A Tradition of Stewardship
A Commitment to Service

Napa County
Groundwater Resources
Advisory Committee

AGENDA

REGULAR COMMITTEE MEETING

Thursday, October 27, 2011, 3:00 p.m.

Agricultural Commissioner's Office/UCCE Conference Room
1710 Soscol Avenue, Napa CA

Committee Members

Michelle Benvenuto
Franklin Tucker Catlin
John Alan Galbraith
Donald Gleason
David Graves
Michael Haley
Peter McCrea
Charles Slutzkin
Steve Soper
Marilee Talley
William Trautman
James Frederick Verhey
Susanne von Rosenberg
Duane Wall
Dale Withers

1. CALL TO ORDER & ROLLCALL

2. WELCOME & INTRODUCTIONS *(40 minutes)*
   (Staff, Consultant, Committee)

3. ORGANIZATIONAL ITEMS *(50 minutes)*
   (Staff, Consultant, Committee)

   a. ELECT CHAIR/VICE CHAIR

   b. REVIEW NOTEBOOK/WEBSITE/STAFF CONTACTS

   c. REVIEW/ADOPT BYLAWS

   d. REVIEW/ADOPT MEETING CALENDAR & WORKPLAN

   e. REVIEW/ADOPT COLLABORATION GUIDELINES

   f. PRESENTATION/DISCUSSION OF BROWN ACT

4. PUBLIC COMMENT

In this time period, anyone may comment to the Committee regarding any subject over which the Committee has jurisdiction, or request consideration to place an item on a future Agenda. No comments will be allowed involving any subject matter that is scheduled for discussion as part of this Agenda. Individuals will be limited to a three-minute presentation. No action will be taken by the Committee as a result of any item presented at this time. *(Chair)*

5. BREAK

6. PRESENTATIONS AND DISCUSSION ITEMS *(60 minutes)*

   a. COUNTY POLICIES REGARDING GROUNDWATER *(10 minutes)*
   (Hillary Gitelman, Director/CDPD)

   b. STAKEHOLDER ASSESSMENT FINDINGS *(10 minutes)*
   (Dorian Fougeres, Center for Collaborative Policy)

1195 Third Street,
Suite 210
Napa, CA
94559

Tel: 707-253-4417
Fax: 707-253-4336

c. NAPA COUNTY GROUNDWATER STUDY RESULTS - PART I *(40 minutes)*
(Vicki Kretsinger Grabert, Luhdorff & Scalmanini Consulting Engineers)

7. OTHER BUSINESS *(10 minutes)*

a. CASGEM UPDATE
(Phil Miller, Deputy Director/Public Works)

b. GROUNDWATER RFP/CONSULTANT SELECTION UPDATE
(Patrick Lowe, Deputy Director/CDPD)

8. ANNOUNCEMENTS

9. FUTURE AGENDA ITEMS

10. ADJOURNMENT to the NEXT MEETING (*Chair)*

Thursday, December 15, 2011 – 3:00pm
Agricultural Commissioner's Office/UCCE Conference Room
1710 Soscol Avenue, Napa CA

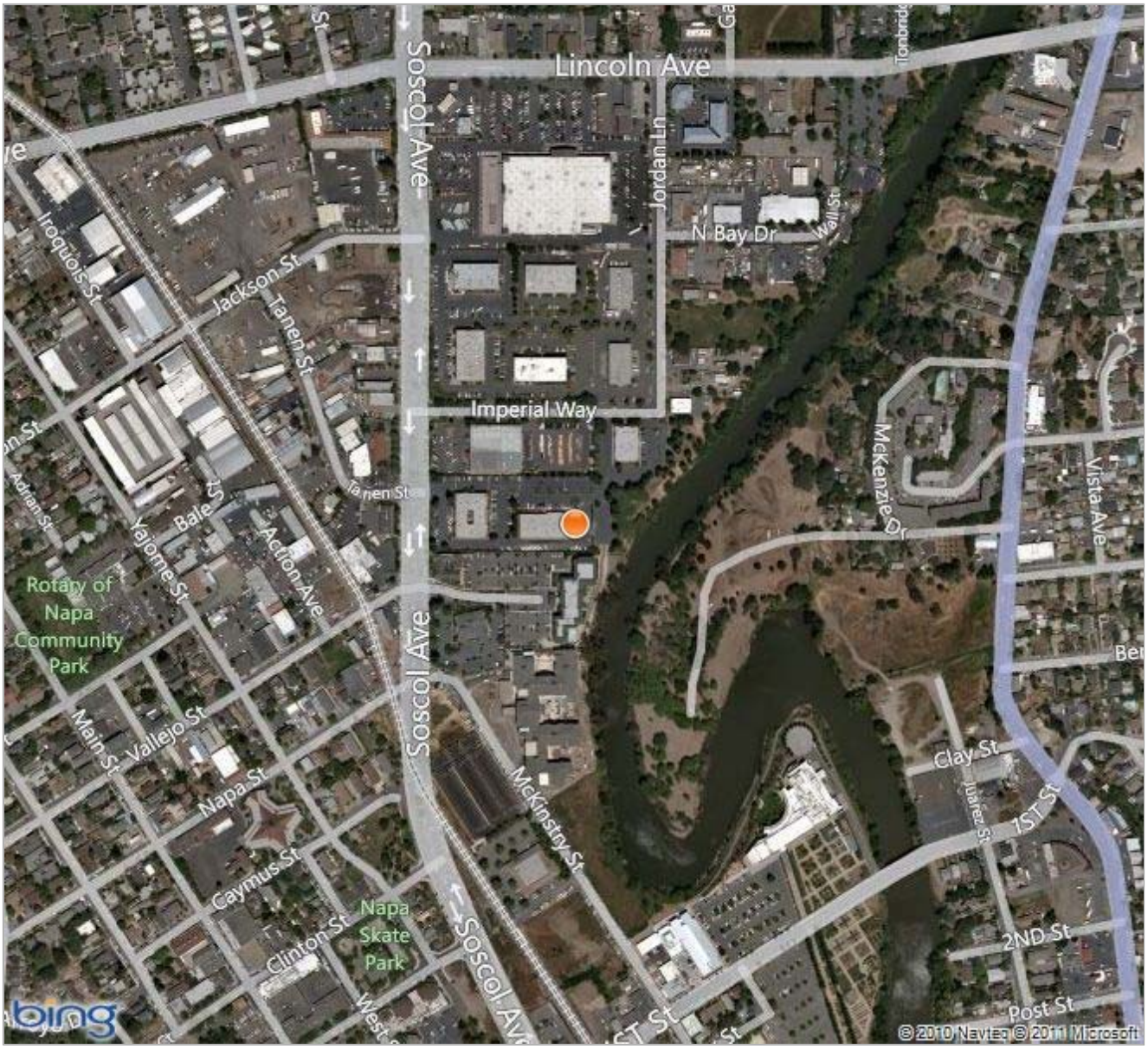
Note: Where times are indicated for agenda items they are approximate and intended as estimates only, and may be shorter or longer, as needed. If requested, the agenda and documents in the agenda packet shall be made available in appropriate alternative formats to persons with a disability. Please contact Greg Morgan at 707-259-8621, 804 First St., Napa CA 94559 to request alternative formats.

bing Maps

1710 Soscol Ave, Napa, CA 94559

October 27, 2011, 3:00PM
Ag. Commissioner/UC Cooperative Ext.
Conf. Room

On the go? Use **m.bing.com** to find maps, directions, businesses, and more



Bird's eye view maps can't be printed, so another map view has been substituted.

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Napa County
Groundwater Resource Advisory Committee (GRAC)
Staff Support

F_NAME	L_NAME	TITLE	DEPT	ADDRESS_1	CITY	STATE	ZIP	EMAIL	PHONE
Hillary	Gitelman	Director	Conservation, Develop. & Planning	1195 Third St., Suite 210	Napa	CA	94559	hillary.gitelman@countyofnapa.org	707-253-4805
Don	Ridenhour	Director	Public Works	1195 Third St., Suite 201	Napa	CA	94559	don.ridenhour@countyofnapa.org	707-259-8321
Steve	Lederer	Director	Environmental Management	1195 Third St., Suite 101	Napa	CA	94559	steven.lederer@countyofnapa.org	707-259-8228
Patrick	Lowe	Deputy Director	Conservation, Develop. & Planning	1195 Third St., Suite 210	Napa	CA	94559	patrick.lowe@countyofnapa.org	707-259-5936
Phil	Miller	Deputy Director	Public Works	1195 Third St., Suite 201	Napa	CA	94559	phillip.miller@countyofnapa.org	707-259-8620
Jeff	Sharp	Principal	Conservation, Develop. & Planning	1195 Third St., Suite 210	Napa	CA	94559	jeff.sharp@countyofnapa.org	707-259-5936
Rick	Thomasser	Operations Manager	Public Works	1195 Third St., Suite 201	Napa	CA	94559	richard.thomasser@countyofnapa.org	707-259-8657
Sheldon	Sapoznik	Env. Health Supervisor	Environmental Management	1195 Third St., Suite 101	Napa	CA	94559	sheldon.sapoznik@countyofnapa.org	707-259-8328
Daisy	Lee	Senior Analyst	Public Works	1195 Third St., Suite 201	Napa	CA	94559	daisy.lee@countyofnapa.org	707-253-4514
Janice	Killion	Deputy Co. Counsel	Office of County Counsel	1196 Third St., Suite 301	Napa	CA	94559	janice.killion@countyofnapa.org	707-259-8246
Greg	Morgan	Supervising Office Asst.	Public Works	1195 Third St., Suite 201	Napa	CA	94559	greg.morgan@countyofnapa.org	707-259-8621
Barbara	Futz	Office Asst.	Public Works	1195 Third St., Suite 201	Napa	CA	94559	barbara.fultz@countyofnapa.org	707-259-8600
Molly	Rattigan	Senior Analyst	County Executive Office	1195 Third St., Suite 310	Napa	CA	94559	molly.rattigan@countyofnapa.org	707-253-4112

Dorian	Fougères	Facilitator	Center for Collaborative Policy	815 S Street, 1st Floor	Sacramento	CA	95811	dfougeres@ccp.csus.edu	415-812-7819

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RESOLUTION NO. 2011-79

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF NAPA, STATE OF CALIFORNIA, APPROVING CREATION OF THE GROUNDWATER RESOURCES ADVISORY COMMITTEE

WHEREAS, groundwater is used to support agriculture and other rural uses within unincorporated Napa County; and

WHEREAS, members of the community regularly express concern about well interference, impacts to surface water, and the long term sustainability of groundwater resources; and

WHEREAS, the County is geographically and geologically diverse, and site- and area-specific data is needed before groundwater conditions can be fully understood; and

WHEREAS, the State Department of Water Resources will initiate groundwater monitoring and reporting ("CASGEM") requirements in 2011; and

WHEREAS, Action Item CON WR-8 in the Napa County General Plan requires the County to "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;" and

WHEREAS, Action Item CON WR-8 further requires the County to use monitoring data "to determine baseline water quality conditions, track groundwater levels, and identify where problems may exist" and work collaboratively with property owners and other stakeholders where there is a demonstrated need for actions to address groundwater problems; and

WHEREAS, the General Plan also requires the County to identify groundwater recharge areas (CON WR-5), establish and disseminate standards for well pump testing (CON WR-6), and work toward development and implementation of an integrated water resources management plan with groundwater management objectives (CON WR-7); and

WHEREAS, on February 14, 2011, the Board of Supervisors held a special meeting to receive a presentation regarding the results of two groundwater studies, as follows:

- *Assessment of the Feasibility of a Collaborative Groundwater Data Gathering Effort in Napa County* by the Center for Collaborative Policy, California State University, Sacramento, August 2010

- *Napa County Comprehensive Groundwater Monitoring Program*, by Luhdorff & Scalmanini Consulting Engineers, February 2011; and

WHEREAS, both studies identified the need for a collaborative data gathering effort, including establishment of an advisory committee to guide the synthesis of existing information, additional data collection and analysis; and

WHEREAS, the Board desires to establish an advisory committee that is representative of various geographic locations and interest groups within the County to complement the work of County staff and technical experts; and

WHEREAS, to facilitate compliance with the Maddy Act, the Board desires to formalize the creation of the Napa County Groundwater Resources Advisory Committee ("GRAC"), including its purpose and the number, terms and qualifications of the members, in this Resolution as set forth below; and

WHEREAS, procedures relating to the formation and operation of the GRAC are defined by Section 15378 (b)(2) of Title 14 of the California Code of Regulations as administrative procedures not subject to the California Environmental Quality Act:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors hereby creates the GRAC as follows:

Section 1. Purpose.

The GRAC is hereby created to assist County staff and technical consultants with recommendations regarding (a) the synthesis of existing information and identification of critical data needs; (b) the development and implementation of an ongoing groundwater monitoring program; (c) the development of revised well pump test protocols and related revisions to the County's groundwater ordinance; (d) the conceptualization of hydrogeologic conditions in various areas of the County and an assessment of groundwater resources as data becomes available; (e) the development of groundwater sustainability objectives that can be achieved through voluntary means and incentives; and (f) building community support for these activities and next steps.

The GRAC shall cease to exist upon completion of these purposes or on December 31, 2014, whichever occurs first, unless the GRAC is affirmatively perpetuated by resolution of the Board of Supervisors.

Section 2. Member Qualifications.

The GRAC shall be comprised of fifteen (15) county residents appointed by the Board of Supervisors representing diverse interests from a geographical perspective and interest-based perspective including, but not limited to, environmental, agricultural, development, and community interests. A familiarity with water resources is desired but not required. When possible, membership priority shall be given to those residing within State designated groundwater basins, or surrounding watershed basins.

Members shall collectively address the following requirements (individual members may fulfill more than one requirement):

A. At least one member shall be from each one of the five County Board of Supervisors Districts.
B. At least one member should be from one of the following groundwater basins: Pope Valley, Clearlake Pleistocine Volcanic Area and Berryessa Valley.
C. At least one member should be from each of the following sub-areas of the of the Napa-Sonoma Valley groundwater basin, Milliken-Sarco-Tulocay, Angwin, Carneros, Calistoga, St. Helena, Yountville and Napa.
D. At least five members should work in agriculture and/or represent agricultural/wine industry interests; and
E. At least five members shall represent environmental organizations, property rights organizations, or other community-based organizations.

Section 3. Term of Office & Recruitment of Members.

Members shall serve until December 31, 2014.

The County Executive Office is directed to immediately commence the process of seeking applicants for appointments of the GRAC in accordance with the procedures prescribed by the Maddy Act set forth in Government Code section 54970 et seq. and shall use the same process to fill any vacancies that may arise on the GRAC prior to December 31, 2014.

Section 4. Bylaws.

The GRAC Bylaws attached hereto as Exhibit "A" and incorporated by reference are hereby approved.

Section 5. First Organizational Meeting.

The GRAC shall conduct its first organizational meeting no later than October 31, 2011, for the purpose of adopting bylaws, setting its meeting schedule, and taking such other organizational actions as may be required, including the election of a Chair and Vice-Chair. The Secretary of the GRAC shall be a non-elected office filled by an employee of the County of Napa designated by the Director of Conservation, Development and Planning.

Section 6. Liaison & Technical Assistance.

The Conservation, Development and Planning Department shall act as a "liaison department" and the Conservation, Development and Planning Director or designee shall serve as "liaison officer" to the GRAC for purposes of complying with the Maddy Act.

The Department of Public Works shall provide technical support to the GRAC, and shall make staff and consultants with appropriate expertise available to the committee on an as needed basis as funding permits.

Section 7. Compensation and Budget.

The members of the GRAC shall serve without compensation but may be reimbursed for actual expenses incurred within the limits of a budget approved by the Board of Supervisors for the GRAC. The GRAC shall submit a proposed expense budget annually to the Board of Supervisors for consideration and possible approval by the Board, to the extent funds are available.

The foregoing resolution was duly and regularly adopted by said Board of Supervisors of the County of Napa, State of California, at a regular meeting held June 28, 2011, by the following vote:

AYES:	SUPERVISORS	DILLON, LUCE, WAGENKNECHT and CALDWELL
NOES:	SUPERVISORS	NONE
ABSENT:	SUPERVISORS	DODD

BILL DODD, Chairman
Board of Supervisors

ATTEST:

GLADYS COIL
Clerk of the Board
By: _____

Approved as to form:

By: *Janice D. Killion (e-signature)*

Napa County Counsel

Exhibit "A" – Bylaws

Approved by Napa County Board of Supervisors

Date: June 28, 2011

Processed by: _____

EXHIBIT "A"
BYLAWS OF THE NAPA COUNTY
GROUNDWATER RESOURCES ADVISORY COMMITTEE

I. **OFFICERS.** The officers of the Napa County Groundwater Resources Advisory Committee (the "GRAC") shall be the Chair, Vice-Chair and Secretary, chosen as follows:

A. **Time of Election.** At the first organizational meeting, the members of the GRAC shall elect the Chair and Vice-Chair from among their members. For purposes of these Bylaws, the terms "Chair" and "Vice-Chair" shall have the same meaning as, and may be used interchangeably with, the terms "Chairman" and "Chairperson," and the terms "Vice-Chairman" and "Vice-Chairperson." The Secretary shall be an employee or consultant of the County of Napa designated from time to time by the Napa County Director of Conservation, Development and Planning to perform the functions of Secretary described in these Bylaws.

B. **Term.** The Chair and Vice-Chair nominated and elected at the initial meeting of the GRAC shall begin their terms of office immediately upon election. Thereafter, the officers shall be nominated and elected in January of each year, beginning with 2013 and shall serve until their successors are elected and assume office. If the office of Chair becomes vacant during the term, the Vice-Chair shall become Chair. Vacancy in the office of Vice-Chair during the term shall be filled by election to serve the remainder of the term.

C. **Duties of the Chair and Vice-Chair.** The Chair, or the Vice Chair in the absence of the Chair, shall act as the presiding officer of the GRAC and in that capacity shall preserve order and decorum, decide questions of order subject to being overruled by a two-thirds vote and perform such other duties as are required by these Bylaws, the resolution(s) of the Napa County Board of Supervisors creating and/or modifying the composition and charge of the GRAC, or by vote of the GRAC. The Chair shall have all the rights and duties enjoyed by any other member of the GRAC, including the right to make and second motions.

II. **MEETINGS**

A. **Date and Location of Regular GRAC Meetings.** Regular meetings of the GRAC shall be held on the fourth Thursday of every other month as shown on a calendar and at a location which the GRAC shall adopt at the first meeting of the GRAC, of each calendar year. Notwithstanding the foregoing, any regularly scheduled meeting of the GRAC may be canceled by majority vote of the GRAC or, for lack of business or a quorum, by the Chair or Secretary.

B. **Time of Regular GRAC Meetings.** Regular meetings of the GRAC shall commence at 3:00 p.m. and continue until all agendized business is concluded

unless adjourned earlier on motion of the GRAC for any reason or by the Chair or Secretary for lack of a quorum or unavailability of a meeting location due to an emergency.

C. **Emergency GRAC Meetings.** Emergency meetings of the GRAC shall be called in conformance with the provisions of the Brown Act (Government Code Section 54950 and following).

D. **Special GRAC Meetings.** Special meetings of the GRAC shall be called in conformance with the provisions of the Brown Act, including 24 hour notice of the meeting posted at the regular meeting location, and in those local newspapers who have requested to be informed of GRAC meetings.

E. **Agendas.** The Secretary shall prepare, post, and otherwise give notice of the agenda for each meeting of the GRAC in accordance with the requirements of the Brown Act. No matter may be considered or acted upon unless it is included on the posted agenda or a supplemental agenda. If not so included, questions or comments regarding the item shall be limited to the scope permitted for "public comment" under the Brown Act. Supplemental agendas will be prepared and considered by the GRAC only under the following conditions:

1. **Emergencies.** Upon a determination by the GRAC that an emergency situation exists, as defined in Section 54956.5 of the Government Code.

2. **Recently Continued Item.** The item was properly posted for a prior meeting of the GRAC occurring not more than five calendar days prior to the date action is taken on the item, and at the prior meeting the item was continued to the meeting at which action is being taken.

III. CONDUCT OF MEETINGS

A. **Order of Business.** The regular order of business of the GRAC shall be:

1. Call to order.

2. Approval of the minutes of the previous meeting.

3. Public comment on unagendized items.

4. Consideration and action on Agenda Items.

5. Adjournment.

In the event public comments exceed 10 minutes the Chair may continue public comment on unagendized items to the end of the meeting if desired.

B. **Parliamentary Procedure.** Unless otherwise provided by these Bylaws or required by law, all proceedings before the GRAC shall be conducted in accordance with and pursuant to the parliamentary procedure prescribed in "Sturgis Standard Code of Parliamentary Procedure, 4th edition" or the most current published and available edition of such work.

C. **Recording of Meetings.** Any meeting of the GRAC, other than a closed session permitted under the Brown Act, may be recorded by any person, unless the GRAC determines that such recording could constitute a disruption of the proceedings.

D. **Presentations to the GRAC.** Any person desiring to address the GRAC shall be requested, when recognized by the Chair, to give his or her name and address to facilitate preparation of the minutes, although no persons shall be denied recognition or denied the opportunity to speak solely because they decline to state their names and addresses. The Chair may, in the interest of facilitating the business of the GRAC, set in advance of the presentation of public input reasonable time limits for oral presentations. Persons may submit written comments in lieu of oral comments if the Chair determines that a reasonable opportunity for oral presentations has been provided, and in such a case, the matter may be continued to a later date to allow a reasonable time for such submittals to occur.

