

TECHNICAL MEMORANDUM

**Groundwater Planning Considerations
and
Review of Napa County Groundwater
Ordinance and Permit Process**

Prepared for:
Napa County

January, 2011



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Figure 1

Follows text

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1. Napa County General Plan – Conservation Element Section on Water Resources Goals, Policies and Action Items
2. California Water Code – Groundwater Management Act (Sections 10750 - 10755.4)
3. SBX2-1, Integrated Regional Water Management Planning Act (Water Code Sections 10530 *et seq.*)
4. California Department of Water Resources, Integrated Regional Water Management (IRWM) Guidelines
5. California Department of Water Resources, California’s Groundwater, Bulletin 118, Update 2003, Appendix C, Recommended and Required Components of Local Groundwater Management Plans
6. California Department of Water Resources, California’s Groundwater, Bulletin 118, Update 2003, Appendix D, Groundwater Management Model Ordinance
7. SBX7-6, California Statewide Groundwater Elevation Monitoring Program (CASGEM)
8. Neighboring County Groundwater Management Plans and Ordinances
9. Napa County Codes (Chapters 13.04, 13.12 and 13.15), Water Availability Analysis Policy Report (August 2007), and Well Construction Application

1.0 Introduction

Groundwater and surface water are highly important natural resources in Napa County. Collectively, County entities along with numerous others, including municipalities, water districts, commercial and industrial operations, the agricultural community, and the public, are stewards for the water resources available to Napa County. The Napa County community actively supports and invests in its water resources to sustain agricultural productivity. Concurrently, municipal and private stakeholders are actively engaged in assessing the development and reliability of current and additional water supplies. Important sources include both groundwater and surface water of good quality, to meet future urban and rural water demands. Similar to other areas in California, the County faces many future water-related challenges including:

- Increased competition for available supplies,
- Preserving the quality and availability of imported water supplies,
- Sustaining groundwater supplies,
- Additional challenges arising during drought conditions, and
- Changes in long-term availability due to global warming and/or climate change.

To address these challenges, long-term, systematic monitoring programs are essential to provide data that allow for improved evaluation of water resources conditions and availability to facilitate effective water resources planning. Established groundwater and surface water monitoring networks result in the collection of data necessary to distinguish long-term trends from short-term fluctuations, anticipate unintended consequences due to current and historical land uses, identify emerging issues, and design appropriate water resources planning and management strategies. In 2009, Napa County embarked on a countywide project referred to as “Comprehensive Groundwater Monitoring Program, Data Review, and Policy Recommendations for Napa County’s Groundwater Resources” (Comprehensive Groundwater Monitoring Program) to meet identified action items in the 2008 General Plan update. The program emphasizes developing a sound understanding of groundwater conditions and implementing an expanded groundwater monitoring and data management program as a foundation for future coordinated, integrated water resources planning and dissemination of water resources information.

The focus of this Memorandum is on a review of Groundwater Planning Considerations and the County’s Groundwater Ordinance and Permit Process in the context of the County’s General Plan goals and policies, and future steps towards integrated regional water planning that ensures sustainability for all of the County water resources. This Memorandum describes the following:

- Purpose of this Memorandum;
- Summarizes background information;
- The study of water supply and demand projections to 2050;
- The County’s General Plan goals and policies related to water resources;
- Other tasks completed as part of the Comprehensive Groundwater Monitoring Program;

- The assessment of stakeholder interviews regarding the feasibility of a collaborative groundwater data gathering effort in Napa County (Center for Collaborative Water Policy and California State University Sacramento, 2010);
- Overview of the statewide groundwater management plan process and associated water resource planning activities and guidance documents;
- Summarizes groundwater management programs and related ordinances in neighboring counties;
- Reviews the County's Groundwater Ordinance and permit process;
- Provides recommendations to the County regarding the development of a countywide groundwater sustainability plan and/or coordinated individual plans that might be developed through coordination among one or more entities in the County; and
- Recommends that the County apply to become the lead entity in the State's groundwater elevation monitoring program (CASGEM) and assume monitoring functions that contribute to the new statewide monitoring effort.

2.0 Purpose

2.1 Napa County General Plan -- Water Resources Goals and Policies

As recognized in the County's General Plan (2008, amended June 23, 2009), "water is one of the most complex issues related to land use planning, development, and conservation; it is governed and affected by hundreds of federal, state, regional, and local mandates pertaining to pollution, land use, mineral resources, flood protection, soil erosion, reclamation, etc. Every year, the state legislature considers hundreds of bills relating to water issues, and in Napa County, more than two dozen agencies have some say in decisions and regulations affecting water quality and water use."

As part of the General Plan update in 2008, and within the Conservation Element, six goals are set forth relating to the County's water resources, including surface water and groundwater. Complementing these goals are twenty-eight policies and ten water resources action items (one of which is "reserved" for later description). The County's six water resources goals are included below (the entire group of water resources goals, policies, and action items is included in **Appendix 1**).

Goal CON-8: Reduce or eliminate groundwater and surface water contamination from known sources (e.g., underground tanks, chemical spills, landfills, livestock grazing, and other dispersed sources such as septic systems).

Goal CON-9: Control urban and rural storm water runoff and related non-point source pollutants, reducing to acceptable levels pollutant discharges from land-based activities throughout the county.

Goal CON-10: Conserve, enhance and manage water resources on a sustainable basis to attempt to ensure that sufficient amounts of water will be available for the uses allowed by this General Plan, for the natural environment, and for future generations.

Goal CON-11: Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urbanized areas and ensure that land use decisions recognize the long-term availability and value of water resources in Napa County.

Goal CON-12: Proactively collect information about the status of the County's surface and groundwater resources to provide for improved forecasting of future supplies and effective management of the resources in each of the County's watersheds.

Goal CON-13: Promote the development of additional water resources to improve water supply reliability and sustainability in Napa County, including imported water supplies and recycled water projects.

Key General Plan Action Items related to the focus of this Memorandum include:

Action Item CON WR-1: Develop basin-level watershed management plans for each of the three major watersheds in Napa County (Napa River, Putah Creek, and Suisun Creek). Support each basin-level plan with focused sub-basin (drainage-level) or evaluation area-level implementation strategies, specifically adapted and scaled to address identified water resource problems and restoration opportunities. Plan development and implementation shall utilize a flexible watershed approach to manage surface water and groundwater quality and quantity. The watershed planning process should be an iterative, holistic, and collaborative approach, identifying specific drainage areas or watersheds, eliciting stakeholder involvement, and developing management actions supported by sound science that can be effectively implemented. [Implements Policies 42 and 44]

Action Item CON WR-4: Implement a countywide watershed monitoring program to assess the health of the County's watersheds and track the effectiveness of management activities and related restoration efforts. Information from the monitoring program should be used to inform the development of basin-level watershed management plans as well as focused sub-basin (drainage-level) implementation strategies intended to address targeted water resource problems and facilitate restoration opportunities. Over time, the monitoring data will be used to develop overall watershed health indicators and as a basis of employing adaptive watershed management planning. [Implements Policies 42, 44, 47, 49, 63, and 64]

Action Item CON WR-6: Establish and disseminate standards for well pump testing and reporting and include as a condition of discretionary projects that well owners provide to the County upon request information regarding the locations, depths, yields, drilling and well construction logs, soil data, water levels and general mineral quality of any new wells. [Implements Policy 52 and 55]

Action Item CON WR-7: The County, in cooperation with local municipalities and districts, shall perform surface water and groundwater resources studies and analyses and

work toward the development and implementation of an integrated water resources management plan (IRWMP) that covers the entirety of Napa County and addresses local and state water resource goals, including the identification of surface water protection and restoration projects, establishment of countywide groundwater management objectives and programs for the purpose of meeting those objectives, funding, and implementation. [Implements Policy 42, 44, 61 and 63]

Action Item CON WR-8: The County shall monitor groundwater and interrelated surface water resources, using County-owned monitoring wells and stream and precipitation gauges, data obtained from private property owners on a voluntary basis, data obtained via conditions of approval associated with discretionary projects, data from the State Department of Water Resources, other agencies and organizations. Monitoring data shall be used to determine baseline water quality conditions, track groundwater levels, and identify where problems may exist. Where there is a demonstrated need for additional management actions to address groundwater problems, the County shall work collaboratively with property owners and other stakeholders to prepare a plan for managing groundwater supplies pursuant to State Water Code Sections 10750-10755.4 or other applicable legal authorities. [Implements Policy 57, 63 and 64]

Action Item CON WR-9.5: The County shall work with the SWRCB, DWR, DPH, CalEPA, and applicable County and City agencies to seek and secure funding sources for the County to develop and expand its groundwater monitoring and assessment and undertake community-based planning efforts aimed at developing necessary management programs and enhancements.

The review and recommendations included in this Memorandum are aimed at achieving the goals and action items contained in the County's General Plan update. As discussed later in the report, potential revisions to the County's Groundwater Ordinance (Groundwater Conservation Ordinance) may provide conformance, valuable data, and a clearer link to conservation policies and goals of the General Plan.

2.2 Groundwater Monitoring Program Overview

The Comprehensive Groundwater Monitoring Program will provide the County a scientifically based assessment and facilitate effective groundwater planning as defined and promoted by the California Department of Water Resources (DWR). The Program will also serve as the foundation for effective and fair implementation of current and future County policies embodied in ordinances and permits related to groundwater. To establish the important link between the recommended monitoring program, groundwater sustainability actions, and the County's Groundwater Ordinance, an overview of California groundwater management history and related state legislation is presented in this Memorandum.

2.3 Groundwater Management Neighboring Counties

This Memorandum includes an overview and summary of neighboring County efforts toward development of groundwater management plans and associated activities. As part of this

assessment, recommendations have been developed regarding the future development of a groundwater sustainability plan and/or coordinated individual plans that might be developed by one or more entities in the County.

2.4 Review of Existing County Groundwater Ordinance and Permit Process

The purpose of this work was to review the County's Groundwater Ordinance in the context of the County's goals and policies for protection and conservation of water resources and to provide recommendations on potential improvements. This task also involved review of the County's existing groundwater well permit application process and how conditions are imposed on projects that affect groundwater resources. The review included an assessment of the County's Water Availability Analysis application forms and recommendations on how to best integrate permit conditions (e.g., monitoring actions) with the County's Comprehensive Groundwater Monitoring Program and related General Plan policies to a broad-scale long-term evaluation of the County's groundwater resources (i.e., regional hydrology, trends in groundwater levels and quality, and recharge sources and mechanisms).

3.0 Background

3.1 2050 Water Resources Study

In October 2005, the *2050 Napa Valley Water Resources Study* (2050 Study) was completed by West Yost & Associates (WYA) on behalf of numerous local entities, including the Napa County Flood Control & Water Conservation District, City of Napa, City of American Canyon, Town of Yountville, City of St. Helena, City of Calistoga, and the Napa Sanitation District. The purpose of the study was to summarize the planning assumptions and criteria that had previously been used to develop the key findings and recommendations in previous 1991 and 1992 studies related to water resources in Napa County.

