming choked with debris and gravel which reduces their ability to convey stormwater downstream and leads to localized flooding on City roads and private property.	ma-EW-WL-272
ps-EW-WL-124	Extreme Weather	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , SP - Structural Projects	**City of Willits**	Strong winds can blow over trees and utility lines, posing a threat to traffic and pedestrians and leading to power outages.	ma-EW-WL-273
ps-FL-WL-119	Flood	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Willits**	The following City assets are in the 100-YR flood plain: 6 bridges (including bridges at E. Commercial/Lenore; E. Valley St./Railroad Ave.), City of Willits Library, and City Wastewater Treatment Plant.	ma-FL-WL-96, ma-FL-MCOE-274, ma-FL-WL-93

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-FL-WL-120	Flood	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Willits**	Approximately 714 people live in the 100-YR flood plain.	ma-FL-WL-103
ps-PN-WL-176	Pandemic	Victim	PRV - Prevention , SP - Structural Projects	**City of Willits**	EOC is not designed for possible social distancing guidelines to be in place during a hazard event (flood, wildfire, earthquake), nor does it have adequate fresh air ventilation	ma-PN-WL-292
ps-PN-WL-177	Pandemic	Impact	ES - Emergency Services	**City of Willits**	Need for additional sheltering locations in event of pandemic social distancing needs paired with another hazard event (flood, wildfire, earthquake)	ma-PN-WL-293
ps-WF-WL-125	Wildfire	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	**City of Willits**	The City's wastewater treatment facility, 3 City bridges, and the airport are located in a high or very high wildfire severity zone.	ma-WF-WL-275
ps-WF-WL-126	Wildfire	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**City of Willits**	Many City buildings are of older construction and require retrofitting to better withstand impacts of wildfire.	ma-WF-WL-275
ps-WF-WL-127	Wildfire	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Willits**	Approximately 2,845 people live in a high or very high wildfire severity zone.	ma-AH-WL-259, ma-WF-WL-92, ma-WF-WL-288
ps-WF-WL-128	Wildfire	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	**City of Willits**	The following critical infrastructure is located in a high or very high wildfire severity zone: 4 residential elder care facilities, Frank Howard Memorial Hospital, and 1 child care center.	ma-AH-WL-259, ma-WF-WL-288

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-WL-129	Wildfire	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	**City of Willits**	Excessive fuels may exist around City facilities and roads.	ma-WF-WL-284, ma-WF-WL-288
ps-WF-WL-130	Wildfire	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	**City of Willits**	Excessive fuels exist around the airport, which serves as an emergency evacuation area.	ma-WF-WL-284
ps-WF-WL-175	Wildfire	Impact	PPRO - Property Protection , SP - Structural Projects	**City of Willits**	Inadequate water pressure exists in the City's water system which impacts the effectiveness of emergency fire response and fire suppression systems in buildings throughout the City.	ma-WF-WL-291
ps-WF-WL-179	Wildfire	Victim	PPRO - Property Protection , SP - Structural Projects	**City of Willits**	Sparks from wildfire can enter city center with many older wooden construction, creating urban conflagration.	ma-WF-WL-275

4.4.3.5 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through https://mitigatehazards.com/mendocino-county/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.

4.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

4.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity. (Cal. Adaptation Planning Guide, 2020, p. 94)

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

4.5.1.1 Planning and Regulatory Capabilities

Table 4-8: Planning and Regulatory Mitigation Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code.
BCEGS Rating				
Public Protection (ISO Class)				Class 4. (Mendocino County Community Wildfire Protection Plan, 2005).
Hazard Related Development Standards				Earthquake Hazard Reduction in Existing Buildings. (Ch. 15.36) Floodplain Combining (Ch. 17.40); Subdivision Standards. (§ 17.40.110)
Zoning Ordinance				
Hazard-Specific Ordinance				Natural Hazard Combining. (Ch. 17.46)
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Adopted Budget Fiscal Year 2019-2020.
Erosion/Sediment Control Program				Erosion and sediment procedures designated in Deisgn and Construction Standards, 2009.
Hazard-Related Public Outreach Program				
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural)				Updated seismic safety procedures identified in General Plan Safety Element update.
Earthquake Modernization Plan (Building Safety)				
Hazard Plans				
General Plan Safety Element				2019 update.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Community Wildfire Protection Plan (CWPP)				2016 County-wide CWPP in existence.
Floodplain Management Plan				
Stormwater Management Plan				Coastal Mendocino Co Storm Water Resource Plan, 2019 Update, applies to the County Unincorp. and Fort Bragg.
Emergency Operations Plan				Mendocino County Operational Area Emergency Operations Plan (2016)
Climate Action Plan				
Ground Water Management Planning / Plans				Ukiah Valley is the only groundwater basin required to have a groundwater sustainability plan in the County.
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Floodway Combining (-FW) Zone. (Ch. 17.38)
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				
Community Rating System (CRS)				

4.5.1.2 Administrative and Technical Capabilities

Table 4-9: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Community Development Department.
Civil Engineer				A licensed engineer is contracted by the City.
Building Code Official (Full time or Augmented)				Building Division of the Community Development Department.
Floodplain Administrator				Building Department: the building official is designated as the floodplain administer. (Ch. 17.40.070)
Fire Marshal				Little Lake Fire Protection District.
Dedicated Public Outreach Personnel				Human Resources Department.
GIS Specialist and Capability				
Emergency Manager				City Manager.
Full-Time Building Official				Building Division of the Community Development Department.
Grant Manager, Writer, or Specialist				Jim Robbins- Community Development Department
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				Nixle and Reverse 911.
Flood				Nixle and Reverse 911.
Wildfire				Nixle and Reverse 911.
Geological Hazards				Nixle and Reverse 911.

4.5.1.3 Financial Capabilities

Table 4-10: Fiscal Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				
Benefit assessments				
System Development Fee				
General Obligation Bonds to Incur Debt				
Special Tax Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				City of Willits Rates and Fees Schedule Fiscal Year 2019/20.
Capital Improvement Project Funding				City of Willits Adopted Budget Fiscal Year 2019/2020.

4.5.1.4 Education and Outreach

Table 4-11: Education / Outreach Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Both the City and the Community Development Department have Facebook pages.
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				The Mendocino County Fire Safe Council assists local Councils a variety of needs. These Councils include: the Caspar Community and Island Cove Estates (south of Point Arena) on the coast; Pine Mountain, Ridgewood Park, and Willowbrook/Sherwood Forest Hills (past Brooktrails) in the Willits area; and Deerwood, Oak Knoll Road, Upper Parducci Road, Black Bart Trail and Robinson Creek Road in the Ukiah area.
Resource Conservation Districts				The Mendocino County Resource Conservation District has implemented a wide range of programs across the County
Other	N/A	N/A	N/A	

4.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 4-12 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

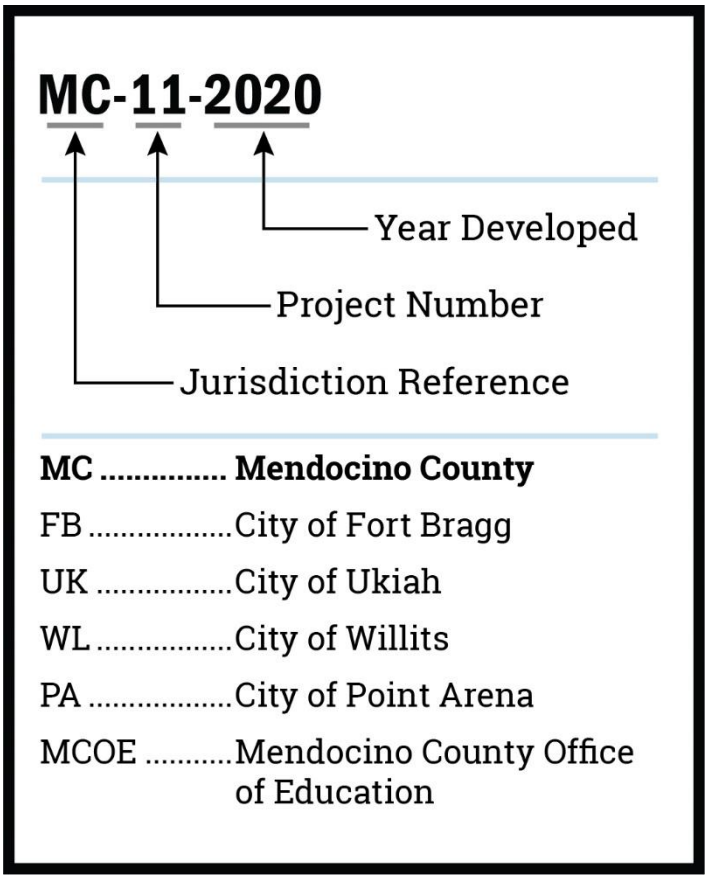


Figure 4-13: Mitigation Action Key

Each participating jurisdiction, including the City of Willits, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. City of Willits has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County-wide mitigation actions, the status, and additional notes for each action.

Table 4-12 lists each mitigation action for City of Willits. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 4-12 meets the regulatory requirements of FEMA and DMA 2000.

Table 4-12. City of Willits Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-WL-258	All Hazard	PRV - Prevention	Pending	2020	City of Willits	Develop a program that allows for expedited permitting and review process for backup power generation at facilities that are considered critical during a natural disaster (grocery stores, gas stations, cell/communication towers).	Community Development and Building	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	Medium	ps-AH-WL-137, ps-AH-WL-139
ma-AH-WL-259	All Hazard	PRV - Prevention	Pending	2020	City of Willits	Develop a program that creates incentives, through expedited permitting/review and reduced/waived permit fees, for homeowners and business owners to retrofit their homes and businesses to be more resilient to natural disasters.	Community Development and Building	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	Medium	ps-AH-WL-140, ps-WF-WL-127, ps-WF-WL-128, ps-WF-WL-135, ps-WF-WL-133
ma-AH-WL-260	All Hazard	PE&A - Public Education & Awareness	Pending	2020	City of Willits	Conduct outreach to the general public to better understand where vulnerable populations live within the City of Willits so that they can be better served by the City with hazard-related outreach.	Community Development	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Project	HMGP / BRIC	Low	ps-AH-WL-141
ma-AH-WL-261	All Hazard	PRV - Prevention	Pending	2020	City of Willits	Develop a City-wide evacuation plan that identifies alternative evacuation routes in the event of a natural disaster.	City of Willits	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC	Medium	ps-AH-WL-142
ma-AH-WL-263	All Hazard	PE&A - Public Education & Awareness	Pending	2020	City of Willits	Install redundant communication systems, beyond existing landline, internet, and cell tower infrastructure, to allow for emergency notification in the event of primary systems becoming compromised during a natural disaster.	City of Willits	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-AH-WL-138

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-DR-WL-264	Drought	NRP - Natural Resource Protection	Pending	2020	City of Willits	Implement water supply contingency projects, explore and acquire alternative water supplies, and retrofit water supply systems in order to improve water supply and delivery and conserve water.	City of Willits	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Medium	ps-DR-WL-116
ma-DR-WL-265	Drought	NRP - Natural Resource Protection	Pending	2020	City of Willits	Replace existing water intensive landscaping with drought resistant landscaping.	City of Willits	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Project	HMGP / BRIC	High	ps-DR-WL-117
ma-DR-WL-266	Drought	PRV - Prevention	Pending	2020	City of Willits	Amend land use codes to incorporate regulations that encourage and require water savings for development.	Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC	Medium	ps-DR-WL-118
ma-EQ-WL-101	Earthquake	SP - Structural Projects	Pending	2014	City of Willits	Seismically retrofit or replace public works and/or emergency response facilities that are necessary during and/or immediately after a disaster or emergency.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps=DR-WL-178
ma-EQ-WL-267	Earthquake	SP - Structural Projects	Pending	2020	City of Willits	Install seismic gas shut-off valves on County buildings to prevent the flow of gas into buildings during a seismic event.	City of Willits	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EQ-WL-131
ma-EQ-WL-268	Earthquake	SP - Structural Projects	Pending	2020	City of Willits	Retrofit / Harden City-owned critical facilities and buildings and their ability to withstand earthquakes.	Public Works and Building Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-EQ-WL-132