E. **Recordation of GRAC Actions.** All official actions or decisions by the GRAC shall be entered in the minutes of the GRAC kept by the Secretary. The vote tally on every question shall be recorded, except where a roll call vote is used, the votes of each member of the GRAC shall be recorded. Only written action minutes will be maintained, however, electronic recordings may be made by the Secretary of each meeting of the GRAC which shall be available to the public for inspection by request made at the Napa County Conservation, Development and Planning Department, 1195 Third Street, Suite 210, Napa, California 94559.

IV. VOTING AND QUORUM

A. **Roll Call Vote.** A roll call vote may be required for voting upon any motion of the GRAC, at the discretion of the Chair.

B. **Inaudible Votes.** Any member present who does not vote in an audible voice shall be recorded as voting "aye". A member may abstain from voting only if the member has recused himself or herself from participating due to a conflict of interest under Government Code section 87100 and following, in which case the member shall not be present in the meeting room during the discussion and action on the item.

C. **Quorum.** A quorum for the transaction of business shall exist only as long as a majority of the GRAC members are present. For purposes of this Bylaw,

"majority of the members" means a majority (8) of the authorized positions, whether or not all of the positions have been filled by the Board of Supervisors.

D. **Number of Votes Required for Action.** No action or recommendation of the GRAC shall be valid and binding unless a quorum is present and the action is approved. Whenever possible the GRAC shall seek consensus. If matters arise that cannot be resolved by consensus, action or recommendation shall be obtained by a two-thirds vote of the GRAC members actually present at the meeting. Each member shall have one vote. No votes may be cast by proxy. Tie votes shall be considered as denial of the motion.

E. **Voting Affected by Conflict of Interest.** As a general rule, no member shall participate as a member in any discussion or voting if to do so would constitute a conflict of interest. However, if a quorum cannot be achieved or the required number of affirmative votes for action obtained because conflicts of interest exist that prevent members having such conflicts from discussing or voting on the matter, and the conflicts are such that an insufficient number of non-conflicted members will be available to vote at a later date even if the matter is continued, then the matter shall not be continued and a sufficient number of members having conflicts of interest, selected by lot, shall be allowed to participate to provide enough votes for the GRAC to form a quorum and take affirmative action.

F. **Motion to Reconsider.** The GRAC may reconsider a matter during the meeting at which the vote was taken, provided all members who were present when the matter was discussed and voted upon are still present and provided further that the motion to reconsider is made by a member who voted with the prevailing side. A motion for reconsideration shall have precedence over every motion except a motion to adjourn. A final vote on any matter may also be placed on the agenda for reconsideration by the GRAC upon motion of any member at any later meeting. When the GRAC approves a motion for reconsideration, the GRAC may, in its discretion, reconsider the matter immediately or at a later date.

V. SUBCOMMITTEES.

Ad Hoc Subcommittees. The GRAC hereby authorizes the creation of ad hoc subcommittees on special subjects from time to time so that GRAC members having the necessary expertise to conduct field, plan or other specialized reviews, or to investigate, observe, review, or otherwise study and report back their observations and conclusions to the full GRAC for possible further action. When creating such ad hoc committees, the GRAC shall specify the subject to be investigated and time to report, and shall appoint those GRAC members who will serve on the ad hoc subcommittee.

Residents of the County with special expertise or interest who are not members of the GRAC may be appointed to the subcommittee, but in no instance may the number of non-members exceed the number of GRAC members on the sub-committee. The number of GRAC members appointed to any particular ad hoc committee shall be less than the number of members required to constitute a quorum of the full GRAC. Upon presentation of its report to the full GRAC, each such ad hoc subcommittee shall cease to exist. Ad hoc subcommittees created pursuant to this subsection shall not be subject to the Brown Act.

VI. CHANGES TO BYLAWS

The provisions of these Bylaws may be altered, amended, or repealed by the GRAC at any time, within limitations imposed by the Brown Act and by resolution of the Napa County Board of Supervisors.

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10/18/11 DRAFT

GRAC Member Community Representation

Member	Supervisorial District*	Sub Basin/Area								Agriculture/Wine	Environmental/Property/ Community Based Organizations
		Pope Valley/Clearlake Volcanic/Berryessa Valley Basins	Milliken-Sarco-Tulocay	Angwin Sub-Area	Caneros Sub-Area	Calistoga Sub-Area	St. Helena Sub-Area	Napa Sub-Area	Yountville Sub Area		
Michelle Benvenuto	5		x								x
Franklin (Tucker) Catlin	3	x								x	
John Alan Galbraith	3						x				
Donald Gleason	3					x				x	
David Graves	1				x					x	
Michael Haley	3								x	x	
Peter McCrea	3						x			x	
Charles Slutzkin	5		x								x
Steve Soper	2								x		x
Marilee Talley	2							x			x
William Trautman	4		x								x
James Frederick Verhey	3							x		x	
Susanne von Rosenberg	5		x								x
Duane Wall	2									x	
Dale Withers	3			x							

**District # 1 - Brad Wagenknecht District # 2 - Mark Luce District # 3 - Diane Dillon District # 4 - Bill Dodd District # 5 - Keith Caldwell*

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Napa County

Groundwater Resources Advisory Committee

A Tradition of Stewardship
A Commitment to Service

2011 Meeting Calendar

Members:

Michelle Benvenuto
Franklin Tucker Catlin
John Alan Galbraith
Donald Gleason
David Graves
Michael Haley
Peter McCrea
Charles Slutzkin
Steve Soper
Marilee Talley
William Trautman
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Duane Wall
Dale Withers

Staff:
Patrick Lowe,
Secretary
Deputy Director, CDPD

Phillip Miller,
Deputy Director
Public Works, CDPD

Janice Killion,
Legal Counsel
County Counsel's Office

Meeting Details

Time: 3:00 PM

Location:
Agricultural Commissioner's Office/UCCE Conference Rm., 1710 Soscol Ave., Napa CA

These are public meetings, all are welcome to attend.

Time and location may change as directed by the Board.

January

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- Regular Meeting Dates

- Special Meeting Dates

http://www.countyofnapa.org/bos/grac/

Napa County Groundwater Resources Advisory Committee

A Tradition of Stewardship
A Commitment to Service

2012 Meeting Calendar

Members:

Michelle Benvenuto
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Staff:
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Phillip Miller,
Deputy Director
Public Works, CDPD

Janice Killion,
Legal Counsel
County Counsel's Office

Meeting Details

Time: 3:00 PM

Location:
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February

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- Regular Meeting Dates

- Special Meeting Dates

http://www.countyofnapa.org/bos/grac/

Napa County Groundwater Resources Advisory Committee

GRA Committee Work Plan

Purpose:

The GRAC's duties and responsibilities are to assist staff and consultants with: (a) the synthesis of existing information and identification of critical data needs; (b) the development and implementation of an ongoing groundwater monitoring program; (c) the development of revised well pump test protocols and related revisions to the County's groundwater ordinance; (d) the conceptualization of hydrogeologic conditions in various areas of the County and an assessment of groundwater resources as data becomes available; (e) the development of groundwater sustainability objectives that can be achieved through voluntary means and incentives and next steps; and (f) building community support for these activities.

Meeting Time & Location:

The GRAC will meet every other month at 3PM on the 4th Thursday of the month (except in December, when the GRAC meets on the 2nd Thursday - Dec. 15th). All meetings will be held at 1710 Soscol Ave, Suite 3, Napa, in the Napa County Agricultural Commissioner/UCCE conference room.

Work Plan Overview: The following provides a topical overview of scheduled meetings.

October 2011: Introduction & background

- Welcome/introduction/round table
- Organizational Items (bylaws, elect Chair/Vice Chair, calendar, ground rules, Brown Act)
- County Policies regarding groundwater
- Stakeholder assessment findings
- Groundwater Study Results Part 1
- Other Business (CASGEM participation & consultant selection)

December 2011: What we know & what we don't know

- Organizational items (cont.)
- Groundwater Study Results Part 2
- Confidentiality protocol for groundwater data/information
- CASGEM program requirements, County compliance & next steps
- Volunteer well monitoring & public outreach to date
- Discuss Draft Plan for Public Outreach/Education
- Other Business (Consultant contract & schedule)

February 2012: Prioritizing data needs

- Review/adopt revised Plan for Public Outreach/Education
- Conceptualizing the hydrogeology of Napa County & modeling challenges
- Monitoring wells, location, construction and funding opportunities
- Components of a robust groundwater monitoring program
- Prioritizing data needs
- Other Business

April 2012: Draft groundwater monitoring program

- Discuss draft groundwater monitoring program
- Review of work plan status & accomplishments

June 2012: Draft groundwater monitoring program

- Review conceptualization of hydrologic conditions
- Review groundwater monitoring program

July 2012: Joint meeting with the WICC Board & Report to the Board of Supervisors

- Review/adopt revised groundwater monitoring program

August 2012 to June 2013:

- Complete conceptualization of hydrogeologic conditions
- Assess/adjust groundwater monitoring program as needed
- Public outreach & education
- Recommend updated well pump-test standards and related changes to groundwater ordinance

August 2013 to June 2014:

- Continue groundwater monitoring program & outreach
- Develop groundwater sustainability objectives and incentives
- Define next steps

August 2014 to December 2014:

- Conclude GRAC's work and make final recommendations to the Board of Supervisors

A Tradition of Stewardship
A Commitment to Service

Napa County
Groundwater Resources
Advisory Committee

10/17/11 DRAFT

COLLABORATION GUIDELINES

GENERAL PROCESS

1. **Members agree to act in good faith in all aspects of this process and to communicate their interests.** Members speak honestly and as candidly as possible. Members provide requested information or explain the reason why not. Tentative or sensitive information will be treated appropriately.

2. **Members agree to address the issues and concerns of the participants.** All members have a stake in the issue at hand. Members acknowledge the validity of other parties' concerns, and work to develop agreements that include all the issues and interests under consideration. Disagreements and impasses are viewed as problems to be explored and solved, rather than battles to be won.

3. **Members agree to only make commitments that they intend to keep**.

4. **Members agree to provide effective representation of their constituents.** This may include, but is not limited to, regularly communicating with his or her organization and geographic area constituents regarding the status of the Groundwater Resources Advisory Committee's (Committee) work and its deliberations, for the purpose of exploring topics of concern and advancing agreements.

5. **General meeting summaries focus on key issues discussed, action taken, decisions, and agreements, and are not meant to serve as detailed minutes or transcripts.** A general meeting summary will be provided to members within two weeks of a meeting. Statements therein will not be attributed to individual members unless this is necessary to understand specific points or proposals. More detailed "Action Minutes" will be prepared and provided at the Committee's following meeting for review and approval. Meeting Summaries and Action Minutes will be publicly available on the Committee's website http://www.countyofnapa.org/bos/grac.

MEETING GROUND RULES

1. **Electronics courtesy**. We ask for your attention during the full meeting, and seek to avoid disruptions when working. Please turn any electronics off or to a silent or vibrate mode. Cell phone data transmitters interfere with microphone and recording equipment. Please do not place these devices near the recording equipment.

2. **Be comfortable**. Help yourself to refreshments, stretch as needed, and/or take personal breaks.

3. **Humor is welcome** and important, but should never be at someone else's expense.

4. **Stay focused on the group's charge, deliverables, and agenda**. There are many related topics that people care about. The committee cannot address all of these. The facilitator will help the group stay within scope and complete the work identified for each meeting.

5. **Use common conversational courtesy**. Don't interrupt others. Use appropriate language. Avoid third party discussions.

6. **Seek to understand others and develop inclusive solutions.** You may hear something you do not agree with. This is okay, you are not required to defend or promote your own perspective. Instead, seek to understand and creatively address the other perspective. If you believe another approach is better, offer it as a constructive alternative or friendly amendment. All ideas have value and will be documented in the meeting summaries.

7. **Avoid editorials and treat each other with respect**. People are passionate about these issues and in many cases have invested their careers in this work. Avoid ascribing motives to or judging the actions of others. Tell us what is important to you; tell us what you would like to see.

8. **Honor time**. Follow the time guidelines provided by the facilitator to get through the agenda.

MEDIA PROTOCOL

1. If contacted by the media or an external party, or in other sessions outside the meeting, members will:

    a. Clarify that they are speaking only for themselves, not on behalf of the Committee.

b. Express concerns and support in ways that are consistent with their expressions in Committee meetings.

c. Represent other comments made in these meetings as general group concerns and support, rather than attributing statements to other people or characterizing the views of others.

d. Avoid using the press as a vehicle for negotiation.

2. Members reserve the right to express their own opinion to the media, but not the opinions of others.

3. Members can refer media inquiries to other group members, who then can speak for themselves.

4. The facilitator will develop a paragraph-long meeting synopsis within four business days of a meeting, and provide it via the County to members for use in updating their networks and sharing with the media, as necessary.

5. The Committee may periodically develop and approve lengthier consensus statements to keep the public and media informed of its work and progress, and associated decisions and agreements. Members can speak freely about these consensus statements.

JOINT FACT-FINDING PROTOCOL

The Committee may choose to conduct joint fact-finding when it needs to provide direction on a complex scientific or technical issue, but cannot readily reach agreement on how best to proceed. Joint fact-finding provides an approach to building consensus and making informed decisions in the face of uncertainty. It involves a subset of Committee members working with subject-matter experts to frame policy and/or research questions, interpret and synthesize existing and/or new information, and generate recommendations. Joint fact-finding conducted by the Committee will include the following steps:

1. The facilitator develops a short Issue Summary that identifies key issues and questions in enough detail to clearly communicate concerns to all members.

2. The Committee identifies a few members to form an ad hoc subcommittee, as described in the Committee's bylaws, on the designated topic. The Committee and ad hoc subcommittee identifies additional expertise needed to understand and address the topic, and invites

mutually agreed-upon individual subject-matter experts to support the ad hoc subcommittee as necessary.

3. At its first meeting, ad hoc subcommittee members discuss how existing information applies to the issues and questions identified in the Issue Summary. Members identify areas where they are in consensus, and if possible, recommend to the Committee how to move forward on the issues and questions identified. If the ad hoc subcommittee desires more information, it identifies the immediate next steps for gathering this. If the desired information does not exist, the ad hoc subcommittee decides whether it can be generated in a timeframe that is consistent with the Committee's work plan; if not, the ad hoc subcommittee agrees to continue its joint fact-finding effort and ultimately make a recommendation the absence of perfect information.

4. At its second or subsequent meetings, the ad hoc subcommittee reviews new information and seeks consensus on what to recommend to the Committee. If the ad hoc subcommittee makes a sincere effort but cannot reach consensus, it may provide more than one set of recommendations to the Committee.

5. When recommendations are ready, the ad hoc subcommittee presents these to the Committee and answers any substantive or procedural questions from Committee members. The Committee in turn seeks consensus on what recommendation(s) to adopt. The Committee may request ad hoc subcommittee to conduct additional fact-finding and report back.

6. The final recommendation adopted by the Committee is recorded in the Issue Summary, as well as the standard meeting summary that is made publicly available on the website.

During the joint fact-finding process, the ad hoc subcommittee will update the Committee as to its progress during the Committee's regular meetings.

Parliamentary Motions Guide

Based on *Sturgis Standard Code of Parliamentary Procedure (4th Ed.)*

The motions below are listed in order of precedence.
Any motion can be introduced if it is higher on the chart than the pending motion.

YOU WANT TO:		YOU SAY:	INTERRUPT?	2ND?	DEBATE?	AMEND?	VOTE?
(77)	Close meeting	I move that we **adjourn**	No	Yes	No	Yes	Majority
(75)	Take break	I move to **recess** for	No	Yes	Yes	Yes	Majority
(72)	Register complaint	I rise to a **question of privilege**	Yes	No	No	No	None
(68)	Lay aside temporarily	I move that the main motion be **postponed temporarily**	No	Yes	No	No	Varies
(65)	Close debate and vote immediately	I move to **close debate**	No	Yes	No	No	2/3
(62)	**Limit or extend debate**	I move to limit debate to ...	No	Yes	Yes	Yes	2/3
(58)	**Postpone to certain time**	I move to postpone the motion until ...	No	Yes	Yes	Yes	Majority
(55)	**Refer** to committee	I move to refer the motion to …	No	Yes	Yes	Yes	Majority
(47)	Modify wording of motion	I move to **amend** the motion by ...	No	Yes	Yes	Yes	Majority
(p 32)	Bring business before assembly (a **main motion**)	I move that …	No	Yes	Yes	Yes	Majority

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Parliamentary Motions Guide

Based on *Sturgis Standard Code of Parliamentary Procedure (4th Ed.)*

Incidental Motions - no order of precedence. Arise incidentally and decided immediately.

YOU WANT TO:	YOU SAY:	INTERRUPT?	2ND?	DEBATE?	AMEND?	VOTE?
(82) Submit matter to assembly	I **appeal** from the decision of the chair	Yes	Yes	Yes	No	Majority
(84) Suspend rules	I move to **suspend the rule** requiring	No	Yes	No	No	2/3
(87) Enforce rules	**Point of order**	Yes	No	No	No	None
(90) Parliamentary question	**Parliamentary inquiry**	Yes	No	No	No	None
(94) Request to **withdraw motion**	I wish to withdraw my motion	Yes	No	No	No	None
(96) **Divide motion**	I request that the motion be divided …	No	No	No	No	None
(99) Demand rising vote	I call for a **division of the assembly**	Yes	No	No	No	None

Restorative Main Motions - no order of precedence. Introduce only when nothing else pending.

(36) **Amend a previous action**	I move to amend the motion that was …	No	Yes	Yes	Yes	Varies
(38) Reconsider main motion	I move to **reconsider** ...	Yes	Yes	Yes	No	Majority
(42) Cancel previous action	I move to **rescind**...	No	Yes	Yes	No	Majority
(44) Take from table	I move to **resume consideration** of ...	No	Yes	No	No	Majority

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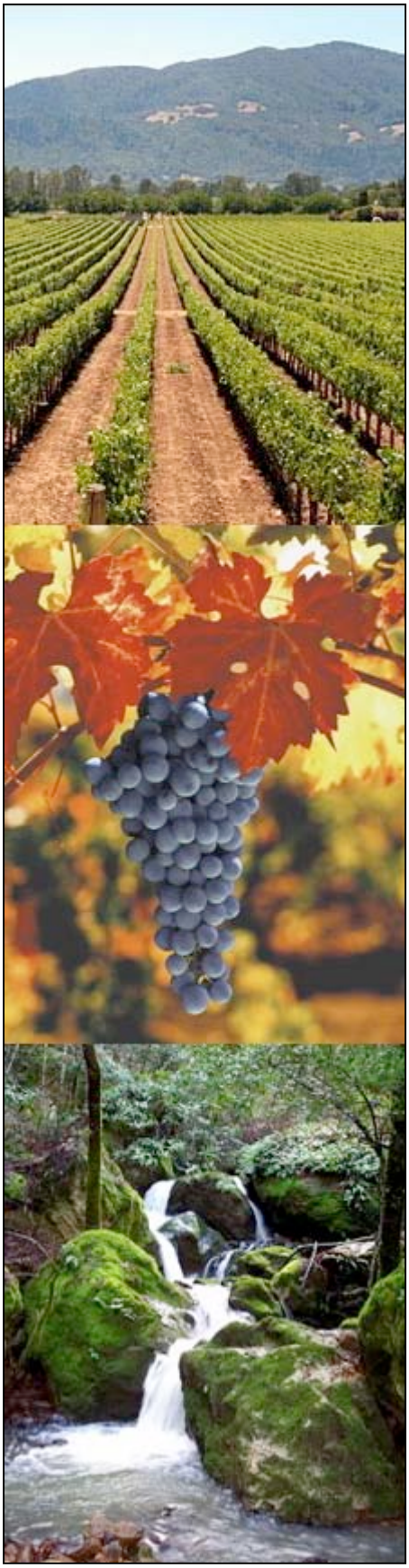

Assessment of the Feasibility of a Collaborative Groundwater Data Gathering Effort in Napa County, California

Findings, Conclusions, and Recommendations

FINAL REPORT

August 2010

Prepared by

Center for Collaborative Policy
California State University, Sacramento

SACRAMENTO STATE

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Executive Summary

Napa County has one of the most productive agricultural economies in northern California, and historically has identified agriculture as the most appropriate use of groundwater. Since the mid-1990s several issues have drawn attention to this implicit allocation of groundwater, including the continued growth of several small cities; a multiple-year drought; continued and in some cases intensified vineyard development; rural development; and emerging markets for ecofriendly wines. Most visibly the Milliken-Sarco-Tulocay region and some other areas have experienced groundwater shortages.

In 2008 the County decided to develop a proactive, inclusive, broadly supported approach to understanding the region's groundwater, and to managing groundwater in unincorporated areas if the information and analyses supported such efforts. In addition to commissioning technical studies in accord with the 2008 Napa County General Plan, the County asked the Center for Collaborative Policy (CCP), CSUS, to conduct a neutral, third-party assessment of public support for a voluntary groundwater monitoring program.[1] Between February and May 2010, the CCP team conducted 15 interviews with 34 people, seven of these as group interviews. The CCP team sought to interview stakeholders who represented the range of groundwater interests in the County, including representatives of winegrape growers, vintners, rural residents, property rights organizations, environmental organizations, municipalities, and public agencies. Major topics for the interviews included people's concerns about groundwater, experiences with collaboration in the County, willingness to participate in voluntary monitoring, and desired technical and other information.

This report presents the interview findings; a series of conclusions about whether current conditions in the county would support the convening of a collaborative data gathering process; and a series of professional recommendations about whether and how the County should convene a collaborative data gathering effort. This report is a product of the Center for Collaborative Policy, CSUS, and does not represent the views or recommendations of the County of Napa.