The Study was limited to the Napa Valley Plan and focused on the Milliken-Sarco-Tulucay (MST) area. Following review of the historical studies, WYA used baseline data to update and reevaluate the applicability and validity of previous assumptions, findings, and recommendations. The overall study described the historical municipal and industrial (M&I) water demands for the Napa County incorporated municipal areas to project those demands to the year 2050 (based on currently available information and adopted General Plans prior to 2005), and compared the projected demands to the demands projected in the earlier studies.

The 2050 Study was based on data received from the various agencies and other sources (and used a combination of population projections and land-use projections to estimate the potential future water demands. For many of the entities, "build-out" of the developable areas as specified in the approved and adopted General Plans was anticipated to occur prior to the year 2050 (end of the evaluation period for the study). Because of the possibility that the currently adopted General Plan boundaries studied may be expanded in the future, or that additional densification of urban areas (and corresponding increased water demand) may occur, during the latter years of the study period a nominal growth in population was anticipated following the build-out of each

municipality's General Plan (with the exception of the Town of Yountville, which was held at buildout) (WYA, 2005).

The 2050 Study document was included as an appendix in the County's 2008 General Plan environmental impact documentation and incorporated by reference into the County's adopted General Plan (Napa County, 2008). While it was recommended that the study be periodically updated at about 5-year intervals to update supply and demand information, the results of the 2050 Study illustrate the need for integrated water resources planning on a countywide basis. Based on estimated surface and groundwater supply availability (the certainty of which was constrained in many areas due to data limitations), the study indicated supply deficits for the Main Basin (includes the incorporated and unincorporated areas in the vicinity of Calistoga, St. Helena, Yountville, Napa, and American Canyon) for multiple and single-dry water years, and projected deficits for 2020 and 2050 for all water year types. Current and projected demands for the MST and the Carneros areas showed supply deficits for 2020 and 2050 during normal water years; estimates were not made for multiple and single-dry water years for these areas. These projected increases should be reevaluated in the future in coordination with data collected as part of the countywide groundwater monitoring program.

3.2 Overview of Napa County Comprehensive Groundwater Monitoring Program

The Comprehensive Groundwater Monitoring Program is concerned with gathering available water-related data from local, state and federal entities, cross-correlating ancillary data (e.g., well construction information and geologic and subsurface hydrogeologic features) to improve the County's understanding of groundwater occurrence and conditions county-wide. Baseline water level and water quality data are necessary to assess groundwater conditions and to develop a centralized water resources data management system to efficiently and effectively guide planning to provide long-term protection and conservation of the County's groundwater resources.

The program objectives include:

- Compiling available historical monitoring data (including water level records and selected groundwater quality records). Data collection for purposes of this program focused on overall groundwater quality conditions, i.e., point source data for local contamination investigations were generally not a focus of this project.
- Developing and implementing a Data Management System for ongoing, centralized storage of water resources data that would be annually updated with data from cooperating entities, exchanged with area cooperators, state and federal agencies, and (with appropriate security tiers) accessible to the public (LSCE, 2010a).
- Reviewing existing groundwater level and quality monitoring network(s) and initially "qualifying" the wells such that the collected data are representative of the portion of the aquifer system of interest.

- Performing a critical review and evaluation of selected available data (particularly groundwater data) to determine adequacy and accuracy of the data for desired assessments of groundwater conditions. Data gaps would be identified and recommendations provided for the ongoing countywide monitoring program to facilitate effective interpretation, understanding, and dissemination of groundwater conditions (LSCE, 2010b).
- Developing recommendations to enhance the countywide groundwater level and quality monitoring program (parameters, distribution, monitoring frequency, data management, and evaluation) that provides the data and assessment procedures needed to describe current groundwater conditions.
- Providing a comprehensive report (LSCE, 2010c) that includes an evaluation of the historical and current groundwater level and quality data and recommendations for a countywide groundwater monitoring program.
- Reviewing groundwater management approaches in neighboring counties and also the County's Groundwater Ordinance and Permit Process and providing recommendations (the subject of this Memorandum).

3.3 Center for Collaborative Policy Stakeholder Assessment

With funds provided by DWR, the County commissioned the Center for Collaborative Policy (CCP), California State University Sacramento to conduct a neutral, third-party assessment of public support for a voluntary groundwater monitoring program.

Between February and May 2010, the CCP team conducted 15 interviews with 34 people, seven of these as group interviews. The CCP team interviewed stakeholders who represented a broad range of groundwater interests in the County, including representatives of wine grape growers, vintners, rural residents, property rights organizations, environmental organizations, municipalities, and public agencies. Major topics for the interviews included concerns about groundwater, experiences with collaboration in the County, willingness to participate in voluntary monitoring, and desired technical and other information (CCP, 2010).

The CCP report presents the interview findings; a series of conclusions about whether current conditions in the County would support a collaborative data gathering process; and a series of CCP's recommendations about whether and how the County should convene a collaborative data gathering effort (CCP, 2010). The County is currently reviewing the CCP's recommendations.

3.3.1 Assessment of Issues – CCP Key Findings

The CCP interviewees raised several issues and sub-issues (CCP, 2010), including:

- A majority of interviewees expressed concern that groundwater was being extracted at unsustainable rates. At the same time, a majority of interviewees stressed the County's geographical and geological diversity and complexity, and the need for more locally specific information.
- Several interviewees expressed concern about the viability of groundwater supplying cities, and the potential for urban use and rural residential use to diminish the groundwater available for agriculture.
- Several interviewees expressed strong concern about government involvement in groundwater, including impacts on private property rights and business viability. At the same time, several interviewees recognized groundwater's legal status as a private property right, yet felt that, in areas with identifiable basins and basin interconnections, groundwater was geologically and in practice a common pool resource, with one user's actions directly impacting the ability of others to derive benefit from the same resource.
- Several interviewees recognized the potential for recycled water to reduce demands on groundwater, and supported exploring its use in the County. At the same time, almost all expressed concerns about regulatory, technical, and economic details, and the role of the County in supporting its use.
- Numerous interviewees felt that groundwater level decline could noticeably reduce stream flows, and thus threaten aquatic and riparian habitat, stimulate creek bank erosion, and weaken fish populations.
- Almost all interviewees emphasized that existing information about groundwater is geographically patchy. Almost all interviewees identified that there are critical information needs.
- Almost all interviewees stressed that any effort must be tailored to locally-specific conditions, rather than treating the County as a homogeneous region.
- Several interviewees criticized the lack of access to relevant groundwater information, at the same time as several expressed concern about confidentiality and how gathered information would be used and disseminated.
- Almost all interviewees were open to considering participation in a voluntary monitoring program, but only if several conditions were met, including safeguarding the confidentiality of information. A few interviewees emphasized that they would actively oppose any collaborative data gathering efforts.
- Interviewees held divergent views of who should convene a process, but agreed that any new effort must have a clear purpose, executive commitment, and transparency.

- A majority of interviewees felt that the work needed to include a broader vision of inclusion and benefit for everyone in the County.
- Interviewees also emphasized that any effort should work through existing stakeholder networks, develop consistent messaging for use in all forums, and build a strong, proactive relationship with the media. They also emphasized the importance of an inclusive process that brought conflicting perspectives and all major institutions in the water delivery system together, and then established a framework for productive conversations.

The above issues reflect the wide range of issues and concerns that will be integral to future steps taken to ensure future groundwater quality and supply availability and reliability in the County. As learned through this initial assessment by the CCP, and as commented further below, issues such as those identified above, and also others included in the CCP report, are key to laying the foundation for the development of a countywide groundwater program encompassing appropriate data acquisition and collaboration to ensure that groundwater resources are available to serve both human and environmental needs.

4.0 California Groundwater Management Overview

California's groundwater resources are widespread and diverse. There are 431 delineated groundwater basins in California. Twenty four of these basins are subdivided into 108 subbasins, resulting 515 groundwater systems that underlie 40 percent of the state in 10 hydrologic regions (California Department of Water Resources, DWR, 2003). In an average year, groundwater supplies about 30 percent of the state's overall water demands; in drought years, groundwater may account for 40 percent, or greater, of supply (DWR, 2003). Population projections estimate growth to about 48 million people in 2020, an increase of about 16 million people since 1995. DWR (1998) reported total water needs in 1995 (for an average year) of 79.5 million acre feet (maf), while for 2020 it forecasted needs of 11.8 maf for urban use, 31.3 maf for agricultural use, and 37.0 maf for environmental use, or a total of 80.1 maf. For 2050 (DWR, 2009), population forecasts range from 44.2 million ("Slow & Strategic Growth") to 69.8 million ("Expansive Growth"). The estimated water demand change for 2050 (Expansive Growth Scenario) ranges from an increase of about 6 maf per year (without climate change) to 9 maf per year (with climate change).

Future groundwater availability in the state is not well understood. In many basins, information is insufficient to assess or quantify overdraft. Additionally, the impacts of urban and other land uses on groundwater quality, and also elevated concentrations of naturally occurring physical and chemical constituents, contribute to other stresses, or restrictions, on the available supply.

The California legislature has taken measures toward improving water resources management approaches on a statewide scale. Recently, the frequency of legislative and other initiatives have increased partly in response to public awareness and concern, which are more acute during dry periods when problems are more evident. The state's long-term goal is to incentivize and

implement integrated regional water management that achieves sustainable water resources (*see Section 4.4.3*).

4.1 Basic Groundwater Laws – A Bit of History

Groundwater development has been mostly unregulated in California. Though regulation has been broached in the Legislature several times, groundwater management remains a voluntary local activity, or it is regulated in adjudicated¹ groundwater basins.

As California's agricultural economy and urban centers grew at the turn of the 20th century, the state government initiated efforts to conserve water resources. The Civil Code of 1911 and the Water Commission Act of 1914 established principles for beneficial use of the State's water resources. Specifically, the Civil Code stated that all water within the State is the property of the people of the State, and that the right to use water may be acquired, as prescribed by law. The Water Commission Act required surface water appropriators to comply with a permitting process. In 1921, a State law passed declaring that the people have a paramount interest in the use of all water of the State, including surface and underground, and that the State determines (Water Code Section 104) what water can be converted to public use or controlled for public protection (California Water Code 2005). Despite the progressive steps taken during 1911 and 1914, riparian owners of water (i.e., landowners with property situated along a watercourse) were seen as a source of continued surface water waste. In 1928, a referendum passed (and was later incorporated in California's Constitution) declaring that the water resources of the State be put to reasonable and beneficial use, regardless of whether a user had riparian or appropriative rights.

Under the public trust doctrine, originating in early Roman law, resources such as air, running water, the sea, and the lands adjoining the sea are available to all humankind by "natural law." This doctrine is part of the constitution of California. In California, the State is responsible for ensuring that water is beneficially, and not wastefully, used. Legally, public trust applies only to navigable waters and tidelands; thus, the scope of public trust is restricted to surface water resources. However, from declarations in 1911 and 1921 that were later incorporated in the Water Code, groundwater falls within the realm of public trust, if not within its legal fold (Narasimhan and Kretsinger, 2003).

