STATE OF CALIFORNIA
COUNTY OF MARIPOSA
BOARD OF SUPERVISORS

Resolution
No. 2014-353

A resolution approving a Drought Preparedness Plan for Mariposa County

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WHEREAS, the State of California has declared a statewide Drought Emergency; and

WHEREAS, Mariposa County has declared a Local Drought Emergency; and

WHEREAS, it is in the public's interest to adopt a Drought Preparedness Plan; and

WHEREAS, a draft plan has been prepared and reviewed by the Board of Supervisors; and

WHEREAS, the drought preparedness plan is not intended to be utilized for regulatory purposes;

NOW BE IT THEREFORE RESOLVED THAT, the Board of Supervisors of the County of Mariposa does hereby approve a Drought Preparedness Plan. This plan shall be updated as necessary in the future.

ON MOTION BY Supervisor Bibby, seconded by Supervisor Carrier, this resolution duly passed and adopted this 15th day of July, 2014 by the following vote:

AYES: Stetson, Jones, Bibby, Cann, Carrier
NOES: None
EXCUSED: None
ABSTAIN: None

Kevin Cann, Chair
Mariposa County Board of Supervisors

ATTEST:

René LaRoche
Clerk of the Board of Supervisors

APPROVED AS TO FORM:

Steven W. Dahlem
County Counsel

ATTACHMENT 1
Drought Preparedness Plan

MARIPOSA COUNTY

Photo Credit: Pat Garcia

Drought Preparedness Plan

July 15, 2014

Adopted by Mariposa County Board of Supervisors Resolution No. 2014-353

Executive Summary

Calendar year 2013 closed as the driest year in recorded history for many areas of California, and the severe drought is continuing this year.

On January 17, Gov. Edmund G. Brown Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response. On April 25, Governor Brown asked all Californians to redouble their efforts to conserve water, instructed agencies to cut red tape to get water to farmers more quickly, ensure that people have safe drinking water, protect vulnerable wildlife species and prepare for an extreme fire season.

Read the executive order at http://gov.ca.gov/news.php?id=18496.

For California as a whole, 2013 was the driest year on record. From the period July 1, 2013 to February 14, 2014, the state-wide average precipitation value was just 4.54 inches. Normal rainfall for the period is 16.52 inches.

The drought conditions have resulted in loss or substantial reduction of available surface and ground water available for domestic and agricultural uses, discussions regarding re-allocation of water resources statewide, reduction in air quality, a decrease in the snow and water-related tourism activity in the Sierras, and an unprecedented increase in fire danger to Sierra foothill communities.

The majority of Mariposa County's rural residents rely on private on-site wells for their domestic water source. The responsibility for development and maintenance of private wells in the county lies with the property owner. Groundwater supplies for rural development are found in fractures in the bedrock, and the costs associated with drilling and developing a private well is highly variable. It is unknown how much, if any water can be found within the fractures underlying any parcel and there is no guarantee potable water of adequate quality or quantity for development can be found on any parcel.

There are also a number of public drinking water systems in Mariposa County, managed and maintained by "water purveyors". These systems serve residents, guests and business interests in communities, on commercial developed property outside of communities, and in more densely developed residential areas outside of communities. These systems are maintained by Federal Government agencies, State Government agencies, Mariposa County, private and mutual water companies, and individuals. There are currently 63 Public Drinking Water Systems in the County, operating under permits from the State Department of Public Health.

Agricultural properties in the county rely on private on-site wells and surface water for crop irrigation and livestock.

Historically, Mariposa County has been subject to multi-year dry periods, and individual residents, owners of agricultural properties, and "water purveyors" have developed strategies to adjust to

anticipated droughts. Some purveyors have developed their own drought plan.

This Drought Preparedness Plan (Phase 1) is intended to provide information to water purveyors, business owners (including agricultural businesses) and county residents, to assist them in responding to the current drought and future droughts. It is noted that purveyors and individuals will all be affected differently by the drought, depending on their particular supply sources.