A. Key Findings

Interviewees raised several major issues, each of which includes additional sub-issues.

- 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 regionally-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.

[1] The Center for Collaborative Policy, a branch of California State University Sacramento, provides neutral third-party facilitation and mediation services to public agencies in California. See http://www.csus.edu/ccp for more information.

- 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 the drawing down of groundwater could noticeably reduce streamflows, and thus threaten aquatic and riparian habitat, stimulate creekbank erosion, and weaken fish populations.
- A few interviewees expressed concern about the scientific and technical expertise needed to address groundwater issues, and suggested that the Public Works Department would be the most appropriate institutional locus for addressing the associated water supply, infrastructure, and flood control issues.
- Almost all interviewees emphasized that existing information about groundwater is geographically patchy. Almost all interviewees identified what they considered critical information needs, and the report documents these suggestions.
- Several interviewees criticized the lack of access to relevant County information, at the same time as several expressed concern about confidentiality and how gathered information would be used.
- Interviewees provided numerous examples of successful collaborative efforts in Napa County, variously led by public agencies or non-profit organizations or private citizens.

Interviewees also shared their perspectives on collaboration, including specific recommendations for any such process.

- 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 be reframed to include a broader vision of inclusion and benefit for everyone in the county.
- Almost all interviewees stressed that any effort must be tailored to regionally-specific conditions, rather than treating the county as homogeneous.

Interviewees also provided feedback on communication and engagement strategies. They 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.

B. Conclusions

The findings form the basis of several conclusions about whether current conditions in the county would support the convening of a collaborative data gathering process. Accordingly, the conclusions are organized around a series of "conditions for collaboration", each of which can be viewed as a best practice.

- Clear desired outcomes: Best practices in collaborative public policy involve engaging participants in work that is genuinely desired by the convening party. At this time the general purpose of a groundwater data gathering process seems clear: to establish a commonly accepted foundation of information that can be used to decide whether additional efforts are needed to safeguard the County's groundwater resources. However, it remains to be clarified what issues would be included, what questions are trying to be answered, what data would be collected and analyzed (and the corresponding rationale), and how this would feed into a larger decision-making process. This condition is met, but would need continued attention during design if the County did convene an effort.
- Political leadership and commitment: Best practices in collaborative public policy involve securing adequate political support and pressure for initiating a process. At present this condition is not met, and a few interviewees directly oppose any collaborative data gathering. At the same time, almost all interviewees stated they would participate in such an effort if it would clearly address the serious concerns they raised. Therefore, this condition appears to have a good chance of being met if careful attention is paid to understanding the major concerns people have, and ensuring that these will be appropriately addressed in any effort.
- Economic resources: Best practices in collaborative public policy involve securing the economic resources needed to professionally convene a group, educate participants, generate and analyze options, negotiate an agreement, and establish a framework for implementation. The condition appears unmet. It is closely tied to political support, and would need to be addressed before convening a process.
- Opportunities to create shared value: Best practices in collaborative public policy involve identifying and taking advantage of opportunities for stakeholders to do work that has not just individual but shared value. In this regard a significant opportunity exists for stakeholders, including local government, to jointly establish a commonly accepted foundation of scientific data and information that can inform public deliberation and political decision-making. This condition is met.
- Primary Parties: Best practices in collaborative public policy involve several issues concerning key stakeholders and the relationships between them. These include confirming that primary parties are identifiable and have legitimate spokespersons. These also include identifying incentives for participation, establishing a relative balance of power among the parties, and confirming that key parties will participate.

Collectively, these conditions help to ensure that the entire system is represented in the process, that primary parties represent their constituents' interests, and that participants are able to have productive conversations and negotiations. Individually and overall, these conditions about primary parties are met.

C. Judgment and Recommendations

The findings and resulting conclusions about conditions for collaboration provide the foundation for a series of professional recommendations about whether and how the County should convene a collaborative data gathering effort. As mentioned earlier this report is a product of the Center for Collaborative Policy, CSUS, and does not represent the views or recommendations of the County of Napa.

With regard to an overarching judgment, conditions are favorable for the County to proceed to develop a collaborative data gathering effort. **However, the County should not do this if it cannot first secure political support for the effort, and secure the economic resources necessary to see the effort done well and to completion.** After a reconnaissance period of weeks or months, the County must respond affirmatively to both these conditions before it starts a formal design process and then brings people to the table. If the County does not meet these conditions yet still convenes a collaborative effort, the County faces a high risk of stimulating open conflict between already tense parties, creating widespread mistrust of its capacity to lead and implement policy, and eroding remaining chances that parties work together.

If the County has met all the conditions for collaboration and decides to develop a data gathering effort, the following recommendations apply.

1. Convene a Groundwater Resources Information Advisory Committee (GRIAC). This committee would guide the synthesis of existing information and establish a framework for a county-wide data gathering effort that is built around regional joint fact-finding teams (see Recommendation 3). It would also develop a confidentiality protocol; help the County convene the different regional teams during the second year and then coordinate, support, and track their activities; develop a communication and education plan; and during the fifth year oversee a synthesis and assessment of regional data and analyses, and the subsequent public involvement process.
2. Synthesize existing information, assess the resource, identify critical regional information needs, and develop a data gathering framework. To provide a foundation for the work of the regional joint fact-finding teams, the GRIAC would lead the development of an independently-reviewed synthesis study and framework for data gathering. The County would support this effort by assigning staff to organize and analyze the information to which it has exclusive access. The GRIAC would hire an independent consultant to research and then synthesize the range of existing information, focusing on an assessment of the status and trends of groundwater resources in different regions of the county, and critical information needs for each of these regions. The consultant would also propose a framework for data gathering that would set a minimum requirement for data gathering

efforts. The GRIAC would chose an appropriate consultant and approve the final documents by consensus.[2]

3. Convene and support regional joint fact-finding teams. Each team's major role would involve designing and implementing a regional strategy for voluntarily gathering data. Careful attention would be given to collecting and storing data in ways that protect the confidentiality of individual users. At the end of each year, each of the teams would submit an annual report to the GRIAC, including data sets, analyses, and overall progress. The teams would also support the GRIAC communication effort as described in the committee's plan. They would also make decisions by consensus about the substance and process of their data gathering effort.

4. Synthesize findings-to-date, assess the resource, and involve the public in developing a vision and next steps. Following three years of data gathering by the regional joint fact-finding teams, the GRIAC would lead the production of a second, independently-reviewed synthesis of information from the past five years, and assessment of the status and trends of groundwater resources in different regions of the county. The GRIAC would then lead an inclusive public involvement process to develop a vision for the use of groundwater resources in Napa County, and associated next steps. Next, based on the countywide vision and the second synthesis document, the GRIAC would develop a publicly-reviewed proposal for how to address outstanding groundwater issues in the different parts of the county, and submit this to the Board of Supervisors for approval and implementation.

5. Develop and implement an ongoing communication and education plan. In its first year the GRIAC would develop and begin to implement a communication and education plan. The communication portion of the plan would keep people throughout the county and its regions informed of the GRIAC's efforts and deliberations, while the education portion of the plan would help people better understand and engage in discussions about groundwater issues. Following their formation, the regional teams would help to refine messages and educational components for regionally-specific audiences. The plan would also include standing mechanisms for the public to provide input.

[2] Making decisions by consensus requires that each party in an effort agrees to support a decision, whether minimally or wholeheartedly. In practice this requires ensuring balanced representation and participation, achieving mutual understanding, developing inclusive solutions, and sharing responsibility for all aspects of a process.

1. Introduction

Napa County has one of the most productive agricultural economies in northern California. Like other San Francisco Bay Area counties, it also includes several small cities that continue to grow. While Napa County residents draw on several different sources for their water supply, historically many of the County's agricultural interests have relied on groundwater as their main source for irrigation.

Over the past decade, the County has worked to better understand the County's groundwater resources. After problems with overdrafts emerged in the Milliken-Sarco-Tulocay region in the early 1990's, the Board of Supervisors adopted an ordinance to improve monitoring of groundwater levels and prevent future overdraft problems in groundwater deficient areas. In 2005 the County commissioned technical investigations of current and projected future water demands in the County, including demands on groundwater.

Since the mid-1990s, a number of issues have developed that have the potential for increasing the use of the County's groundwater resources. As cities throughout the County grew, some areas started debating the exclusive allocation of groundwater to agricultural users. Other issues that have drawn public attention include the impacts of a multiple-year drought; continued and in some cases intensified vineyard development; continued immigration, rural development, and requirements for affordable housing; and trends toward the greening of vineyard and winery practices.

The County recognizes the complexity of groundwater issues, and that recent policy and legislative efforts in Sacramento reflect widespread public concern about the protection of groundwater. For this reason in 2008 the County decided to develop a proactive, inclusive, broadly supported approach to understanding the region's groundwater resources, and to managing groundwater in unincorporated areas if the information and analyses supported such efforts. The County obtained a capacity-building grant from the California Department of Water Resources' Local Groundwater Assistance Program to assess current groundwater basin conditions through the County, and support for a voluntary groundwater monitoring program.

In addition to commissioning technical studies in accord with the 2008 Napa County General Plan, the County asked the Center for Collaborative Policy (CCP), CSUS, to conduct a neutral, third-party assessment of public support for a voluntary groundwater monitoring program.[3] The Center would conduct in-depth interviews with stakeholders representing a variety of interests in different parts of the County. Interviews would focus on stakeholder concerns about groundwater, their experiences with collaborative efforts, their views on needed information, their willingness to participate in voluntary monitoring, and their recommendations for effective public involvement.

[3] The Center for Collaborative Policy, a branch of California State University Sacramento, provides neutral third-party facilitation and mediation services to public agencies in California. See http://www.csus.edu/ccp for more information.

This report presents the results of the assessment. Following this introduction, the next section briefly describes the methods used by the CCP team. The third section reviews the interview findings. This includes a summary of the general interests of the groups involved with groundwater in the County, and description of the issues of concern raised by interviewees. It also covers stakeholder input on existing and desired data and information, and a series of precedents for collaboration within the County. The section closes with stakeholder suggestions about how to best reach out to and involve the public in voluntary groundwater management, if the County decided to do this. The fourth section draws conclusions about whether conditions in the County would support collaboration. The fifth and final section presents CCP's professional recommendations about whether and how to proceed in establishing a collaborative data gathering effort.

A. Key Terms

The word "county" is capitalized in cases where it refers to Napa County government.

The word "regional" is used to signify small, distinct portions of Napa County.

2. Assessment Methodology

The assessment relied almost entirely on individual and group interviews. In preparation for the interviews, the CCP team conducted a small amount of background research to familiarize themselves with groundwater issues in the County. This included reviewing technical memoranda unincorporated area water demands and supplies for the year 2050, produced by West Yost and Associates in 2005. It also included a small amount of internet research on existing organizations and programs within the County, including news articles.

The CCP team then met with staff from the County's Department of Public Works to develop a list of interview questions and interviewees. Major topics for the interviews included people's concerns about groundwater, experiences with collaboration in the County, willingness to participate in voluntary monitoring, and desired technical and other information. Appendix A lists the questions asked in the interviews.

The CCP team sought to interview stakeholders who represented the range of groundwater interests in the County. These included representatives of agricultural producers and winegrape growers, vintners, rural residents, property rights organizations, environmental organizations, municipalities, and public agencies. Given resource constraints, the team could not interview someone from every organization, agency, profession involved in groundwater, and did not design the assessment for statistical analysis. However, they did interview at least one person representing each main type of interest, and did seek interviewees who were considered legitimate spokespersons and key opinion leaders. The team also recognized the geographic diversity of the county, and to the extent possible tried to interview people from different areas.

Between February and May 2010, the CCP team conducted 15 interviews with 34 people, seven of these as group interviews. The team completed the interviews in two rounds, using recommendations people made during the first round to identify people to interview in the second round. Twelve interviews took place in person, and three by telephone. Appendix B provides a list of interviewees. The CCP team sent a draft summary of interview notes to each interview, and asked for their review and correction of any errors or mischaracterizations. The team kept all findings confidential.

This report presents findings in general terms, and maintains the anonymity of individual interviewees. The bases its conclusions and recommendations on qualitative analysis of the findings. The CCP team circulated a draft report to the County and to all interviewees for review before producing the final public document. The intent was to identify any issues that need clarification or are missing, and any substantive errors that need correction. This report is a product of the Center for Collaborative Policy, CSUS, and does not represent the views or recommendations of the County of Napa.

3. Interview Findings

Interviewees provided information, commentary, and advice on numerous topics. This section first describes generally the main groups concerned with groundwater and the key issues they identified. It then summarizes their remarks on existing and needed information, reviews precedents for collaboration within the county, and closes with their perspectives on how one might best design a collaborative data gathering effort.

As mentioned earlier the CCP team did not structure the assessment for qualitative, statistical analysis. Nonetheless, to give a general sense of the distribution of responses, this report uses the following: the terms "a few" or "some" refer to approximately three to seven interviewees, while "several" or "numerous" refer to approximately seven to 15 interviewees, "a majority" denotes more than 17 interviewees, and "almost all" indicates 30 or more interviewees.

A. Groups and their Interests

The people and institutions in Napa are diverse, and characterizing their interests necessarily involves simplifying this complexity. This section provides a thumbnail sketch of key groups and their interests in groundwater, including governmental, agricultural, rural residential, and environmental bodies.

1. County Interests

Napa County has limited authority over groundwater resources. Its 2008 General Plan prioritizes the use of available groundwater for agricultural and rural residential uses, rather than urban uses. The County's Environmental Management Department issues well permits to protect groundwater from contamination and to protect public health, safety, and welfare. In 1996 the County adopted an ordinance, revised in 2003, to regulate the extraction, use, and preservation of groundwater associated with agricultural land development or re-development located on parcels within identified groundwater deficient areas. In 2005 the County issued additional guidelines for groundwater permits in the Milliken-Sarco-Tulocay (MST), an area that experienced groundwater shortages and was identified as groundwater deficient. The Conservation, Development, and Planning Department addresses land use and development in unincorporated areas. The Flood Control and Water Conservation District has responsibility for county-wide flood control activities. The Watershed Information Center and Conservancy (WICC) program works to gather and assess data, and communicate with the public. The County's primary interests include protecting public health, safety, and welfare; protecting groundwater from contamination; ensuring reliable water supplies; and supporting the county's economy.

2. City Interests

The cities (Napa, American Canyon, Calistoga, Town of Yountville, and St. Helena) have different relationships with groundwater. This reflect their varying dependence on the State Water Project and location in relation to groundwater basins. American Canyon, for example, does not have a readily available groundwater, while Calistoga lies above a geothermal groundwater basin. Partly due to the three-year drought and the uncertainty associated with Bay-

Delta water deliveries, some cities have recently begun exploring or using groundwater to augment their surface water supplies (e.g., American Canyon, St. Helena, Napa, Yountville). Some have also explored the use of recycled water to offset the use of groundwater for landscaping and irrigation (e.g., Yountville). In terms of groundwater, the interest of the cities can be characterized generally as using groundwater to augment urban water supplies during times of drought and peak summer demands, as well as to provide emergency supplies. Some cities are also interested in groundwater injection and aquifer storage.

3. Special District and Other Agency Interests

Since the late 1990s, Napa Sanitation District (NSD) has produced recycled water through a tertiary wastewater treatment process. The District's 2005 Recycled Water Strategic Plan recommended providing recycled water to Carneros, MST, and Silverado. In 2007 an initial large-scale recycled water project proposal was developed jointly by the County and NSD to try to help address the declining groundwater levels in the MST basin. As information about the project was disseminated to the community, questions about the proposed project were raised including topics such as assessment methodology and equity, recycled water quality, future delivery and service by NSD, regulatory requirements and County land use policies. It became apparent that the MST community was divided on the idea of a large-scale recycled water project. Therefore the County and NSD are now considering a smaller project that includes specific customers who indicated that they would be interested in participating in a benefit district instead of assuming levels of participation for all potential customers in the area.. Napa Sanitation District's interests include finding a use for its recycled water that augments Napa Valley's limited water supplies while simultaneously enhancing the environment.

The Napa County Resource Conservation District (RCD) is a local non-regulatory organization. Its primary interest is to promote responsible watershed management through voluntary community stewardship and technical assistance. The RCD's work includes a Napa River Voluntary Monitoring Program that informs understanding of the connections between rainfall, streamflow, and groundwater.

The U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS) partners closely with the RCD, and similarly aims to encourage community stewardship. NRCS achieves this primarily through collaborating with individual landowners to develop private Conservation Plans that link management practices with environmental goals.

4. Agricultural Interests

Agricultural production in Napa Valley takes many forms. It includes family farms and international corporate agribusinesses that occupy the hillsides and valleys, and range from dozens of acres to well over a thousand acres. Some properties combine vineyards and wineries, while others focus on one or the other and either sell or buy winegrapes accordingly. For many properties, groundwater serves as a critical complement to surface water for the purpose of irrigation, frost protection, and wine production. Limited ranching and floral and nursery production also occurs.

Several large associations represent agriculture. As businesses, the primary interests of agriculture include sustaining economically viable vineyards and wineries, and minimizing the regulatory constraints, requirements, and fees that can undermine economic viability. At the same time, agriculture has demonstrated a strong interest in adopting "green" practices and technologies that reduce costs, improve their business image, support the County's wine-based economy, and advance the greater social-ecological good (e.g., the Napa Green Land/Fish Friendly Farming Program). With regard to groundwater, agriculture would like to preserve the use of this resource for agricultural purposes, and prevent the use of groundwater as an urban water supply.

5. Rural Residential Interests

A large number of citizens live in unincorporated areas of the County. Their residences exist adjacent to cities as well as in the most remote parts of the County, and depend on groundwater for potable water and other household and property uses. Like cities and agriculture, rural residents have diverse relationships with groundwater. In the MST some residents have had their wells run dry, while residents in other parts of the County may not have experienced a shortage, but likely have observed changes in flow rates depending on the season and corresponding land use.

Rural residents are represented by a few organizations. Some organizations focus on specific geographic areas, and others looking at the county as a whole, and their interests vary. Many are foremost concerned with ensuring that their properties have a sustainable supply of high quality groundwater, and are looking to the County to provide leadership on the issue. To the extent that it is economically feasible, some rural residents support the use of recycled water to replace the use of groundwater for non-drinking purposes. Other property owners share the desire for secure supplies, while being directly opposed to the County getting involved with how they use groundwater. They emphasize the beneficial use of groundwater as a private property right, and are interested in minimizing and if possible eliminating regulation and government intervention.

6. Environmental Interests

A range of environmental organizations exist in the County, with most focused on specific stretches of water and a few looking at the entire watershed. Groundwater is seldom the key mobilizing issue; typically it is part of the organization's portfolio because its linkages with other critical issues (such as fish populations and aquatic habitat). Some organizations rely on volunteer efforts and engage in regular field activities. Others involve formal membership structures and focus on environmental review and policy development processes, and have engaged in high profile litigation. Some are part of national networks, while others do not extend beyond the immediate community.

Environmental groups have a suite of interests. They share an overarching concern with treating the watershed holistically. Groundwater is seen as inseparable from surface water, just as the upper parts of the watershed are connected with the estuary. More specifically, key interests include the identification and protection of groundwater recharge areas, and ensuring that rivers and riparian areas receive adequate groundwater to maintain their ecology.

B. Key Issues

The above groups are variously arrayed around particular groundwater issues. This section reviews the key issues and the range of perspectives and concerns on each of these.

1. The Sustainability of Groundwater Supplies

A majority of interviewees expressed concern that groundwater was being extracted at unsustainable rates. They pointed to known overdraft problems in MST and Carneros, and cited ongoing debates from other parts of the county like Calistoga. Conversely, a few interviewees felt that these were isolated, unique examples, and that other parts of the county would never have a groundwater shortage in the future.

At the same time, a majority of interviewees stressed the importance of the county's geographic and geological diversity and complexity. They noted that the county has several distinct basins, and that mountainous regions differ from valley floors. They suggested focusing on regional and local analyses rather than making broad-brush statements.

A majority of interviewees emphasized the need to quickly identify and protect groundwater recharge areas. One interviewee questioned how the widespread installation of subsurface drainage impacted groundwater infiltration and streamflows.

A few interviewees noted that groundwater supply shortages had the potential to significantly decrease property values. It was mentioned that real estate representatives in MST already notify potential property buyers so they are aware of the issue.

Several interviewees questioned the ordinance for deficient groundwater basins. One felt that the restrictions did not address the issue of further residential development in MST. Another felt that it could limit overdraft, but would not address the need for a reliable potable supply for those whose wells have already run dry. A third felt that the restrictions stifled further exploration of groundwater in the area that might solve the problem simply by drilling deeper. Numerous interviewees expressed significant concern about how the County managed the data it collected. They noted that they had no access to the data, and felt that the data appeared to have little influence on the County's planning decisions.

Several interviewees expressed concern about how climate change would influence supplies. They flagged the potential for increased susceptibility to drought and saltwater intrusion into coastal aquifers. They also emphasized that avoiding overdraft and aquifer subsidence was critical to ensuring that groundwater can be stored as the region experiences fewer but more intense storms.

Almost all interviewees agreed on the need for better, more geographically comprehensive scientific information about groundwater supplies (details are provided in the Existing and Desired Data and Information section below). A few questioned the validity of existing assessments. One noted that developers had an interest in overestimating supplies, and there were no legal repercussions if their findings were inaccurate. Others felt that estimates could be

politically influenced, and that consultants could be hired to support whatever position a client desired. Another pointed out that existing basin designations do not account for upstream influences on groundwater replenishment, and treat the basins as if they were self-contained. It was noted that a universally accepted method for testing wells and estimating their yields does not exist, hence no comparable levels of confidence could be established. The few interviewees who did not agree with the need for more information felt that data gathering should only be conducted if the need can first be demonstrated.