Groundwater rights in California include overlying rights, appropriative rights, and prescriptive rights. In a 1903 case, *Katz v. Walkinshaw*, the California Supreme Court rejected the British common law doctrine of landowners owning everything beneath their land (Schneider, 1977). The court modified the common law precedent so landowners have overlying rights for reasonable and beneficial use. These rights are correlative to other overlying rights in a groundwater basin; i.e., when water shortages occur, all overlying users share the common supply. Groundwater that is surplus to overlying owner's needs can be withdrawn and used on non-overlying lands; this constitutes an appropriation of groundwater. This use is inferior in

¹ Adjudication is where a case has been heard and decided by a judge. In the context of an adjudicated groundwater basin, landowners or other parties turned to the courts to settle disputes over how much groundwater can be extracted by each party to the decision (DWR, 2003).

priority to overlying uses. Between appropriators, priority is governed by the principle “first in time, first in right” (City of Los Angeles v. City of San Fernando (1975) 14 Cal.3d 199, 241).

Prescriptive rights can be established through the adverse use of another’s water (i.e., pumping of non-surplus water) where the use is actual, open and notorious, hostile, and adverse to the original owner, and also continuous and uninterrupted for five consecutive years, under claim of right (City of Pasadena v. City of Alhambra (1949) 33 Cal.2d 926, 207). Pumping from an overdrafted groundwater basin is generally determined to be adverse to other users; this is an example of a situation where rights may be gained or lost through prescription.

4.2 California’s Groundwater Management Approaches

Groundwater management began to occur in California long before it became formally recognized through state legislative initiatives. Groundwater management may be defined as the ongoing performance of coordinated actions related to groundwater withdrawal and replenishment to achieve long-term sustainability of the resource without detrimental effects on other resources (Kretsinger and Narasimhan, 2006). Preferably, such management programs are a local responsibility, conducted in coordination with other entities (including cooperative monitoring programs), and regularly evaluated to ensure consistency with basin-wide management objectives.

In addition to the groundwater rights categorized above, California’s groundwater is managed through other means, including statutory authority; groundwater management districts or agencies; groundwater management plans; city and county ordinances; and groundwater basin adjudication. As discussed below, formal groundwater management plans and local ordinances mostly came later.

More than 20 types of local districts or agencies have statutory authority to provide water for beneficial uses. The total number of such agencies that have general powers to manage some aspect of groundwater within their boundaries is uncertain (DWR, 2003). However, 13 Special Act districts (formed between 1933 to 1993 by the State Legislature to meet the unique water needs of a specific area) regulate or limit abstraction; 7 agencies adopted plans under Water Code Section 10750, the portion of the Water Code detailing provisions for groundwater management.

Another means of groundwater management that is generally considered as a last resort is court adjudication of the basin where the court determines groundwater abstraction rights for each user. A single groundwater user can initiate basin adjudication. All or most groundwater users must be joined in the adjudication to be bound by the judgment. Adjudications are typically very costly and lengthy. The first basin-wide adjudication occurred in the Raymond Basin in Los Angeles County; this was first filed in court in 1937, and the final decision occurred in 1944 (DWR, 2003). Nineteen adjudications have occurred in California with most of these occurring in southern California.

In 1983, the California Legislature enacted the Urban Water Management Planning Act (Water Code Sections 10610-10657) to facilitate long-term resource planning and ensure adequate water supplies to meet existing and future water demands. The Act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre feet of water annually, should make efforts to ensure that water supplies are sufficient to meet the needs of its various categories of customers during normal, dry, and multiple-dry years. The Act specifies the contents of the Urban Water Management Plans (UWMPs) and describes how urban water suppliers should adopt and implement the plans. When this Act was first adopted in 1983, groundwater was not explicitly addressed. The Act has, however, subsequently been amended by 18 bills. With legislation passed in 2001, groundwater reliability finally became incorporated in the Act as a required component of UWMPs.

4.3 Groundwater Management – AB 3030

The first legislative actions taken by California to broadly address groundwater management occurred in 1991 and 1992. In 1991, an Assembly bill, AB 255, authorized local agencies overlying basins subject to critical conditions of overdraft to establish programs for groundwater management within their service area (DWR, 2003).

In 1992, an attempt was made to revisit the recommendations made by the Governor's Commission (1978) for comprehensive groundwater management. The 1992 legislation passed as AB 3030, the Groundwater Management Act, and was considered a breakthrough for groundwater management at the local level. The initially proposed legislation, however, was substantially weakened. Although voluntary plans for groundwater management as prescribed by AB 3030 could be developed and implemented at the local level, significant groundwater management issues (e.g., overdraft, subsidence, and seawater intrusion) that have long-existed in California are generally being addressed outside of the purview of this legislation. Upon passage of AB 3030, AB 255 was repealed.

Ordinances adopted by city and county local governments are also a relatively recent means of managing groundwater, with 24 out of 27 existing ordinances adopted since 1990 (DWR, 2003). Others are being considered (DWR, 2010a). The main purpose of many of these ordinances is to limit groundwater export from a county or from certain groundwater basins or areas within the county. Only one county has included a more comprehensive approach that includes establishing basin management objectives.

DWR reports that “the authority of counties to regulate groundwater has been challenged, but in 1995 the California Supreme Court declined to review a lower court decision (Baldwin vs. Tehama County) that holds that state law does not occupy the field of groundwater management and does not prevent cities and counties from adopting ordinances to manage groundwater under their police powers” (DWR, 2010a). The full nature of the authority of cities and counties to regulate groundwater is uncertain.

4.4 More Recent Groundwater Management Legislation and Guidance

From 1992 to about 2000, many water agencies and suppliers embraced the notion of formal, yet still volunteered, groundwater management plans. Beginning about 2001, however, heightened interest by state water agencies, state and local governments, and others concerned about future planning and management strategies needed to address California's growing water demands and resulted in a plethora of legislative and other initiatives. Recently adopted legislation and state guidance documents resulted in land-use planning coordinated with water supply sufficiency assessments; expanded groundwater management plans and monitoring programs; funding programs that encourage and even incentivize groundwater management plans and integrated regional water management; and a guidance document for minimum standards for integrated regional water management plans.

4.4.1 Supply Sufficiency, Basin Conditions, and Water Quality

In 2001, land use became more directly linked to the analysis of water supply sufficiency with the passage of two Senate bills (SB 221 and SB 610) that prohibit approval of urban housing projects of a defined magnitude unless the water supplier verifies that sufficient water supplies are available for the planned development project (Government Code Section 66473.7 and Water Code Section 10910). To address sufficiency of supply, public water suppliers are required to describe the total available water supplies (e.g., surface water and groundwater) during various climatic conditions to meet 20-year projected water demands. Additionally, rights to abstract additional groundwater, if used for the project, must be substantiated. When groundwater is identified as a source of supply, the supplier must assess the future sufficiency of not only the groundwater source supplying the proposed project but also existing and planned future pumping occurring by the supplier and also other pumpers. Another bill adopted in 2001, SB 901, requires urban suppliers to also include information in UWMPs relating to the quality of available water sources and the manner in which water quality affects water management strategies and supply (DWR, 2003).

The Groundwater Quality Monitoring Act of 2001 (AB 599) focuses on coordinating state agency monitoring efforts under the State Water Resources Control Board (SWRCB) to develop a comprehensive statewide groundwater monitoring approach. It is also directed toward integrating data and making those data more accessible, including increasing the availability of groundwater quality information to the public. Efforts to implement the bill and program resulted in two reports, including the report to the Governor and Legislature (SWRCB, 2003) and the report prepared by the USGS in cooperation with the SWRCB titled "Framework for a Groundwater Quality Monitoring and Assessment Program for California" (Belitz et al., 2003). The statewide program recommendations prioritized monitoring efforts according to basins that rely most heavily on groundwater for drinking water.

4.4.2 Groundwater Management Act – SB 1938

SB 1938, the Groundwater Management Act adopted in 2002, amends and expands AB 3030 groundwater management plans. The law now also requires public agencies seeking state funds administered through DWR for the construction of groundwater projects or groundwater quality

projects to prepare and implement a groundwater management plan with certain required components (Water Code Section 10753.7). Previously, all plans were voluntary, and there were no required plan components. The requirements now include establishing basin management objectives, preparing a plan to involve other local agencies in the basin in a cooperative planning effort, and more comprehensive monitoring programs (including groundwater levels and quality; surface water flows and quality; and inelastic land surface subsidence for basins where it is identified as a potential concern) to assess changes in basin conditions and “generate information that promotes efficient and effective groundwater management” (Water Code Section 10753.7). Water Code Sections 10750 through 10755.4 (the full Groundwater Management Act) is included in **Appendix 2**. The amended Water Code does not require groundwater management and monitoring by all local entities, but moves the State further toward addressing the many issues and questions about the future of groundwater management in California that were brought forth by the staff of the Governor’s Commission on Water Rights Law (Schneider, 1977).

4.4.3 Integrated Regional Water Management Planning Act - SB 1672

In 2002, days after SB 1938 passed, the Legislature enacted SB 1672, the Integrated Regional Water Management Planning Act of 2002, to encourage local agencies to work cooperatively and develop regional strategies for integrated management of available local water resources and imported water supplies. The Act facilitates development of integrated regional water management plans that coordinate local programs and projects to improve source water quality; provide water supply reliability; augment agricultural, domestic, or environmental water supply; and improve the quality or quantity of groundwater. The enacted legislation contained no specific guidance for regional plans. However, California voters approved a proposition (Proposition 50) in 2002 that provides funding, subject to appropriation, for many land and water quality and quantity management activities. There is a specifically designated Integrated Regional Water Management (IRWM) portion of this program for projects that provided for drought protection, protection and improvement of water quality, and improvement of local water reliability by reducing dependence on imported water.

The IRWM Planning Act of 2002 was recently repealed with the chaptering of SBX2-1 in September 2008 (water bond package by the California State Senate President pro tempore Don Perata, and Senators Michael Machado, Joe Simitian and Darrell Steinberg). The new IRWM Planning Act has similar global objectives; the new sections of the Water Code are included in **Appendix 3**. An IRWM plan (IRWMP) is defined as (Water Code Section 10534):

“a comprehensive plan for a defined geographic area, the specific development, content, and adoption of which shall satisfy requirements developed pursuant to this part. At a minimum, an integrated regional water management plan describes the major water-related objectives and conflicts within a region, considers a broad variety of water management strategies, identifies the appropriate mix of water demand and supply management alternatives, water quality protections, and environmental stewardship actions to provide long-term, reliable, and high-quality water supply and protect the

environment, and identifies disadvantaged communities in the region and takes the water-related needs of those communities into consideration.”

The group that develops and/or implements the IRWMP is defined in the Water Code (Section 10539) as the "regional water management group" which consists of:

“...three or more local agencies, at least two of which have statutory authority over water supply or water management, as well as those other persons who may be necessary for the development and implementation of a plan that meets the requirements in Sections 10540 and 10541, participate by means of a joint powers agreement, memorandum of understanding, or other written agreement, as appropriate, that is approved by the governing bodies of those local agencies.”

The regional water management group can prepare and adopt the IRWMP in accordance with the requirements outlined in the Water Code (Section 10540). The IRWMP can include any or all of other kinds of planning documents, including groundwater management plans pursuant to Section 10750 *et seq.* The other types of planning documents are listed in Water Code Section 10540 in **Appendix 3**. Importantly, the new IRWM Planning Act sets forth in the Water Code (Section 10540(c)) the following minimum content that must be addressed in all IRWMPs, including:

- (1) Protection and improvement of water supply reliability, including identification of feasible agricultural and urban water use efficiency strategies.
- (2) Identification and consideration of the drinking water quality of communities within the area of the plan.
- (3) Protection and improvement of water quality within the area of the plan, consistent with the relevant basin plan.
- (4) Identification of any significant threats to groundwater resources from overdrafting.
- (5) Protection, restoration, and improvement of stewardship of aquatic, riparian, and watershed resources within the region.
- (6) Protection of groundwater resources from contamination.
- (7) Identification and consideration of the water-related needs of disadvantaged communities in the area within the boundaries of the plan.