The public health impacts associated with drought will be addressed in a subsequent document, a Drought Response Plan, currently being prepared by the Health Department, which will specifically focus on public drinking water systems and grey water.

The Draft Plan contained in this packet is labeled as a "Phase 1" Plan. When the Drought Response Plan is completed by the Health Department, it should be referenced or incorporated into this Drought Preparedness Plan.

The Concept of Drought

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate.

Drought is an insidious hazard of nature. Although it has scores of definitions, it originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal". It is also related to the timing (i.e., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness (i.e., rainfall intensity, number of rainfall events) of the rains. Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity.

Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply. Recent droughts in both developing and developed countries and the resulting economic and environmental impacts and personal hardships have underscored the vulnerability of all societies to this "natural" hazard.

Information excerpted from the National Drought Mitigation Center, University of Nebraska, Lincoln.

Photo Credit: Lauren Hubert

Introduction and Purpose

Dry periods and drought are a way of life for Central Sierra California, including residents, businesses and guests of Mariposa County. Local water purveyors understand the need to prevent problems associated with drought, thus most purveyors have more than one supply source to rely on when shortages occur.

The purpose of this plan is to identify both proactive and reactive things that the county's water purveyors and private well users may do, on a voluntary basis, to address the current drought and future droughts. These recommendations may differ from mandatory restrictions or provisions which individual water purveyors institute for their service area.

This plan will be updated as needed, including when the Health Department's Drought Response Plan is published.

Photo Credit: Lauren Hubert

Related Planning Project: IRWM

The California IRWM (Integrated Regional Water Management) Grant Program is designed to encourage integrated regional strategies for management of water resources and to provide funding for implementation projects that support integrated water management. The Mariposa County Regional Water Advisory Committee (RWAC) developed the Yosemite-Mariposa (Y-M) Integrated Regional Water Management (IRWM) Plan for Mariposa County and projects identified within the IRWM Plan will be eligible to apply for IRWM Grant funding.

As a result of the current state-wide drought in California, the 2014 IRWM Drought Guidelines were issued. Mariposa County is submitting grant applications for funding for a number of water supply projects identified in the IRWM Plan. The need for these water supply projects is intensified by the current drought conditions.

The adoption and implementation of a Drought Preparedness Plan is one review component for the Grant Program. Having an adopted Drought Preparedness Plan will help Mariposa County's projects score higher; making them more eligible for funding.

Related Committees or Agencies

RWAC Technical Advisory Committee: The Yosemite-Mariposa Integrated Regional Water Management (IRWM) process "created" a Water Shortage/Drought Preparedness Planning Technical Advisory Committee comprising staff from the local water purveyors. This group helped shape the regional plan (IRWM Plan), and may serve in an advisory capacity for future decisions and discussions related to the impacts of the current drought.

Mariposa County Water Agency: The Mariposa County Water Agency was established by the state legislature in 1959 to provide the legal framework necessary for the conservation, development, control and use of water for the public good and for the protection of the life and property of those within the exterior boundaries of Mariposa County and outside the boundaries of Yosemite National Park. The Water Agency, as a political and corporate body, has the ability to enter into contracts for water supply, to control flood and storm waters, to store water, to contract for the sale and use of falling water for electric energy, and to purchase, lease or acquire water and water rights. The Water Agency may also develop facilities for sewage, waste and storm water, and may contract with other districts to carry out its purposes and powers.

No significant water projects have been completed by the County Water Agency itself, although it has funded many projects through loans to other agencies, including the Coulterville Sewer (bond), the Yosemite West Maintenance district, the Mariposa Public Utilities District, Yosemite Alpine Community Services District and the Coulterville Service Area.

Background Information

This section contains information about rainfall, past droughts, current water demand and supplies and changes which have occurred since the last prolonged drought.