Several interviewees expressed concern about treating groundwater as an isolated resource. They emphasized that planning for groundwater should be integrated with planning for surface water, the reuse of subsurface drainage, recycled water, stormwater runoff, rainwater harvesting, and water conservation.

2. The Use of Groundwater to Supply Urban and Rural Residential Areas

Groundwater currently has many advantages for urban areas compared with surface water: it is free, requires minimal treatment, does not require a manmade reservoir for storage, and is not directly affected by the Bay-Delta environmental and regulatory crisis. Nonetheless, interviewees expressed several concerns about the use of groundwater to supply urban areas.

Some worried that urban use of groundwater would encourage further growth and land conversion. Others noted that further growth is constrained by current land use ordinances and rural-urban limit lines.

Several interviewees questioned whether the supplies identified by cities were viable. They felt that development was being permitted without adequate, realistic knowledge of supplies, and would create new problems. Several interviewees identified Napa Pipe as an example of a proposed development with a questionable supply. Additionally, while the City of Napa does have temporary contracts to buy water from city hydrants for construction purposes, one interviewee felt that some trucks also engaged in illegal water purchases and sales.

Numerous interviewees expressed concern that urban use of groundwater, as well as the use of groundwater for rural residential development, would significantly diminish groundwater available for agricultural enterprises. In cases where cities are already using groundwater, some interviewees expressed concern that this was undermining the adequate recharge of the aquifers upon which nearby agricultural ventures depend.

A few interviewees pointed out that people in some rural areas felt, conversely, that agricultural overdraft had caused their problems, and that residential use was minimal relative to agriculture. A few others noted that it was easy to criticize the agricultural sector because it occupied a large land base yet had numerically few votes, and because its efforts to conserve water were rarely acknowledged.

3. Legal and Moral Rights to Groundwater, including Monitoring

Who owns and controls groundwater is one of the most hotly contested resource issues in California, and Napa County is a microcosm of this debate.

Several interviewees, including both agricultural and rural residential interests, expressed strong concern about government involvement in groundwater. A few emphasized that groundwater constitutes an essential, legal part of private property. Efforts to gather information about groundwater were viewed as the first step toward the County regulating and controlling the resource, and by extension controlling people's land. A few felt that the County was not interested in protecting the resource based on science, but rather sought to gain control over groundwater in order to generate revenue or to reallocate use of the resource to politically powerful agribusiness interests.

Accordingly, several interviewees viewed efforts to establish a monitoring system as an infringement of private property rights and/or a burden on business decision-making and viability. Based on multiple experiences, several interviewees stressed their view that County efforts to monitor land use practices and resources would inevitably lead to regulation, and mistrusted the County's current interest in groundwater. They related stories where the County started by framing its intentions in one way, but came back in the future with new intentions and requirements, and used the information it has gathered under one pretext for a new politically salient purpose.

Meanwhile, several interviewees recognized groundwater's legal status, yet felt that in many cases groundwater was geologically and in practice a common pool resource. Their rationale hinged on viewing individual wells as part of a larger indivisible and finite resource – a groundwater basin. In cases where basins and their interconnections can be identified, a single person's actions and derivation of benefit directly affects the ability of other people to use and benefit from the same resource. Several interviewees suggested that in these cases the connectivity between users necessitates limiting private property rights in order to maintain collective rights to the resource. A few interviewees felt that the State of California or the County should eventually regulate groundwater for this reason.

At the same time, as mentioned earlier, a majority of interviewees emphasized the importance of the county's geographic and geological diversity and complexity, and treating different sources of groundwater accordingly. A few interviewees noted that many parts of the county do not have clear basins, particularly areas of fractured bedrock in foothill and mountainous terrain, and that adjacent wells in these regions may have distinct water compositions and levels. In many cases, therefore, one person's actions and derivation benefit would not affect another person's ability to do the same, and private property rights could be maintained. For this reason they stressed the importance of avoiding an oversimplified approach to data gathering or other activities.

4. The Use of Recycled Water

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. Most of those interviewed had knowledge of or experience with the Phase 1 MST Project.

In terms of regulation, one interviewee noted that State agencies have inconsistent policies. On the one hand, agencies advocate the use of recycled water and describe it as a resource to augment water supplies. Simultaneously, agencies regulate recycled water as a waste and restrict its use near surface water.

A few interviewees noted that technical concerns about the application of recycled water to irrigate winegrapes remain unresolved, particularly the influence of lingering contaminants and salts. For these interviewees this raised concern about the boycotting or reduced value of wines produced from grapes grown with recycled water. At the same time, one interviewee observed that some vineyards have used recycled water with no negative effects on wine quality or consumer perceptions.

Several interviewees commented on the financial aspects of the initially proposed Phase 1 MST Project, suggesting that the experience of the diverse region – a mixture of agriculture, residential development, improved open space, and some industry, like many parts of the county – held several lessons. Some felt that the County had not adequately educated people about the benefits, and could not persuasively justify why people should begin to pay for water when historically they had used groundwater for free. The high cost for a homeowner to connect to the system was another concern. Some felt that the costs were significantly disproportionate to the actual use value of the water, particularly given that the project planned to assess all users the same fees despite their differential need for such a system.

Furthermore, several interviewees felt that the Board of Supervisors and County government did not make a serious political and economic commitment to developing the infrastructure, and focused only on applying recycled water in the most accessible areas. A few felt that the Napa Sanitation District had designed the project without sufficient public involvement, limiting its interaction to large water users when it needed to include all potential beneficiaries in planning. One interviewee emphasized that the County needed to explore a wider range of funding options, including soliciting help from the communities, public-private partnerships, and private water utilities.

5. Linkages between Groundwater and Riverine and Riparian Ecology

A majority of interviewees expressed concern about the connections between groundwater, creeks, and rivers. Numerous interviewees commented that the drawing down of groundwater could noticeably reduce streamflows, and thus threaten aquatic and riparian habitat, stimulate creekbank erosion, and weaken fish populations. One interviewee also noted that groundwater drawdown can promote bacterial growth and mosquito breeding that in turn negatively impact public health and wildlife. Several interviewees underscored that upstream development projects could reduce headwater flows and consequently the water available to replenish aquifers. As mentioned earlier, one interviewee questioned how subsurface drainage influenced streamflows and groundwater infiltration. Two commented that the linkage between groundwater and surface

water meant that the State Water Resources Control Board could use its instream flow standards as a mechanism for regulating the use of groundwater.

6. The Effectiveness of the Existing Institutional Arrangement

A few interviewees expressed concern about the current division of labor for groundwater within the County, and its relationship with the cities and special districts. It was felt that while the County originally focused on groundwater due to concerns about well contamination, the current range of groundwater issues required a broad range of scientific and technical expertise that the Environmental Management Department was not structured to provide. It was suggested that the Public Works Department would have a greater capacity for addressing the water supply, infrastructure, and flood control issues linked to groundwater.

A few interviewees expressed concern about the need for the County, the cities, and the special districts to build stronger relationships and work together to address groundwater. It was observed that each city had major stakes in groundwater, yet had its own water department and seldom considered how they existed within a larger watershed and affected one another. Their policies and standards were often inconsistent, thus making it hard for the County to move in any concerted direction and generating significant uncertainty for landowners. It was emphasized that no single government body had adequate authority, jurisdiction, and resources to develop an integrated understanding and politically salient vision for groundwater in the county.

7. The Comprehensiveness, Quality, Accessibility, and Use of Information

As noted earlier almost all interviewees expressed concern about available groundwater information. Almost all emphasized that existing information is geographically patchy, with significant information available for some regions and almost none for others. Others criticized the fractured view of the ecosystem adopted by many studies – the inattention to connections not just between upstream headwaters and downstream aquifers, but also between different water resources, groundwater basins, floodplain management, on-farm practices, and other issues. Also as explained earlier, a few questioned the validity of existing information and the neutrality of independent experts hired to assess groundwater supplies or estimate groundwater needs for vineyard management and winemaking.

As with many public policy issues, interviewees debated whether adequate information already existed for assessing and planning for groundwater. Numerous interviewees felt that the County already had significantly more information than other counties, including fundamental information, and could not claim to need more studies. Some expressed strong concern that repeated calls for more studies were a political ploy to allow for further development during information gathering periods. At the same time, when asked whether critical information needs existed, almost all interviewees identified one or more pieces of information that did not yet exist (see section C below).

Part of the debate about adequate information stemmed from the accessibility of existing County information. While the County collects groundwater information as a condition of use permits,

several interviewees complained that they could not access this information in any form. They recognized that information on individual land parcels and operations is confidential, yet felt that the County needed to develop ways to share and analyze this information, for example, through aggregating information on a regional basis. One interviewee felt that all information should be made public unconditionally. The current system made several interviewees question whether the County considered the information it has already gathered in its planning decisions.

At the same time, several interviewees expressed serious concern about how gathered information would be used. One interviewee had an experience where information they provided in confidence was shared inappropriately with a third party, who then went to the press and criticized the interviewee. Others shared similar concern about information being leaked or taken out of context.

C. Existing and Desired Data and Information

Interviewees pointed to a wide range of existing information, and also identified several types of data that they felt were essential to better understanding the County's groundwater.

Existing information sources included:

- U.S. Geological Survey studies, including the foundational work by Kunkel and Upson (1960), a series of studies in the 1970s including Johnson's (1977) work on MST recharge, and a series of studies in the late 1990s
- U.S. Geological Survey well data
- California Department of Water Resources well data
- California Department of Water Resources analyses of historical groundwater levels in the Napa Valley (1995)
- Regional Water Quality Control Board work in the 1990s on groundwater quality, with limited information on recharge areas
- Assorted technical consultant studies in the early 1990s
- County well permit monitoring records, and data from the County's own limited number of wells
- Well drillers' geology reports and logs
- Sporadic mining information

With regard to desired data, topics identified included:

- Three-dimensional maps of (A) groundwater basin boundaries, layers, and geology, (B) their interconnections, and (C) overlying land uses
- How groundwater moves into basins, within basins, across basins, and in relation with surface water

- Identification of basin recharge areas and strategies for protecting and utilizing them
- Basin baseline information (A) during wet, normal, and dry years, (B) under different pumping regimes, and (C) changes over time
- Historical and current basin extraction rates and trends, estimates of basin safe annual yields, and assessments of overdraft
- The distribution and number of wells in the basins, including changes over time and associated water quality information
- The resilience of the aquifers under different climate change scenarios
- Ground-truthed estimates of the volume of water required for various vineyard management activities and winemaking processes

D. Precedents for Collaboration within the County

A large number of successful collaborative efforts exist in Napa County, and should inform future initiatives. In some cases public agencies led the process, in others non-profit organizations or private citizens took the lead.

Numerous interviewees remarked that county residents shared a strong environmental stewardship ethic. By way of example, a few pointed to an assortment of winegrowing and vintner associations that promote ecologically sustainable grapegrowing and wine-producing practices. Since 2003 Napa Green Certified Land, for example, has helped landowners develop farming plans that integrate sustainable agricultural practices, wildlife habitat protection, and riparian restoration. The public-private partnership includes the National Marine Fisheries Service; the Napa County Department of Agriculture, which serves as the local delivery system for the California Environmental Protection Agency, Department of Pesticide Regulation; and the Regional Water Quality Control Board.

Similarly, several interviewees noted the numerous creek stewardship efforts supported by the Natural Resource Conservation Service and Napa County Resource Conservation District, such as the Huichica Creek Stewardship Program that began in 1986, or the Carneros Creek Stewardship Project that began in 2001, or the Suscol Creek Collaborative Partnership Restoration Project that began in 2004. These voluntary landowner initiatives have focused on preventing erosion, riparian restoration, and enhancing instream flows and habitat, among other things.

Non-profits and private organizations have also led projects mentioned by interviewees. Friends of the Napa River has fostered a voluntary vineyard runoff reduction program. The non-profit worked with growers to implement practices that retain soil and reduce fertilizer application, thus improving the vineyard's economic bottom-line at the same time as keeping excess sediment and chemicals out of creeks and the river. The Rutherford Dust Society's Restoration Team brought riverside property owners together with Napa County to design and implement a community-based plan for restoring the main stem of the Napa River, including detailed engineering and ecological studies.

A few interviewees praised the Napa County Flood Control and Water Conservation District's Napa River-Napa Creek Flood Protection Project. The two-year collaborative planning process, completed in 1997, took a watershed-based, holistic, and interdisciplinary approach to flood control that integrated land use, surface water, floodplain management, wetland enhancement, and groundwater infiltration. Notably, the District covers the entire county and works closely with the cities. A few interviewees suggested that the District could provide an effective forum for groundwater issues. The County's stormwater management efforts were also noted as effective.

Several interviewees mentioned Groundwater Under Local Protection (GULP) as a notable community-based organization that formed when wells in the MST began running dry around the turn of the millennium and the County asked the U.S. Geological Survey to assess the basin's groundwater. Through a small citizen committee, the area's residents worked with agency scientists to develop a voluntary data gathering program and understand the limits of the basin's yield, and helped the Geological Survey gain access to private wells and streambeds. The subsequent three-year effort included the Geological Survey recruiting over 120 volunteers to have their wells monitored. This educational, highly transparent, public joint fact-finding effort allowed people to understand, engage, and come to own the process and its results. Today the organization still exists, and continues to bring a range of constituents together to review and comment on projects that could negatively impact groundwater supplies, and work with local government to find solutions to overdraft that include residents and vineyards.

The Napa County Board of Supervisors created the advisory Watershed Information Center and Conservancy (WICC) Board in 2002. The politically-neutral board coordinates monitoring and assessment efforts and manages data. It also evaluates and recommends options for resource management, restoration, land acquisition, and long-term planning. It has a strong public outreach and education component. Several interviewees felt that the WICC had advanced the dialogue around surface water constituents and riparian restoration, and a few suggested it could provide an effective forum for groundwater issues.

It is important to recognize that not all collaborative efforts have succeeded, and that their dynamics should also inform future initiatives. In the early part of the decade, for example, County staff drafted a stream setback ordinance following a lawsuit settlement with the Sierra Club. The County agreed to apply California Environmental Quality Act environmental review standards to new vineyards on hillsides, and the ordinance drew on recommendations released in 2000 by the Napa River Watershed Task Force – a collaborative group convened by the County that sought to reach consensus on issues linking hillside development and river protection. After a divisive campaign the ordinance was publicly voted down in 2004.

E. Stakeholder Perspectives on Collaboration

Interviewees provided a variety of observations and recommendations about what works and what should be avoided in any collaborative effort. This included thoughts on data gathering, the design of a process, needed support, and outreach and communication.

1. Data Gathering, including Participation in Voluntary Monitoring

A majority of interviewees stressed that if data gathering and monitoring were to occur, trust between landowners and government would have to be cultivated over a period of years, and confidentiality would be the starting point of discussions. A few emphasized that landowners must have the right to decide whether they wanted to participate; gathering and sharing information must be voluntary. It was noted that some creek stewardship associations maintained the information they gathered, rather than making it publicly available, and suggested that this was a viable option for other parts of the County. Other ways of maintaining confidential monitoring information included assigning each well a number that could not be traced to a particular landowner, and summarizing monitoring information at a regional level rather than talking about individual parcels.

With these fundamental considerations in mind, almost all interviewees were open to considering participation in a voluntary monitoring program. However, several interviewees noted additional conditions, which included (1) having a clear purpose and scope of activity; (2) educating volunteers about proper monitoring techniques and involving them in the work; (3) providing full funding or financial incentives to cover the equipment costs; (4) having a neutral party lead and oversee the effort; and (5) ensuring that those who participated in gathering information also had access to it. If these conditions were met, they felt their constituents would likely participate. At the same time, several interviewees felt that most vineyards and certain groups of landowners would never participate because they believed that the information could create more problems than benefits.

Interviewees made several additional suggestions. One stressed the importance of differentiating between monitoring, which focuses on gathering a narrow band of information, and the broader concept of data gathering, which could include monitoring, metering, direct observation, and other activities aimed at a wider variety of information. A few interviewees suggested taking advantage of new technologies to easily gather a range of information and save money. Well data loggers could gather regular information and require only one annual trip to a person's property to obtain it. The use of new technologies would also help demonstrate that growers were working diligently to maximize crop quality while protecting groundwater resources and minimizing pumping costs. It was suggested that since the County would benefit from access to information, it should provide a cost-share or grant program to help landowners install needed data gathering equipment.

2. Process Design

Interviewees provided many suggestions on what a collaborative effort should look it, if one were developed. This included convening a process; the purpose and commitment to such an effort, including being forthcoming about capacities and intentions; reframing the purpose of the work and promoting collaboration; tailoring efforts in ways that recognize the diversity of regions and people within the County; and key components.

A. Convening an Effort

Of those who supported data gathering in principle, most interviewees held divergent views about who should convene a data gathering process. A few felt that the County was the only institution that could present itself as the neutral arbiter. A few more felt that the County had been co-opted by the wine industry or had handled poorly earlier attempts to involve the public, and at the moment did not have enough credibility to lead a process. Similarly, a few others felt that historically the County had variously ignored the issues, waited for a crisis to emerge before acting, or taken a piecemeal approach, rather than expressing a proactive, strategic interest in addressing groundwater issues. They felt the County could lead a productive effort, but would have to commit itself to the task and demonstrate its genuine desire. A few recommended forming an independent commission to address the issues.

B. Having a Clear Purpose and Commitment

Numerous interviewees emphasized that the County had had limited success in its previous efforts to address groundwater, and that it was therefore essential for any new effort have a clear purpose, a clear desired outcome, and strong executive support. Interviewees did not want "just another survey" or "just more talking and disagreeing." They wanted the Board of Supervisors to provide leadership and make a genuine commitment to developing a common vision and solution. They wanted to know that the County would make the process a priority and support it with adequate staffing and financial resources. They wanted to know how their involvement would be part of an authentic change process. They felt that the public would now be watching carefully and critically, and stressed that the County would have to cogently explain to the public why a new process was needed. If the County were not prepared to satisfy these conditions, they were not interested in participating.

Along similar lines, a majority of interviewees emphasized the importance of the County being forthcoming about its capacities and intentions. First, some felt the County should acknowledge that previous efforts may not have been ideal, but emphasize that the County had learned from those experiences. Second, based on the history of other policy issues and current dialogue in Sacramento, several interviewees felt that this process might one day lead to regulation, and that the County had to admit this even though it would upset people. At the same time, however, they felt that the County had to explain that nothing was predetermined or would be done immediately. Rather, the recommended that the County study and analyze existing conditions over the next few years, and then assess the need for planning or regulation. Similarly, other interviewees felt that the County had to be honest about the resources – or lack thereof – that it had for a data gathering process. The bottom line was to be truthful and transparent, and use people's time in the best possible ways.

C. Reframing the Work at Hand

Building on earlier remarks, a majority of interviewees felt that the County needed to reframe the purpose of gathering data and emphasize collaboration. Some felt that such an effort would provide opportunities to ensure that groundwater shortages did not occur, and avoid the need for regulation. Others felt that it would ensure that any eventual legislation would be based on solid

information and hence be accurate and effective, rather than being thrown together during a period of crisis. A few felt that greater emphasis should be placed on helping people maintain their property and land values.

More broadly several interviewees felt that a data gathering effort provided opportunities for people to come together, learn, take ownership, and demonstrate leadership for the rest of California. They felt it should avoid focusing on stereotypical agricultural, environmental, and rural residential winners and losers. Instead the work should focus on gathering and maintaining information to ensure a sustainable groundwater supply and income for everyone's benefit, and making decisions that are right for people's grandchildren, who will continue to farm and fish. Along these lines several interviewees emphasized that the County must move away from a "decide-announce-defend" model of public policy development, and involve stakeholders from the start in generating, selecting, and implementing options for data gathering.

D. Tailoring an Effort

Almost all interviewees stressed that any data gathering effort must take account of regionally-specific conditions. A single framework for the entire county cannot account and adequately address the range of conditions found in different parts of the region, particularly the mixture of groundwater basins, sub-basins, basin interconnections, and fractured bedrock. For example, geology and land use patterns differ significantly in Calistoga and Pope valley, in the mountains and on the valley floor. Referring to the 1996 groundwater ordinance and a proposed stream setback ordinance voted down in 2004, a few interviews expressed frustration with previous County efforts that had treated all parts of the county and all people equally, using one case as a surrogate for hundreds of cases involving unique locations and divergent practices. Several interviewees suggested that an exploration of this geographical heterogeneity and identification of regionally-specific issues and information needs should constitute the first step in any data gathering effort. They felt this would provide the only viable foundation for further activity.

E. Key Components of an Effort

Interviewees suggested several basic components of a data gathering process.

- A few stressed the need for a core group of subject matter experts that can work with non-technical stakeholders to develop a commonly accepted foundation of scientific information. The effort could draw subject matter experts from Napa's highly educated community, including semi-retired and retired engineers, planners, public interest advocates, and water managers. The effort could involve a public-private partnership.
- Others stressed the need for non-partisan legal advice to help all parties understand existing mechanisms, constraints, and potential options and their associated implications.
- Several emphasized the importance of education on topics like existing information on groundwater, its use by different sectors, property and water rights, existing regulations, and general awareness of key issues and debates. Case studies of successful groundwater data gathering efforts elsewhere in California were suggested as particularly helpful, because people could see how individuals in similar situations had come together and successfully addressed the issues.