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EQ--269	Earthquake	PRV - Prevention	Pending	2020	City of Willits	Develop a memorandum of agreement/understanding with neighboring cities to share building inspection services in the event of a natural disaster.	Community Development and Building	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC	Medium	ps-EQ-WL-134
ma-EQ-WL-270	Earthquake	PE&A - Public Education & Awareness	Pending	2020	City of Willits	Encourage privately owned critical facilities to evaluate the ability of the buildings to withstand earthquakes and to address any deficiencies identified.	Community Development	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	Planning	HMGP / BRIC	High	ps-EQ-WL-136
ma-EQ-WL-294	Earthquake	SP - Structural Projects	Pending	2020	City of Willits	Conduct seismic inspections of City facilities to determine what retrofits are needed to make facilities more resilient to seismic events.	City of Willits	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EQ-WL-178
ma-EW-WL-271	Extreme Weather	PPRO - Property Protection	Pending	2020	City of Willits	Perform a feasibility study for flood proofing options and analyze the drainage systems City-wide.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA	High	ps-EW-WL-122
ma-EW-WL-272	Extreme Weather	PPRO - Property Protection	Pending	2020	City of Willits	Routinely inspect storm water channels for vegetation build up or encroachment, trash and debris, silt and gravel build up, and erosion or bank failure.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC , FMA	High	ps-EW-WL-123
ma-EW-WL-273	Extreme Weather	PPRO - Property Protection	Pending	2020	City of Willits	Implement a tree removal program for trees that are at a high risk to snapping in wind events around City facilities and infrastructure.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC	Medium	ps-EW-WL-124

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-FL-WL-93	Flood	PPRO - Property Protection	Pending	2014	City of Willits	Acquire, relocate, or elevate residential structures, in particular those that have been identified as Repetitive Loss (RL) properties that are located within the 100-year floodplain.	Community Development and Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA	Medium	ps-FL-WL-119
ma-FL-WL-96	Flood	PPRO - Property Protection	Pending	2014	City of Willits	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.	Community Development and Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 years, ongoing	Project	HMGP / BRIC , FMA	High	ps-EW-WL-121, ps-FL-WL-119
ma-FL-WL-103	Flood	PRV - Prevention	Ongoing	2008	City of Willits	Continue to participate in the NFIP program by enforcing the floodplain management ordinance to reduce future flood damage. In addition, join the Community Rating System (CRS) program. A community that participates in additional floodplain management activities, such as those outlined in the CRS program, will reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.	Community Development	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC , FMA	High	ps-FL-WL-120
ma-FL-MCOE-274	Flood	PPRO - Property Protection	Pending	2020	City of Willits	Elevate and retrofit bridges and culverts to allow proper stormwater / 100-YR flows.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA	High	ps-FL-WL-119
ma-PN-WL-292	Pandemic	SP - Structural Projects	Pending	2020	City of Willits	Install additional barriers and proper ventilation in Emergency Operations Center (EOC, City Hall) to allow for operation of EOC during pandemic and hazard event.	City of Willits	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-WL-176

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-PN-WL-293	Pandemic	ES - Emergency Services	Pending	2020	City of Willits	Develop alternative sheltering/ evacuation locations for distancing required during pandemic and other hazard event.	City of Willits	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-WL-177
ma-WF-WL-92	Wildfire	PPRO - Property Protection	Pending	2014	City of Willits	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , FP&S	High	ps-WF-WL-127
ma-WF-WL-275	Wildfire	SP - Structural Projects	Pending	2020	City of Willits	Retrofit City facilities with fireproof building materials to better withstand potential impacts of wildfire.	City of Willits	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FP&S	High	ps-WF-WL-126, ps-WF-WL-125, ps-WF-WL-179
ma-WF-WL-284	Wildfire	PPRO - Property Protection	Pending	2020	City of Willits	Develop vegetation management program to remove under story brush and excessive fuels around City roads, evacuation routes, and buildings.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	Project	HMGP / BRIC , FP&S	High	ps-WF-WL-129, ps-WF-WL-130
ma-WF-WL-288	Wildfire	PPRO - Property Protection	Pending	2020	City of Willits	Implement Mendocino County CWPP Mitigation Projects (Battalion 2: Willits) Including shaded fuel break to protect Willits water system, construct replacement fire station, and replace 1 aging fire apparatus.	Mendocino Unit at Howard Forest Station	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , AFG , FP&S	High	ps-WF-WL-127, ps-WF-WL-128, ps-WF-WL-129
ma-WF-WL-291	Wildfire	SP - Structural Projects	Pending	2020	City of Willits	Increase City water supply storage to achieve adequate water pressure throughout the City's system for emergency fire response and so fire sprinkler systems in buildings can function properly.	City of Willits	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FP&S	High	ps-WF-WL-175

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MENDOCINO COUNTY
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN

Mendocino County Office of Education

JURISDICTIONAL ANNEX

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Mendocino County

Multi-Jurisdiction Hazard Mitigation Plan

OFFICE OF EDUCATION (MCOE)

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Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Mendocino County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.

Office of Education - Adoption Resolution

Resolution of the
Mendocino County Board of Education
No. 20.11. 1

A RESOLUTION FOR THE MENDOCINO COUNTY OFFICE OF EDUCATION TO ADOPT THE 2020 MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR MENDOCINO COUNTY AS ITS OFFICIAL PLAN

WHEREAS, the County Office of Education is a political subdivision of the State of California and an official participating jurisdiction of the "2020 Mendocino County Multi-Jurisdictional Hazard Mitigation Plan" (MJHMP); and

WHEREAS, the County Office of Education recognizes the MJHMP as the official hazard mitigation plan for the County and participating jurisdictions; and

WHEREAS, the County Office of Education, with the assistance from Mendocino County, has gathered information and prepared the MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 C.F.R. § 201.6; and

WHEREAS, the County Office of Education Annex in Volume 2 of the MJHMP recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, the County Office of Education has reviewed the MJHMP and affirms that the plan actions in the County Office of Education's Annex will reduce the potential for harm to people and property from future hazard occurrences with our community; and

WHEREAS, Congress passed the Disaster Mitigation Act of 2000 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted multi-hazard plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the Board of Education fully participated in the FEMA-prescribed mitigation planning process to prepare this MJHMP; and

WHEREAS, the citizens were afforded opportunities to comment and provide input in the MJHMP and the actions in the Plan; and

WHEREAS, the Office of Education, as a fully participating jurisdiction of the MJHMP is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the Board of Education desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the MJHMP; and

WHEREAS, adoption by the Board of Education demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the MJHMP;

NOW, THEREFORE, BE IT RESOLVED by the Board of Education of the Mendocino County Office of Education:

1. That the Mendocino County Board of Education adopts the 2020 Multi-Jurisdictional Hazard Mitigation Plan Vol. 1 for Mendocino County and Office of Education Annex in Vol. 2, as approved by FEMA and Cal OES, as the mitigation plan for the Office of Education.

2. That the Board orders the County Superintendent to submit an approved and signed copy of this resolution to the Cal OES and FEMA Region IX officials to enable the plan's final approval.

By Order of the Mendocino County Board of Education

Dated: November 9, 2020

Michelle Hutchins, Ex Officio Secretary
County Superintendent of Schools

Donald Cruser, President
Mendocino County Board of Education

Section 5. Office of Education

5.1 Purpose

This Annex details the hazard mitigation planning elements specific to the Mendocino County Office of Education (MCOE). This Annex is not intended to be a standalone document but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the Office of Education. This Annex provides additional information specific to the Office of Education, with a focus on providing additional details on the planning process, risk assessment, and mitigation. Figure 5-1 displays the boundaries of the Office of Education.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

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Alternate Point of Contact

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5.2 Planning Methodology

The Office of Education followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 5-1.

Table 5-1: Planning Committee Members

Planning Committee Members	Department
Steve Turner	Maintenance and Operations
Gabriel Sherman	Ukiah Unified School District
Barry Silva	Fort Bragg Unified School District
Terry McEntee	Willits Unified School District
Ottopascal Rice	Mendocino Unified School District
Mac Adam Lojowsky	Mendocino -Lake Community College District
Cindy Gonzalez	Manchester Elementary School
Scott Ritchie	Point Arena Elementary and High School

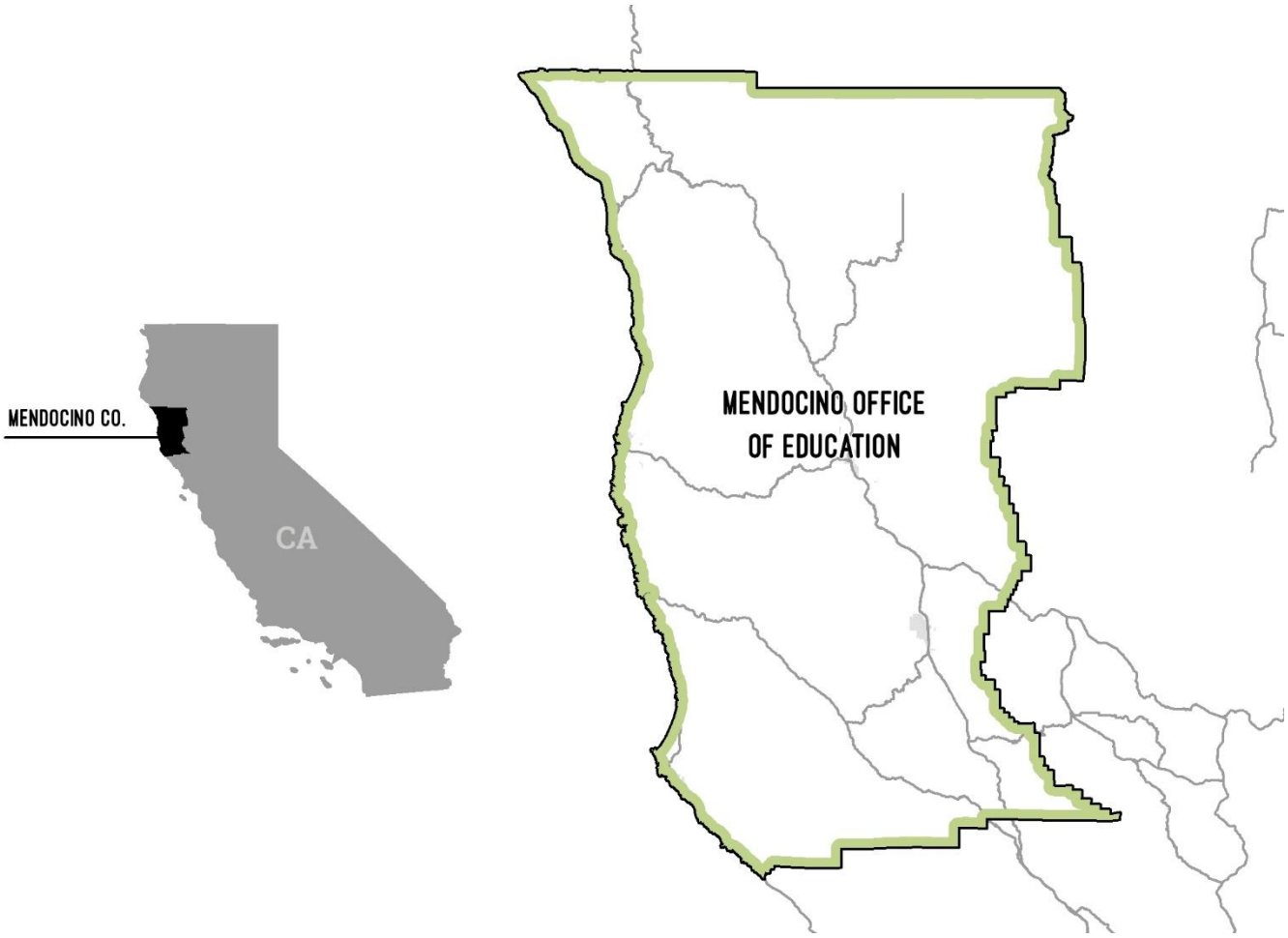


Figure 5-1: Mendocino County Office of Education Location

5.3 What's New

The Office of Education has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Currently there are no previous mitigation actions designated completed. Table 5-2 those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 5-12.