Rainfall

Average annual precipitation in Mariposa County varies from 20"- 39" near the town of Mariposa to a maximum of about 50" at the uppermost elevations of the Sierra Mountains. See Figure 1 for Mariposa County's historic precipitation levels and rainfall statistics.

Figure 1

Mariposa County Rainfall Statistics

Most Rainfall in a Year:
1997-2012: 55.75'' in Mariposa (1997 was the worse flood year in the last 200 years.)

Wettest Month:
December 1997: 21.36'' in Mariposa

Biggest Storm Event:
January 1997: Highest flow in Merced River in approximately 150 years—89,000 cfs (cubic feet per second- about 40 million gallons per minute) flowed into Lake McClure

Driest Year:
1877: 4.49 inches in Mariposa

Photo Credit: K. Williams

Mariposa County Hydrology

The western portion of the County is relatively flat, with gently rolling hills that gradually increase

toward the east. Elevations begin around 300 feet in western areas of the County, and rise to nearly 11,000 feet in the east. Most inhabited regions are below 5,000 feet.

Precipitation varies between the lower elevations in the western and southern portions of the County and the higher elevations in the eastern and northern portions of the County. Average precipitation ranges from about 15 inches annually in the lower elevations to about 50 inches at the higher elevations. Most of the annual precipitation falls between November and late April. Precipitation at the lower elevations occurs mainly in the form of rainfall with snowfall becoming the dominant form at the higher elevations. Melting of the winter snowpack at the higher elevations becomes the major source of runoff to the Merced River during the spring and summer months.

Mariposa County contains three major drainage basins: the Merced River, Chowchilla/Fresno River, and a localized cluster of streams of the east valley known as the Lower Mariposa group of streams. These three basins and their component watersheds are part of the much larger San Joaquin River system that drains the western slopes of the Sierra Nevada.

All three basins contain significant acreage managed by the Bureau of Land Management (BLM), United States Forest Service (USFS) and the National Park Service (NPS). The lower portions of the three basins contain significant watershed acreage managed by BLM. Most of this land is subject to grazing, and much of the precipitation falls as rain. At higher elevations, however, the NPS manages considerable acreage of pristine forests, riparian woodlands, meadows, and exposed rock strata in Yosemite National Park that act as sources of both surface waters and groundwater recharge. Much of the precipitation on NPS lands falls in the form of snow, which in wet years, produces significant snowpack.

The two national forests in Mariposa County are the Sierra and Stanislaus, administered by the Forest Service. In contrast to NPS, USFS manages relatively small areas of both the middle and upper portions of the Merced River basin and the upper portions of the Chowchilla/Fresno River basin for purposes of “Multiple Use”: grazing, mining, recreation, timber, water and wildlife.

Most of the surface water rights in Mariposa County are owned by jurisdictions from outside the county, the major owner being the Merced Irrigation District (MID). The MID delivers water to agricultural uses in the Central Valley.

In the south of the county, the Madera Irrigation District appropriates Merced River Basin water based on a court settlement and pre-1914 water rights to Big Creek. The Big Creek Diversion operated by the Madera Irrigation District conveys water across the Merced River Basin/Chowchilla River Basin divide in a ditch and flume system. According to the County of Mariposa, the surface water rights to the Chowchilla River Basin are fully appropriated, "and water rights may not be available.” (County of Mariposa, General Plan Volume III Technical Background Reports, 2006).

Importance of Rainfall to Water Supplies

Local surface and ground water supplies are dependent on precipitation for recharge. An indicator of local hydrologic conditions is the level of storage in Lake McClure. High reservoir storage levels result

from wet periods or even just one wet year. Low reservoir storage results from years or low precipitation.

Past Droughts

Historical records show that local drought periods of several years or more are cyclical, recurring about every forty years. Tree ring studies covering time periods of several centuries reveal apparent droughts lasting as long as 16 years or more. Past records show droughts in Mariposa County have lasted an average of five years.

