

**State Water Resources Control Board  
Groundwater Ambient Monitoring and Assessment Program**

**Groundwater Basin Assessment Kick-Off Meeting:  
North San Francisco Bay Region**

Tuesday, September 14, 2004  
10:00 AM to 1:00 PM  
City of Santa Rosa Laguna Wastewater Treatment Plant  
Administration Building  
4300 Llano Road  
Santa Rosa, California

**A G E N D A**

- |  |               |
|--|---------------|
| 1. <i>Convene Meeting</i>  | 10:00         |
| 2. <i>Introductions; Meeting Overview; Review Agenda</i>           | 10:00 – 10:15 |
| 3. <i>Agencies and Organizations Participating</i>                 | 10:15 – 10:30 |
| 4. <i>GAMA Program Overview – Benefits to Program Participants</i> | 10:30 – 11:00 |
| 5. <i>GAMA Program Well Selection and Analytical Methods</i>       | 11:00 – 12:00 |
| 6. <i>GAMA Program Results Reporting</i>                           | 12:00 – 12:30 |
| 7. <i>Timeline</i>   | 12:30 – 12:40 |
| 8. <i>Discussion: Existing Water Quality Information and Data</i>  | 12:40 – 12:50 |
| 9. <i>Wrap-up, Meeting Evaluation, and Adjourn</i>                 | 12:50 – 1:00  |

**Note:**

To confirm your attendance, please contact Carolyn Brookshire at (916) 341-5860 or [brookshe@swrcb.ca.gov](mailto:brookshe@swrcb.ca.gov). A brief discussion of agenda items is included in the following pages. For more information about the GAMA Program, please visit our Internet site at <http://www.swrcb.ca.gov/gama/> or contact John Borkovich at (916) 341-5779 or [borkovij@swrcb.ca.gov](mailto:borkovij@swrcb.ca.gov).

**Directions:**

Take Highway 101 (North or South) exit West on Todd Road (southern Santa Rosa). Follow Todd Road west about 3 miles to Llano Road and turn left. The plant is located about a mile down on Llano Rd. on the left (east side of road). The Administration Building is in back of the plant on the right.

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**Groundwater Basin Assessment Meeting:  
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**Agenda Item Discussion**

**1. Convene Meeting**

**2. Meeting Overview**

**3. Agencies and Organizations Participating**

Stewardship of the state's groundwater resources is the shared responsibility of all levels of the government and community. A key aspect of the Groundwater Ambient Monitoring and Assessment Program (GAMA) is interagency collaboration and communication with local water agencies. The intent is to include such agencies in local Groundwater Basin Assessment meetings and involve them in discussions about program implementation. In general, participants will include representatives from State and Regional Water Boards (SWRCB/RWQCBs), Department of Water Resources (DWR), Department of Health Services (DHS), U.S. Geological Survey (USGS), Lawrence Livermore National Laboratory (LLNL), County, Local Water Purveyors, Local Groundwater Management Authorities, and Regional Water Management Entities. Local participation in the GAMA Program is voluntary.

The SWRCB is collaborating with the USGS and LLNL to implement the GAMA Program. The USGS plays a key role in local agency coordination, well network design and the selection of target constituents, monitoring and assessment, and results reporting.

*Desired Outcome:* Inclusion of relevant agencies and organizations in local Groundwater Basin Assessment meetings.

**4. GAMA Program Overview – Benefits to Program Participants**

The primary objective of the GAMA Program is to comprehensively assess statewide groundwater quality and gain an understanding about contamination risk to specific groundwater resources. The Groundwater Quality Monitoring Act of 2001 (Sections 10780-10782.3 of the Water Code) resulted in a publicly accepted plan to monitor and assess the quality of all priority groundwater basins that account for over 90% of all groundwater used in the state. The plan builds on the existing GAMA Program and prioritizes groundwater basins for assessment based on groundwater use (reports available at <http://www.swrcb.ca.gov/gama/>). Groundwater basin assessments are planned across the state and represent areas in all 10 Hydrogeologic Provinces. To facilitate a statewide, comprehensive groundwater quality-monitoring and assessment program most efficiently, uniform and consistent study-design and data-collection protocols are being applied to the entire state. Monitoring and assessments for priority

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groundwater basins are to be completed every ten years, with trend monitoring every 3 years. To maximize interagency collaboration and communication with local agencies, Groundwater Basin Assessment coordination meetings will be held with appropriate government and community organizations.