Table 5-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled
ma-AH-MCOE-164	All Hazard	Cancelled	2014	Mendocino County Office of Education	Mitigate all risks through periodic drills and trainings based on identified hazards.	Incorporated into newly drafted mitigation actions for 2020
ma-AH-MCOE-168	All Hazard	Cancelled	2014	Mendocino County Office of Education	Integrate the Mendocino County HMP, in particular the hazard analysis and mitigation strategy sections, into local planning documents, including general plans, school emergency operations plans, and capital improvement plans.	Ongoing work, opportunities for integration reflected in capabilities assessment.
ma-PN-MCOE-166	Pandemic	Cancelled	2014	Mendocino County Office of Education	To protect vulnerable populations from disease by conducting increased surveillance and development of more stringent requirements at high-risk facilities, (i.e., day-care centers, hospitals, nursing homes, schools, as well as restaurants and hotels).*	Not specific to the Office of Education.
ma-PN-MCOE-167	Pandemic	Cancelled	2008	Mendocino County Office of Education	Developed procedures for District reporting of flu related absences to MCOE which then forwards to Public Health (during periods of flu)	Replaced w/ COVID specific MA's.
ma-TS-MCOE-174	Tsunami	Cancelled	2014	Mendocino County Office of Education	Participate in the NOAA Tsunami Ready Program.	Covered under ma-AH-MCOE-255

5.3.1 Mitigation Successes

The Office of Education has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted. The MCOE has instituted several mitigation actions from the existing MJHMP. See Vol. 1 for a listing of historic mitigation actions. Listed below is a success story where Office of Education successfully implemented hazard mitigation projects.

STORY 1: *Office of Education Building Retrofits*

In 2015 MCOE was able to replace a collection of 40+ year old wood framed portable school buildings at our Community School site. This site is located in a zone with moderate wildfire risk and very strong to Severe earthquake risk. They complied with a siting and construction requirements of the California Division of State Architect, including conducting a Geotechnical Survey of the site. The Modular complex of two buildings, was constructed on a permanent foundation using fire resistant materials.

STORY 2: *Point Arena High School Fire Mitigation*

In 2016, Point Arena High School reduced the fire danger from trees on a seven acre area of their campus by removing dead trees and trimming healthy trees to eight feet above ground then chipping the slash.

STORY 3: ***Office of Education Backup Power Generation***

MCOE is the Internet Service Provider for all school districts in Mendocino County and the payroll processor for all school employees in the county. To sustain this critical function, MCOE has installed three, propane powered, backup generators to sustain our internet connectivity and financial services during natural disasters and Public Safety Power Shutoffs (PSPS). The last generator was installed in 2018. The generators proved invaluable during the fire season of 2019 when three consecutive PSPS events, one lasting five days, plunged most of the county into darkness, potentially disrupting three separate payroll cycles. Even though some districts were unable to connect to MCOE due to their local power outage, by exercising the various options in our Business Continuity Plan, each payroll was completed on time.

STORY 4: ***Leggett Unified School District Water Well and Water Treatment***

In 2016, Leggett Unified School district undertook a project to replace their water system because the water quality was so poor it was declared unfit and the district had to purchase bottled water for drinking, cooking, and sanitation. The poor water quality was partially due to the varying annual rainfall from the effects of climate change. The district drilled two new wells and constructed a new water treatment plant, eliminating the need to haul water.

5.4 Risk Assessment

The intent of this section is to profile the Office of Education's hazards and assess the Office of Education's vulnerabilities, distinct from that of the County-wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

5.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 5-3. Detailed hazard profiles of the most significant County-wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect Office of Education. Table 5-4 provides a crosswalk of relevant planning documents and the hazards discussed therein. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to Office of Education and which ones were not. Section 5.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to Office of Education.

Table 5-3: Hazard Prioritization

Hazard Type	Explanation
Climate Change	**High priority county-wide, profiled hazard.**
Dam/ Levee failure	**High priority county-wide, profiled hazard.**
Drought	**High priority county-wide, profiled hazard.**
Earthquake/ Geologic Hazards	**High priority county-wide, profiled hazard.**
Flood	**High priority county-wide, profiled hazard.**
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	**High priority county-wide, profiled as part of Severe Weather.**
Insect Hazards	While hazardous insects exist in Mendocino County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	**High priority county-wide, profiled hazard.**
Severe Weather, including:	**High priority county-wide for heavy wind and heavy rain.**
Extreme Heat	Not a priority as extreme weather event, discussed as climate change impact.
Hail	Hail events are rare in Mendocino County and not profiled in this plan.
High Wind	**Profiled as part of Severe Weather hazard.**
Heavy Rain	**Profiled as part of Severe Weather hazard.**
Fog	While fog events do occur within Mendocino County, they are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	While winter storms are present in Mendocino County, they were not identified as a priority for this plan.
Slope Failure	**High priority county-wide, profiled hazard.**
Soil Hazards	**High priority county-wide, profiled hazard (includes erosion and naturally-occurring asbestos).**
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	**High priority county-wide, profiled hazard.**

Table 5-4: Document Review Crosswalk

Hazards	2014 Mendocino County MJHMP	2009 Mendocino County General Plan	2018 California State HMP
Agricultural Pests	■		■
Climate Change		■	■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake	■	■	■
Flood	■	■	■
Insect Hazards	■		
Landslide		■	■
Levee Failure	■*		■
Manmade Hazards		■	■
Pandemic Disease	■		■
Sea Level Rise			■
Severe Weather			■
Soil Hazards	■**		
Terrorism & Tech Hazards			■
Tsunami	■	■	■
Volcano			■
Wildfire	■***	■	■

** included as part of dam failure*
*** included naturally occurring asbestos*
**** included urban conflagration*

5.4.2 Hazard Risk Ranking

The Office of Education's Planning Team used the same hazard prioritization process as the Mendocino County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 5-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess Office of Education's vulnerability to following hazards:

- Dam Failure
- Climate Change
- Earthquake
- Pandemic
- Flood
- Extreme Weather
- Wildfire
- Drought

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address Office of Education's vulnerability to these specifically-identified hazards.

5.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within Office of Education are vulnerable to specific hazard events. The vulnerability assessment included field visits and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

5.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 5-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Mendocino County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to Office of Education. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - **Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate Change impacts will be addressed at the end of each hazard section within the 2020 plan update and as a stand alone section for each jurisdiction...



For County and Municipal governments you will be required to address climate change impacts in the Safety Element of your General Plan. Climate change may change the frequency, duration and intensity of hazards listed above.

Pandemic will be profiled for every jurisdiction.

Office of Education Risk Matrix

IMPACT

PROBABILITY

	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	High (FLOOD)	Extreme	Extreme (WILDFIRE, EARTHQUAKE)
Likely	Medium	High (DROUGHT)	Extreme (EXTREME WEATHER)	Extreme
Possible	Medium (SOIL HAZARD)	High (SLOPE FAILURE)	High	High (DAM FAILURE)
Unlikely	Low	Low	Medium	Medium

Figure 5-2: Mendocino County Office of Education Risk Assessment

5.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 5-3 through Figure 5-10, illustrate Office of Education's vulnerability to specific hazards. These maps overlay hazard areas with property owned by the Office of Education and school districts represented by the Office of Education. Individual property vulnerability is described in Section 5.4.3.2 and is further available on the Risk Assessment Mapping Tool at MitigateHazards.com.

Figures include:

- Figure 5-3: Mendocino County Office of Education Dam Inundation
- Figure 5-4: Mendocino County Office of Education M7.4 Maacama Garberville
- Figure 5-5: Mendocino CTY Off. of Education M7.8 N. San Andreas -N. Coast -Peninsula – SC MTN
- Figure 5-6: Mendocino County Office of Education FEMA Flood Risk Exposure
- Figure 5-7: Mendocino County Off. of Education Av. Annual Precipitation (1981-2010. Inches)
- Figure 5-8: Mendocino County Office of Education Annual Average Wind Speed (Power Class)
- Figure 5-9: Mendocino County Office of Education Wildfire Risk Exposure
- Figure 5-10: Mendocino County Drought Severity Timeline 2000-2021

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.

5.4.3.3 Facility Exposure Table

The Office of Education is participating in this MJHMP on behalf of school districts within Mendocino County. Mapping is shown for all District facilities throughout the County. Table 5-5 reflects which properties owned by the Office of Education or one of the school districts it represents are particularly vulnerable to prioritized hazards.

This table is unique to the Office of Education because of the County-wide geographic extent of the Office of Education and the individual school districts who are responsible for mitigation within their own facilities in partnership with the Office of Education.

Table 5-5: Office of Education Facility Exposure to Hazards Table

Mendocino Office of Education Facility Exposure to Hazards

Facility	Wildfire	Flood	M7.4 EQ Scenario	M7.8 EQ Scenario	Dam Inundation	Asbestos
Anderson Valley Unified						
Anderson Valley District Office	Moderate		Very Strong	Very Strong		
Anderson Valley Elementary School	Moderate		Very Strong	Very Strong		
Anderson Valley Junior High School	Moderate		Very Strong	Very Strong		
Bus Barn	Moderate		Very Strong	Very Strong		
Arena Union Elementary						
Arena Union Elementary	Moderate		Strong	Severe		
District Office	Moderate		Strong	Severe		
Fort Bragg Unified						
Bus Garage W Fuels	Moderate		Strong	Very Strong		
Coast Center	Moderate		Strong	Very Strong		
Dana Gray Elementary	Moderate		Strong	Very Strong		
District Office	Moderate		Strong	Severe		
Fort Bragg High School	Moderate		Strong	Very Strong		
Fort Bragg Middle School	Moderate		Strong	Very Strong		
Noyo High School	Moderate		Strong	Very Strong		
Redwood Elementary School	Moderate		Strong	Very Strong		
Shelter Cove	Moderate		Strong	Very Strong		
Laytonville Unified						
District Office	Moderate		Strong	Severe		
Laytonville Elementary School	Moderate		Severe	Strong		Yes
Laytonville High School (New And Old)	High		Severe	Strong		Yes
Spy Rock School	Moderate		Severe	Moderate		
Leggett Valley Unified						
Bus Garage	High		Severe	Moderate		
Leggett Elementary / High School	High		Severe	Moderate		
Whale Gulch Elementary / High School	High		Very Strong	Moderate		
Manchester Union Elementary						
Manchester Elementary School	Moderate		Strong	Violent		
Mendocino College						
Mendocino College	Moderate		Severe	Strong		Yes
Mendocino College-Coast Campus Offsite	Moderate		Strong	Very Strong		
Mendocino College-Coast Center	Moderate		Strong	Very Strong		
Mendocino College-North County Center	Moderate	100yr	Violent	Strong		
Mendocino College-Point Arena Field Station	Moderate		Moderate	Severe		