Eligibility for authorized funding from the IRWM program hinges on applicants having completed (or preparing based on a set schedule) an AB 3030/SB1938 (i.e., a groundwater management plan) or IRWMP depending on the type of project proposed. DWR subsequently developed and then updated a guidance document that delineates minimum standards for IRWMPs, including eligibility for project funding (DWR, 2010b). The latest guidelines were modified to be consistent with recent legislation, including:

- Public Resources Code (PRC) §75026 *et seq.* (Proposition 84)
- SBX2-1 (Perata, Statutes of 2008) – CWC §10530 *et seq.* – which repealed and replaced the Integrated Regional Water Management Planning Act of 2002

- AB 739 (Laird, Chapter 610, Statutes of 2007) – consultation with State Water Resources Control Board (SWRCB) and identification of stormwater flood management (SWFM) preferences
- SB 732 (Steinberg, Chapter 729, Statutes of 2008) – PRC §75100 and PRC §75102 – requiring new grant solicitation for each funding cycle and tribal notification
- SB 790 (Pavely, Chapter 620, Statutes of 2009) – stormwater resource planning as part of IRWM planning
- AB 626 (Eng, Chapter 367, Statutes of 2009) – the 10% of appropriated funds for DAC projects should target distribution on a funding area basis
- CWC §525 – water meter installation as condition of receiving a water management grant
- CWC §10610 – Urban Water Management Plans (UWMP)
- AB 1420 (Laird, Chapter 628, Statutes of 2007) – CWC §10631.5 – implementation of demand management measures as condition of receiving a water management grant
- SBX7-6 (Steinberg, Chapter 1, Statutes of 2009) – groundwater elevation monitoring as a condition of receiving a water management grant

Additionally, the requirements of Public Resources Code Section 5096.800 *et seq.* (Proposition 1E) were incorporated into the guidelines because of the linkages between the IRWM grants and the SWFM grants. The latest guidelines are included in **Appendix 4**. The updated DWR guidelines (DWR, 2010b) also address many other required elements for IRWMPs (Water Code Section 10541(e)) including evaluation of the adaptability to climate change of water management systems in the region.

Various state funding vehicles have been approved by the Legislature or the State's voters for programs to improve groundwater management. The Local Groundwater Management Assistance Act was passed by the State's voters in 2000; as of 2009, six rounds of AB 303 grants have been awarded to support local groundwater assistance projects. Under Proposition 13 funding (approved by the State's voters in 2000), a total of \$200 million was authorized for the Groundwater Storage program. The Proposition 13 Groundwater Recharge Program authorized DWR to provide \$30 million in grants and loans for groundwater recharge feasibility studies and projects. However, not until 2002, when SB 1938 was passed and groundwater management plans became required to be eligible for state funds, and in 2004, when the minimum guidelines for IRWM project eligibility for Proposition 50 funds were developed, were there mechanisms that provided additional eligibility criteria for using state funds for groundwater management-related projects. Consequently, until recently, many entities enjoyed the opportunity to use the funds with minimal eligibility criteria.

Napa County's Participation in San Francisco Bay Area and Westside IRWMPs

In 2005, the County formed the Napa County regional water management group (RWMG), a working group of local water agencies, where the Napa County Flood Control and Water Conservation District served as the lead agency. The County RWMG worked together to draft

the Napa-Berryessa IRWMP Functional Equivalent (Napa-Berryessa Regional Water Management Group, 2005).

In 2009, DWR established IRWM regions that have been accepted through the Regional Acceptance Process (DWR, 2009). Currently, there are two formally accepted regions that include Napa County (**Figure 1**). These regions are 1) the San Francisco Bay Area Region (which covers the generally southern part of Napa County and focuses on the Napa River and Suisun Creek watersheds) and 2) the Westside Region (which covers the generally northern part of Napa County and focuses on the Putah Creek/Lake Berryessa watershed; the Westside Region also covers parts of Yolo, Solano, Lake, and Colusa Counties).

Due to DWR's approved Regional Acceptance Process, Napa County no longer intends to develop its own IRWMP, but the County plans to contribute to two larger regional IRWMPs (West Coast Watersheds, 2010). Consistent with the intent of the County's General Plan Action Item CON WR-7 (described above and included in **Appendix 1**), the County is actively collaborating with the San Francisco Bay and Westside RWMGs to update the IRWMP for the San Francisco Bay and to develop a new IRWMP for the Westside Region. Previous collaborations among Napa County entities have resulted in the identification of programs and projects that would benefit one or more local entities as well as the County. The County's representation and participation in the San Francisco Bay and Westside IRWMPs enables further coordination and sharing of information on water resources management planning programs and projects (particularly those that are a high priority for the County) and other information for IRWMP grant funding and implementation.

Although Napa County has numerous individual water-related plans, it has become increasingly apparent that the County's collaboration with larger regional IRWMP efforts would facilitate individual and also collective water management efforts in a cost-effective and environmentally responsive manner that will contribute to the overall well-being of the county. Accordingly, the County has begun to implement the planning approach outlined in the *Napa County Integrated Water Resource Management Planning Framework* (Napa IWRMPF) (West Coast Watersheds, 2010), which has four key elements, including:

1. A proposed IWRMPF local governance structure to facilitate the development of, and participation in, integrated inter- and intra-regional water resource management efforts and achieve specific stakeholder-endorsed goals and objectives.
2. Utilization of an inclusive, equitable, transparent process within an adaptable, dynamic planning framework.
3. Participate in and sustain working relationships with stakeholders, and with other organizations and agencies throughout the applicable IRWMP regions (San Francisco Bay Area and Westside Regions) and the state.
4. Share water and watershed related data and information through a database on the Watershed Information Center & Conservancy of Napa County (WICC) website (www.napawatersheds.org). (The WICC website focuses on information exchange and outreach and is playing an increasing role in storing watershed data and information

related to natural resources, studies and research and stream restoration efforts, especially as related to Napa County).

4.5 Groundwater Management Plans and Their Effectiveness

More than 200 agencies have developed AB 3030 Plans, over 60 agencies have adopted plans under other statutory authority, and at least 20 coordinated plans were prepared as of 2003, involving nearly 120 agencies. DWR (2003) has offered its perspective on these plans, including:

- There are no reporting requirements when plans are implemented, so a comprehensive assessment of local planning efforts is not possible;
- Some plans are simply brief recitations about continuing the agency's programs; and
- Not all agencies are actively implementing enacted programs.

Even though a measure of effectiveness is yet to be determined, DWR (2003) views the overall existence of these plans as "giant strides forward" considering the previous lack of management on a broad scale. It is yet to be seen whether the addition of SB 1938 results in more effective groundwater management planning. Whether monitoring data will be better used to understand water resources conditions and the effectiveness of local management actions and whether data sharing among local entities will become better coordinated will largely depend on the commitment of and efforts by local entities to accomplish these objectives.

The 1999 California Budget Act directed DWR to develop criteria for evaluating groundwater management plans and also to develop a model groundwater management ordinance. In 2003, both these directed tasks were completed. DWR (2003; Appendix C), with input from the Groundwater Committee of the Association of California Water Agencies, prepared a summary of "Recommended and Required Components of Local Groundwater Management Plans." These components (shown in **Appendix 5**) include the Water Code requirements, Section 10750 *et seq.*, and also additional components that are not directly captured in the Water Code but are considered important aspects of any groundwater management plan. Ultimately, the objective is to ensure groundwater management plans are prepared, implemented, and achieve the global goals of a "long-term, sustainable, reliable, good quality groundwater supply" (DWR, 2003). An example of a recommended component is the periodic reporting of groundwater basin conditions and groundwater management activities.

On the heels of independent local efforts to prepare and implement groundwater management plans, DWR (2003; Appendix D) prepared a "model ordinance" to further encourage local entities to actively engage in groundwater management. DWR's Groundwater Management Model Ordinance is included in **Appendix 6**. While well intended, the model could result in overlapping and potentially conflicting efforts by local governments and water agencies. The formula-oriented model may also detract from its use or result in more time and cost devoted to unnecessary actions and less attention to locally specific management needs. Importantly, though, the "model ordinance" offers a useful tool to begin the dialog between regional entities about the governance and structure for an overall groundwater management program that accomplishes a long-term sustainable, reliable, and good quality groundwater supply that meets human and environmental needs.

The recent actions described above now result in: local groundwater management plans (Water Code Section 10753.7); model ordinances; specified management strategies that must be included in IRWM plans; and a designated regional agency or regional group if project funding necessitates an “eligible” IRWM plan. Recent actions move local entities and governments closer to “full” groundwater management where water agencies bring water supply and use into long-term balance (Peters, 1982). However, much remains to be done.

Rather than sustainability, “sufficiency” is the term presently used in California’s Water Code in association with land use and water supply assessments. While consideration of historical groundwater conditions and whether a basin has been reported to be in overdraft are required as part of water supply sufficiency analyses, future supply sufficiency is left to broad interpretation. A determination of future supply sufficiency is influenced by many variables, including the future reliability of the source of supply (e.g., groundwater, surface water, and recycled water); methods used to optimize the available source of supply (e.g., conjunctive surface and groundwater management, conservation, recycled water use, desalination, or other strategies); climatic variability; and water quality issues. Another factor that complicates the determination of future supply sufficiency is the stage of basin development. Particularly, an increase in the level of utilization of basin-wide water resources compounded by estimated increased water demands for multiple future uses increases the complexity of the determination.

Recent state documents more often incorporate the term sustainable (e.g., DWR, 2003 and DWR, 2010b). Sustainable, when referring to sustainable yield, is tending to supplant use of the term safe yield, perhaps because of the heightened attention to its broader implications. The overall concept of sustainability varies primarily in that the overarching objectives connote greater consideration for balancing the beneficial use of components of whole systems while avoiding long-term detriment to any part.

4.6 Monitoring – An Integral Part of Understanding Groundwater Conditions

There is a clear need for improved data collection to better estimate groundwater conditions, including short- and long-term changes in response of the aquifer system and for understanding future water availability and quality. Particularly, fundamental data, ongoing monitoring programs, data standards, data coordination and sharing, and regional aquifer characterization are core requirements to enable understanding of groundwater resources in Napa County.

Correspondingly, such monitoring programs need to become an integral part of water resources programs to distinguish trends from short-term fluctuations, anticipate unintended consequences due to changes in resource utilization, and identify emerging issues. Systematic groundwater data collection is particularly important due to the slow response of aquifers to changes in natural and imposed system stresses (Alley et al., 2002; Taylor and Alley, 2005). Long-term data derived from programs designed to evaluate specific monitoring objectives allow for improved assessments of local and basin-scale processes. Other programs that form the essential core of local and regional analyses include geological mapping programs and regional aquifer characterization efforts that result in sufficient detail to understand the historical response of major aquifer systems due to natural or imposed stresses.