3. Communication and Engagement

Interviewees had a few overarching suggestions about how to communicate strategically, and then numerous recommendations about groups that should be included in any data gathering effort.

Almost all interviewees stressed that the County should not reinvent the wheel to communicate with and engage stakeholders. They recommended that the County should work through existing organizations and venues, which already have trusted relationships with their constituents, diverse expertise, interested volunteers, and deep topical and place-based understandings of the issues. This included grapegrower and vintner associations, creek stewardship programs, other agricultural and environmental organizations, the Farm Bureau, the Resource Conservation District, and the Natural Resources Conservation Service. It was felt that these organizations would have greater legitimacy than government and not be viewed suspiciously. A few interviewees offered to help develop a data gathering process and solicit participation from their membership. As mentioned earlier, a few interviewees recommended the Watershed Information Center and Conservancy as a good forum and resource, given its credibility, success-record, and annual spring public event, even though it has no authority to initiate programs.

Second, a few interviewees felt that a strong effort would need to be made to ensure that the different agencies and organizations involved have consistent messaging. Part of this would involve briefing councils and elected officials, and ensuring that they are familiar with and support the messaging used to describe the effort. Another part of this would involve developing targeted communications, including email, and taking advantage of the County's clear and accessible website. Inserts in people's garbage bills, parent-teacher associations, and the Fire Safe Council were also noted as effective communication mechanisms and venues.
Third, several interviewees recommended working strategically and proactively with the media to ensure that the effort is transparent and accessible, and educates the public. Several noted that the *Napa Valley Register* is a respected, detail-oriented newspaper with a broad following within the County, and should be invited to report on the work.

In terms of participation, numerous interviewees emphasized the importance of an inclusive process that brought conflicting perspectives together, and established a framework for productive rather than polarizing conversations. They noted that the County could not lay a solid foundation for data gathering if people's concerns were not understood and addressed. They felt that some constituents and parts of the county would be hard to engage because they had no groundwater problems or benefited from the status quo, yet it was critical to reserve a seat at the table for them and encourage them to bring their voices into the dialogue. While the County would not get complete participation, it could still make a lot of progress. It was hoped that peer pressure and the desire to influence discussions – rather than be left out of them – might eventually convince people to participate. A few interviewees felt that the County needed to make a stronger effort to communicate with growers, ranchers, private property owners, and homeowners that were not part of larger organizations, and invite them to participate in the effort.

Several interviewees advocated that all major parts of the delivery system be included in deliberations, including city water departments, water purveyors, stormwater districts, the Flood Control and Water Conservation District, and Napa Sanitation District, given its interest in recycled water. In particular, numerous interviewees stressed that the cities need to be included, given the stakes they have in groundwater and their political power, and also the Regional Water Quality Control Board, given its role in regulating streamflows and water quality. One person suggested also reaching out to other agencies and organizations that participate in Integrated Regional Water Management planning efforts.

Interviewees identified a few other potential types of stakeholders, including commercial real estate associations, country clubs, and open space committees. In addition to the organizations interviewed for this assessment, other groups identified included:

- Napa Valley Taxpayers Alliance
- Get a Grip on Growth
- EcoVines
- Watershed Information Center and Conservancy
- Trout or Ducks Unlimited
- Academics from the University of California
- Large-scale vineyard management companies

Lastly, one interviewee suggested including people whose wells had run dry and experienced a groundwater crisis. It was felt that people could better identify with their neighbors and fellow county residents than with government agencies, and that this would help make the issues real and immediate for people.

4. Conclusions about Conditions for Collaboration

The interview findings form the basis for drawing several conclusions about whether current conditions in the county would support the convening of a collaborative data gathering process. Accordingly, the conclusions are organized around a series of "conditions for collaboration", each of which can be viewed as a best practice. In the Recommendations that follow this section, an overall judgment and suggestions about how to proceed are derived from weighing whether and to what extent each of the conditions discussed here are met or could be satisfied readily.

A. Clear Desired Outcomes

Best practices in collaborative public policy involve engaging participants in work that is genuinely desired by the convening party. Participants' limited time is used effectively for a purpose and scope of work that are clearly identified, and will provide meaningful input on decisions.

At this time the general purpose of a groundwater data gathering process seems clear: to establish a commonly accepted foundation of information that can be used to decide whether additional efforts are needed to safeguard the County's groundwater resources. However, it remains to be clarified what issues would be included, what questions are trying to be answered, what data would be collected and analyzed (and the corresponding rationale), and how this would feed into a larger decision-making process.

This condition is met, but would need continued attention during design if the County did convene an effort.

B. Political Leadership and Commitment

Best practices in collaborative public policy involve securing adequate political support and pressure for initiating a process. This demonstrates that public officials recognize the significance of the issues and the need to enact change. In turn, this political leadership and commitment helps to ensure that key stakeholders will join and continue to participate in the process. It also significantly increases the likelihood that resulting proposed actions are implemented.

At this time political support for a data gathering process seems present within the County. In the 2008 General Plan Update, the County Board of Supervisors prioritized the review of all available information, the establishment of a data management system, and consideration of the appropriateness of a monitoring program. Since then the County has approved a technical consultation contract. However, it is unclear whether the Board of Supervisors would support a collaborative, stakeholder-based approach. This assessment seeks to help the Board of Supervisors better understand the range of stakeholder concerns and advice about a collaborative process, and make an informed decision about whether to support of such an effort.

Current political support by the various cities remains unclear. A joint city-county technical advisory group meets regularly, but each city has different relations with groundwater and its own public officials. City water department representatives interviewed for this assessment expressed general support for data gathering, so long as the effort had a clear purpose and good design. However, this assessment did not interview elected officials directly.

A few interviewees stressed that the would directly oppose any collaborative data gathering. They viewed any efforts by the County to get involved with the use of groundwater as an infringement on private property rights and the beneficial use of groundwater. At the same time, almost all interviewees stated they would participate in a collaborative data gathering effort if it would clearly address the serious concerns they raised (these concerns are identified in section 3 on Interview Findings). Overall, this condition appears to have a good chance of being met if careful attention is paid to understanding the major concerns people have, and ensuring that these will be appropriately addressed in any effort.

C. Economic Resources

Best practices in collaborative public policy involve securing the economic resources needed to professionally convene a group, educate participants, generate and analyze options, negotiate an agreement, and establish a framework for implementation. Adequate funding ensures that needed steps and activities are completed in a timely fashion, and that resulting products are high quality. This includes dedicated staff time, the capacity to hire subject matter consultants, and the capacity to cover associated logistical costs.

It is doubtful that the resources necessary to conduct a data gathering process currently exist, and it remains unclear whether they could be found. The County obtained a capacity-building grant from the California Department of Water Resources' Local Groundwater Assistance Program to conduct this assessment. A data gathering process, however, would require the County to obtain or allocate additional funding at a time when the recession continues to stress local government revenues and budgets. It remains unclear whether participating cities and special districts would be willing to share the costs, or whether additional state grants could be obtained.

The condition appears unmet. It is closely tied to political support, and would need to be addressed before convening a process.

D. Opportunities to Create Shared Value

Best practices in collaborative public policy involve identifying and taking advantage of opportunities for stakeholders to do work that has not just individual but shared value. These opportunities to join together in new ways and find creative solutions to intractable problems provide another major incentive for stakeholders to participate, and for politicians to support collaborative efforts and their outcomes.

This condition is met. On the one hand, the status and trends of the county's groundwater resources remain debated. The county's geographical heterogeneity, and the lack of an overarching analytical framework for synthesizing the findings of disparate studies amplify the

debate. Nevertheless, while a few interviewees believed that gathering data would simply validate their perspectives and were unwilling to share information with the County, almost all interviewees saw value in having good information on groundwater. In the context of a recognized information gap and a widespread desire to fill it, a significant opportunity exists for stakeholders, including local government, to jointly establish a commonly accepted foundation of scientific data and information that can inform public deliberation and political decision-making.

Although it would require a subsequent policy process, a common pool of information could serve as a foundation upon which stakeholders, including local government, jointly build a shared vision of the County's future relationship with groundwater. This opportunity stems from the strong attachment that people feel towards the land, their communities, and the region as a whole; the obvious energy they are willing to commit to safeguarding their future; and the common challenges they continue to face around changing land uses and environmental conditions.

More immediately, opportunities exist to have greater certainty about land and business investments, and about constraints on agricultural, municipal, and household practices that use groundwater.

E. Primary Parties

Best practices in collaborative public policy involve several issues concerning key stakeholders and the relationships between them. These include confirming that primary parties are identifiable and have legitimate spokespersons. These also include identifying incentives for participation, establishing a relative balance of power among the parties, and confirming that key parties will participate. Collectively, these conditions help to ensure that the entire system is represented in the process, that primary parties represent their constituents' interests, and that participants are able to have productive conversations and negotiations.

This assessment identified the major parties involved in Napa County groundwater issues. Almost all of these have clearly identifiable, legitimate spokespersons – people who are articulate, respected leaders that understand their constituents' concerns, and can represent them in an accurate as well as productive manner. At the same time, as mentioned earlier, a few interviewees felt that the County should make special efforts to reach out to and involve individual growers, ranchers, private property owners, and homeowners that were not part of existing organizations.

In terms of incentives for participating, major parties had a shared history of engagement and already knew one another, oftentimes personally. Looking to the future, these parties have a strong incentive for working together, as they are highly likely to continue to have to engage one another on groundwater issues. Additional incentives identified by interviewees, as mentioned earlier, include having a voice in the discussions taking place among key parties; generating economic, social, and ecological benefits; and establishing community-based methods for protecting the resource.

Despite perceptions that one or another group had significantly more power than others, parties are also relatively balanced in terms of power, understood as the capacity to influence people's decisions. This is not to ignore that certain groups have considerable economic sway and influence on elected officials – some are well-known for contributing to the campaigns of supervisors. Nonetheless, the history of resource conflicts in the county illustrates that major property-owning, winegrowing and winemaking, rural residential, and environmental interests have sophisticated organizations, a range of resources that they can draw upon, large constituencies that they can mobilize readily, and a track record of winning some disputes. Likewise, county, city, and special district agencies have experience with groundwater issues and are capable of participating, even if their staff resources may not be extensive.

It appears that no key party has a clear and certain better alternative to a collaborative data gathering process. Several have experience with litigation and referendums. However, numerous considerations suggest that relying on either of these strategies cannot provide a large guarantee of success. These considerations include:

- the regional diversity of groundwater conditions and issues in county
- the lack of a comprehensive, commonly accepted scientific assessment of groundwater resources and trends
- the relative balance of power among key parties
- the uncertainty associated with the trajectory of state policy on groundwater; and
- as a result of all of these, the large uncertainty associated with evolving legal and public opinion regarding the need for groundwater protection in Napa County.

As mentioned earlier, almost all parties expressed interest in participating in a data gathering effort. In addition they expressed a willingness to communicate what they viewed as the value of this effort to their constituencies, assuming its design met a variety of conditions (i.e., a clear purpose, education of volunteers, financial incentives, neutral supervision, and information access). Each of these conditions has a high likelihood of being able to be met in the design of the data gathering effort. At the same time, a few parties expressed a clear unwillingness to participate in gathering data and sharing it with the County. One of these interviewees indicated a willingness to participate in discussions to advise the County on these issues, but not to gather and share data.

Individually and overall, these conditions about primary parties are met.

5. Judgment and Recommendations

This final section presents a series of professional recommendations about whether and how the County should convene a collaborative data gathering effort. This assessment and these recommendations do not address groundwater management, groundwater regulation, or the existing voluntary and cooperative efforts. The assessment and recommendations focus specifically on a collaborative process for gathering data. Lastly, this report is a product of the Center for Collaborative Policy, CSUS, and does not represent the views or recommendations of the County of Napa.

The recommendations below are guided by the interview findings and resulting conclusions about conditions for collaboration. The section starts with a quick recap of key design points flagged by interviewees, and a summary of conditions. Next it provides one overarching judgment and then several more elaborate recommendations. The recommendations build sequentially. They focus on critical design elements, and avoid being overly prescriptive about less important aspects.

A. Review of Key Design Points

A majority of interviewees emphasized two things about the design of any effort:

1. Analyses of existing information, identification of needed data, and the design and implementation of data gathering efforts should take place at and be tailored to the regional level.
2. Data gathering and related public involvement efforts should utilize existing organizations, forums, and networks.

Other repeated design concerns included:

1. The need for independent analyses of scientific information.
2. The need to ensure confidentiality in the gathering, analysis, presentation, and public access to data and information.
3. The need for a clear and meaningful purpose and corresponding scope of work to guide an effort.
4. The need for an enduring commitment to seeing the process through to completion.
5. The need for effective institutional arrangements to support an effort politically, financially, technically, and administratively.

B. Summary of Conditions

The need to have a clear desired outcome for a collaborative effort is a condition that could readily be satisfied, if this is given enough attention during the design phase and in communication efforts.

Political leadership and commitment is not a currently satisfied condition, although broad support exists for a better understanding of groundwater resources. It seems the condition would have a good chance of being met if the County consulted early on with elected officials, agency leaders, and key opinion leaders from groups that represent various public interests, and made sure that their concerns would be appropriately addressed in any effort.

Currently economic resources to support an effort do not seem available. Given widespread stakeholder wariness of engaging in another effort that lacks adequate resources, this condition would have to be clearly met before bringing any people to the table. The chances of this increase to the degree that the effort obtains political support and commitment.

A clear, broad-desired opportunity to create shared value exists. This condition is well met.

The multiple conditions involving primary parties are positive. Main parties are identifiable. Most of these are organized and have legitimate spokespersons, although some will require additional attention to ensure they are kept abreast of activities and opportunities for participation. Numerous incentives exist for them to participate, including the aforementioned creation of shared value. Many of the main parties are powerful, yet none has near-exclusive control over resources, support, information, and communication. Neither does any appear to have an end-run to the courts, to elected officials, to popular votes that will nearly certainly meet their interests. Almost all have expressed interest in participating.

C. Overarching Judgment

Conditions are favorable for the County to proceed to develop a collaborative data gathering effort. **However, the County should not do this if it cannot first secure political support for the effort, and secure the economic resources necessary to see the effort done well and to completion.** After a reconnaissance period of weeks or months, the County must respond affirmatively to both these conditions before it starts a formal design process and then brings people to the table. If the County does not meet these conditions yet still convenes a collaborative effort, the County faces a high risk of stimulating open conflict between already tense parties, creating widespread mistrust of its capacity to lead and implement policy, and eroding remaining chances that parties work together.

If the County has met all the conditions for collaboration and decides to develop a data gathering effort, the following recommendations apply.

D. Recommendation 1 (Year 1 and Onward): Convene a Groundwater Resources Information Advisory Committee

A standing county-wide advisory committee consisting of leaders from the main parties and public agencies would serve as a central advisory and oversight body for a groundwater data gathering effort over a period of several years. This would be called the Groundwater Resources Information Advisory Committee, or GRIAC. Like the Watershed Information Center and Conservancy, the GRIAC would be convened by and advise the County Board of Supervisors. Administratively it would be located under the County's Public Works Department.

1. Major Activities

As its first activity, the committee would compile the range of information it already has available, synthesize the conclusions of these analyses and studies, and establish a framework for a county-wide data gathering effort that is built around regional joint fact-finding teams. Given its complexity, Recommendation 2 below provides detailed information on this task.

Second, the GRIAC would develop a uniform confidentiality protocol for use by all the regional joint fact-finding teams (Recommendation 3 provides details on the teams). The protocol would develop ways of collecting, using, and storing data that address the concerns identified by interviewees in this assessment. The intent of the protocol would be to balance the need for access to data and information with respect for the privacy, practices, and integrity of those who volunteer to gather this material. Individual regional teams could augment this protocol for their efforts, but could not adopt a weaker confidentiality protocol.

Following the completion of the synthesis study and data gathering framework, the committee would assist the County as needed in convening the regional teams. From this point onward, the committee would coordinate the activities of the different regional teams, and organize technical and administrative support for them as needed. The synthesis study and data gathering framework would serve as the basic reference for the committee's oversight and support of the regional teams. At the end of the second, third, and fourth years, the committee would receive the annual status report produced by each regional team.

The committee would also develop a communication and education plan during its first year (see Recommendation 5). In subsequent years the committee would oversee the implementation of this plan, including necessary revisions.

The committee would also select three impartial science and technical advisors to assist as needed. Assistance would include but not be limited to explaining technical concepts and analyses, and providing professional advice in response to committee requests. Advisors could come from federal agencies, academia, or the private sector, so long as they were amenable to the GRIAC.

During the fifth year the committee would oversee the independent, peer-reviewed synthesis of the three years of regional data gathering and analyses, and lead the subsequent public involvement process (see Recommendation 4).

The GRIAC would be responsible for reaching consensus on the substance and process of the data gathering effort. Making decisions by consensus requires that each party in an effort agrees to support a decision, whether minimally or wholeheartedly. In practice this requires ensuring balanced representation and participation, achieving mutual understanding, developing inclusive solutions, and sharing responsibility for all aspects of a process.

2. Representation

The GRIAC would be structured similarly to the County's Watershed Information Center and Conservancy. It would include representatives from the major interests – rural residential, winegrowing, vintning, environmental, and property rights. Careful consideration would be given to the inclusion of alternate perspectives within these interests, rather than treating them as monolithic blocks. These representatives would be appointed by the County Board of Supervisors, based on qualifications and criteria agreed upon by the Board.

The committee would also include senior representatives from major public agencies, including each of the municipal water agencies, the Flood Control and Water Conservation District, and Napa Sanitation District. It would also include a representative from each of the cities, and from the U.S. Geological Survey, U.S.D.A. Natural Resource Conservation Service, Napa County Resource Conservation District, and the Regional Water Quality Control Board.

The committee would seek to leverage the County's range of departmental mandates, expertise and resources. For this reason it would include the County's Agricultural Commissioner's Office; Environmental Management Department; Public Works Department; and Conservation, Development, and Planning Department.

E. Recommendation 2 (Year 1): Synthesize Existing Information, Assess the Resource, Identify Critical Regional Information Needs, and Develop a Data Gathering Framework

Interviewees did not have a common understanding of what data is available, what gaps exist regionally and topically, and what can be reasonably concluded from the resulting array of information. To provide a foundation for the work of the regional joint fact-finding teams, the GRIAC would lead the development of a synthesis study and a framework for data gathering. The synthesis study would compile the range of information already available, and then pull together the conclusions of these analyses and studies in order to provide an overall assessment of groundwater resources in different parts of the county. This would include helping to identify key questions about groundwater. The synthesis study would provide a foundation for establishing a data gathering framework for subsequent activities. These materials would focus on the regional level, with limited attention to county-wide generalizations. The GRIAC would approve the final documents by consensus.

1. Major Activities

To support this effort, the County would assign staff to organize and analyze the information to which it has exclusive access. This includes the historical well logs for the wells that it operates, and the logs for wells that it permits or has permitted in the past.

The bulk of this effort would involve the GRIAC hiring an independent consultant to research and then synthesize the range of existing information, and provide an overall assessment of the resource in different parts of the county. The consultant would not initiate a new data gathering

effort or new analyses of existing data sets. Instead they would review and pull together information and insights from the existing information record. Their synthesis study would focus on two topics: an assessment of the status and trends of groundwater resources in different regions of the county, and critical information needs for each of these regions. To provide general direction at the start, the GRIAC would identify the minimum informational questions that this work should address. The critical information topics identified by interviewees in this report provide a starting point (see section 3-C above, Existing and Desired Data and Information). The GRIAC would identify criteria for selecting an appropriate consultant, and make their choice by consensus.

The final part of this effort would involve the independent consultant proposing a framework for a county-wide data gathering effort built around regional joint fact-finding teams. The framework would build upon the synthesis and assessment, and focus both on the data needs that are common to the entire county and those that are regionally-specific (again, section 3-C provides a starting point for consideration). Furthermore, the framework would anticipate the need and have the flexibility to expand and incorporate additional data gathering needs as the work of the regional joint fact-finding teams unfolds (see Recommendation 3). The framework would thus set a minimum requirement for data gathering efforts, rather than a limit.

2. Independent Review

A three-person independent scientific and technical review panel would examine and comment on the consultant's synthesis and proposed framework. The consultant would then have a short window to revise the documents as necessary. The GRIAC would appoint the panelists by consensus. Panelists could come from the U.S. Geological Survey, the University of California at Berkeley, or other institutions, so long as all GRIAC members viewed them as neutral and approved of them. Panelists could come from outside California to minimize potential conflicts of interest, so long as at least one panelist has first-hand expertise with California groundwater resources.

The County analysis, the contemporaneous consultant synthesis and framework proposal, the subsequent independent review and document revision, and GRIAC approval of the final documents would take no more than one year from the date that the GRIAC convenes for the first time. These documents would provide foundational reference materials upon which the regional joint fact-finding teams and other recommendations would build.

3. Ongoing Technical Studies of Luhdorff and Scalmanini

As mentioned in the Introduction, the County commissioned concurrent technical studies in accord with the 2008 Napa County General Plan. Currently being completed by Luhdorff and Scalmanini Consulting Engineers, this work is compiling and evaluating existing information for all basins/subbasins in the county. Future steps will include focused assessments (subbasin scale) to understand hydrologic processes and effects (for example, stream-aquifer interactions) that occur locally but are also important regionally. The work is also compiling and evaluating what is known about changes in groundwater levels, quality, storage, recharge, and discharge, and identifying major regional groundwater availability and water resources management issues.