Mendocino Office of Education Facility Exposure to Hazards

Facility	Wildfire	Flood	M7.4 EQ Scenario	M7.8 EQ Scenario	Dam Inundation	Asbestos
Mendocino County Office						
CA Conservation Corps Site Leased			Violent	Strong		Yes
Calpella School	Moderate		Severe	Strong		Yes
Coast Center	Moderate		Strong	Very Strong		
Data Center For All County Schools			Violent	Strong		Yes
Low Gap Center	Moderate		Severe	Strong		
New Beginnings Community School	Moderate		Severe	Very Strong		
River Center			Violent	Strong		Yes
Mendocino Unified						
Albion School	Very High		Strong	Very Strong		
Bus Barn W Fuel	Moderate		Strong	Severe		
Community Center & Friendship Park Leased	Moderate		Strong	Very Strong		
Community High School	Moderate		Strong	Very Strong		
Comptche School	High		Strong	Very Strong		
District Office	Moderate		Strong	Severe		
Greenwood Preschool	High		Strong	Severe		
Maintenance Shop W 30K Water Tanks	High		Strong	Very Strong		
Mendocino Community Network Isp	Moderate		Strong	Very Strong		
Mendocino High School	Moderate		Strong	Very Strong		
Mendocino K-8 School	High		Strong	Very Strong		
Point Arena Joint Union High						
Bus Barn W Fuel	Moderate		Strong	Severe		
Point Arena High School	Moderate		Strong	Severe		
South Coast Continuation High School	Moderate		Strong	Severe		
Potter Valley Community Unified						
Bus Barn	Moderate		Very Strong	Very Strong		
District Office	Moderate		Strong	Severe		
Potter Valley Elementry	Moderate		Very Strong	Strong		Yes
Potter Valley High School	Moderate		Very Strong	Strong		Yes
Round Valley Unified						
Bus Barn W Fuel	Moderate		Strong	Severe		
District Office	Moderate		Strong	Severe		
Parent Center Counseling Office	Moderate		Very Strong	Moderate		
Round Valley Elementary School	Moderate		Very Strong	Moderate		
Round Valley High School	Moderate		Very Strong	Moderate		
Ukiah Unified						
Adult School Facility	Moderate		Severe	Very Strong		

Mendocino Office of Education Facility Exposure to Hazards

Facility	Wildfire	Flood	M7.4 EQ Scenario	M7.8 EQ Scenario	Dam Inundation	Asbestos
Calpella Elementary School	Moderate		Severe	Strong		Yes
Community Transition Program	Moderate		Severe	Strong		
District Service Center	Moderate		Violent	Very Strong	Yes	
District Warehouse	Moderate		Severe	Very Strong		
Eagle Peak Middle School	Moderate		Severe	Strong		
Frank Zeek Elementary School	Moderate		Severe	Very Strong		
Grace Hudson Elementary School	Moderate		Severe	Strong		
Hopland Elementary School-Vacant	Moderate	100yr	Severe	Very Strong	Yes	Yes
Maintenance Transportation Yard W Fuels	Moderate	100yr	Severe	Very Strong	Yes	
Nokomis Elementary School	High		Severe	Strong		
Oak Manor Elementary School	Moderate	500yr	Violent	Very Strong	Yes	Yes
Pomolita Middle School	Moderate		Severe	Very Strong		
Preschool Village	Moderate		Severe	Very Strong		
Redwood Valley Elementary School-Vacant	High		Severe	Strong		
Redwood Valley Outdoor Ed Project	High		Severe	Strong		Yes
South Valley Continuation High School	Moderate	500yr	Severe	Strong		
Technology Office			Severe	Very Strong	Yes	
Ukiah High School	Moderate		Severe	Strong		
Yokayo Elementary School	Moderate		Severe	Strong		
Willits Unified						
Adolescent Program	Moderate		Violent	Strong		
Baechtel Grove Middle School	Moderate		Violent	Strong		Yes
Blosser Lane Middle School And District Office	Moderate		Violent	Strong		Yes
Brookside Elementary School	High		Violent	Strong		Yes
Bus Barn W Fuel	Moderate		Strong	Severe		
District Office	Moderate		Strong	Severe		
San Hedrin Continuation High School	High		Violent	Strong		Yes
Sherwood Elementary School	Very High		Severe	Strong		Yes
Willits High School	Moderate		Violent	Strong		
Willits Kids Club - Leased	Moderate		Violent	Strong		Yes