In many basins, except where intensive groundwater development has been accompanied by corresponding comprehensive investigations, the data are typically limited in one or more of the following ways: aquifer characteristics are not defined for all developed formations, long-term groundwater level measurements may be available but are not necessarily adequately distributed in time (including frequency) or space (i.e., limited distribution among formations, wells may be of unknown completion, or are lacking in areal distribution, including proximity to natural or engineered sources of recharge). Correspondingly, the implication of loss of storage due to inelastic compaction of aquitards is not well understood on a basin-wide scale.

Data and analysis limitations can result in misinterpretation of groundwater conditions, primarily due to the use of an inadequate conceptual model. The State monitors nearly 14,000 wells, and these data are largely available online for use by water agencies and others. These data, however, are not always appropriately used. For example, water levels representing different geologic formations have been contoured in aggregate; as a result, declining water levels in one area, or one formation of the basin, may bias understanding of actual conditions or may be misinterpreted to connote a condition occurring on a broader scale. Without the availability or better understanding of fundamental data, it remains difficult to address such important questions as how much water is withdrawn from a formation(s) and the rates of replenishment of formations from which that withdrawal occurs. If overdraft estimates are based on simplified assumptions (i.e., specific yield times groundwater level decline) that do not consider water levels in the context of the aquifer system (i.e., confined or unconfined and the formation(s) the levels represent), such rough estimates will not be very useful for future water resources planning. Nevertheless, these estimates have been used on a statewide planning and policy basis for decades.

4.6.1 Statewide Groundwater Elevation Monitoring Program – SBX7– 6 (CASGEM)

In 2009, a state bond package was passed that included a bill referred to as SBX7 – 6, or CASGEM. Development of the countywide DMS, groundwater data quality evaluation (LSCE, 2010a), and the recommended groundwater monitoring program presented in the report *Napa County Groundwater Conditions and Monitoring Program Recommendations* (LSCE, 2010c) provide a means for further coordination with statewide monitoring program interests, particularly groundwater elevation monitoring being implemented in response to adoption of SBX7 – 6 in 2009 and the state’s newly created CASGEM program (<http://www.water.ca.gov/casgem/>) (**Appendix 7**). DWR is facilitating the statewide program where local entities can apply to DWR to assume the function of regularly and systematically collecting groundwater level data to determine seasonal and long-term trends in the state’s groundwater basins and subbasins. Napa County’s Comprehensive Groundwater Monitoring Program covers the continuation and expansion of countywide groundwater level and also quality monitoring efforts (including many basins, subbasins and/or subareas throughout the County) for the purpose of understanding groundwater conditions (i.e., seasonal and long-term groundwater level trends and also quality trends) and availability to enable integrated water resources management and planning to meet future funding and water supply demands.

The legislature added a key aspect to SBX7 – 6 which was to make certain elements of the groundwater level information available to the public. Napa County’s combined efforts through the Comprehensive Groundwater Monitoring Program along with the related AB 303 Public Outreach Project (CCP, 2010) and the efforts of the WICC of Napa County create a framework for applying the findings and recommendations from these programs to the County’s continued efforts to increase public outreach and participation. An informed and engaged public enables support of planned water resources projects and programs proposed by the County and others. As discussed further below (*Section 7.2.1*), the County Board of Supervisors recently approved the County’s plan to notify DWR that it intends to become the monitoring entity for Napa County (Napa County Board of Supervisors, meeting December 14, 2010).

5.0 Neighboring County Groundwater Management Plans and Ordinances

Statewide, twenty-nine counties have, or are considering, groundwater ordinances. DWR’s website lists the names of counties that have adopted ordinances (DWR, 2010a). These ordinances are available on county web sites. Napa County’s neighbors and near neighbors, such as Lake, Colusa, and Yolo Counties are included on DWR’s list. Examples of preparation and implementation of integrated regional water management plans, groundwater management plans, and groundwater ordinances in nearby areas were reviewed to gain an appreciation for the ways in which neighboring counties and regions have addressed groundwater resources in their planning documents or local ordinances.

Table 5.1 below lists Napa’s neighboring counties and the existence of plans and ordinances pertaining to groundwater. Many areas have indicated participation in the development of management plans that address groundwater; be it through locally adopted groundwater management plans or regionally through integrated regional water management planning (<http://www.water.ca.gov/irwm/index.cfm>). For more detailed information on each county’s plans and ordinances, (see **Appendix 8**).

Table 5.1 Neighboring County IRWMs, Groundwater Management Plans and Ordinances

County/Area	Integrated Regional Water Management Plan	Groundwater Management Plan ¹	Groundwater Ordinance
Sonoma County	X	X*	X
Solano County	X*		
Colusa County		X	X
Lake County	X*	X	X
Yolo County	X*	X	X
San Francisco Bay Area	X	X	X
1. In some counties, there is more than one entity that has adopted a groundwater management plan. *Indicates the intention of further Plan development			

6.0 Napa County Groundwater Ordinance

6.1 Introduction

Napa County regulates groundwater usage and well development through its Code of Ordinances, Title 13 Water, Sewers, and Services. Those parts of Title 13 that are concerned with wells and groundwater usage were reviewed in this chapter for consistency with the County’s policies and goals with respect to resources and conservation as expressed in the 2008 General Plan Update. Specifically, the Plan prioritizes “available groundwater for agricultural and rural residential uses...” and seeks to ensure “that discretionary projects will be required to assess and mitigate their potential impacts...” The ordinances are a means to ensure that these Plan objectives are managed effectively.

6.2 Consistency with County Policies and Goals

The Conservation Element of the 2008 General Plan Update is relevant to ordinances concerning groundwater and wells through the establishment of specific water resources goals:

Goal	Description
CON-8	“Reduce or eliminate groundwater and surface water contamination from known sources...”
CON-10	“Conserve, enhance and manage water resources on a sustainable basis...”
CON-11	“Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urban areas...”
CON-12	“Proactively collect information about the status of the county’s surface and groundwater resources to provide for improved forecasting of future supplies and effective management...”

Water resources policies that are relevant to the review of groundwater and well ordinances include:

Policy	Description
CON-52	“The County encourages responsible use and conservation of groundwater resources by way of its groundwater ordinances. “
CON-53	“The County shall ensure that the intensity and timing of new development are consistent with the capacity of water supplies and protect groundwater and other water supplies by requiring all applicants for discretionary projects to demonstrate the availability of an adequate water supply prior to approval. May include “evidence or calculation of groundwater availability...”
CON-53.5	“Before authorizing any new exportation of water from the County, the County shall ensure an adequate, long term supply of ground and surface water...”
CON-54	“The County shall maintain or enhance infiltration and recharge of groundwater aquifers...” This policy applies to deficient areas and requires

Policy	Description
	that projects maintain predevelopment recharge potential to the extent possible.
CON-55	County shall curtail new or expanded water uses under discretionary projects where they will cause significant well interference or reduce groundwater discharge to surface waters. Seeks to protect riparian habitats and fisheries, and avoid overdraft.
CON-56	“The County shall discourage the drilling or operation of any new wells in known areas of saltwater intrusion...”
CON-57	“The County shall work with appropriate agencies and districts to develop an understanding of potential groundwater deficiencies...”
CON-58	“...the County shall periodically review and update groundwater policies and ordinances as new studies and monitoring data become available...”
CON-59	States that County shall disseminate groundwater information.
CON-60	States that County shall promote water conservation and efficiency measures.

The County seeks to implement water resources goals and policies through various Water Resources Action Items stated in the General Plan Update. Several action items are addressed through the Comprehensive Groundwater Monitoring Program initiated by the County in 2009, which includes this Memorandum as a work product. Action Items that are implemented partially or wholly under the Comprehensive Groundwater Monitoring Program include CON-WR-1 and WR-4 through WR-9. Action Item CON-WR-6 is most directly related to this chapter and states that the County will “Establish and disseminate standards for well pump testing and reporting and include as a condition of discretionary projects that well owners provide to the County upon request information regarding the location, depths, yields, drilling and well construction logs, soil data, water levels and general mineral quality of any new wells.” Review comments on the County’s well and groundwater ordinances are made with this action item in mind and they address Chapters 13.04, 13.12, and 13.15 of Title 13 of the municipal code.

6.3 Recommended Code and Other Updates

6.3.1 Title 13, Chapter 13.04 Approved Water Supply Systems

Recommendations for modifying the following section in this Chapter are proposed to improve the quality of data received by Environmental Management concerning reporting of well yield:

<p>13.04.050 - Determination of yield.</p> <p>A. The determination of yield of any water supply source shall be made demonstrated by continuous pumping until the production rate is established and the drawdown level stabilized for at least one hour. Wells with less than five gallons per minute shall be tested at maximum production for at least four hours. Other methods for the determination of yield may be required by the environmental management director and must receive prior approval by the environmental management director.</p>

B. The determination of yield of any water source under this division shall be made by the director of environmental management, and shall be supported by a record of tests performed by a person duly licensed to perform such tests in the state of California. The expense of such testing shall be borne by the applicant or the applicant's agent.

C. ~~The sustained yield of any water source shall be measured by bailing, pumping, air lifting, or by any manner that is generally accepted within the well drilling industry. Determination of the sufficiency of such measurement and of the supporting records, however, shall rest solely with the director of environmental management.~~ If a water source cannot maintain a minimum sustained yield as referenced in Section 13.04.040, it shall not be considered an approved water source. Water sources may not be combined for the purpose of meeting the required minimum sustained yield.

Justification

1. The most reliable determination of yield is through pumping.
2. Bailing or air-lifting are not acceptable alternatives for the purposes of Title 13 and are in conflict with the requirement for "continuous pumping" in part A.

The following is a proposed new section under Chapter 13.04 to maintain an existing approved water system when a lot line is moved.

13.04.090 - Use of abutting lots.

A. Nothing in this division shall be construed to prohibit the use of all or part of an abutting lot or lots to either:

1. Provide access through a sufficient legal easement to connect a building sewer to an approved water supply system, when appropriate cause has first been established to the satisfaction of the administrative authority; or
2. Provide space through a sufficient legal easement for an approved water supply system or part thereof.

B. "Legal easement," as used in this section, means easements and/or, where all parcels involved are in common ownership, contracts to convey easements upon severance of such ownership. Such easements and contracts shall be in a form approved by county counsel and shall be deemed effective for the purposes of this section only when recorded in the office of the Napa County Recorder.

6.3.2 Title 13, Chapter 13.12 Wells

Review comments on sections in this chapter focus on clarifications and conformance with the state DWR Well Standards and with the Department of Public Health Drinking Water Program regulations, which has standards for protection of groundwater sources.

13.12.085 – Department of Public Health

Department of Public Health means the state Department of Public Health, Drinking Water Program.

Justification

Add definition to enable cross-referencing with standards and regulations of the state concerning potable wells.

13.12.160 - Shallow water well.

"Shallow water well" means any water well ~~thirty~~ **fifty** feet or less in depth.

Justification

Recommend fifty feet to discourage shallow wells and enhance wellhead protection. Change does not prohibit approval of a shallow well and Section 13.12.380(C) provides for seals as shallow as ten feet.

13.12.180 - Surface water.