Supply

Groundwater (supplying private and water purveyor wells) and surface water are the most widely used supplies in Mariposa County.

Like many mountainous areas of California, the majority of Mariposa County's groundwater originates from cracks or fractures in hard rocks, such as granite, greenstone, and basalt (only Yosemite Valley has a "groundwater basin", where ground water is encountered at predictable levels). This ground water does not actually penetrate the rocks, because there is no pore space between the grains of the rock. However, some of these rocks have fractures in them. These fractures store water and yield small amounts of water to wells that intersect the fractures. Some sedimentary rocks, like sandstone, are hard but can still absorb some water into their pores. The cracks or fractures are fed by runoff and snowmelt.

County Drought Actions

The following section provides voluntary actions that may be undertaken by water purveyors, residents, business owners, and visitors during a drought. These actions are organized into the following:

- Methods to Increase Existing Supplies
- Methods to Increase Efficiency and Reduce Use
- Modifications to Operations
- Cooperative Efforts with Other Agencies
- Demand Reduction Actions
- Public Outreach

Methods to Increase Existing Supplies – Residential and Commercial Uses

- Install more water storage, so that pumping can be done during times of lower demand.
- Bring more wells into water purveyor system – either new wells or existing wells.

Methods to Increase Efficiency and Reduce Water Use - Residential Uses

Laundry room

- Use the washing machine for full loads only.
- Install a water-efficient clothes washer (save up to 16 gallons/load).

- Wash dark clothes in cold water (will help clothes retain their color as well).

Kitchen

- Run the dishwasher only when full.
- Install a water- and energy-efficient dishwasher (save 3 to 8 gallons/load).
- Install aerators on the kitchen faucet (reduce flows to less than 1 gallon per minute).
- When washing dishes by hand, don't let the water run. Fill one basin with wash water and the other with rinse water.
- Use the dishwasher instead of washing dishes by hand. Dishwashers typically use less water than hand washing dishes.
- If your dishwasher is new, cut back on pre-rinsing dishes before loading them. Newer models clean more thoroughly than older ones.
- Soak pots and pans instead of letting the water run while you scrape them clean.
- Use the garbage disposal sparingly. Instead, compost vegetable food waste.
- Wash fruits and vegetables in a pan of water instead of running water from the tap.
- Don't use running water to thaw food. Defrost food in the refrigerator.
- Keep a pitcher of drinking water in the refrigerator instead of running the tap for cold water.
- Cook food in as little water as possible. This also helps it retain more nutrients.
- Select the proper pan size for cooking. Large pans may require more cooking water than necessary.
- If ice cubes are dropped on the flood, don't throw them in the sink. Drop them in a house plant instead.
- Collect the water used for rinsing fruit and vegetables. Use it to water house plants or yard plants.

Bathroom

- Install low-flow shower heads (save up to 2.5 gallons per shower).
- Take five minute showers instead of 10 minute showers (save 12.5 gallons with a low flow showerhead or 25 gallons with a standard 5.0 gallon per minute showerhead).
- Take a (short) shower instead of a bath. A bathtub can use up to 70 gallons of water.
- Fill the bathtub halfway or less (save 12 gallons or more per bath).
- When running a bath, plug the bathtub before turning on the water. Adjust the temperature as the tub fills.
- Install aerators on bathroom faucets (save up to 1.2 gallons per person/day).
- Turn water off when brushing teeth or shaving (save approximately 10 gallons/day).
- Install a high-efficiency toilet (save 19 Gallons per person/day).
- Don't use the toilet as a wastebasket.
- Test your toilet for leaks regularly (at least once a year). Put food coloring in your toilet tank. If it seeps into the bowl without flushing, there's a leak. Fix it and save gallons of water per day.
- Install a dual-flush toilet. It has two flush options: a half-flush for liquid waste and a full-flush for solid waste.
- Plug the sink instead of running the water to rinse your razor (save up to 300 gallons a month).
- Turn off the water while washing your hair (save up to 150 gallons a month).