Future steps will include evaluating and enhancing the previously developed regional groundwater model to improve water budgets and apply the model to evaluate future responses of the aquifer system, including responses due to alternative water management strategies in various areas of the county. The regional model applications could also consider the effects of varying climatic scenarios.

These technical studies began before the start of this assessment. Although their development process differs from Recommendation 2, they could be integrated with a larger collaborative data gathering process as outlined in this assessment, including the review of County information, development of a data gathering framework, and independent review.

F. Recommendation 3 (Years 2 and Onward): Convene and Support Regional Joint Fact-Finding Teams

Regional joint fact-finding teams would work together to develop commonly accepted data and analyses for review and use by the GRIAC. The teams would leverage existing regional organizations, and employ and build upon the county-wide data gathering framework developed during Recommendation 1. At minimum they would gather the data sets required to meet the critical information needs identified for their region, using the framework as a touchstone for their work. The regional teams could also gather additional data as they identify further needs and their resources allow.

1. Major Activities

Each team's major role would involve designing and implementing a regional strategy for voluntarily gathering data. This would involve locally active organizations, agencies, and professionals working together to engage groundwater users in the most appropriate ways, and would leverage the existing networks of trust and communication. Careful attention would be given to collecting and storing data in ways that protect the confidentiality of individual users; each regional team would adhere to the protocol established by the GRIAC, and could augment but not weaken this. At the end of each year, each of the teams would submit an annual report to the GRIAC. This would include data sets and corresponding analyses, and an overall progress report.

The County would convene the regional teams during the second year, after the County has convened the GRIAC. The teams would be expected to complete the design of their data gathering strategies and initiate implementation by the end of the second year. Their work would continue indefinitely, at minimum through three years of monitoring (approximately the fifth year). In some cases the data they gather might serve as baseline information; in other cases it will add to existing records. The regional teams would be responsible for reaching consensus in their decisions about the substance and process of the data gathering effort.

The teams would support the GRIAC communication effort as described in the committee's plan. They would conduct limited education efforts, focusing primarily on teaching volunteers how to gather data appropriately.

2. Relationship with the GRIAC

The teams would function largely autonomously. Representatives from the teams would periodically brief the GRIAC. The GRIAC would help to coordinate their activities, and organize administrative and technical support as needed. This would include establishing a clear scope of work for each group. The GRIAC would also have to consider whether and how it could support the regional teams using financial incentives as part of their effort.

3. Representation

The regions for the teams could be similar to the list developed in the synthesis document or the West Yost (2005) technical memoranda (i.e., Calistoga, St. Helena, Yountville, Napa, MST, Carneros, American Canyon, and Hillside).

Each regional team would include representatives of the major interests in the area, as well as people with needed scientific and technical expertise. If certain interests were minor or absent in an area, they would not require representation on that area's team. As noted earlier, each team would leverage the existing organizations in their region, and work through their existing networks. The teams would remain small, and would not attempt to replicate the full suite of GRIAC members assembled to deal with policy issues. Instead they would focus on establishing regionally appropriate strategies for data gathering, and the associated fieldwork with landowners. One staff from the County would consistently serve as its representative for each of the regional teams.

Each team would have co-leads, one from the County and one selected by the group, to help ensure neutral leadership. Like the GRIAC, the teams would make decisions by consensus about the substance and process of their data gathering effort.

G. Recommendation 4 (Years 5 and 6): Synthesize Findings-to-Date, Assess the Resource, and Involve the Public in Developing a Vision and Next Steps

Following three years of data gathering by the regional joint fact-finding teams, the GRIAC would lead the production of a second synthesis document. A consultant would synthesize the analyses of recent years of County data as well as the analyses submitted by the regional teams over previous years. This would include an assessment of the status and trends of groundwater resources in different regions of the county. A three-member independent review panel would review the consultant's synthesis, and identify necessary revisions.

The GRIAC would then lead a public involvement process to develop a vision for the use of groundwater resources in Napa County, and associated next steps. The first part of the visioning process would involve a wide range of interested members of the public in different parts of the county. Participants would describe what their communities, landscapes, and rivers and creeks would look like in 15 years if groundwater resources were used best. The GRIAC would then be responsible for combining regional elements into an inclusive vision for the county.

Based on the countywide vision and the synthesized information from the past five years, the GRIAC would develop a straw proposal for how to address outstanding groundwater issues in the different parts of the county. The committee would then invite the public to review and improve upon the proposal through regional public workshops. The GRIAC would then seek consensus on a final proposal, which would go to the Board of Supervisors for approval and implementation. Making decisions by *seeking* consensus means that a group will work genuinely to develop inclusive solutions, but can ultimately make a decision without unanimous agreement. In this situation they can consider providing more than one set of conclusions or recommendations.

H. Recommendation 5 (Year 1 and Onward): Develop and Implement an Ongoing Communication and Education Plan

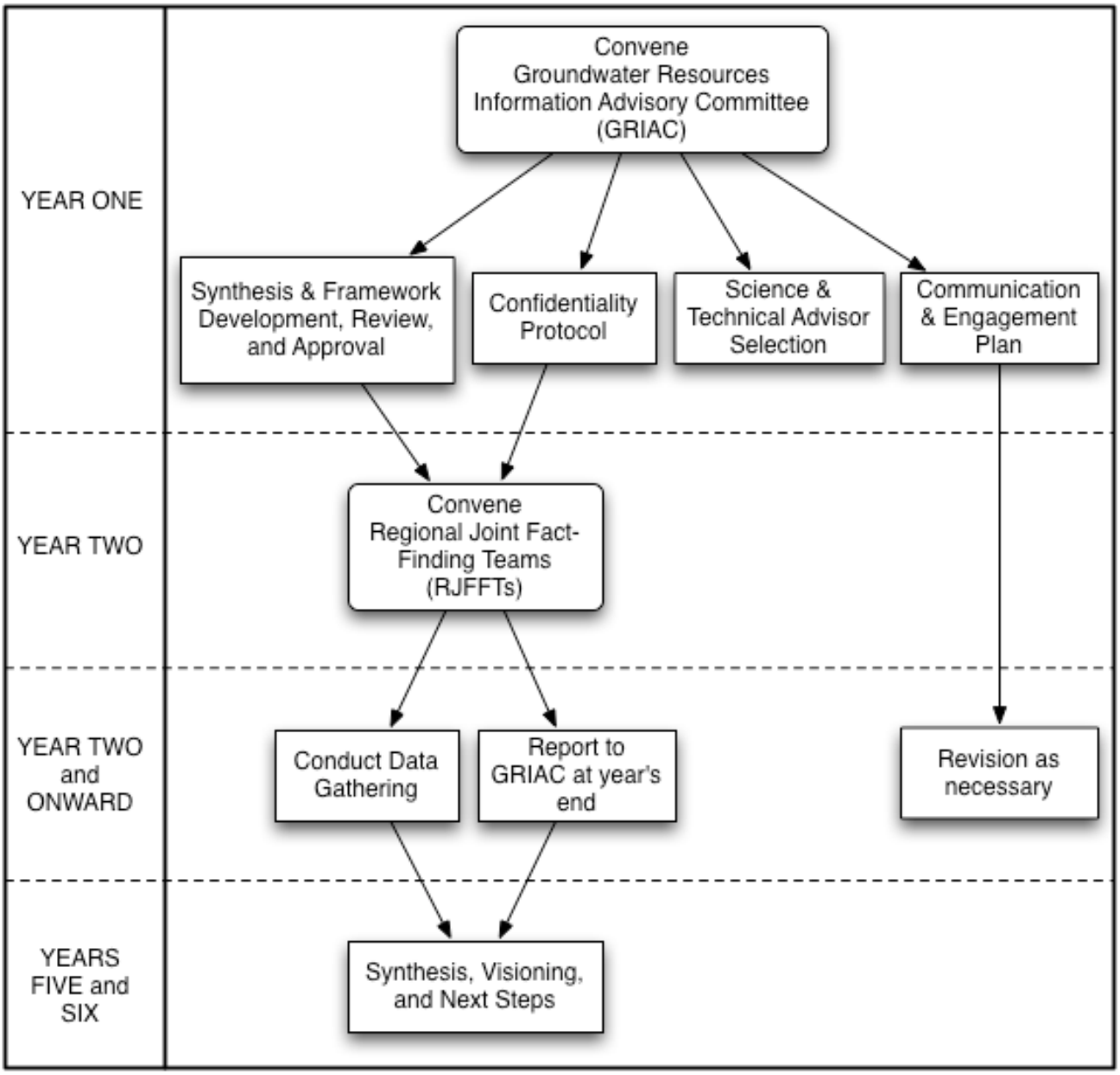
In its first year the GRIAC would develop and begin to implement a communication and education plan. The communication portion of the plan would keep people throughout the county and its regions informed of the GRIAC's efforts and deliberations, while the education portion of the plan would help people better understand and engage in discussions about groundwater issues. The GRIAC would work with the Napa County Watershed Information Center and Conservancy to develop both portions of the plan.

The communication portion of the plan would share information about the purpose, deliverables, major steps, and timeline of all phases of the work. It would include identifying key communication objectives and the associated messages, audiences, and mechanisms. It would leverage the networks, forums, and devices of existing organizations. One tier of communication would focus on county-wide messaging, and a second would focus on regionally-specific messaging. Following their formation, the regional teams would help to refine the second tier efforts. In addition to sharing information, the plan would identify standing mechanisms (outside of the GRIAC and regional teams) for the public to provide input and comments on the work.

The education portion of the plan would teach people about the natural dynamics of groundwater, as well as the issues surrounding the use of groundwater resources (e.g., connections with land use, connections with surfacewater). It would thus help people understand the work of the GRIAC, and participate in a more informed way in various opportunities for public engagement. The plan would include practical approaches for agricultural and urban water conservation. The plan would also teach volunteers and other interested people how to gather data about their groundwater resources and use.

General elements of the education portion of the plan would be developed during the first year of the GRIAC's work. As the regional teams developed information and analyses, the plan would expand to include regionally-specific components to help people understand the unique conditions and issues in their area.

I. Timeline for Recommendations and Major Activities



Addendum: The Existing *Local Groundwater Assistance Program* Grant, and the County as the Local Groundwater Monitoring Entity

This addendum addresses two near-term issues facing the County. First, as noted in the Introduction, the County obtained a grant from the California Department of Water Resources' (DWR) Local Groundwater Assistance Program to assess current groundwater basin conditions through the County, and support for a voluntary groundwater monitoring program. The grant expires in May of 2011. For this reason, the County requested the CCP team to identify what action it might take before this time, including expanding voluntary monitoring. Second, Senate Bill x7-6 (2009) regarding Groundwater Elevation Monitoring (California Water Code §10927-10936) requires local agencies to monitor the elevation of their groundwater basins and report the information to DWR. As part of this, local agencies must notify the California Department of Water Resources by January 1, 2011, whether they take responsibility for monitoring and reporting. The County requested the CCP team to provide input on how it might address this notification requirement.

A. Using the Existing Grant

Before May 2011, the County could solicit volunteer participation in an expanded groundwater monitoring program. However, the same cautions identified in the Judgment and Recommendations section apply – the County should not do this if it cannot first secure political support for the effort, and secure the resources necessary to see the effort done well and to completion. If the County does not meet these conditions, it risks prompting open conflict between already tense parties, and losing stakeholder trust in its capacity to lead and implement a voluntary monitoring program. The Senate Bill x7-6 legislation provides a powerful stimulus for this work, but the County should nevertheless discuss and obtain political and economic support from the Board of Supervisors before expanding its efforts.

Additionally, in order to ensure that efforts to expand voluntary monitoring are well received by stakeholders and residents, the County must still establish a clear context and rationale for this activity. The Judgment and Recommendations section's advice therefore still applies: the County should synthesize existing information, identify critical regional needs, and develop a data gathering framework – all with independent scientific and technical review – before starting any work on the ground. If the County does not have the time or resources to convene a Groundwater Resources Information Advisory Committee (GRIAC) to oversee this work before May 2011, it could nevertheless proceed with the synthesis and framework development, including independent review. The work would not benefit from the guidance and support of the GRIAC, but at least would provide a coherent, fact-based foundation for expanding the voluntary monitoring effort within the next year.

The County should also carefully incorporate three other issues before expanding voluntary monitoring. First, it must work with and utilize existing regional organizations, many of which would likely be part of a GRIAC. Numerous interviewees stressed the importance of the County

working through trusted, often community-based institutions, and leveraging their existing networks and established relationship. Second, it must still develop a confidentiality protocol that is supported by stakeholders before initiating further monitoring. As explained earlier, confidentiality constituted one of the overarching concerns shared by a broad range of interviewees, and for many constituted a basic condition that must be satisfied before they would participate. Lastly, the County must still tailor monitoring efforts to regional conditions. Numerous interviewees emphasized that a one-size-fits-all approach to monitoring ignores the wide variety of geographical and land use conditions that exist in the County, and will thus reduce the usefulness of gathered information and not make the best use of limited resources.

Within the next two to five years, the County should continue to consider initiating a collaborative effort, including a GRIAC and regional groups, to gather information, synthesize findings, and develop a vision for the use of groundwater resources in Napa County. Any near-term voluntary monitoring effort should be developed with eventual integration in encompassing collaborative effort in mind.

B. Volunteering as the Local Groundwater Monitoring Entity

The Groundwater Elevation Monitoring law states that if no local agency volunteers by January 1, 2011, to monitor and report groundwater elevations, DWR will assume responsibility for this, and the local agencies and County will not be eligible for State water grants or loans. If stakeholders, residents, and public officials would prefer to maintain control over local groundwater monitoring, and to maintain the County's eligibility for future planning and implementation grants and loans, a local agency should volunteer and take on this responsibility.

Based on preliminary analyses that start from this assumption, several local agencies could play a monitoring and report role. These include the County Department of Public Works, County Department of Environmental Management, the Flood Control and Water Conservation District, and departments within each of the cities.

The CCP team recommends that the County Department of Public Works convene a focused dialogue with other local agencies to identify criteria for a good institutional arrangement for monitoring and reporting; identify possible institutional arrangements; and determine which of these options best meets local agency interests. At minimum a few factors warrant discussion, including:

1. The tradeoffs associated with having a central, single local agency represent the County. For example, a single agency can present a unified voice and characterization of the status, interests, and needs of the County to DWR and the Legislature, and hence exercise greater political strength in future discussions about statewide policy and planning. Conversely, multiple smaller local agencies could speak in more specific terms, even though their political power might amount to less than a single, more encompassing agency.
2. The legitimacy and impartiality of a local agency. Any local agency that volunteers must be considered a legitimate representative of its constituents. This is of particular concern

if a single local agency is chosen to represent the entire County in terms of monitoring and reporting, given the political sensitivity of groundwater resources. Similarly, if a single agency is chosen, it must be considered impartial with regard to the status, interests, and needs of all the local agencies that it represents, rather than filtering or presenting information in a way that serves more narrow purposes.

3. The capacity of a local agency to monitor and report on groundwater. Any volunteer agency should have the requisite economic resources and staff. In this regard a single local agency might benefit from economies of scale. Conversely limited budgets might make it less feasible for a single local agency to conduct monitoring that encompasses the entire County. As described earlier, any countywide monitoring effort should obtain adequate political and economic support up front, before making new commitments and initiating new programs.

Additionally, the CCP team recommends that the County Department of Public Works discuss and seek feedback on these options from a diverse group of the organizations interviewed for this assessment. This recognizes both the importance of their political support and their role in implementing any monitoring effort.

Appendix A: List of Stakeholder Interview Questions

Introduction

1. Please tell me about yourself and your organization(s) and how you are involved in groundwater issues in Napa County.

Issues to be Addressed

2. What concerns and interests do you have regarding water supply in Napa County, and groundwater in particular? What concerns, if any, do you have about future water issues in the County?
3. What are your thoughts on how the County has handled groundwater issues up to now? How would you assess the effectiveness of those approaches/programs?
4. What types of coordination (formal and informal) currently occur between groundwater users in your area of the County? What other opportunities for coordination do you foresee or would you like to see?
5. How do you think groundwater issues should be handled in the future?
6. What issues or concerns might others raise? Are any of their concerns in conflict with yours?

Stakeholder Involvement

7. In order to increase common understanding about the state of the resource, the County is interested in establishing broader public engagement around groundwater. What do you think would be a good approach to this? How best can the County reach out to those who are dependent upon groundwater?
8. In order to increase common understanding about the state of the resource, would you be open to voluntarily allowing the County to monitor groundwater levels in your area/Do you know of other property owners who might be willing to allow the County to monitor groundwater levels on or near their property?
9. Do you have any experience in participating in any County-wide, regional or local collaborative information sharing, resource management or planning efforts? If yes, how would you assess their effectiveness?
10. If such an effort were to be developed, would you be interested in participating, or do you know others who might be?
11. Who should be involved in groundwater discussions regarding the future of the resource? How should they be involved?
12. Who doesn't usually participate in these types of public efforts that you believe should be involved?
13. What kinds of public outreach would you recommend?

Context and Information Needs

14. What information on the resource would you like to have? What technical questions would you like answered? What types of groundwater information is most important to you as part of this effort?

Conclusion

15. Do you have any interests or concerns about groundwater that you have not yet mentioned?
16. Is there anything else you think I should know or any advice you might offer the County in this effort?
17. Who else, if anyone, do you think I should speak with?

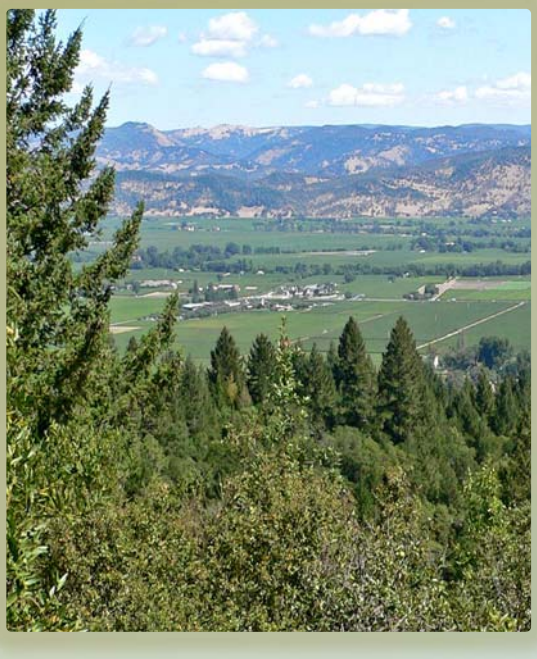
Appendix B: List of Stakeholders Interviewed

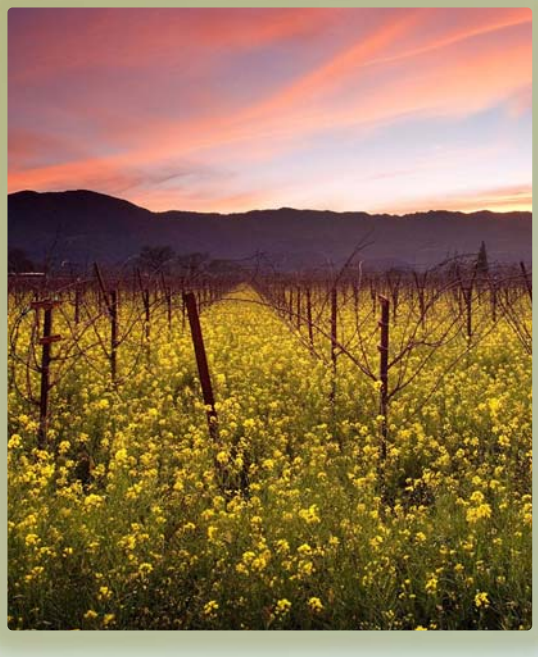
1. George Bachich, Napa Valley Land Stewards Alliance
2. Larry Bettinelli, Napa Valley Grape Growers Association
3. Phill Blake, Natural Resource Conservation Service
4. Susan Boswell, Napa Valley Vintners
5. Tom Carpenter, Napa County Farm Bureau
6. Fred Chopping, Napa Valley Land Stewards Alliance
7. Volker Eisele, Napa Valley Vintners
8. Joy Eldredge, City of Napa
9. Sandy Elles, Napa County Farm Bureau
10. Randy Gularte, Groundwater Under Local Protection
11. Toby Halkovich, Napa Valley Vintners
12. Bill Hanna, Napa Valley Grape Growers Association
13. Rainer Hoenicke, Napa County Resource Conservation District
14. Art Hurley, Groundwater Under Local Protection
15. Bernhard Krevet, Friends of the Napa River
16. Warren Kubler, Napa Valley Land Stewards Alliance
17. Jim Lincoln, Napa County Farm Bureau
18. Chris Malan, Living Rivers Council
19. Steve Moore, City of American Canyon
20. Steve Moulds, Napa Valley Grape Growers Association
21. Peter Nissen, Napa County Farm Bureau
22. Beth Painter, Napa County Resource Conservation District
23. Marc Pandone, Sierra Club – Napa County Chapter
24. Leigh Sharp, Napa County Resource Conservation District
25. James Smith, City of Calistoga
26. Ann Steinhauer, Napa Valley Vintners
27. John Stewart, Los Carneros Water District
28. Gretchen Stranzl-McCann, Napa County Resource Conservation District
29. Fred Swingle, Groundwater Under Local Protection
30. Nancy Tamarisk, Sierra Club – Napa County Chapter
31. Sam Turner, Napa Valley Grape Growers Association
32. Susanne von Rosenberg, Groundwater Under Local Protection
33. Dave Whitmer, Napa County Agricultural Commissioner's Office
34. Tyler York, Sierra Club – Napa County Chapter

Napa County Comprehensive Groundwater Monitoring Program
Executive Summary

Prepared for:
Napa County
Department of Public Works

February, 2011





LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

EXECUTIVE SUMMARY

Napa County Comprehensive Groundwater Monitoring Program

prepared for

NAPA COUNTY

A Tradition of Stewardship
A Commitment to Service

February, 2011

LUHDORFF & SCALMANINI
CONSULTING ENGINEERS

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ATTACHMENT 1

Napa County General Plan Update (2008), Water Resources Goals and Policies

OVERVIEW

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 potential for the development of additional water supplies, 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 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 management. Previously established groundwater and surface water monitoring networks in Napa County have resulted in the collection of data necessary to distinguish trends from short-term fluctuations, anticipate unintended consequences due to historical land uses, identify emerging issues, and design water resources management strategies.