A. "Surface water" means all those waters found on or immediately below the surface of the ground and that have not been filtered through any considerable amount of soil, ~~as defined by industry standards, and which normally do not meet California drinking water standards~~ and are not protected so as to exclude real or potential sanitary hazards.

B. Any groundwater determined to be under the influence of surface water, according to regulations of the state Department of Public Health, Drinking Water Program, shall be considered surface water for the purposes of this ordinance.

C. In the event that a conflict of opinion arises as to whether or not any waters are "surface waters," within the meaning of this division, the burden and expense of proving that such waters are not surface waters shall be upon the person or persons making such claim, and in the absence of findings to the contrary, the opinion and/or findings of the director shall be final.

Justification

1. The term "industry standards" is vague.
2. For potable sources, need to recognize category of groundwater that is "under the influence of surface water." These sources need to be treated as surface water to protect public health.

13.12.252 - Pump contractor.

Pump contractor means a person who possesses a valid C-61 contractor's license and is certified to pull, repair, and reinstall well pumps in water wells.

Justification

Add definition to recognize that some well work can be performed by other than **licensed** well drilling contractors under 13.12.250.

13.12.253 - Well standards, state

State well standards means Water Well Standards of the California Department of Water Resources Bulletin 74-81 and 74-90 combined.

Justification

Add definition.

As applicable to well applications submitted within the service of an existing water supply system, such as within a city that has a public water supply system, the County should seek to limit development of groundwater sources. This would be consistent with its conservation goals and policies. To limit such wells, for projects that can otherwise be served by an existing system, the following new section is recommended:

13.12.275 – Prohibition of wells that can be connected to existing systems

The director shall not approve a drilling application for a well located on a parcel within the service area of an existing water supply system unless it is demonstrated that the system is legally prohibited from providing a source of supply to the parcel or is incapable of providing an adequate supply.

13.12.330 - Materials and workmanship—Standards.

All materials and workmanship shall be no less than the quality specified in this division. The requirements of these standards are minimal only, and any material or method determined by the director to give equivalent or better results may be required. Materials or methods not covered by these standards must meet the standards of the California state Water Well Standards Bulletin 74-81 and the supplement thereto, bulletin 74-90, and must receive the written approval from the director prior to use. In the event of conflicting or contradictory requirements, the provisions of this division shall prevail. The director shall determine the appropriate standards according to the specific case. Except as otherwise contradictory, the California state Water Well Standards Bulletin 74-81 and 74-90 and any subsequent supplements and revisions thereto are hereby incorporated by reference.

Justification

Modified to reflect added definition of “Well Standards”, 13.12.260.

13.12.340 - Location—Distance from other facilities.

A. All water wells, geothermal heat exchange wells, extraction wells for the purpose of

Minimum Distances	
From property line	5 25 feet (see comment under Justification 1))
From septic tank and/or any portion of a sewage disposal system or sewage disposal system expansion area	100 feet
From public or private approved sewer line	25 50 feet
From a public road	SEE NAPA COUNTY CODE CHAPTER 18.112
From river, creeks	See Section 13.12.280

permanent dewatering, and horizontal wells shall be located as follows.:

As determined by the director, special setback distances may be required when the above wells are located near the following: regulated or unregulated underground fuel or storage tanks; contaminated sites, sanitary landfills and large scale animal or fowl operations.

B. Monitoring and cathodic protection wells, and exploratory borings shall maintain setbacks from potential sources of contamination as approved by the director. Such setbacks shall be dependent on the source of contamination, the depth of the monitoring or cathodic protection well, the depth and type of the annular seal, the formations which are penetrated, and the proposed usage.

Justification

1. Increase distance from property line to a) help ensure adequate offset from neighboring septic and/or b) help minimize interference. It is recognized that the minimum property line offset may impact land use on some parcels. In such cases, exemptions from the offset may be made in accordance with Section 13.12.350 with consideration given to the ability to meet all other minimum offset requirements.
2. Increase distance from sewer lines to conform to state Department of Public Health regulations.

13.12.350 - Location—Exemptions.

A well may be located closer than the minimum distances prescribed in Section 13.12.340 if the director finds that compliance is impractical because of unusual conditions, or if the director finds that special standards may be applied to the well construction so that no danger of contamination or pollution to the ground water will result. Such special standards of construction shall be approved by the director, and additional inspections may be required to assure strict compliance with such special standards. Such a well shall require a Class IB or a Class II permit. The setback distances may be increased when a special hazard exists as determined by the director.

Comment

See preceding Section regarding property line offset.

13.12.391 - Access opening for water level measurement.

A sounding pipe or tap hole with plug shall be installed on the finished wellhead to permit access for water level measurements.

Justification

Add provision to permit water level access in all new wells as an aid to Comprehensive Monitoring Program.

13.12.420 - Pump installation.

All pumps shall be installed by a licensed drilling or pump contractor. Pumps shall be installed so as to prevent contamination of the ground water supply by surface water or other contaminants. The pump shall be mounted through a sanitary well seal. There shall be an access opening for introduction of chlorine into the well and gravel pack.

Justification

Add provision requiring licensed contractor for pump installation.

13.12.430 - Completion report—Driller responsibilities.

The ~~driller~~ **well drilling contractor** shall submit a report of completion within the time frame required by state law, made out in detail on the ~~State~~ **state** Department of Water Resources reporting form to the director. **The well application will not be closed until a satisfactorily completed reporting form is submitted to the director. The director may withhold approving other well construction applications by a contractor which has failed to comply with the requirements in this section.**

Justification

Enacts leverage for timely submittal of properly completed well completion reports.

13.12.480 - Destruction of wells.

Prior to destroying a well, a detailed ~~evaluation and report on the well~~ **work plan** shall be submitted for approval to the director by a licensed well driller (as defined in Section 13.12.250). Such ~~report~~ **work plan** shall conform to state well standards for well destruction. The work plan shall indicate the type of well to be sealed, all known information of the geological conditions ~~of the soil~~ **existing in the well**, and the methods and material to be used in the destroying and sealing process. The methods and materials used in destroying wells shall be such that the ground water is protected from pollution or contamination.

C. For the destruction of monitoring wells, cathodic protection wells or exploratory holes, refer to ~~Bulletin 74-90 for requirements~~ Department of Water Resources Bulletin 74-90 and Supplement 74-90.

~~—Alternative well or test hole destruction methods.~~

~~Other methods of destroying wells, including large diameter wells and wells considered to pose a higher degree of risk to the ground water, may be approved by the director if in his opinion an equivalent effect will result, and no contamination or pollution to the ground water will occur.~~

~~(Ord. 1159 § 1 (part), 1999)~~

Justification

1. State well standards provide current best practices for well destruction..
2. “Alternative” methods under 13.12.490 not needed as preceding section allows applicant to propose any form of destruction program that protects groundwater.

6.3.2.1 Definitions

All ordinance sections can be improved by using consistent terms. For example, it was found that “well drilling contractor” is also called “well driller”, “well contractor”, or “driller” throughout the various parts. These different usages may raise questions as to whether there is intent in different ordinance parts to make distinctions when likely only meaning was intended. In this case, Chapter 13.12 Article I. General Provisions and Definitions provides an appropriate definition of a “well drilling contractor” as holding a C-57 contractor’s license. It is recommended that this term be employed consistently throughout.

6.3.2.2 Well Construction Application

As a complement to Chapter 13.12.430, Completion report, driller responsibilities, it is recommended that the County's Well Construction Application (see **Appendix 9**) have a provision that triggers the application close-out upon receipt of a properly completed well completion report. As indicated in comments above, the purpose is to provide the County with some leverage for timely submittal of completed well completion reports, which serve as an important source of information on new wells and initial groundwater conditions; the latter in the form of initial groundwater levels and well yield test results, which are required entries on the state reporting form.

6.3.3 Title 13, Chapter 13.15 Conservation

Napa County adopted a groundwater conservation ordinance was most recently revised in 2003 and 2007 to address concerns and needs regarding conservation of groundwater resources. The ordinance is intended to regulate the extraction and use, and promote the preservation of the county's groundwater resources. Compliance with this ordinance applies to development of new water systems or improvements to an existing water system that may use groundwater and imposes conditions on that use if it exceeds pre-determined thresholds. Consistent with the 2008 General Plan Update Water Resources Action Item WR-9, the County is currently implementing the State's Water Efficient Landscape Ordinance (WELo) as a conservation measure. Incorporation of the most current efficiency standards is included in recommendations in this chapter.

The groundwater conservation ordinance makes a distinction with respect to permitting requirements within groundwater deficient basins of which one is currently recognized: the Milliken-Sarco-Tulucay area, or MST. Because the MST basin is considered a groundwater deficient area, additional regulations and review requirements under the CEQA have required application of "no net increase" and "fair share" principles in groundwater use associated with discretionary actions requiring county approval. The "no net increase" in groundwater use is required because there is no surplus water to support new projects without adverse environmental impacts. The County has also recently established a water conservation program in the MST to disseminate information relevant to the unique needs of this deficient area.

The Conservation Chapter in Title 13 is consistent with prioritizing groundwater use for agricultural and rural residential uses as envisioned in the County's General Plan. It accomplishes this by limiting other uses when alternative sources of supply are available and by defining guidelines for acceptable usage rates. Notwithstanding the purposes and methods employed in the ordinance, it should also be recognized that for a groundwater deficient areas or basins, as the MST is classified, continued or even increases in groundwater pumping will not achieve a balance between extraction and recharge and declining trends in groundwater levels would not be abated. Thus, while it may be concluded that the ordinance is effective in providing a regulatory framework and procedures for identifying and mitigating potentially wasteful uses, it should not be viewed as a remedy for a deficient condition such as seen in the MST. Rather,

other actions outside of the ordinance that are concerned with developing new sources must be pursued in the long-term by the County.

Comments and recommended revisions to Chapter 13.15 are presented below:

13.15.010 - Title, purpose and definitions.

"Aquifer" means a geologic formation, underground layers of porous rock that are saturated from above or from structures sloping toward it, that stores, transmits and yields significant quantities of water to wells and springs. ~~Aquifer capacity is determined by the porosity of the subsurface material and its area.~~

Justification

"Aquifer capacity" is not a relevant scientific or engineering term.

13.15.010 - Title, purpose and definitions.

"Water efficient landscaping regulations" means the most current regulations in effect that are employed by the County to comply with state requirement to adopt a water efficient landscape ordinance.

Justification

Add definition that flexibly accommodates current standards.

13.15.030 - Classification of applications.

C. Applications Involving a Ministerial Approval.

Add as an additional requirement under Part 1. and Part 2.:

The permittee shall provide access to the County to measure water levels in spring and fall of each year, if requested.

Justification

Access to measure water levels is intended to provide opportunities to improve the Comprehensive Groundwater Monitoring Program.

13.15.035 – Applicability of water efficient landscape regulations.

All groundwater permits shall comply with the County's water efficient landscape regulations where applicable.

Justification

"Aquifer capacity" is not a relevant scientific or engineering term.

13.15.040 - Agricultural activities exempt from groundwater permitting requirements.

B. Developments or improvements in water sources serving agriculture on any other properties,

including adjacent property not qualifying as "contiguous" for purposes of this section, shall be subject to the same permitting criteria and standards identified in Section 13.15.030 for metering, water level access, reporting and water usage and Section 13.15.070.