- When washing your hands, turn the water off while you lather.

Outside

- Water early in the morning or later in the evening when temperatures are cooler (save up to 25 gallons/watering).
- Check sprinkler system frequently and adjust sprinklers so only needed areas are watered (save up to 15 gallons/watering).
- Choose a water-efficient irrigation system such as drip irrigation for your trees, shrubs, and flowers (save up to 15 gallons/watering).
- Water deeply but less frequently.
- Put a layer of mulch around trees and plants to reduce evaporation. Organic mulch also improves the soil and prevents weeds. Save up to 30 gallons per 1,000 sq. ft./watering.
- Plant drought-resistant trees and plants. Save up to 60 gallons per 1,000 sq. ft./watering.
- Choose the correct plants for the climate and location in yard (microclimate).
- Do not overwatering landscapes.
- Invest in a weather-based irrigation controller—or a smart controller to automatically adjust the watering time and frequency based on soil moisture, rain, wind, and evaporation and transpiration rates.
- Wash vehicles less often; use a commercial car wash that recycles water.
- Install a water-saving pool filter for swimming pools.
- Lower pool water level to reduce amount of water splashed out.
- Channel splashed-out pool water onto landscaping.
- Use pool filter backwash for landscape irrigation.
- Use a pool cover to reduce evaporation when pool is not being used.
- Sweep or blow paved areas to clean, rather than hosing off.

Methods to Increase Efficiency and Reduce Water Use – Commercial Uses

Interior

- Post conspicuous notices in lodging facilities encouraging conservation.
- Install ultra-low flow toilets, or adjust flush valves or install dams on existing toilets.
- Install faucet aerators and high efficiency showerheads.
- Use water-conserving ice makers.
- As appliances and equipment wear out, replace them with water-saving models.
- Detect and repair all leaks in supply and distribution lines.
- Minimize the water used in cooling equipment in accordance with manufacturer's recommendations. Shut off cooling units when not needed.
- Turn off dishwashers when not in use. Wash full loads only.
- Scrape rather than rinse dishes before washing.
- Use water from steam tables to wash down cooking areas.
- Do not use running water to melt ice or frozen foods.
- Handle waste materials in a dry state whenever possible.

- Wash only full loads of laundry or select the appropriate washing cycle provided on the washing machine. Use rinse water / recycle system. Consider purchasing high efficiency equipment.

Exterior

- Wash commercial vehicles less often; use a commercial car wash that recycles water.
- Install a water-saving pool filter for swimming pools.
- Lower pool water level to reduce amount of water splashed out.
- Channel splashed-out pool water onto landscaping.
- Use pool filter backwash for landscape irrigation.
- Use a pool cover to reduce evaporation when pool is not being used.
- Sweep or blow paved areas, sidewalks, driveways and parking lots to clean, rather than hosing off.
- Do not water landscape every day; two-to-three times a week is usually sufficient.
- Avoid plant fertilizing and pruning that would stimulate excessive growth.
- Remove weeds and unhealthy plants so remaining plants can benefit from the water saved.
- In many cases, older, established plants require only infrequent irrigation. Look for indications of water need, such as wilting, change of color, or dry soils.
- Install soil moisture overrides or timers on sprinkler systems. Time watering, when possible, to occur in the early morning or evening when evaporation is lowest.
- Make sure irrigation equipment applies water uniformly. Install drip irrigation systems.
- Mulch around plants to reduce evaporation and discourage weeds.
- Remove thatch and aerate turf to encourage the movement of water to the root zone.
- Avoid runoff and make sure sprinklers cover just the lawn or garden, not sidewalks, driveways, or gutters.
- Replace traditional landscaped areas with xeriscaping or hardscape landscaping (using areas of decorative rocks or mulch instead of ground cover)