In 2009, Napa County embarked on a countywide project referred to as the "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 (Napa County, 2008; Attachment 1). 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 Comprehensive Groundwater Monitoring Program involved many tasks that led to the preparation of five technical memorandums and a report on *Napa County Groundwater Conditions and Groundwater Monitoring Recommendations* (LSCE, 2011a).

The report on groundwater conditions is based on the reconnaissance evaluations completed in Tasks 1 and 2 which concerned the collection, review, and organization of groundwater-related data and the development of a countywide data management system. The report documents the results of the existing knowledge of countywide groundwater conditions and establishes the framework for the reporting of water levels and water quality on a periodic basis. The report includes: spatial and vertical descriptions and illustrations of geologic units and the occurrence

of groundwater; groundwater elevation hydrographs throughout the county; historical and current contours of equal groundwater elevations for some subareas; time-series plots and illustrations of the distribution of key groundwater quality constituents. Historical trends or occurrences are described to explain historical groundwater levels and/or quality in relation to the current condition.

An updated hydrogeologic picture has been developed to describe the occurrence and movement of groundwater beneath Napa County, especially key subareas of the county. As additional data become available, "layers" of detail can be added to describe and illustrate various hydrologic, groundwater quality and other related items of pertinence or interest (i.e., response of groundwater levels to changes in pumping stresses and/or existing or new recharge activities).

It is intended that the report will serve as a basis for future periodic reports that expand on the existing knowledge of countywide groundwater conditions; provide an update on groundwater conditions (including groundwater level and quality trends and variations); and recommends enhancements and/or modifications to the framework for future reporting of groundwater conditions.

Other tasks included a review of precipitation and streamflow stations; review of the County's regional planning models, especially the groundwater model; and review of California's groundwater management approaches and legislation along with review of the County's groundwater ordinance and permit process. Technical memorandums were prepared for each of these tasks that summarized the review work and recommendations for expanding streamflow monitoring, improving the tool(s) utilized to assess current and future surface water/groundwater interrelationships; and improving the County's groundwater ordinance and permit process.

The program has led to a broader awareness of available groundwater data and an assessment of current groundwater conditions and trends, and also identified factors related to future assessment of groundwater availability. Spatial data coverage was good for some County subareas; however, for other subareas, monitoring network enhancements are needed. Recommendations are presented to enhance and expand countywide monitoring to facilitate understanding of groundwater availability and integrated regional water planning efforts. A table in section ES.9 summarizes the recommended implementation steps, including the implementation time frame, a relative estimated budget, and the relative priority for implementation.

ES.1 Napa County Comprehensive Groundwater Monitoring Program

ES.1.1 Program Goals

The countywide Comprehensive Groundwater Monitoring Program addresses the initial goal of the County to understand current and historical groundwater conditions based on available data, develop an expanded data management system to store monitoring data from different County, state, and federal sources, and develop recommendations for expanded groundwater monitoring

and water resources management. Broad program goals included gathering available groundwater-related data, cross-correlating ancillary data, evaluating historical groundwater level and quality data, and developing a centralized data management system that contains the data necessary to manage regional water resources and enable long-term protection of surface and groundwater resources in the county. This program led to a broader awareness of available groundwater data and how those data can be better used to assess current groundwater conditions and trends and also identify factors related to future assessment of groundwater availability. The program also led to an awareness of data security issues, data gaps, and actions needed to continue efforts to "qualify," organize, store, and disseminate water-related data to enhance the long-term value of the data. The County has been divided into 17 subareas based on geographic, geologic, and political boundaries. Spatial data coverage was good for some County subareas; however, for other subareas, monitoring network enhancements are needed (Figure ES-1). The program includes recommendations to enhance and expand countywide monitoring in order to facilitate understanding of groundwater availability and integrated regional water management and planning efforts.

ES.1.2 Program Tasks

The overall Napa County Comprehensive Groundwater Monitoring Program included a series of tasks that culminated in the six documents summarized in **Table ES-1**.

Table ES-1
Documents Produced for Napa County Comprehensive Groundwater Monitoring Program

Task Number and Document Title	Reference
Task 1, *Napa County Data Management System*. Technical Memorandum	LSCE, 2010a
Task 2, *Review and Evaluation of Data Collection Procedures and Recommendations for Improvement*. Technical Memorandum.	LSCE, 2010b
Task 3.2, *Conceptual Model Review of Napa Valley Groundwater Model*. Technical Memorandum.	LSCE, 2010c
Task 3.3, *Guidance on Precipitation and Streamflow Monitoring Activities, Napa County, CA*. Technical Memorandum.	LSCE, 2010d
Task 4, *Napa County Groundwater Conditions and Groundwater Monitoring Recommendations*. Report.	LSCE, 2011a
Task 5, *Groundwater Planning Considerations and Review of Napa County Ordinance and Permit Process*. Technical Memorandum.	LSCE, 2011b

The program tasks and the resulting documents that describe the work conducted and recommended steps in support of the countywide Comprehensive Groundwater Monitoring Program are summarized in the sections below.

ES.2 Geology and Groundwater Resources

A first step in the study was to review prior investigations to understand the geology and hydrogeology in the County and the region. Essentially, the geology of Napa County can be divided into three broad geologic units based on their ages and geologic nature. These units are: 1) Mesozoic Basement Rocks (pre-65 million years (my)), which underlie all of Napa County, but they are primarily exposed in the Eastern County area and the Western Mountains Subarea, 2) Older Cenozoic Volcanic and Sedimentary Deposits (65 my to 2.5 my), including Tertiary Sonoma Volcanics (Miocene and Pliocene; 10 my to 2.5 my) which are found throughout the County, especially in the mountains surrounding Napa Valley, and 3) Younger Cenozoic Volcanic and Sedimentary Deposits (post 2.6 my to present), including the Quaternary alluvium of the Valley Floor. The two primary water-bearing units for Napa County are the tuffaceous member of the Sonoma Volcanics and the Quaternary alluvium.

Outside of the Napa Valley Floor, percolation of surface water appears to be the primary source of recharge. The rate of recharge within areas such as the Milliken, Sarco and Tulucay (MST) Subarea has been shown to be significantly higher where streams and tributaries cross highly permeable outcrops (e.g., the tuffaceous member of the Sonoma Volcanics or shallow alluvium). Direct infiltration of precipitation is a major component of recharge in the main Napa Valley. Recharge throughout much of the county is generally limited by underlying shallow bedrock of low permeability. An additional component of groundwater recharge is deep percolation through fractured rock and fault zones. This type of recharge can be very difficult to quantify due to the highly variable size and distribution of faults, fractures, and joints in a given area.

ES.3 Data Management System

As part of the task to establish a countywide data management system (DMS), historical groundwater level data from the California Department of Water Resources (DWR), the U.S. Geological Survey (USGS), the State Water Resources Control Board (SWRCB), and the County were gathered and organized. Groundwater quality data as available from these entities as well as from the SWRCB GeoTracker program and the California Department of Public Health (DPH) were also incorporated. The countywide DMS was developed to establish a centralized repository for historical groundwater level and quality measurements, providing a foundation for programs that enhance integrated water resources management and planning. The countywide data can be further expanded upon to better understand available water resources (e.g., surface water resources and precipitation). Future applications of the DMS will lead to identification and improved understanding of the issues that may affect the quantity and/or quality of the County's water resources (e.g., climate change, human stresses due to withdrawal, or land use). Recommendations for the maintenance and utilization of the DMS are provided in section ES.9.1 and Table ES-3.

ES.4 Groundwater Conditions

ES.4.1 Groundwater Levels

Groundwater level data are primarily available for the subareas in the Napa Valley Floor. Most groundwater level data are not able to be correlated to specific aquifer units due to a lack of well construction and lithologic log information associated with the monitored wells. As a result, evaluation of groundwater levels and conditions specific to individual aquifer zones is limited.

Based on the available groundwater level data, groundwater levels in the county are generally stable, with the exception of the MST Subarea. Groundwater in the Napa Valley Floor generally flows toward the axis of the valley and south when not influenced by local pumping depressions. The MST Subarea, however, has shown significant declines in groundwater levels, especially in the central portion of the subarea. Contemporaneous changes in water level trends are possible to discern throughout the MST. The variation and timing of groundwater level declines and trends in the north, central, and southern areas of the MST that have historically occurred may be attributable to increased pumping and/or variations in geologic conditions. Wells in the immediate vicinity of the MST Subarea may be vulnerable to these variations as well, as seen from limited data in the eastern portion of the Napa Valley Floor-Napa (NVF-Napa) Subarea and the southwestern part of the Eastern Mountains Subarea. Most wells elsewhere in the valley with a sufficient record indicate that groundwater levels are more affected by climatic conditions, are within historic levels, and seem to recover from dry periods during subsequent wet or normal periods.

Groundwater level conditions outside of the Napa Valley Floor are much less known. Subareas south of the Valley have very limited water level data, making it difficult to impossible to assess any potential for historic or current saltwater intrusion from San Pablo Bay. Subareas east and west of the valley floor all have limited data or are lacking groundwater level data entirely (as seen in Livermore Ranch, Southern Interior Valleys, and Western Mountains Subareas). Where data are available, most records are short, spanning a few years at most, and it appears that groundwater level conditions are stable.

ES.4.2 Groundwater Quality

Less is known about the quality of Napa County's groundwater. Historical groundwater quality records are typically lacking in Napa County. From records that do exist, groundwater is generally of good quality throughout most subareas. Poor groundwater quality exists in the south and the north central parts of the county. The areas with poor groundwater quality contain concentrations of metals such as arsenic, iron, and manganese that exceed drinking water standards. Elevated levels of boron are prevalent in most subareas. The Calistoga Subarea of the Napa Valley Floor also has poor quality water in many wells due to hydrothermal conditions resulting in higher concentrations of metals. Nitrate concentrations are not generally a concern throughout the county, but nitrate levels tend to be higher in agricultural areas in the Napa Valley Floor.

Areas of potential saltwater intrusion were preliminarily assessed through examination of available chloride, total dissolved solids (TDS), and sodium concentrations. The highest concentrations of each constituent are observed in the Napa River Marshes, Jameson/American Canyon, and Carneros Subareas. A lack of groundwater quality and well construction data for these areas is a limiting factor in determining the source and distribution of salinity.

Available groundwater quality data in the county are incomplete in regards to spatial distribution, number, and record. Many subareas do not have sufficient spatial coverage to gain a full understanding of groundwater quality. Six out of the 17 subareas have ten or less wells with available groundwater quality data, which limits the ability to determine representative quality, and some subareas have no historical data. Without sufficient groundwater quality records, trends are not able to be determined.

ES.5 Historical and Future Groundwater Monitoring

Historical to current (data extending through at least 2005) groundwater level and quality data were examined and groundwater data gaps identified in county subareas. Groundwater level measurements have been recorded at a total of 676 wells (at 173 locations, as most regulated facilities tend to have clusters of monitoring wells with data that represent one location) through at least 2005. Of these sites where levels are measured, some type of well construction information (depth and/or perforated interval(s)) is readily available for 118 locations. Groundwater quality monitoring has been conducted at a total of 283 wells (or 153 locations) through at least 2005. Of these sites where groundwater quality samples are collected, some type of well construction information (depth and/or perforated interval(s)) is readily available for 15 locations.

There are many areas in the county where further efforts to establish groundwater monitoring, using existing or new monitoring facilities, will improve the understanding of groundwater conditions and availability. The objectives and priorities for addressing groundwater level and quality monitoring needs are summarized below.

ES.5.1 Groundwater Monitoring

The primary objectives of the countywide groundwater monitoring program include:

- Evaluate groundwater conditions in the various county subareas to describe the occurrence, movement, and trends of groundwater levels and quality, spatial variability between areas, and vertical variability in the aquifer system(s) in the subareas;
- Detect the occurrence of, and factors attributable to, natural (e.g., direct infiltration of precipitation, surface water seepage to groundwater, groundwater discharge to streams) or induced factors (e.g., pumping, purposeful recharge operations) that affect groundwater conditions and trends;
- Identify where data gaps occur and provide infill, replacement, and/or project-specific

monitoring (e.g., such as may occur for planned projects or expansion of existing projects) as needed;

- Develop and/or refine water budgets for key subareas, including recharge, extraction, and change in storage in the aquifer(s); and

- Employ methods to better estimate groundwater basin conditions, assess local current and future water supply availability and reliability, and update analyses as additional data become available.

A preliminary ranking and priorities for improving or expanding groundwater level monitoring was prepared for each county subarea. Seven subareas (including the NVF-Calistoga, NVF-MST, NVF-Napa, NVF-St. Helena, NVF-Yountville, Carneros, and Pope Valley Subareas) are given a higher priority for improving the groundwater level monitoring network based on factors of current and/or projected land and water use. A preliminary ranking and priorities for improving or expanding groundwater quality monitoring was prepared for each of the county subareas. Four subareas (including NVF-MST, Carneros, Jameson/American Canyon, and Pope Valley Subareas) are given a higher priority for improving the groundwater quality monitoring network based on factors of current and/or projected land uses and also the lack of spatially distributed groundwater quality monitoring. Three subareas, including Livermore Ranch, Southern Interior Valleys, and Western Mountains, are preliminarily assigned lower priorities for groundwater quality monitoring due to the likely lower levels of projected land and groundwater use. The ten remaining subareas are designated as medium priorities for groundwater quality monitoring. Many of these areas have current monitoring programs, so the emphasis is to further examine land use with respect to monitoring locations and the units(s) of the aquifer system represented by this monitoring.

Many subareas outside the Napa Valley Floor have limited spatial distribution of the current groundwater monitoring wells (or monitoring locations). Basic data are described as a key monitoring need and expansion and/or refinement of groundwater monitoring conducted in all subareas should be coordinated with efforts to provide additional characterization of subsurface geologic conditions and well construction information. This will allow for the evaluation groundwater conditions specific to an aquifer rather than composite information which limits the ability to fully understand groundwater conditions in the County and in individual subareas.

Recommendations for improving the groundwater level and quality monitoring networks and program are provided in section ES.9.1 and Table ES-3.

ES.6 Review of Napa Valley Groundwater Model

A task within the overall Comprehensive Groundwater Monitoring Program was to provide a general review of a previously developed groundwater model produced by DHI Water & Environment (DHI) as part of the 2005 *Napa County Baseline Data Report (2005 BDR)* (Jones & Stokes et al., 2005). The product of the review was a Technical Memorandum (LSCE, 2010c) based solely on a review of the 2006 *Final BDR Technical Appendix* (DHI, 2006), which

presents the model code, model construction, calibration, and application of modeling efforts introduced in Chapters 15, 16, and 17 of the BDR. Further information on the groundwater model was reviewed from the *2005 BDR* and a 2007 technical memorandum *Modeling Analysis in Support of Vineyard Development Scenarios Evaluation* (DHI, 2007) in which the groundwater model was updated/expanded and applied in evaluating various vineyard development scenarios. The information reviewed included the conceptual model developed by DHI from which the inputs to the groundwater model were based. In addition, information provided on the model code (the actual model code was not part of the general review), construction, and development of the groundwater model and model calibration were also reviewed.

ES.6.1 Napa County Regional Planning Models

In 2005/2006, a group of models was developed by DHI as regional planning tools to evaluate Napa County watershed-scale conditions and how potential land-use changes in the watershed would affect groundwater and surface water conditions. A key document developed during the County's General Plan Update (2008 and later update in 2009) was the 2006 BDR Technical Appendix (DHI, 2006); this document describes the development, calibration, and application of several surface and groundwater models (i.e., the Napa County Models). The names and purposes of the Napa County Models are shown in **Table ES-2**.

Table ES-2 Napa County Regional Planning Models

Model	Purpose	Model Domain
Napa Valley Surface Water	Streamflow and water budgets	Napa River watershed
Napa Valley Groundwater (MIKE SHE Model)	Groundwater levels	Napa River watershed except its southernmost portion
Napa Valley Water Quality	Surface and groundwater quality	Napa River watershed
Lake Berryessa Surface Water	Streamflow and water budgets	Putah Creek and Suisun Creek watersheds within Napa County
Lake Berryessa Water Quality	Surface water quality	Putah Creek and Suisun Creek watersheds within Napa County
SEAGIS	Sediment erosion and transport	All of Napa County

The Napa County 2006 BDR Technical Appendix states that the objectives for the Napa County Models were to "establish baseline (existing) conditions by which county-wide planning efforts and programs can be assessed and evaluated for their benefits, constraints, and environmental impacts. The models are an analytical tool and data management system capable of evaluating the hydrologic and water quality effects of landscape-scale planning decisions…."

ES.6.2 Groundwater Model Purpose and Review

The groundwater model (referred to as the MIKE SHE Model) was developed by DHI in conjunction with the Napa Valley and Lake Berryessa Surface Water models to simulate existing groundwater and surface water conditions on a regional basis. The groundwater model focused primarily on three regions: the North Napa Valley and the MST and Carneros Subareas. These areas currently experience significant amounts of private pumping (i.e., little or no municipal pumping). The purpose of the groundwater model as currently constructed has been to assess regional rather than local groundwater conditions. Overall, the MIKE SHE groundwater model provides a short-term snapshot of regional groundwater conditions for the Napa River watershed; however, the short calibration period (four years) limits the application of the current version of the model to assess long-term changes in groundwater conditions resulting from droughts and wet periods. Recommendations for improving the modeling tool to simulate groundwater and surface water conditions and interrelationships on regional and local scales are provided in Section ES.9.5 and Table ES-3.

ES.7 Review of Precipitation and Streamflow Monitoring Stations

Another part of the overall programt included reviewing Napa County's currently active precipitation and streamflow monitoring stations and providing guidance in the Task 3.3 Technical Memorandum (LSCE, 2010d) on the design of a countywide network of precipitation and streamflow monitoring stations that would help:

1. Improve the County's understanding of the major watersheds' responses to precipitation and natural and/or anthropogenic changes, and
2. Attain goals outlined in the *Napa River Sediment TMDL and Habitat Enhancement Plan* (Napa River TMDL [Total Maximum Daily Load]) (San Francisco Bay RWQCB, 2009) that pertain to instream sediment occurrence and temperature.

Data collected from the recommended monitoring network would provide the necessary information to continue the calibration of the County's water quantity and water quality models (Napa County Models), discussed in the *Napa County Baseline Data Report* (Napa County BDR) (Jones and Stokes & EDAW, 2005) and its appendix the *Final BDR Technical Appendix – Water Quantity and Water Quality Report, Napa County, CA* (Napa County BDR Technical Appendix) (DHI, 2006). In addition, the Task 3.3 Technical Memorandum (LSCE, 2010d) discussed near-stream groundwater level monitoring for assessing surface water/groundwater interactions and aiding the interpretation of streamflow changes that cannot be explained solely with surface water data and modeling.

The extent and nature of surface water/groundwater interactions are largely unknown in Napa County with the exception of the MST area. Groundwater levels throughout much of the Napa Valley are within 5 to 20 feet (bgs) during times of seasonally high groundwater levels in the spring. Such shallow groundwater conditions suggest that groundwater is in direct hydraulic communication with stream channels for at least part of the year. Under these conditions,

relatively small groundwater level declines have the potential to significantly influence surface water/groundwater interactions such that stream percolation losses increase and stream baseflow decreases. Given that public and regulatory interest in surface water/groundwater interactions will likely continue to grow during the implementation of the Napa River TMDL, increasing pressure on natural resources and land use, and since it is important to better understand water resource availability to meet projected increases in annual water demands (2020 and 2050 projections), monitoring of near-stream shallow groundwater conditions in key locations can contribute to this understanding. Therefore, such monitoring efforts should be given high priority (see recommendations in section ES.9.3). Other recommendations on priorities for precipitation and streamflow monitoring are provided in the Task 3.3 Technical Memorandum (LSCE, 2010d); the County has begun to implement some of these recommendations.

ES.8 Groundwater Planning Considerations and County Ordinance and Permit Process

The overall 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 the Task 5 Technical Memorandum (LSCE, 2011b). The Task 5 Technical Memorandum also includes examples of the preparation and implementation of integrated regional water management plans, groundwater management plans, and groundwater ordinances in nearby areas that 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.

The focus of work conducted for Task 5 was 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 water resources in the county.

ES.8.1 California Groundwater Management Approaches and Legislation

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 in 515 groundwater systems that underlie 40 percent of the state in 10 hydrologic regions (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).

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 provide incentives and implement integrated regional water management that achieves sustainable water resources.

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.

The Task 5 Technical Memorandum (LSCE, 2011b) describes the history of groundwater-related legislation and groundwater management approaches in California. Two key legislative bills relating to groundwater management and one bill regarding groundwater elevation monitoring are summarized below.