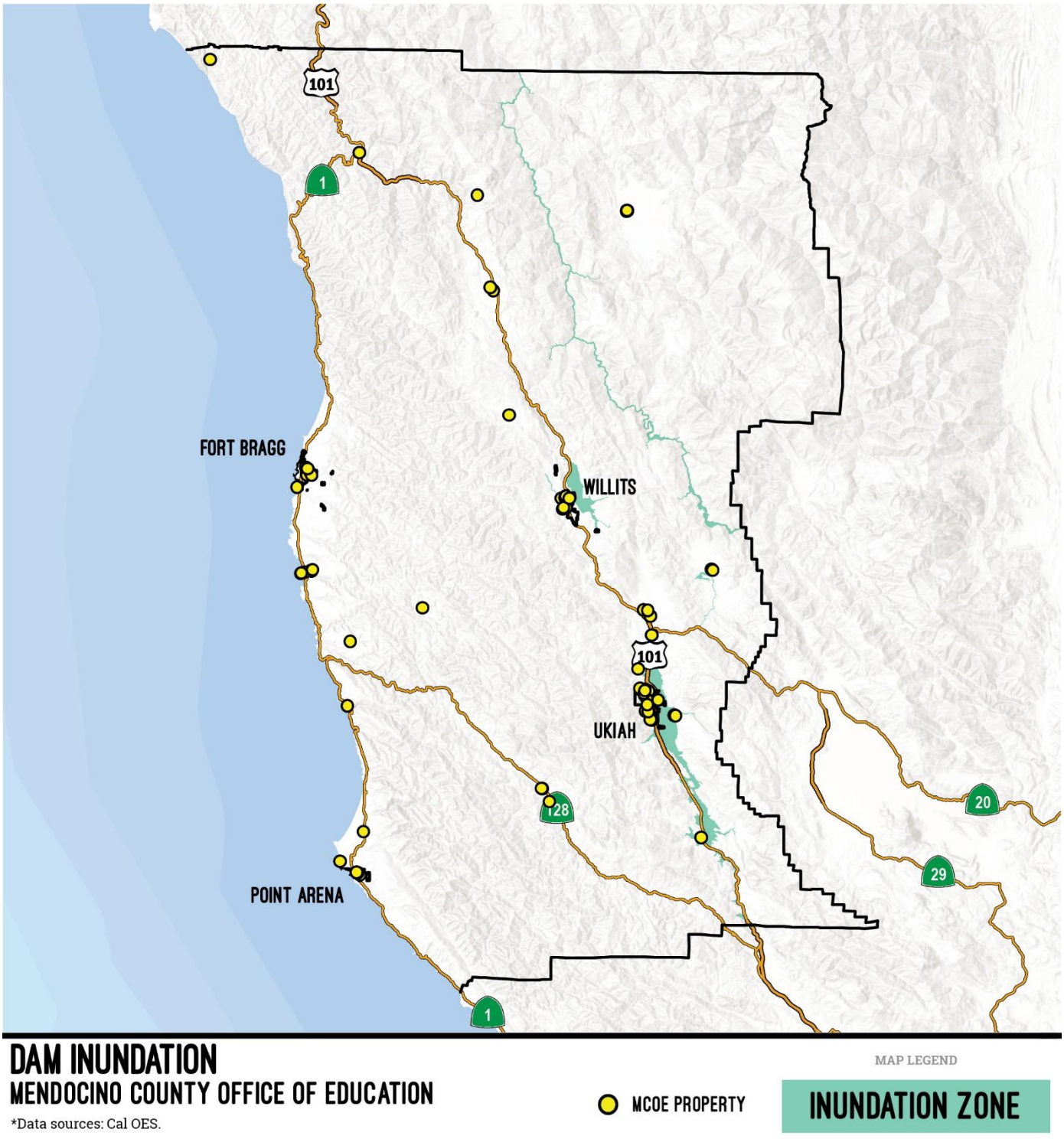


Figure 5-3: Mendocino County Office of Education Dam Inundation

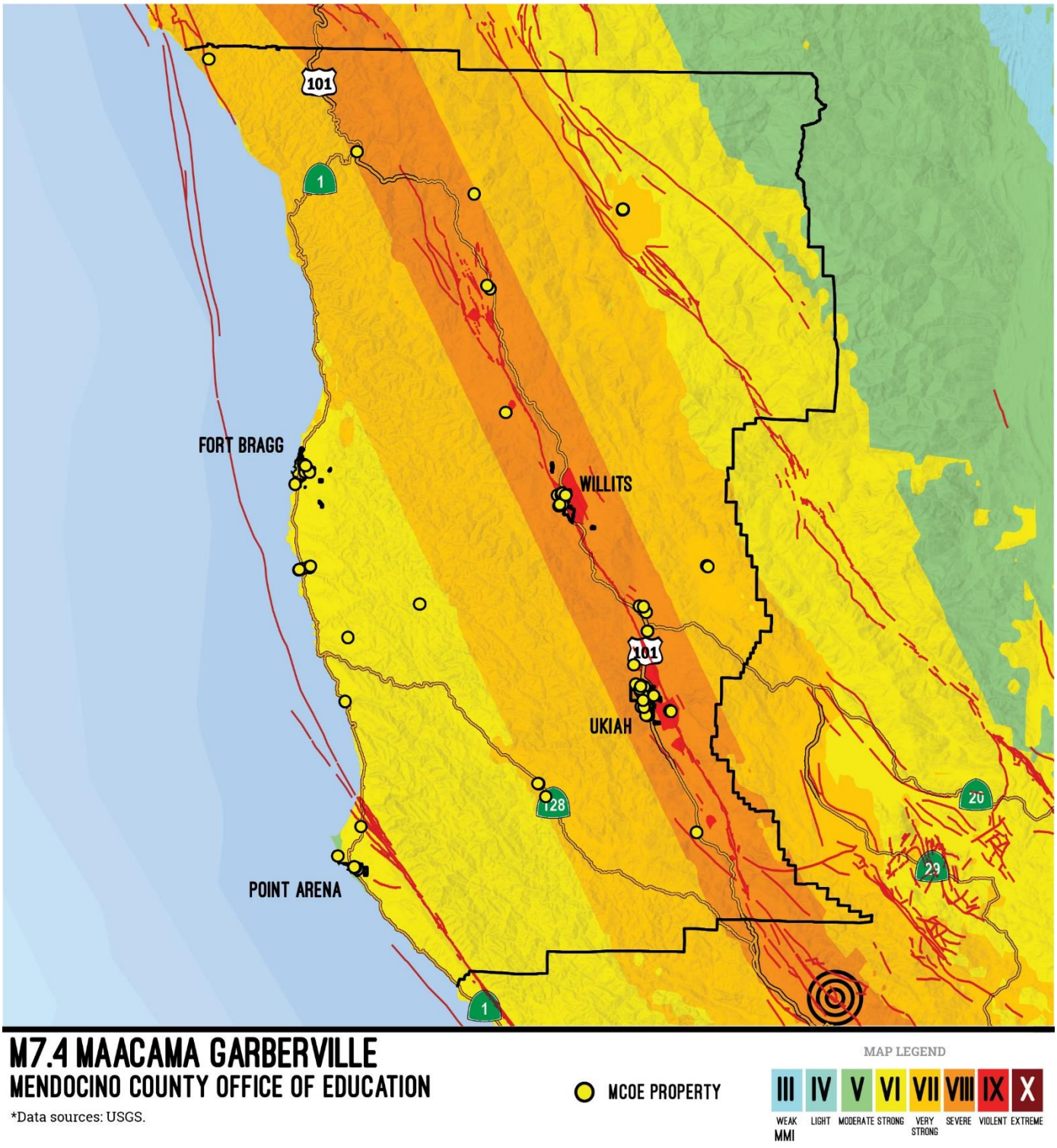


Figure 5-4: Mendocino County Office of Education M7.4 Maacama Garberville

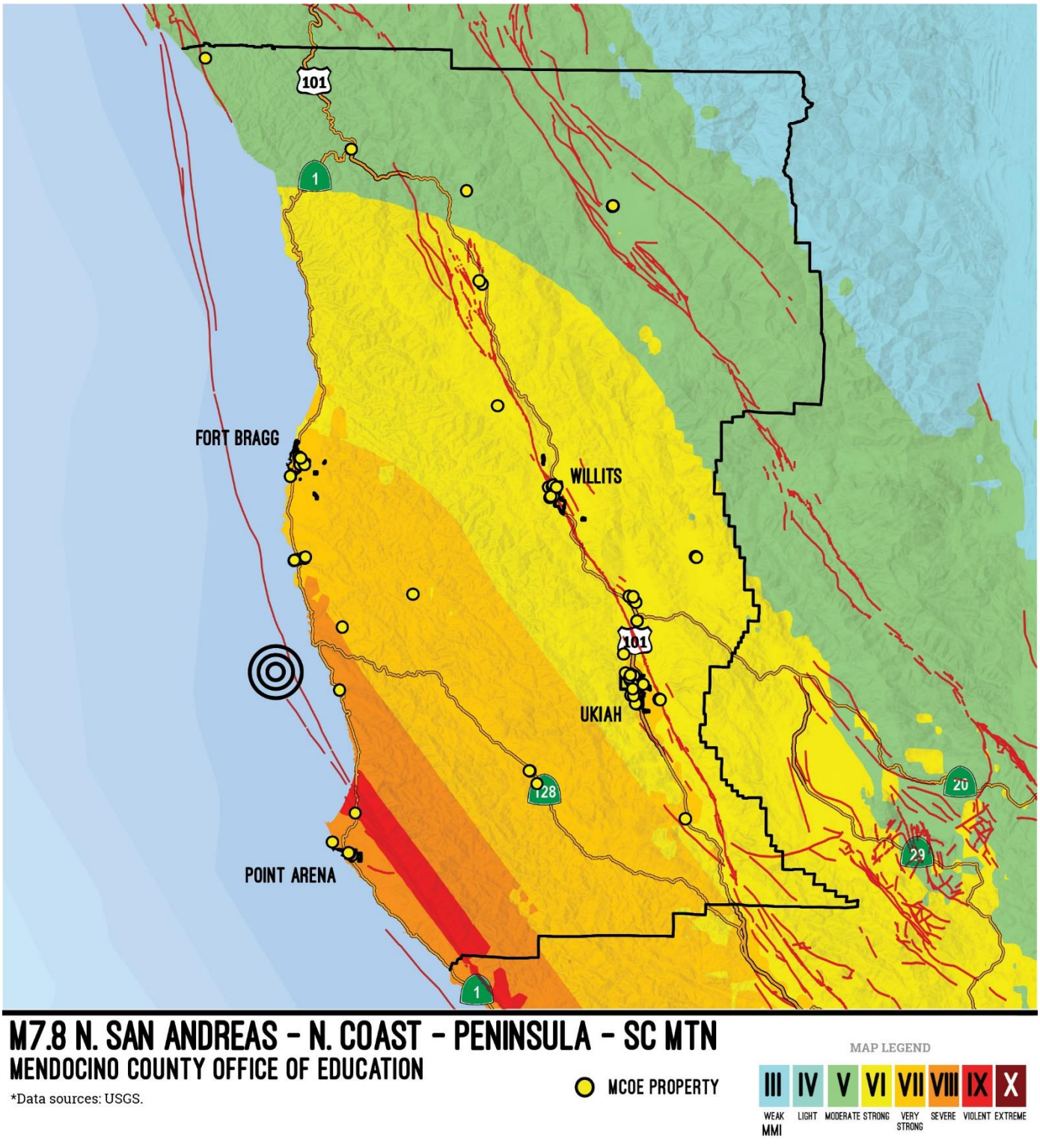


Figure 5-5: Mendocino CTY Off. of Education M7.8 N. San Andreas -N. Coast -Peninsula – SC MTN

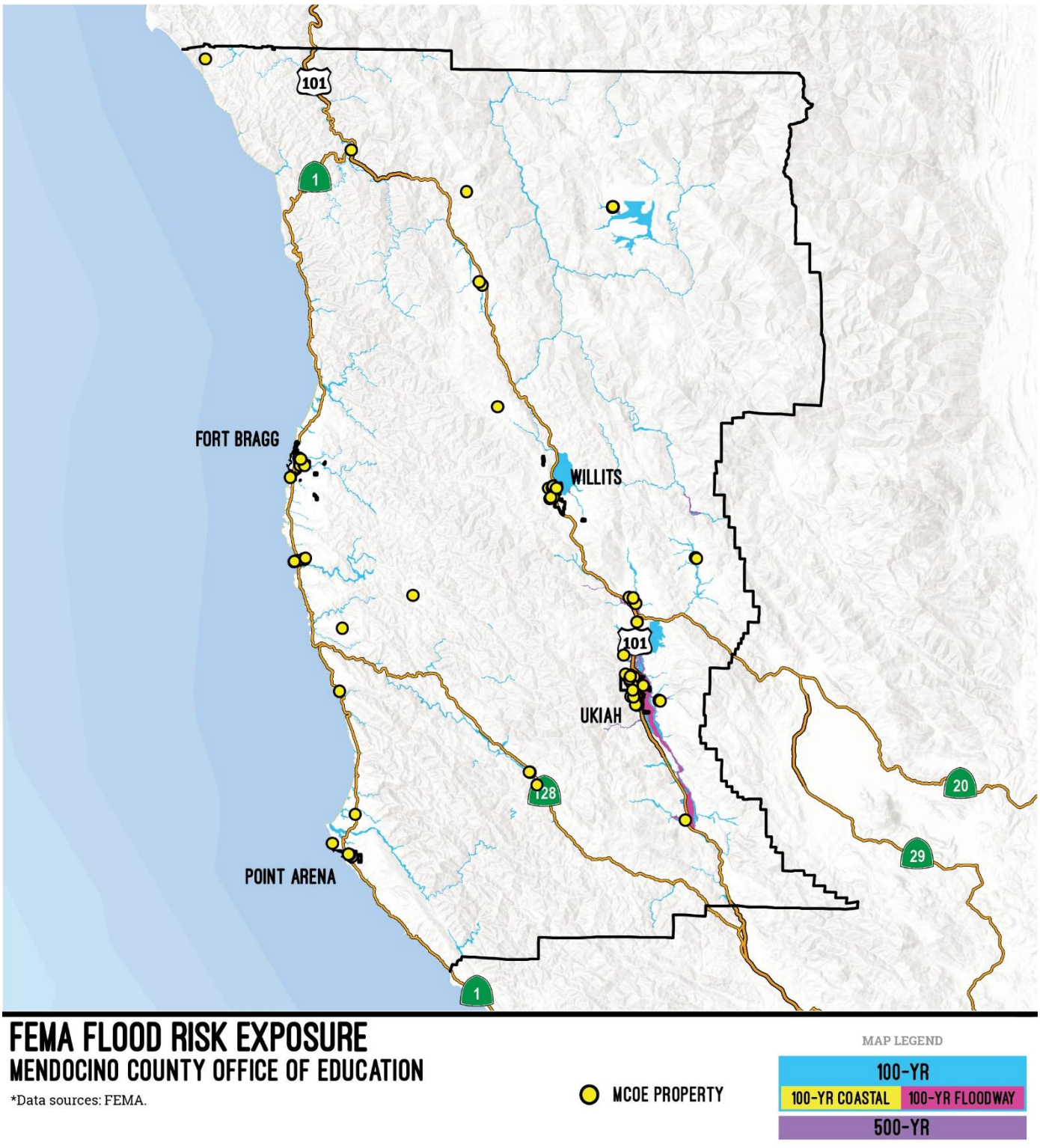


Figure 5-6: Mendocino County Office of Education FEMA Flood Risk Exposure

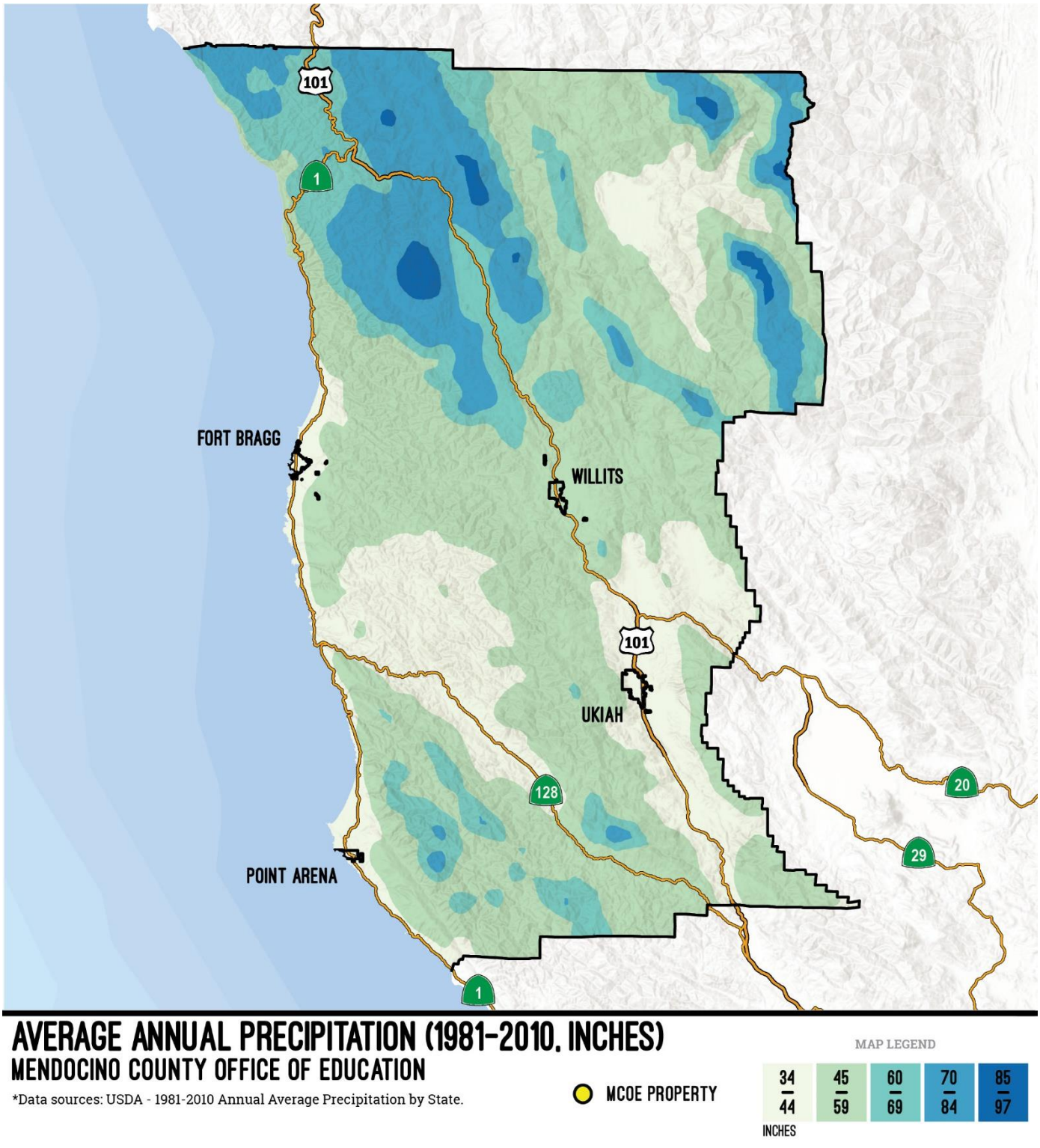


Figure 5-7: Mendocino County Off. of Education Av. Annual Precipitation (1981-2010. Inches)