General

- Designate a water efficiency coordinator on staff to monitor water use and waste and to coordinate all efficiency efforts.
- Develop a mission statement and a plan for water use efficiency.
- Educate and involve employees in water efficiency efforts. Increase employee awareness of water conservation.
- Seek employee suggestions on water conservation; locate suggestion boxes in prominent areas.
- Conduct contests for employees for improved conservation ideas and efforts.
- Install signs encouraging water conservation in employee and customer restrooms.
- When cleaning with water is necessary, use budgeted amounts.
- Read water meter weekly to monitor success of water conservation efforts.
- Develop a water use plan to determine and monitor the quantity and purpose of water being used for various aspects of business operation.

Building Maintenance

- Check water supply and distribution system for leaks. Fix leaks as soon as they are detected.
- Repair dripping faucets, showers and continuously running or leaking toilets.
- Install flow reducers and faucet aerators in all plumbing fixtures whenever possible.
- Reduce the water used in toilet flushing by either adjusting the vacuum flush mechanism or installing toilet tank displacement devices (dams, bottles, or bags).
- Replace appliances and fixtures with water-saving models.
- Shut off water supply to any areas / rooms not in use.
- Minimize water used in cooling equipment, such as air compressors, in accordance with the manufacturer recommendations.
- Reduce the load on air conditioning units by shutting air conditioning off when and where it is not needed.
- Keep hot water pipes insulated.
- Avoid excessive boiler and air conditioner blow down. Monitor total dissolved solids levels and blow down only when needed.
- Instruct clean-up crew to use less water for mopping.
- Switch from wet or steam carpet cleaning methods to dry powder methods.
- Change window cleaning schedule from periodic to an on-call/as required basis.

Kitchens

- Turn off the continuous flow used to clean the drain trays of the coffee/milk/soda beverage island; clean the trays only as needed.
- Turn dishwasher off when not in use. Wash full loads only.
- Replace spray heads to reduce water flow. If necessary, use ponded water.
- Use water from steam tables to wash down cooking area.
- Do not use running water to melt ice or frozen foods.
- Use water-conserving ice makers.
- Recycle water where feasible, consistent with state and county requirements.
- Recycle rinse water from the dishwater or recirculate it to the garbage disposer.
- Presoak utensils and dishes in ponded water instead of using running water rinse methods.
- Wash vegetables in ponded water; do not let water run in preparation sink.

Bar

- Do not use running water to melt ice in the sink strainers.

Laundry Facilities

- Reprogram machines to eliminate a rinse or suds cycle, if possible and if not restricted by health regulations.
- Reduce water levels, where possible, to minimize water required per load of washing.
- Wash full loads only.
- Evaluate wash formula and machine cycles for water use efficiency.

Agriculture

- Check all portions of water system to eliminate leaks.
- Increase water storage as permitted.
- Use floats on water troughs.
- Do not wash vehicles.
- Eliminate irrigated grounds until drought is over.

Photo credit: K. Williams

Cooperative Efforts

- Research grant and other funding opportunities for local water supply and storage projects.
- Apply for grant funding for local water supply and storage projects.
- Convene meetings of the RWAC's Regional Water Shortage/Drought Preparedness Technical Advisory Committee (TAC) to coordinate local efforts and communication with water purveyors during the on-going drought.

Demand Reduction Actions

- Water purveyors could develop scaled billing rates to encourage conservation.
- Water purveyors could develop financial incentive programs to encourage fixture replacement with high efficiency models.

Public Outreach

The County, water purveyors and/or the Technical Advisory Committee could hold public workshops or

meetings, develop flyers for distribution, put educational notices in local newspapers (including on-line papers), develop a website, or have public service announcements on local radios to:

1) educate water users and managers about proactive and reactive steps to take during the drought,
2) conduct education programs in coordination with schools
2) obtain feedback from water users and managers,
3) keep the community informed about current drought conditions,
4) coordinate future emergency actions necessary to respond to the drought, and
5) other purpose as needed.