ES.8.1.1 AB 3030 and SB 1938

In 1992, legislation passed as AB 3030, the Groundwater Management Act, was considered a breakthrough for groundwater management at the local level. This legislation outlined voluntary plans for groundwater management that could be developed and implemented at the local level. 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 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).

ES.8.1.2 Statewide Groundwater Elevation Monitoring Program

In 2009, a state bond package was passed that included a bill referred to as SBX7 – 6 and the newly created California Statewide Groundwater Elevation Monitoring (CASGEM) program (http://www.water.ca.gov/casgem/) which is a statewide groundwater elevation monitoring program**.** 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. 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 Watershed Information Center & Conservancy (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. Recommendations for the County's participation in the CASGEM program are provided in the Task 4 and 5 Technical Memorandums and are summarized in ES.9.2 and Table ES-3.

ES.8.2 Napa County Groundwater Ordinance and Permit Process

One of the key purposes of Task 5 was to review the County's Groundwater Ordinance and permitting process 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 the County's well and groundwater ordinances (including Chapters 13.04, 13.12, and 13.15 of Title 13 of the municipal code) and 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).

Napa County adopted a groundwater conservation ordinance (Chapter 13.15) which is intended to regulate the extraction and use, and promote the preservation, of groundwater resources in the county. 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. The groundwater conservation ordinance makes a distinction with respect to permitting requirements within groundwater deficient areas of which one is currently recognized: the NVF-MST Subarea. Because this area is considered

groundwater deficient, additional regulations and review requirements under the California Environmental Quality Act (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.

ES.9 Findings and Recommendations

This section presents recommendations for enhancing and expanding countywide monitoring to facilitate understanding of groundwater availability and integrated regional water planning efforts. A table at the end of this section summarizes the recommended implementation steps, including the implementation time frame, a relative estimated budget, and the relative priority for implementation.

ES.9.1 Data Management System

At the outset of the development of the DMS, it was recognized that, in the future, the County would assist with the entry of other historical groundwater level and groundwater quality data. It was anticipated that future County staff time would be needed for this effort and also to incorporate well construction information for wells historically monitored in the County, recent surface water delivery information (as desired), and municipal pumping data. Recommendations for ongoing utilization and maintenance of the DMS are included in the Task 1 Technical Memorandum (LSCE, 2010a) and summarized in Table ES-3.

ES.9.2 CASGEM Groundwater Elevation Monitoring Program

Napa County's overall Comprehensive Groundwater Monitoring Program covers the continuation and expansion of countywide groundwater level 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 water supply demands. Development of the countywide DMS, groundwater data quality evaluation, and the recommended groundwater level monitoring program provide a means for further coordination with statewide monitoring program interests, particularly the CASGEM program.

The Task 4 and Task 5 Technical Memorandums (LSCE, 2011a and 2011b) recommend that the County participate in the CASGEM program. 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).

ES.9.3 Groundwater Monitoring Program

The County's Comprehensive Groundwater Monitoring Program has resulted in recommendations for continuation of current monitoring programs and expansion and/or refinement of the programs conducted by the County and others. For the overall groundwater level and quality monitoring program to be successful, coordination with other cooperating entities, such as representatives from cities and towns in the County and numerous other entities, is required. A successful program will also require interest by and the cooperation of landowner participants who have already authorized use of their wells for current monitoring programs and also those that express an interest in being an active participant in the County's efforts to expand the countywide groundwater level and quality monitoring programs.

The program presents a detailed list of the steps to expand and improve the County's groundwater monitoring program. Those steps include:

1. Establish the County's role as lead agency for ongoing groundwater monitoring program coordination and database oversight and management.
2. Establish plan for pertinent County departments (e.g., Groundwater Advisory Group representatives and others as appropriate, including County GIS persons(s)) to coordinate data collection, storage, and analysis efforts.
3. Identify potential collaborators (including local, federal, and state agency representatives) and interested stakeholders for the ongoing program.
4. Annually update the DMS (e.g., groundwater levels and quality and other water-related data), assess network and findings, and make changes to the program where necessary.
5. Discuss monitoring parameters of special interest with collaborators.
6. Review groundwater data annually and revise or make recommendations to revise data collection accordingly, pending changes to network wells and/or specific program objectives.
7. Identify locations for construction of dedicated monitoring wells for groundwater level and quality monitoring (e.g., County subareas where more subsurface information is required to better quantify groundwater availability and quality, recharge areas where aquifer-specific monitoring is lacking, surface water-groundwater interaction, etc.).
8. Replace (over time) wells in the monitoring network that have no well construction information (or are perforated in more than one zone) to improve the understanding of aquifer-specific conditions.
9. Coordinate efforts being conducted for water supply investigation work (e.g., testhole construction) with opportunities for constructing zone-specific dedicated monitoring facilities for countywide groundwater level and/or water quality monitoring.
10. Communicate program results to the cooperating entities in the form of periodic reports of groundwater conditions.
11. Provide an overview of program objectives, benefits, and results to general public via web information and other communication vehicles.
12. Seek funding to support program continuation, including DMS maintenance, data evaluation, and implementation of priority recommendations.

13. Explore the need to develop guidelines for testing private wells to evaluate potential groundwater quality issues.

ES.9.3.1 Groundwater Level and Quality Monitoring Networks

Groundwater level measurements have been recorded at a total of 676 wells (173 locations) through at least 2005. Groundwater quality monitoring has been conducted at a total of 283 wells (or 153 locations) through at least 2005. Recommendations to implement the expansion and improvement of countywide groundwater monitoring activities by the County and others are summarized in Table ES-3 and also include:

1. Continue groundwater level monitoring on at least a semi-annual basis; increase the spatial and vertical distribution of wells for monthly water level measurements as described in this report to allow more comprehensive evaluation of groundwater conditions and stream-aquifer relationships.
2. Implement efforts to expand and/or refine groundwater quality monitoring program such that more wells can be "qualified" with well construction information.
3. Review the historically monitored wells to determine whether some of these may be suited to the objectives of gathering basic data and/or expanding groundwater level and/or quality monitoring in the various County subareas.
4. Coordinate expansion of the groundwater quality monitoring program with the expansion/refinement of subarea groundwater level monitoring.
5. As feasible, replace water level monitoring wells that are completed in more than one aquifer with wells completed in (or representative of) a single aquifer (a phased approach is recommended for this effort that considers the historical record for existing wells in the network).

Additional recommendations are included in the Task 4 Technical Memorandum (LSCE, 2011a).

ES.9.4 Regional and Local Physical Conceptualization

Understanding the hydrogeology of Napa County is essential to determine how much water is available and to what extent it can be sustainably produced. Previous hydrogeologic studies have focused on the MST Subarea and northern portion of the Napa Valley without much attention to the other areas within the county. With the exception of the Farrar and Metzger (2003) study, which looked at the MST, all of these studies are more than 30 years old. In the last 30+ years, hundreds of new wells have been drilled to greater depths than previously reached, supplying a potential abundance of new data. Due in part to the scarcity of hydrogeologic data available for the majority of Napa County, data collection and analysis need to be prioritized; the highest priority needs are presented below.

ES.9.4.1 Napa Valley Floor – Update of Geologic and Hydrologic Conditions

Currently, analysis of the Napa Valley has been largely limited to two studies, one by Kunkel and Upson (1960) and one by Faye (1973). Since the Kunkel and Upson study, plate tectonics theory has been introduced, which significantly expanded the understanding of the relationship between individual geologic units within the County and the structures (faults, folds, and fractures) that accompany these relationships. Also, a large number of new wells (and therefore new well logs) have been added to the Valley, which expanded the breadth and depth of the aquifer materials explored and developed for groundwater production.

Delineation and description of the primary aquifer units are essential to determine how much available groundwater is present within the Napa Valley and to evaluate the response of the aquifer system to natural and induced stresses. The geologic cross sections prepared by Kunkel and Upson should be updated and expanded to include the last 50 years of new log data and plate tectonics theory. New cross sections should also be created throughout the Valley and into the surrounding foothills to better delineate the vertical/horizontal extent of the alluvium and underlying Sonoma Volcanics. Faye's isopach map of the alluvium and hydraulic conductivity distribution map should be updated to include the new well log data and be extended to the southern end of the Valley. As data become available, similar maps could be produced for the Sonoma Volcanics within the Napa Valley.

Faye's investigation identified direct infiltration of precipitation and percolation of surface water as the primary mechanisms for groundwater recharge in the Napa Valley. He also concluded that the contribution of percolating surface water was significantly limited by high groundwater levels. Farrar and Metzger (2003) subsequently noted that subsurface inflow to the southern Napa Valley has been significantly decreased by increased pumping within the MST. The interrelationships between surface water and groundwater due to changing stresses (including increased pumping) should be further examined. Both mass balance and streamflow infiltration methods could be used to improve estimates of regional and local recharge.

Summarized below are recommendations for three other areas of the County.

ES.9.4.2 Pope Valley, Carneros, and Jameson/American Canyon and Napa River Marshes Subareas: Update Hydrogeologic Understanding

Pope Valley: The Pope Valley Subarea is forecast to have an increase in development and a corresponding increase in groundwater pumping. Currently, subsurface geology has not been investigated and only limited hydrogeologic data are available.

Carneros: Limited data are available that describe the hydrogeologic setting of the Carneros Subarea. The available data suggest that groundwater resources are limited and may be susceptible to over development. Future planning decisions require knowledge of current groundwater conditions and the possible impacts that may result from additional pumping.

Jameson/American Canyon and Napa River Marshes: Limited data are available for the Jameson/American Canyons and Napa River Marshes Subareas which make up the southern county area. The two main issues facing this area are potential saltwater intrusion and the possibility that current water resources will not be sufficient to meet future demand. The current lack of groundwater data makes it difficult to determine the source and distribution of salinity in the southern county area with any certainty.

The further recommended activities and analyses to improve the hydrogeologic understanding in these areas include the following:

- Monitoring groundwater levels;
- Monitoring groundwater quality;
- Collection and interpretation of geologic data;
- Analysis of streamflow and precipitation;
- Estimation of pumping and irrigation demand;
- Estimation of groundwater recharge and discharge.
- Determination of the extent and properties of aquifer materials; and
- Investigation of the influence of natural and induced hydrologic stresses occurring in neighboring subareas.

ES.9.5 Napa Valley Groundwater Model

Application of the current Napa Valley groundwater model to basin-wide applications where the effects on groundwater resources from wet and dry periods, along with local site-specific planning applications, is not recommended until such additional work as described in the Task 3.2 Technical Memorandum (LSCE, 2010c) is completed. For example, a longer calibration period is needed for the modeled areas. Climatic variability (extended wet and dry periods) need to be better represented by the calibration data. The groundwater model represents a regional watershed perspective which does not incorporate local geologic and hydrologic attributes. Groundwater/surface water interactions are modeled, but not in a fully active and dynamic method.

The complexity of the MIKE SHE model code limits the ability of Napa County staff in using the model for in-house analysis of regional and/or localized applications where groundwater is a primary focus. If Napa County does not want to rely fully on outside consultants for modeling services, it is recommended that a public domain model code be considered. Once a regional model is developed with a longer calibration period, separate models which focus on localized areas of the county could also be developed, as needed, using boundary conditions from the regional model as a foundation.

ES.9.6 Groundwater Sustainability Planning

Counties, regions, and local entities throughout California are striving to sustain their surface and groundwater resources. The Task 5 Technical Memorandum (LSCE, 2011b) described California's groundwater management approaches and legislation and reviewed Napa County's groundwater goals, policies, ordinances and procedures, including its groundwater/well permitting process. The Task 5 Technical Memorandum also provided 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. These recommendations are summarized below.

ES.9.6.1 Benefits of Groundwater Sustainability Planning

Napa County's General Plan 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 actions described in the County's General Plan and to complement the recommendations culminating from the work conducted as part of the Comprehensive Groundwater Monitoring Program, 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 use[1] 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)[2]

The Task 5 Technical Memorandum (LSCE, 2011b) and Table ES-3 outline the recommended steps for preparing a groundwater sustainability plan.

ES.9.7 Groundwater Ordinance

The Task 5 Technical Memorandum (LSCE, 2011b) provides 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 County chapter is as follows:

[1] 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).

[2] 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.

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.

ES.9.8 Summary of Recommended Implementation Steps for Comprehensive Groundwater Monitoring Program

Table ES-3 summarizes the steps necessary to implement the above-described recommendations. The summary table includes the following:

- **Implementation time frames**: near term, mid term and long term (approximately 3, 5, and 10-year periods, respectively);
- **Relative estimated preliminary budgets:** "$ to $$$", where $ budget ranges up to $50,000; $$ budget ranges up to $500,00, and $$$ budget ranges up to $1,000,000;
- **Relative priorities for implementation**: the priority ranking is on a scale of 1 to 4, with 1 being the highest priority and 4 being the lowest priority, and
- **Related document for additional information**: indicates in which Technical Memorandum or Report related to the Comprehensive Groundwater Monitoring Program additional information is presented.

Table ES-3

Summary of Recommended Implementation Steps
Comprehensive Groundwater Monitoring Program

Item	Summary Description	Implementation Time Frame[1]	Relative Estimated Budget [2]	Relative Priority Ranking [3]
1. Data Management System [see LSCE, 2010a for more information]				
1.1a	Entry of archived data not previously available, link WellMA table information, add well construction data from wells the County monitors, add recent surface water delivery information, add municipal pumping data, and other information along with development and implementation of quality control protocols for inputting new data and reviewing existing data discrepancies	**Near to Long Term**	**$**	**1**
1.1b	Establishment of a map-interface with the DMS to enhance the use of the database by non-database users	**Near Term to Mid Term**	**$**	**3**
2. CASGEM Groundwater Level Monitoring Program [see LSCE, 2011a and b for more information]				
2.1a	Input CASGEM groundwater level data into the DMS	**Ongoing**	**$**	**1**
2.1b	Establish data format to meet DWR guidelines for electronic data transfer	**Near Term**	**$**	**1**
2.1c	Optimize CASGEM monitoring well network per DWR guidelines by filling in data gaps where identified (Note: high cost ($$$) is assuming new monitoring wells will be required to fill data gaps in those DWR basins which currently have minimal to no monitoring)	**Mid to Long Term**	**$$ to $$$**	**3**
3. Napa County Monitoring Program [see LSCE, 2011a for more information]				
3.1a	Update County field procedures for measuring groundwater levels	**Near Term**	**$**	**1**

Table ES-3 Continued

Summary of Recommended Implementation Steps
Comprehensive Groundwater Monitoring Program

3.1b	Develop and/or expand aquifer-specific groundwater monitoring network in Napa Valley Floor, Pope Valley and Carneros Subareas by identifying existing wells with well construction data and constructing new aquifer-specific monitoring wells as needed where data gaps may exist (Note: cost is dependent on whether new facilities are required)	**Near to Mid Term**	**$ to $$$**	**2**
3.1c	Develop aquifer-specific groundwater monitoring network in the other Subareas (except for Napa Valley Floor, Carneros, and Pope Valley Subareas) by identifying existing monitored wells with well construction data and constructing new wells where data gaps may exist (Note: cost is dependent on whether new facilities are required)	**Mid to Long Term**	**$ to $$$**	**3**
4. Napa County Conceptualization of Hydrogeologic Conditions [see LSCE, 2011a and LSCE, 2011c for more information]				
4.1a	Update geologic cross sections for the Napa Valley Floor and Carneros Subareas (previous ones are 50 years old)	**Near to Mid Term**	**$ to $$**	**2**
4.1b	Develop new geologic cross sections in those areas with the greatest short- and long-term growth and/or land use potential	**Near to Long Term**	**$**	**2**
4.1c	Investigate groundwater/surface water interactions and the affect of recharge and pumping on groundwater levels in the Napa Valley Floor Subareas, along with the Carneros Subarea to assess the sustainability of groundwater resources. May include groundwater modeling, as needed.	**Near to Mid Term**	**$ to $$**	**1**
5. Groundwater Sustainability Planning [see LSCE, 2011b for more information]				
5.1a	Prepare workplan for the purposes of preparing a Groundwater Sustainability Plan; workplan includes steps to implement County Monitoring Program and CASGEM Program	**Near Term**	**$**	**1**

Table ES-3 Continued

Summary of Recommended Implementation Steps
Comprehensive Groundwater Monitoring Program

5.1b	Utilize the Watershed Information Center and Conservancy (WICC) Board for various public outreach components related to groundwater sustainability planning	**Near Term**	**$**	**2**
5.1c	Develop objectives for public outreach, including information sharing and education about the County's groundwater resources	**Near to Mid Term**	**$**	**2**
5.1d	Preparation of a Groundwater Sustainability Plan for Napa County	**Near to Mid Term**	**$ to $$**	**2**
5.2a	Public outreach, including information sharing and education about the County's groundwater resources	**Ongoing**	**$ to $$**	**3**
6. County Groundwater Ordinance and Well Permitting [see LSCE, 2011b for more information]				
6.1a	Updating of Ordinances 13.04, 13.12, and 13.15	**Mid Term**	**$**	**2**
6.1b	Update Groundwater Permitting Process	**Mid Term**	**$**	**3**

[1] Implementation schedule reflects relative multi-year time frames for completing or conducting the task. Near, Mid, and Long Terms are reflective of 3, 5, and 10 year periods.

[2] Relative estimated budget symbols: $, $$, and $$$ reflect preliminary budget ranges of up to $50,000 ($), up to $500,000 ($$), and up to $1,000,000 ($$$).

[3] Priority ranking is on a scale of 1 to 4 with 1 being the highest priority and 4 being the lowest.

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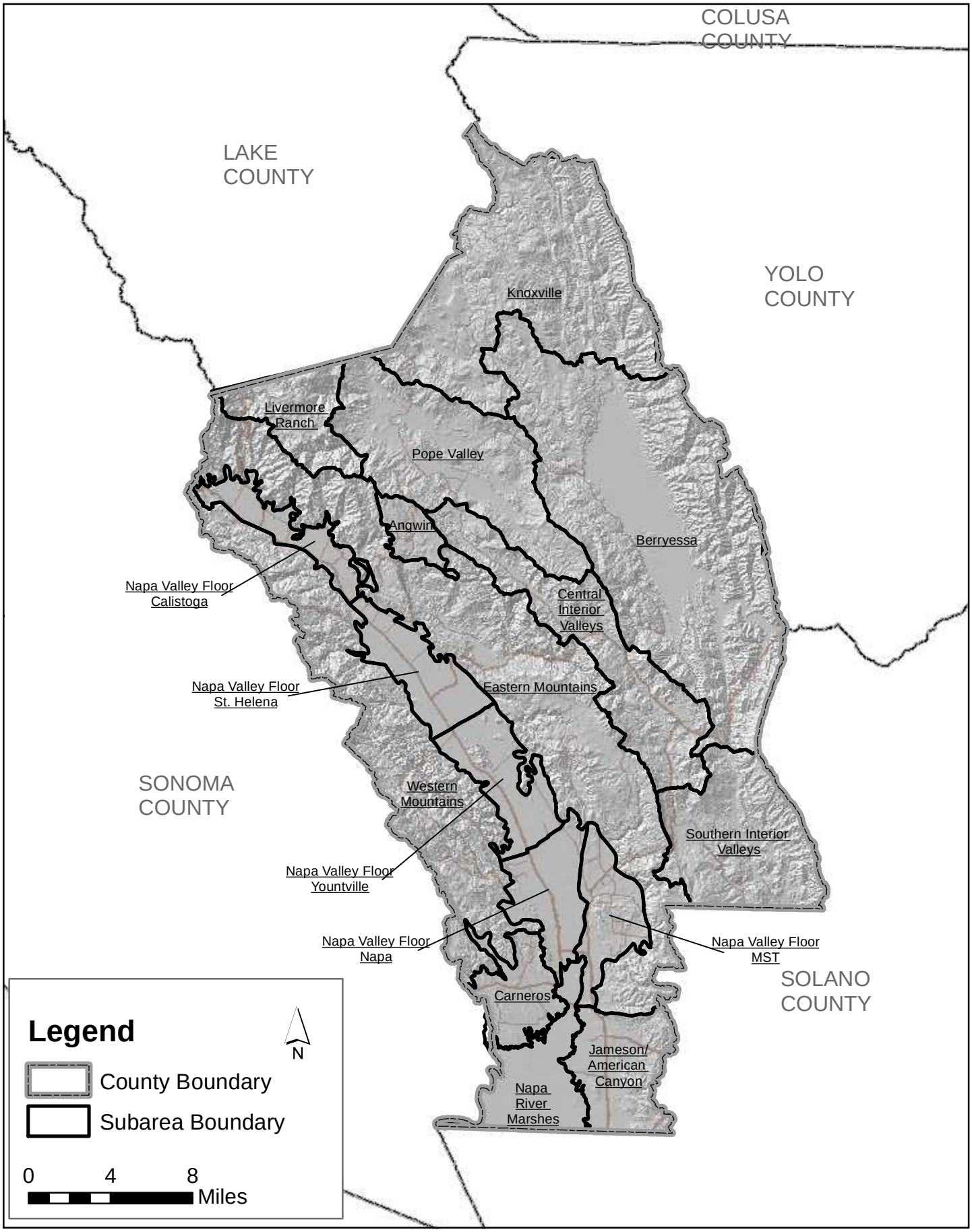

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Figure ES-1
Napa County Subareas
Napa County, CA

ATTACHMENT 1

Napa County General Plan Update 2008 (excerpt)
Water Resources Goals and Policies

Napa County General Plan Update 2008 (excerpt)
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 LSCE, 2011b).

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 Program 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 State Water Resources Control Board (SWRCB), California Department of Water resources (DWR), Department of Public Health (DPH), California Environmental Protection Agency (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.