C. Notwithstanding subsection (A) of this section, developments or improvements in water sources located on parcels included within those groundwater deficient areas depicted on Map 13-1 shall be subject to those permitting criteria and standards identified in Section 13.15.030 for metering, water level access, reporting and water usage and Section 13.15.070.

Justification

Clarification of requirements under 13.15.030.

13.15.060 - Application for groundwater permit.

Each applicant determined not to be exempt or eligible for a groundwater permit issued pursuant to subsection (C) of Section 13.15.030 shall be required to obtain a groundwater permit and shall submit a groundwater permit application to the director, using a form provided by the director. That application shall:

E. In the form of a Water Availability Analysis-Phase I, as outlined in the Department of Public Works August 2007 Water Availability Policy Report, as it may be amended from time to time, provide sufficient information and supporting documentation to enable the director of public works to determine whether it is likely the new water system, improvement or addition might significantly affect the impacted groundwater area or basin within Napa County, whether or not the proposed improvement or new system may be reasonably expected to adversely affect reasonable and beneficial uses of groundwater, interfere with surface water flows, or cause other adverse changes to the physical environment adversely affecting the impacted groundwater area or basin, or in any way conflict with the County's adopted policies or goals.

F. In cases for which the director finds that the application for a groundwater permit poses potential adverse impacts to groundwater or to neighboring wells, the director may impose conditions on the application to alleviate those potential adverse impacts. The applicant may propose alternative conditions to the director with additional data or studies in support of those alternatives.

Justification

See Section 6.5.1 on Water Availability Analysis.

13.15.070 - Processing of groundwater permit applications.

The following procedures and standards shall govern the review and disposition of applications requiring groundwater permits other than groundwater permits issued pursuant to subsection (C) of Section 13.15.030:

B. Following the director's determination that the groundwater declaration complies with Section 13.15.060, the director shall furnish a copy of the applicant's declaration to the director of the Department of Public Works to obtain the written comments of that department on the application. The director of public works shall instruct the applicant to perform any testing or produce supplemental information based on review of the application prepared under Section 13.15.060. ~~required phase II or III water availability analysis required by the written procedures established by the Department of Public Works. The Department of Public Works, in assessing any required phase II or~~

~~phase III analysis~~ determining a need for supplemental information, shall take into consideration the potential ~~changes~~ **direct impacts due to pumping on** ~~in static water levels of~~ neighboring wells prior to submitting its comments. The director of public works shall submit its comments in the form of a written appraisal of the application to both the director of the Conservation, Development and Planning Department and the director. That appraisal shall assess the potential for significant negative impacts on **local groundwater** ~~the affected groundwater table~~, and assess potential adverse effects on reasonable and beneficial uses of groundwater, interference with surface water flows, or other adverse changes to the physical environment. The director of the Conservation, Development and Planning Department shall review the application and the written comments and appraisal from the director of public works for the purposes of conducting the required environmental review and shall submit their written comments to the director.

Justification

See Section 6.5.1 Water Availability Analysis.

6.3.3.1 Water Availability Analysis – Policy Report Update

The Water Availability Analysis (WAA) Policy Report was prepared in 2007 to provide a means to cost effectively determine the effect of a project on 1) a neighboring well and/or 2) on the underlying groundwater system. Through implementation of the Comprehensive Groundwater Monitoring Program, the County is developing an improved basis to judge all varieties of project effects that might also be addressed through the process delineated in the 2007 WAA report. This includes basin or subarea analysis of long-term changes in groundwater resource availability using baseline data generated through the Comprehensive Groundwater Monitoring Program. In recognition that additional information and expertise is being developed by the County through implementation of various 2008 General Plan Update goals and policies, it is recommended that the approach outlined in the 2007 WAA Policy Report be updated.

As the WAA policy report acknowledges, interpretation of groundwater conditions in relation to groundwater permit applications entails a “very complex analysis.” With the acknowledged complexity, experience indicates that it is difficult to assess impacts and identify the need for regulatory conditions for groundwater projects in the absence of the basic background data that the County’s groundwater monitoring program is developing. The County’s WAA policy can and should be flexible in interpreting potential impacts and imposing conditions on applications on a case-by-case basis while providing a framework that both County personnel involved in decision making and project applicants understand. To this end, parts of the 2007 WAA policy provide a sound screening tool, specifically the Phase I analysis, while other parts could be updated as discussed further in this section.

The Phase I Analysis of the WAA consists of compilation of basic project information and water usage. This step clearly meets the stated policy objective of a simplified analysis process and it provides County personnel involved in the review process with a basic project description and determination of whether guidelines for water consumption are excessive and/or warrant imposing conditions on the applicant’s permit. To enhance the Phase I process, the County’s groundwater monitoring database could be employed to locate all nearby wells so that horizontal distances to potentially affected neighboring wells can be quantified. Typically, given the horizontal spacing, well depths, screened intervals, and pumping rates (all parameters targeted in

the monitoring database), an initial screening of the potential for significant pumping interference can be made. This is particularly the case for alluvial systems, but may be less so for fractured-rock aquifers. Thus, the current Phase I analysis can provide sufficient screening to address the question of potential impacts to neighboring wells by expanding the basic required information to include existing well locations, depths, proposed pumping rates, etc. A checklist of relevant information that should be compiled in the Phase I analysis is as follows:

1. The characteristics of the groundwater area, or basin (e.g., confined or unconfined; alluvial or hard rock?)
2. Identification of all nearby wells completed to similar depths as the proposed new well; a reasonable limit would be all wells within 500 feet of the proposed new well.
3. Distance to the nearest similarly completed well.
4. Maximum capacity of the proposed well and the nearest neighboring well. Reasonable estimates for any existing neighboring well can be based on casing diameter through a look-up table.
5. Average and peak pumping capacity for the estimated water usage.
6. Identification of all nearby surface waters, including springs or seeps; a reasonable limit is a 500-foot radius around the proposed well.

With the above information, an updated WAA screening process can be developed that concludes with a determination of whether the potential for pumping interference is negligible, moderate, or high. When sufficient information is available, the determination can be complemented with analytical tools that estimate interference between two wells given pump capacity, pumping duration, and estimates of aquifer properties. Such an approach is commonly employed in groundwater hydrology as a screening tool to judge potential impacts of new well projects and can readily be applied through an updated Phase I procedure. The screening tool can also include guidelines as to what constitutes a significant interference impact. Such guidelines would reflect the fact that in some cases 10 feet of impact, for example, would be of little consequence to an adjacent pumper, but could be very significant in another setting.

Utilization of an updated WAA methodology will likely successfully screen potential impacts to adjacent wells and watercourses in a majority of cases. In others, review by a hydrogeologic consultant would likely resolve ambiguous results and in cases where available data are limited and professional judgment is clearly warranted.

Under the 2007 WAA procedures, if there is a determination that a project exceeds or may exceed water usage guidelines, a Phase II analysis consisting of pump testing may be triggered. There are two potential concerns with such a step. First, pump testing to evaluate well interference is subject to many factors which, in the absence of careful planning and design, may result in ambiguous interpretations. And second, it is unlikely that a discrete pump test will reveal anything significant regarding potential impacts to the groundwater basin or potential impacts to surface water hydrology. In most situations, a broader assessment of potential area or basin impacts should not be the responsibility of an individual applicant, rather it should be based on the County's own hydrogeologic assessments of basins or subareas.

Pump testing can also be a large expense for the permit applicant and may require weeks of continuous background monitoring to delineate trends in water levels that occur due to seasonal fluctuations, local well pumping influences, tidal influences, etc. Such a testing and monitoring program is generally not practical for small-scale projects and the County would be better served to seek expert oversight to ensure that its interests with regard to well and aquifer pump testing results are technically sound and where the need for well and aquifer testing is unequivocal.

Experience indicates that it is difficult to simplify testing requirements to address interference and other groundwater impacts to a single protocol. Properly conducted testing, as indicated above, may be costly due to the need to identify background water level trends. It may also require installation of appropriately spaced observation wells to delineate a pumping cone of depression. Such testing usually occurs for projects that conduct a CEQA environmental impact study, i.e., where an initial study indicates potentially significant impacts to local and regional water resources. For all other projects, an updated WAA procedure informed with the results of the County’s ongoing monitoring program and other basin studies can provide an improved approach to evaluate potential pumping impacts. Recommended elements of an updated WAA Phase II review process are presented below and would use the Phase I information discussed previously to define the potential for project impacts:

Step	Relevant Phase 1 Information	Options	Analysis
Identify Type of Hydrogeologic Setting	<ul style="list-style-type: none"> • Well location • Well depth 	<ul style="list-style-type: none"> • Groundwater deficient? • Alluvial or hard rock? • Bayside? 	Decision-tree analysis to identify impact thresholds for interference and surface water interaction based on: <ul style="list-style-type: none"> • Type of aquifer • Completion interval • Maximum and average pumping capacity • Distances to nearby wells • Proximity to surface water
Identify Types of Impacts for Setting	<ul style="list-style-type: none"> • Maximum well capacity • Distances to nearby wells • Proximity to surface water 	<ul style="list-style-type: none"> • Well construction details • Interference with other wells? • Potential for intrusion? • Potential to be under influence of surface water? • Potential to exacerbate overdraft? 	
Identify Baseline Data	<ul style="list-style-type: none"> • County data base • Applicant • None available 	<ul style="list-style-type: none"> • Data sufficient to support a determination of impact magnitude? 	

The analysis performed in the far-right column above could include simple analytical tools to calculate drawdown impacts for the proposed pumping rate and spacing from existing wells. Judgment would be required in using the tool and the procedure would require additional training and expertise to be developed by the County (a stated policy objective in the 2008 General Plan Update (WR Policy CON- 52.5)). Through training, development of a checklist approach to prioritize likely impacts, and utilizing outside expertise in the most technically challenging problems, it is anticipated that well and aquifer testing by an applicant will not be the primary component of an updated Phase II process. Rather, such testing will be part of projects where pumping magnitudes are much larger than existing water usage guidelines. The size of such

projects will likely require detailed hydrologic studies (that may or may not include well and aquifer testing) as part of the environmental review process required under CEQA.

The recommendation to update the WAA policy report should be conducted under technical guidance from qualified hydrologic consultants. The update should include provisions for training County personnel that are involved with reviewing groundwater permit applications.

6.3.3.2 Groundwater Permit Required for Export

Consistent with stated policies and goals concerning preservation of agricultural and natural resources, and specifically Policy CON-53.5 of the 2008 General Plan Update, the County's conservation ordinance should be updated with a provision concerning groundwater exports. Modification to groundwater ordinances are commonly employed to address possible exchange agreements. Groundwater exports may result in the effective reduction in groundwater supplies in a county. Therefore, it is recommended that the County's ordinance be expanded by prohibiting groundwater export outside the county without a permit to ensure that potential impacts of such activities are identified and mitigated. Suggested language is as follows:

13.15.____ - Permit Required for export for use outside county.

A. A groundwater permit shall be required to extract groundwater for export for use outside the county.

B. No permit shall be approved authorizing the export for use of groundwater outside the county without conditions or assurance of the adequate, long-term supply for agriculture, conservation, domestic, industrial, and recreational uses in the affected watershed.