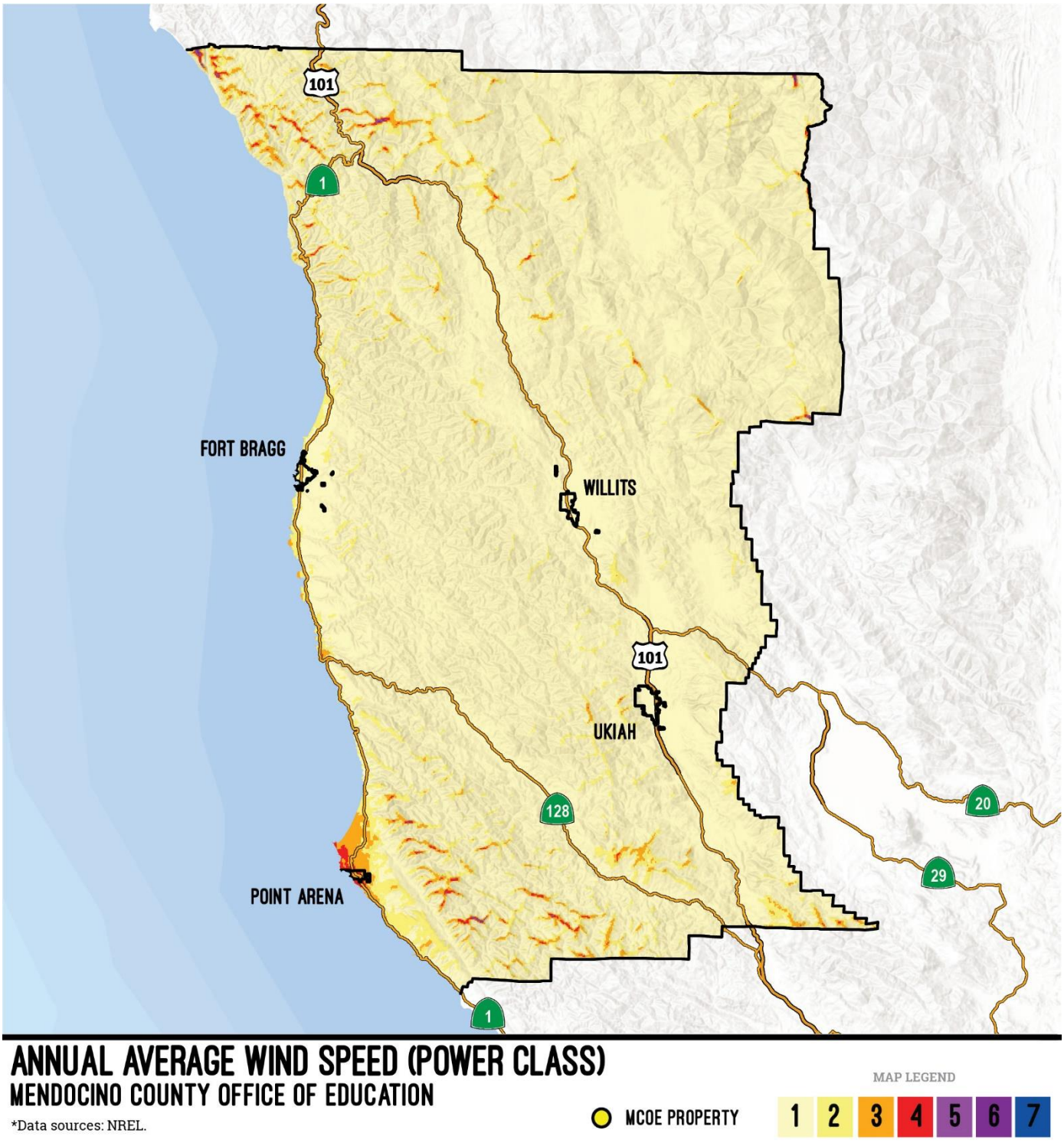


Figure 5-8: Mendocino County Office of Education Annual Average Wind Speed (Power Class)

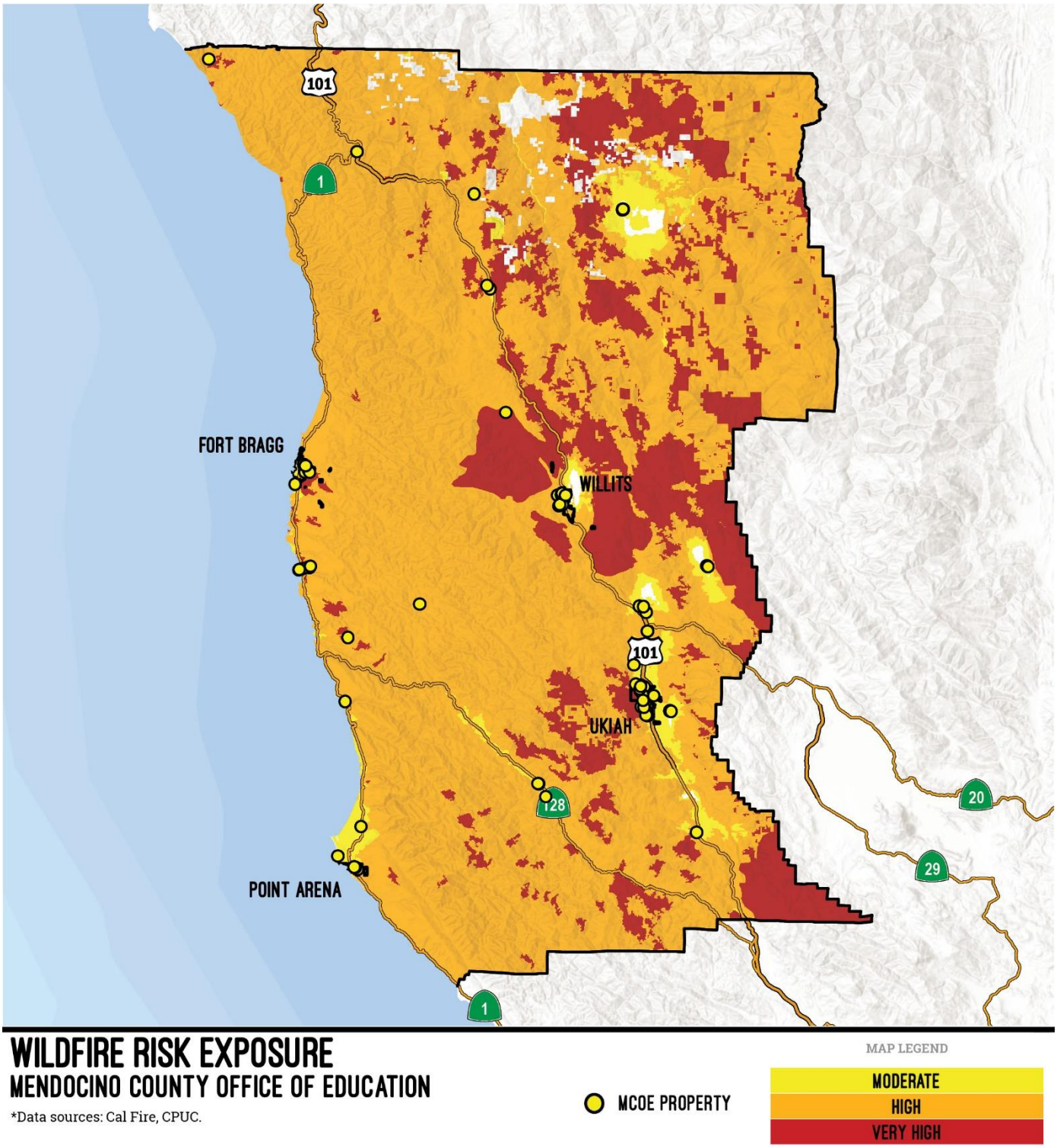


Figure 5-9: Mendocino County Office of Education Wildfire Risk Exposure

Table 5-6: Office of Education Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Going into drought, short term dryness, slowing planting, growth of crops or pastures. ▪ Coming out of drought, some lingering water deficits and pasture or crops not fully recovered.
D1	Moderate Drought	▪ Some damage to crops, pastures ▪ Streams, reservoirs, or wells low, some water shortages developing or imminent ▪ Voluntary water-use restrictions requested
D2	Severe Drought	▪ Crop or pasture losses likely ▪ Water shortages common ▪ Water restrictions imposed
D3	Extreme Drought	▪ Major crop/ pasture losses ▪ Widespread water shortages or restrictions
D4	Exceptional Drought	▪ Exceptional and widespread crop/ pasture losses ▪ Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

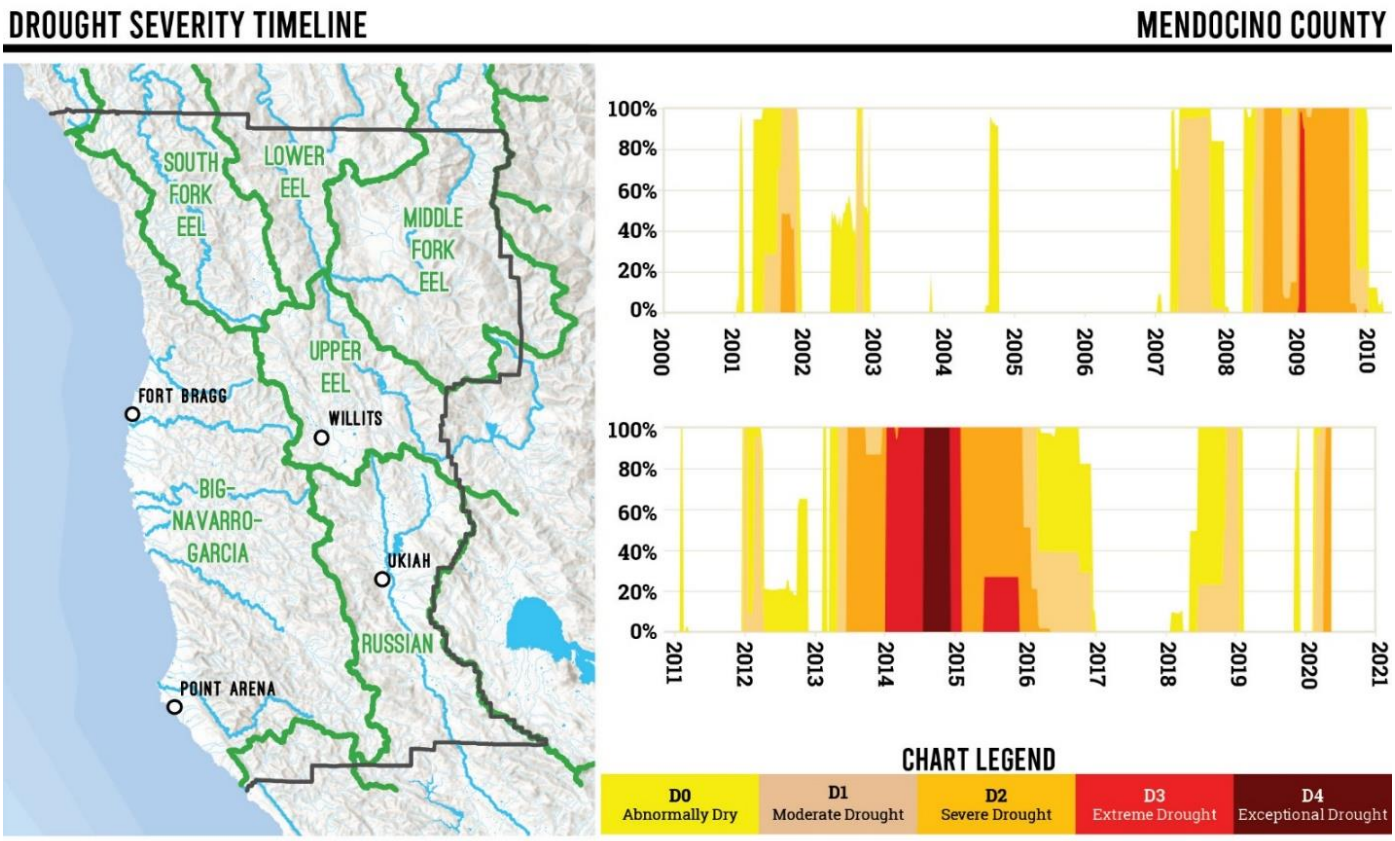


Figure 5-10: Mendocino County Drought Severity Timeline 2000-2021

5.4.3.4 Future Development

School districts, including Office of Education, are guided by numerous state regulations to avoid school sites being located within hazard areas. According to Title 5 of the California Code of Regulations, site selection for future school district facilities must 1) consider the public interest, 2) not be located on an active earthquake fault or fault trace, and 3) be based on geologic and soil engineering studies if the future site is located within any special study zones or an area designated as geologically hazardous in the safety element of the local general plan. State funded school districts are required to coordinate with the local planning agency while siting future school sites, including providing written notice to the relevant planning agency and receive a written report on the site's conformity with the adopted General Plan. (Cal. Code Regs tit. 5 § 14011(f)) The General Plan includes descriptions of areas most appropriate for development, including considerations for hazard safety among many factors.