Justification

Implements Water Resource Policy CON-53.5.

7.0 Summary Review and Recommendations

Counties, regions, and local entities throughout California are striving to achieve sustainable management of their groundwater resources. This Memorandum has described California's groundwater management approaches and reviewed Napa County's groundwater goals, policies, ordinances and procedures, including its groundwater/well permitting process. This Memorandum also provides recommendations to achieve conformance with groundwater related policies, goals, and action items contained in the County's General Plan update and to improve the well and groundwater permitting process. Specifically, this section provides recommendations to the County on:

- 1) Becoming the lead monitoring and reporting entity under the State's CASGEM program, including:
 - a. The development of a DWR-approved monitoring program (as required under SBX7 – 6 and the Water Code), and

- b. To assume monitoring functions for the SBX7 – 6 groundwater elevation monitoring program;
- 2) Developing a Napa County groundwater sustainability plan; and
- 3) Reviewing and updating County Ordinances 13.04, 13.12, and 13.15, and the County’s groundwater permitting process.

7.1 Groundwater Elevation Monitoring – SBX7– 6 (CASGEM)

Napa County’s Action Item CON WR-8 describes “surface and groundwater monitoring in the County that shall be used to determine baseline water quality conditions, track groundwater levels, and identify where problems may exist.” The work conducted as part of the County’s Comprehensive Groundwater Monitoring Program provides key information on current and recommended groundwater level monitoring throughout the County (LSCE, 2010c). The County’s current groundwater monitoring program is well-suited to serve as the basis for planning and implementation of the CASGEM program.

7.1.1 County as Entity to Assume Monitoring Functions – Apply by January 1, 2011

A county is one of several types of entities eligible to assume groundwater monitoring functions in accordance with Water Code Section 10927. To be named as a monitoring and reporting entity, the County must notify DWR in writing by January 1, 2011.² The Water Code indicates that the appointed entity will perform the monitoring functions for DWR’s designated groundwater basins or subbasins. The intent of designating monitoring and reporting entities is to avoid overlapping regions. If more than one entity applies for the monitoring function in a subbasin, DWR will consult with the interested parties to determine the best means for that particular region/basin. DWR has indicated that it prefers that the monitoring function oversight role be determined at the local level by entities interested in the state CASGEM program. Many entities may contribute to performing collection of the pertinent groundwater elevation data; however, one entity would be designated to serve as the point of contact with DWR and would be responsible for submitting the data in accordance with Water Code requirements and other guidance provided by DWR.

Notably, where necessary, DWR will perform the groundwater elevation monitoring in basins/subbasins where no local party has agreed to perform the monitoring functions (Water Code Section 10933.5). Additionally, if local parties (including counties) do not volunteer to perform the groundwater monitoring functions, and DWR assumes those functions, then those parties become ineligible for water grants or loans from the state (Water Code Section 10933.7). Therefore, in addition to the incentive provided in Water Code 10750 for local agencies to manage groundwater resources in order to be eligible for grants or loans from the state, another incentive is now incorporated to encourage the groundwater elevation monitoring that, regardless of whether there is yet a formally adopted groundwater management plan, is an integral and necessary part of local groundwater resources management. On December 14, 2010, the Napa County Board of Supervisors approved the County as the monitoring and reporting entity for the entirety of Napa County.

² The County has submitted its intent to be the monitoring entity for all of Napa County.

7.1.2 Approved CASGEM Monitoring Entity to Commence Reporting to DWR by January 1, 2012

As indicated in the Water Code Section 10932, the entity that assumes monitoring and reporting functions will begin monitoring and reporting seasonal groundwater elevations on or before January 1, 2012. DWR has prepared CASGEM Program guidelines that include detailed descriptions of the measurement procedures and program reporting requirements (<http://www.water.ca.gov/groundwater/casgem/>).

7.2 Benefits of Groundwater Sustainability Planning

Napa County's General Plan (Action Item CON WR-8) describes surface and groundwater monitoring that shall be used to determine baseline water quality and quantity conditions, track groundwater levels, and identify where challenges may exist. This action item also describes that "where there is a demonstrated need for additional management actions to address groundwater problems, the County shall work collaboratively with property owners and other stakeholders to prepare a plan for managing groundwater supplies pursuant to State Water Code Sections 10750-10755.4 or other applicable legal authorities."

To undertake the County's General Plan Action Item CON WR-8 and to complement the recommended Groundwater Monitoring Program (LSCE, 2010c), it is recommended that the County prepare a countywide groundwater plan pursuant to Water Code Sections 10750 *et seq.* As defined in the Water Code, such a plan need not only address groundwater problems, but may describe coordinated and ongoing activities undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin (Water Code Sections 10752(d and e)).

As envisioned by the State, a well designed plan benefits local planning efforts, and it would serve to implement the County's General Plan goals to "conserve, enhance, and manage water resources on a sustainable basis to attempt to ensure that sufficient amounts of water will be available for the uses allowed by the General Plan, for the natural environment and for future generations." There are many additional benefits to developing a countywide plan, including:

- **Monitoring Programs** - A plan includes monitoring programs that aid evaluation of surface and groundwater conditions, allowing for the ongoing assessment of the status of interrelated water resources in the county, facilitates identification of problems or potential problems, and helps identify appropriate actions in advance of adverse and potentially irreversible effects, and strengthens the understanding and assurance that sufficient amounts of water are and will continue to be available for human and environmental needs.
- **Regional Assessment** - The County's groundwater resources transcend local jurisdictional boundaries. The monitoring programs included within a countywide plan would enable superior assessment of the appropriate scale of analysis to accomplish basin management objectives.

- **Coordination** - A countywide plan would encourage coordination of regional and local agency interests and efforts, including consistency between local and regional planning objectives and their implementation.
- **Funding Eligibility** - A countywide plan provides opportunities for the County, and other entities (other local agencies in the county) who decide to participate in or support the planning process, to in the future become eligible for DWR grant (e.g., Proposition 84) and loan funding.
- **Conjunctive Use** - A plan would facilitate identification of conjunctive use³ strategies designed and implemented to build countywide water supply resiliency, while protecting the natural environment.
- **Community Education and Outreach** - A countywide plan would lend support to other county activities aimed at educational and public outreach in support of the General Plan goals to ensure, enhance, and manage water resources on a sustainable basis.
- **Define Responsibilities** - A countywide plan may not manage groundwater within the organized service areas of other local agencies unless there is agreement from the affected entity(ies) (Water Code Section 10750.7)⁴

7.2.1 Preparation of Work Plan

Consensus exists among County stakeholders on the value of the County's water resources. Consistent with the County's goals, it is recommended that the County continue dialog with other entities, citizens, and interested parties about the preparation of a work plan that includes implementation of the recommended countywide groundwater monitoring program and CASGEM program, and would initiate actions such as described in this section that lead to the development of a countywide groundwater sustainability plan.

7.2.1.1 Public Outreach

Public outreach is an essential component of any water resources planning program. A groundwater sustainability plan should include objectives for information sharing and education about the county's groundwater resources, including an understanding of what is known from currently available data and what activities are planned to better understand and ensure these

³ Conjunctive use is defined as "the coordinated and planned management of both surface and groundwater resources in order to maximize the efficient use of the resource; that is the planned and managed operation of a groundwater basin and a surface water storage system combined through a coordinated conveyance infrastructure. Water is stored in the groundwater basin for later and planned use by intentionally recharging the basin during years of above-average surface water supply" (DWR, 2003).

⁴ Water Code Section 10750.7(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

resources are sustained for future generations and the health of the natural environment. The Watershed Information Center and Conservancy (WICC) Board of Napa County, whose mission, vision and guiding principles are highly aligned with these essential outreach components, is well positioned to be an integral part of the public outreach planning process. It is recommended that the WICC Board be utilized to development various public outreach components.

7.2.1.2 Implement Recommended Countywide Groundwater Monitoring Programs and Data Management System

The Comprehensive Groundwater Monitoring Program Study recommends the continuation of current groundwater monitoring programs and expansion and/or refinement of the programs conducted by the County and others (LSCE, 2010c). Recommendations for going forward to expand and improve the County's Data Management System (LSCE, 2010a) and groundwater monitoring procedures should be undertaken. Monitoring elements of a groundwater plan include components relating to groundwater levels and quality, inelastic land surface subsidence (where applicable), and the flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin (Water Code Section 10753.7 (a)(1)). The Water Code also describes the inclusion of "monitoring protocols" (Water Code Section 10753.7 (a)(4)), which is interpreted to mean "developing a monitoring program capable of tracking changes in conditions for the purpose of meeting MOs" (DWR, 2003)(MOs refers to management objectives). It is recommended that the County coordinate and integrate monitoring activities that improve upon the recommended countywide Comprehensive Groundwater Monitoring Program (LSCE, 2010c) to support the development and implementation of an inclusive groundwater sustainability plan that meets local basin management objectives (BMO's) and the minimum requirements outlined in the Water Code.

7.2.1.3 Groundwater Advisory Committee

Consistent with the Water Code Section 10753 *et seq.* and DWR's recommended plan components (DWR, 2003), LSCE recommends an advisory committee be established to help guide the County and provide a forum for stakeholder input. The committee should include stakeholders and interested entities that will help guide the steps taken to update the County's groundwater ordinances and develop a groundwater sustainability work plan.

7.2.1.4 Development of Groundwater Basin Objectives

In consideration of the overall purpose of the County's General Plan action items and stakeholder issues, interests, and concerns identified through the public outreach process, regional and local basin BMOs should be developed that are directed toward the sustainability of groundwater supplies and included in a groundwater sustainability plan.

7.2.2 Development of Groundwater Sustainability Plan and Plan Updates

Following development and implementation of a work plan, steps would lead to preparation of a draft groundwater sustainability plan. The draft plan could include, among other items per Water Code 10750 *et seq.*, the following:

- Map of countywide basins/subbasins;
- Groundwater sustainability goals and BMOs;
- Monitoring program (e.g., groundwater [levels and quality], surface water [flows and quality] and subsidence); and
- Implementation or action components.

Once a countywide plan is developed and adopted, it is expected that the plan would be periodically updated in the future to account for changes to countywide or more local basin objectives, water planning requirements, environmental considerations, and information generated from the countywide monitoring program.

7.3 **Groundwater Ordinance**

Recommendations regarding ordinances on wells and groundwater are made to implement various objectives and policies of the County's General Plan Update. Various recommendations propose modifications to Title 13, Chapters 13.04, 13.12, and 13.15. An overview of key recommendations for each chapter is as follows:

Chapter 13.04 Approved Water Supply Systems

- Modify what is acceptable for demonstrating the yield of a well.
- Add provision for water supply easement when lot line changes.

Chapter 13.12 Wells

- Modify technical terminology for accuracy and consistency.
- Increase property line offset for new well where it does not adversely affect land use.
- Streamline destruction standards by incorporating state requirements.
- Provide access for water level measurements under construction requirements.

Chapter 13.15 Conservation

- Add more provisions for some permits to monitor groundwater conditions.
- Incorporate current standards for water efficient landscaping.
- Update 2007 Water Availability Analysis Policy Report to reflect County's groundwater monitoring and basin studies.
- Add permit requirement for groundwater export and prohibit export without assuring the sufficiency of water supply for County uses.

8.0 References

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