Numerous building and zoning codes at the state and local level apply to the construction of future school district facilities, and are focused on mitigating the impact from hazards to the facilities. For example, the California Field Act of 1933, which is enforced by the Division of the State Architect (DSA), creates a higher standard for the construction of school facilities to make them resilient to earthquake events. (Cal. Education Code § 17280 et seq.) Buildings constructed under the Field Act are among the safest and most resilient buildings to experience an earthquake. Plans for construction of any future MCOE facilities will be submitted to the DSA to ensure they comply with all the provisions of the Field Act.

Three school districts in Mendocino county, Mendocino, Fort Bragg, and Ukiah, received voter approval in June 2020 to issue General Obligation Bonds for facility construction, re-construction, renovation, and upgrades. Many of the projects listed in the bond language could contribute to mitigating hazards in the respective districts but due to the current cost of schools construction it is not enough to address all the issues that have been identified in each district's facility master plan.

5.4.3.5 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 5-11. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 5-7.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 5-12 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 5-7 and Table 5-12.



IMPACT

Casualties

Property Damage

Business Interruption

Financial Loss

Environmental Contamination



VICTIM

School Children in Hazard High Hazard Areas

Care Facilities in High Hazard Area

Vulnerable Population Exposed to hazards



THREAT

Increased Fuels due to drought

Hotter, drier climates

More Intense Storms

Impervious surfaces = greater runoff

Increases of Invasive Species

Figure 5-11: Guidance for Problem Statements

Table 5-7: Office of Education Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-MCOE-180	All Hazard	Impact	PE&A - Public Education & Awareness , ES - Emergency Services	**Mendocino County Office of Education**	MCOOE lacks a formal warning system framework for disseminating information School Districts, faculty, students, and families during and after natural hazard events.	ma-AH-MCOE-169, ma-AH-MCOE-255
ps-CC-MCOE-90	Climate Change	Threat	SP - Structural Projects	**Mendocino County Office of Education**	Climate Change will increase the frequency and intensity of wildfires, droughts and extreme weather events such as high winds, extreme heat, and flooding. This will impact the schools in various ways, such as unhealthy air quality requiring more filtration of ventilation systems, lack of adequate water to meet domestic and landscape needs, preventative power shutoffs disrupting water sources, classroom ventilation, loss of refrigeration and thus stored food.	ma-WF-MCOE-243
ps-DF-MCOE-88	Dam Failure	Impact	PE&A - Public Education & Awareness	**Mendocino County Office of Education**	The following facilities are located in a dam inundation zone: Ukiah maintenance yard, Ukiah unified technology office, Willits High School, Ukiah Unified District Service Center, Oak Manor Elementary School, Hopland Elementary School, and Mendocino College Main Campus	ma-DF-MCOE-256

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-DR-MCOE-62	Drought	Impact	NRP - Natural Resource Protection	**Mendocino County Office of Education**	Drought could impact water supply of schools that rely on well water including Mendocino, Laytonville, Leggett, Manchester, Round Valley, Potter Valley, and Anderson Valley	ma-DR-MCOE-232
ps-DR-MCOE-63	Drought	Impact	NRP - Natural Resource Protection	**Mendocino County Office of Education**	Impacts of drought could lead to killing of grass on sport's fields, affecting school's ability to host sporting events and could lead to more injuries due to playing on harder surfaces	ma-DR-MCOE-229
ps-DR-MCOE-64	Drought	Threat	NRP - Natural Resource Protection	**Mendocino County Office of Education**	School facilities have irrigated turf grass and landscaping	ma-DR-MCOE-230
ps-DR-MCOE-65	Drought	Threat	NRP - Natural Resource Protection	**Mendocino County Office of Education**	Drought could lead to dead plants near buildings which will raise the fire danger around school facilities including Laytonville USD; Round Valley USD; Anderson Va USD; Mendocino, especially Albion and Comptche schools	ma-WF-MCOE-240
ps-DR-MCOE-66	Drought	Threat	NRP - Natural Resource Protection	**Mendocino County Office of Education**	Prolonged drought weakens large unirrigated oak trees, making them more susceptible to breaking	ma-EW-MCOE-209
ps-EQ-MCOE-82	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**Mendocino County Office of Education**	The following school facilities are located in a "violent" shake zone for the Maacama Garberville EQ scenario: Brookside Elementary School, San Hedrin continuation high school, Willits Kids Club, Willits Unified Bus Barn, Willits High School, Baechtel Grove Middle School, Willits Unified District Office, Blosser Lane Middle School and District Office, Ukiah Unified District Service Center, Oak Manor Elementary School, MCOE Data Center, MCOE Conservation Corps Site, all Mendocino College sites	ma-EQ-MCOE-253, ma-EQ-MCOE-252, ma-EQ-MCOE-254, ma-EQ-MCOE-251
ps-EQ-MCOE-83	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**Mendocino County Office of Education**	The following school facilities are located in a "violent" shake zone for the 7.8 N. San Andreas EQ scenario: Manchester Elementary School	ma-EQ-MCOE-252, ma-EQ-MCOE-253, ma-EQ-MCOE-254, ma-EQ-MCOE-251

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-MCOE-84	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	**Mendocino County Office of Education**	Transportation routes that schools rely on could be damaged or destroyed due to earthquake	ma-EQ-MCOE-254
ps-EQ-MCOE-85	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**Mendocino County Office of Education**	School facilities lack seismic shut-off valves on gas meters	ma-EQ-MCOE-252
ps-EQ-MCOE-86	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**Mendocino County Office of Education**	A list of school facilities on the DSA AB 300 list can be found at the following link: https://www.dropbox.com/s/4uyevu108c3a3mw/Mendocio%20COE%20AB-300%20list.pdf?dl=1	ma-EQ-MCOE-249, ma-EQ-MCOE-250
ps-EQ-MCOE-87	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	**Mendocino County Office of Education**	Non-Structural Problem - Unknown vulnerabilities within buildings related to unsecured contents in buildings. Pre -1978 buildings may have older suspension systems of suspended ceilings. EQ hazards exist due to failure of non -structural elements such as ceilings, lights, ducts and plumbing (underpinning only).	ma-EQ-MCOE-249, ma-EQ-MCOE-251
ps-EW-MCOE-71	Extreme Weather	Impact	PPRO - Property Protection , SP - Structural Projects	**Mendocino County Office of Education**	Heavy rain events create localized flooding issues including pooling of water around the foundations of school facilities.	ma-FL-MCOE-245
ps-EW-MCOE-72	Extreme Weather	Impact	PPRO - Property Protection , NRP - Natural Resource Protection	**Mendocino County Office of Education**	High winds along the coast of Mendocino County create a risk of loss of power which would affect school's ability to access well water and prevent food from spoiling. Schools at risk include Ft. Bragg USD, Manchester Elementary, Arena Elementary, Point Arena High School Mendocino USD, and Anderson Va USD.	ma-WF-MCOE-243
ps-EW-MCOE-73	Extreme Weather	Impact	SP - Structural Projects	**Mendocino County Office of Education**	Extreme heat will stress HVAC and electrical systems	ma-EW-MCOE-257
ps-EW-MCOE-74	Extreme Weather	Impact	PPRO - Property Protection , NRP - Natural Resource Protection	**Mendocino County Office of Education**	High winds can break trees and pose a threat to school facilities, students, and faculty	ma-EW-MCOE-209

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-MCOE-75	Extreme Weather	Threat	PPRO - Property Protection , NRP - Natural Resource Protection	**Mendocino County Office of Education**	Big Cypress trees pose a threat to Mendocino Unified School District. Big cypress trees are a hollow tree that wind events can break and create hazards for buildings, students, and faculty.	ma-EW-MCOE-209
ps-EW-MCOE-76	Extreme Weather	Threat	PPRO - Property Protection , NRP - Natural Resource Protection	**Mendocino County Office of Education**	High winds can lead to drying out vegetation and increasing fire risk around school facilities	ma-WF-MCOE-240
ps-FL-MCOE-67	Flood	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**Mendocino County Office of Education**	Laytonville High School routinely experiences flooding, threatening buildings and equipment	ma-FL-MCOE-245, ma-FL-MCOE-247
ps-FL-MCOE-68	Flood	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	**Mendocino County Office of Education**	Hopland Elementary and Ukiah Unified are located in the 100-YR flood plain	ma-FL-MCOE-247, ma-FL-MCOE-248
ps-FL-MCOE-69	Flood	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , SP - Structural Projects	**Mendocino County Office of Education**	Flooding on State HWY 1 cuts off access between Pt Arena schools and Manchester Elementary, potentially stranding students and cutting off school food service to Manchester	ma-EQ-MCOE-254
ps-FL-MCOE-70	Flood	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , SP - Structural Projects	**Mendocino County Office of Education**	Russian River flooding creates access issues for students on east side of Ukiah Valley	ma-EQ-MCOE-254
ps-PN-MCOE-143	Pandemic	Victim	SP - Structural Projects	**Mendocino County Office of Education**	School facilities may not have adequate fresh air/ventilation to safely host school functions (students and faculty).	ma-PN-MCOE-244
ps-WF-MCOE-79	Wildfire	Impact	SP - Structural Projects	**Mendocino County Office of Education**	School facilities lack backup power generation in the event of power shutoffs due to wildfire	ma-WF-MCOE-243
ps-WF-MCOE-80	Wildfire	Impact	SP - Structural Projects	**Mendocino County Office of Education**	Outdated ventilation systems worsen the impacts of wildfire for students and faculty. Poor air quality can impact students/faculty ability to exit/enter school facilities	ma-WF-MCOE-241

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-MCOE-81	Wildfire	Impact	PPRO - Property Protection , SP - Structural Projects	**Mendocino County Office of Education**	Some school facilities may lack fire proofed building materials such as fire proof roofing.	ma-WF-MCOE-242
ps-WF-MC-116	Wildfire	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , SP - Structural Projects	**Mendocino County Office of Education**	Wildfire and the effects of wildfire present a threat to all school facilities in Mendocino County	ma-WF-MCOE-240

5.4.3.6 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through https://mitigatehazards.com/mendocino-county/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.

5.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

5.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity. (Cal. Adaptation Planning Guide, 2020, p. 94)

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (*Column 1, Status*)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (*Column 2, Current Mitigation Use*)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (*Column 3, Future Opportunity*)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

As a special district, the District is not eligible for the National Flood Insurance Program (NFIP), nor does it have repetitive loss properties; no statistics on NFIP participation are included in this annex.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

5.5.1.1 Planning and Regulatory Capabilities

Table 5-8: Planning and Regulatory Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Larger agencies have formal capital plans, smaller is more responsive than planned. The HMP will provide focus
Annual Fire Prevention Plan				Landscape maintenance, Fire suppression equipment at all sites
Seismic Safety Program (Non-structural)				Annual participation in Great Shakeout
Earthquake Modernization Plan (Building Safety)				Routine safety inspection include earthquake damage resistance/mitigation
Stormwater Management Program (Annual Inspections)				
Hazard Plans and Programs				
Floodplain Response Plan				
Community Wildfire Protection Plan (CWPP)				Participated in County funded Fire Vulnerability Assessment and Evacuation Plan listing schools sites and also school transportation resources
Ground Water Management Planning / Plans				
Climate Action Plan				
Drought Mgmt/ Contingency Plan				
FireWise Communities within District				County-wide and well as community councils
Hazard-Related Public Outreach Program				Public outreach activities for both the Wildfire vulnerability and Hazard Mitigation plans

5.5.1.2 Administrative and Technical Capabilities

Table 5-9: Administrative and Technical Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Administrative and Technical				
Staff Capacity				
Emergency Manager				Yes but with other duties as well
Civil Engineer				
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Grant Manager, Writer, or Specialist				Both grant writer and manager on staff
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				MendoAlert and Nixle.
Flood				Flood, wildfire, and geological hazard warning systems have no specific designated warning systems, but are covered under the general warning services listed above.
Wildfire				Flood, wildfire, and geological hazard warning systems have no specific designated warning systems, but are covered under the general warning services listed above.
Geological Hazards				Flood, wildfire, and geological hazard warning systems have no specific designated warning systems, but are covered under the general warning services listed above.

5.5.1.3 Financial Capabilities

Table 5-10: Financial Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval	N/A	N/A	N/A	
Utilities Fees			N/A	
System Development Fee	N/A	N/A		
General Obligation Bonds to Incur Debt	N/A	N/A		Large districts have active bond programs
Special Tax Bonds to Incur Debt	N/A	N/A		
Withheld Spending in Hazard-Prone Areas	N/A	N/A		
Stormwater Service Fees			N/A	
Capital Improvement Project Funding	N/A	N/A		Large districts have active bond programs

5.5.1.4 Education and Outreach

Table 5-11: Education and Outreach Capabilities Summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Updates to hazadous incidents are posted as banner on website
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				Great Shakeout participation
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				Web site includes news outlet.
Fire Safe Councils				Active in both the Wildfire Vulnerability and Evacuation Plan and Multi-Jurisdictional Hazard Mitigation Plan. Engaged with the county FireSafe Council
Resource Conservation Districts				
Other	N/A	N/A	N/A	

5.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 5-12 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

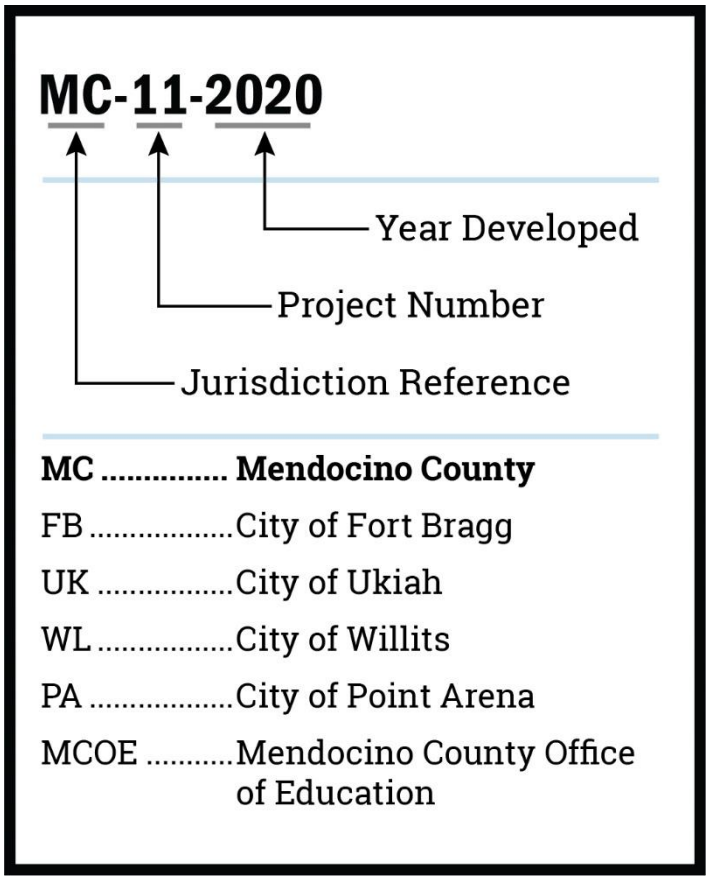


Figure 5-12: Mitigation Action Key

Each participating jurisdiction, including the Office of Education, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. Office of Education has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County-wide mitigation actions, the status, and additional notes for each action.

Table 5-12 lists each mitigation action for Office of Education. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 5-12 meets the regulatory requirements of FEMA and DMA 2000.

Table 5-12. Office of Education Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-MCOE-169	All Hazard	PE&A - Public Education & Awareness	Ongoing	2014	Mendocino County Office of Education	Integrate annual communications lists, which include amateur radio operators, into Emergency Operations Plan to mitigate communications failures during regional disasters.	County Office of Education and School Districts	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	Project	HMGP / BRIC	Medium	ps-AH-MCOE-180
ma-WF-MCOE-243	All Hazard	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Install back-up generators at essential district facilities that currently lack back up power generation.	Facilities Planning and Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	5%	HMGP / BRIC	High	ps-WF-MCOE-79, ps-CC-MCOE-90, ps-EW-MCOE-72
ma-AH-MCOE-255	All Hazard	PE&A - Public Education & Awareness	Pending	2020	Mendocino County Office of Education	Develop disaster warning system framework to disseminate information to districts, faculty, students, and families before, during, and after natural hazard events.	Office of Education	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	5%	HMGP / BRIC	High	ps-AH-MCOE-180
ma-DF-MCOE-256	Dam Failure	PE&A - Public Education & Awareness	Pending	2020	Mendocino County Office of Education	Participate in County-wide warning system program, detailed in MC-199 of Vol. 1 of this HMP, led by the County as a participating jurisdiction.	Mendocino County and Office of Education	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , FMA	High	ps-DF-MCOE-88
ma-DR-MCOE-229	Drought	NRP - Natural Resource Protection	Pending	2020	Mendocino County Office of Education	Replace sports fields with irrigated turf grass with artificial turf that doesn't require watering	Office of Education	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Medium	ps-DR-MCOE-63
ma-DR-MCOE-230	Drought	NRP - Natural Resource Protection	Pending	2020	Mendocino County Office of Education	Retrofit landscape with drought-tolerant plant species and ground cover to minimize water use.	Facilities Planning and Operations	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Project	HMGP / BRIC	Medium	ps-DR-MCOE-64
ma-DR-MCOE-232	Drought	NRP - Natural Resource Protection	Pending	2020	Mendocino County Office of Education	Develop a drought management/contingency plan to minimize the adverse impacts of drought on faculty, students, and facilities.	Office of Education	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	ps-DR-MCOE-62

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EQ-MCOE-249	Earthquake	PPRO - Property Protection	Pending	2020	Mendocino County Office of Education	Conduct seismic evaluations for buildings on AB300 List and buildings acquired by the district built prior to 1978 that have not been addressed.	Facilities Planning and Operations	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EQ-MCOE-86, ps-EQ-MCOE-87
ma-EQ-MCOE-250	Earthquake	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Complete DSA Retrofits for non-wood frame structures built before July 1, 1978 (Category 2 Buildings) on AB300 list that require detailed seismic evaluation.	Facilities Planning and Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-EQ-MCOE-86
ma-EQ-MCOE-251	Earthquake	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Repair and Seismically Upgrade, or remove from inventory, and Replace with permanent buildings, Portable Classrooms AND other essential facilities in portable structures. Structurally reinforce (by securing to the ground) certain portable classrooms for seismic conditions, where adequate per Code and cost-effective. Support additional portable classroom requirements in more cost-effective than permanent construction.	Facilities Planning and Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-EQ-MCOE-87, ps-EQ-MCOE-83, ps-EQ-MCOE-82
ma-EQ-MCOE-252	Earthquake	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Install seismic shut-off valves on gas fixtures on all school facilities.	Facilities Planning and Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EQ-MCOE-85, ps-EQ-MCOE-82, ps-EQ-MCOE-83
ma-EQ-MCOE-253	Earthquake	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Retrofit non-compliant suspended ceilings in district buildings. This includes Non-Structural Suspended Gypsum Dry-Wall & Cement Plaster Ceilings built 1950-1974.	Facilities Planning and Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-EQ-MCOE-82, ps-EQ-MCOE-83

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EQ-MCOE-254	Earthquake	ES - Emergency Services	Pending	2020	Mendocino County Office of Education	Draft and adopt an emergency operations plan that Identifies and plans for alternative transportation routes in case of natural disaster during school operating hours.	Transportation and Planning	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	Medium	ps-EQ-MCOE-84, ps-EQ-MCOE-82, ps-EQ-MCOE-83, ps-FL-MCOE-69, ps-FL-MCOE-70
ma-EW-MCOE-209	Extreme Weather	PPRO - Property Protection	Pending	2020	Mendocino County Office of Education	Implement a tree removal program for trees that are at a high risk to snapping in wind events (i.e. big cypress trees) around OoE facilities and infrastructure.	Mendocino County	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EW-MCOE-74, ps-DR-MCOE-66, ps-EW-MCOE-75
ma-FL-MCOE-245	Extreme Weather	PPRO - Property Protection	Pending	2020	Mendocino County Office of Education	Rehabilitate school site drainage systems.	Maintenance and Operations	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , FMA	High	ps-FL-MCOE-67, ps-EW-MCOE-71
ma-EW-MCOE-257	Extreme Weather	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Upgrade HVAC systems that are adequate to handle projected future temperature increases and heat waves.	Facilities and Maintenance	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Medium	ps-EW-MCOE-73
ma-FL-MCOE-247	Flood	PPRO - Property Protection	Pending	2020	Mendocino County Office of Education	Regrade selected sites to facilitate better drainage.	Facilities and Maintenance	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-FL-MCOE-67, ps-FL-MCOE-68
ma-FL-MCOE-248	Flood	PPRO - Property Protection	Pending	2020	Mendocino County Office of Education	Repair and maintain erosion on retention and detention basins for school sites.	Maintenance and Operations	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-FL-MCOE-68
ma-PN-MCOE-244	Pandemic	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Assess and institute necessary upgrades to critical facilities to allow for usage during pandemic, including adequately filtered ventilation, fresh air options and physical barriers.	Facilities and Operations	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-PN-MCOE-143

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-WF-MCOE-240	Wildfire	NRP - Natural Resource Protection	Pending	2020	Mendocino County Office of Education	Implement a defensible space program to include clearing of excessive fuels (trees, shrubs, brush) around school facilities and installation of landscaping materials that create defensible space.	Facilities and Maintenance	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , FP&S	High	ps-WF-MC-116, ps-DR-MCOE-65, ps-EW-MCOE-76
ma-WF-MCOE-241	Wildfire	PPRO - Property Protection	Pending	2020	Mendocino County Office of Education	Enhance building ventilation systems for wildfire smoke by improving air filtration options.	Maintenance and Operations	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FP&S	High	ps-WF-MCOE-80
ma-WF-MCOE-242	Wildfire	SP - Structural Projects	Pending	2020	Mendocino County Office of Education	Retrofit school facilities with fireproof building materials to better withstand potential impacts of wildfire.	Facilities and Operations	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FP&S	High	ps-WF-MCOE-81

Appendix O: Final Transmittals to County and State Library

City of Ukiah 2020 Urban Water Management Plan

City of Ukiah

June 25, 2021

California State Library
Government Publications Section
P.O. Box 942837
914 Capitol Mall
Sacramento, CA 95814

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

In accordance with the requirements of the UWMP Act and the California Water Code Section 10644(a)(1), we are hereby submitting one electronic (PDF) copy of the 2020 UWMP for the City of Banning on the attached CD. The 2020 UWMP has been prepared in accordance with the UWMP Act and was adopted by the City Council of Banning on June 8th, 2021.

No action is required; this is simply for the County's records as required by the UWMP Act. Please retain this CD copy for your records.

Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755

City of Ukiah

June 25, 2021

Carmel J. Angelo
Chief Executive Officer
Mendocino County
501 Low Gap Road, Room 1010
Ukiah, CA 95482

Subject: **City of Ukiah Urban Water Management Plan – 2020 Update**

Dear Ms. Angelo:

In accordance with the requirements of the UWMP Act and the California Water Code Section 10644(a)(1), we are hereby submitting one electronic (PDF) copy of the 2020 UWMP for the City of Banning on the attached CD. The 2020 UWMP has been prepared in accordance with the UWMP Act and was adopted by the City Council of Banning on June 8th, 2021.

No action is required; this is simply for the County's records as required by the UWMP Act. Please retain this CD copy for your records.

Sincerely,

Jarod Thiele
Management Analyst II
Public Works & Water Resources
300 Seminary Ave.
Ukiah, CA 95482
(707)-463-6755







WEST&ASSOCIATES
ENGINEERING, INC.