The GAMA Program provides several benefits to federal, state, local, and community participants, a few key benefits are described below:

- Improves comprehensive statewide groundwater monitoring;
- Increases the availability of groundwater quality information to the public;
- Provides a mechanism to unite local, regional, and statewide groundwater programs in a common effort to understand and manage groundwater resources effectively;
- Facilitates interagency communication and data-sharing between federal, state, and neighboring local agencies;
- Improves understanding of local, regional, and statewide hydrogeology, as well as groundwater quality issues and concerns;
- Provides groundwater data to establish baseline conditions and early warning of potential water quality concerns;
- Provides agencies with knowledge of groundwater trends and long term forecasting in groundwater quality; which is important for groundwater management plan growth and preparation;
- Provides agencies with better information to respond to concerns of consumers and consumer advocate groups;
- Helps inter-basin agencies that have basin-wide or regional groundwater management objectives; and
- Creates a database with access to groundwater quality data and provides tools to aid in completing groundwater assessments.

*Desired Outcome:* Discuss GAMA Program goals and benefits to participating stakeholders.

#### **5. GAMA Program Well Selection and Analytical Methods**

Groundwater quality will be assessed in selected groundwater basins in the North San Francisco Bay Region in the following groundwater basins: Santa Rosa Valley, Petaluma Valley, Wilson Grove Formation Highlands, Alexander Valley, Lower Russian River Valley, Kenwood Valley, Napa-Sonoma Valley, Napa-Sonoma Volcanic Highlands. Approximately 120 wells will be sampled. The USGS will present the specific well selection and analytical method approach used in the above groundwater basins.

In general, the basic monitoring network utilizes an approach that selects wells that are spatially distributed across a study area, but that also incorporates an element of randomization in the selection process. To optimize data collection, the following sampling density will be used as a guide for the GAMA Program:

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GAMA PROGRAM SAMPLING DENSITY
<ul style="list-style-type: none"><li>• Wells will be sampled at a density of <b>one well per 25 square kilometers</b> (9 square miles).</li></ul>
<ul style="list-style-type: none"><li>• For basins less than 500 square kilometers (180 square miles), the recommended sampling density would provide fewer than 20 wells. However, to achieve statistically significant results, <b>no fewer than 20 wells</b> will be sampled in any study area.</li></ul>
<ul style="list-style-type: none"><li>• For study area larger than 1500 square kilometers (540 square miles), the recommended sampling density would require sampling more than 60 wells. However, to maintain cost-effectiveness, <b>no more than 60 wells</b> will be sampled in any study area.</li></ul>

In general, a tiered analytical approach is being utilized to balance spatial coverage and analytical intensity. In contrast to the public supply well monitoring required by DHS, the GAMA Program monitors a much broader suite of chemicals at much lower detection limits.

The broadest spatial coverage, or first tier, will be provided by utilizing the existing DHS public supply well water quality database; these data can be used to characterize water quality relative to beneficial use. The second tier will be provided by sampling a network of wells for a “basic schedule” list of constituents (see Table 1). The basic schedule list of constituents are those used by the SWRCB for assessing the susceptibility of aquifers to contamination, and include age-dating (tritium/helium-3 analyses provided by LLNL), stable isotopes, and low-level analyses of organic compounds. The third tier will sample for a larger number of constituents, but at fewer wells than the second tier. The “expanded” list of constituents would include constituents covered by the USGS National Water Quality Assessment Program (NAWQA), as well as emergent contaminants (such as wastewater constituents and pharmaceutical products) (see Table 2).

*Desired Outcome:* Discuss GAMA well selection and analytical approach used in the North San Francisco Bay Region.

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Table 1. Chemical analysis, basic schedule (Tier II)

SCHEDULE	CONSTITUENTS
2020	Volatile Organic Compounds (VOC), USGS National Water Quality Assessment Program (NAWQA)
4024	Methyl-tert Butyl Ether (MTBE+), NAWQA
2003	Pesticides, NAWQA
4200	lab filter pesticide sample
1142	Deuterium (D) , Oxygen-18 (O-18)
1565	Tritium, USGS (also Tritium/Helium-3 by LLNL)
	Conductance Sample
	Water Temperature
	Other constituents, as appropriate

Notes: Schedule 2020 includes VOCs included in GAMA.  
 Schedule 4024 includes very low level MTBE  
 Other constituents include “emerging contaminants” such as perchlorate, pharmaceutical products, NDMA, 1-4 dioxane, chromium (total and VI).

Table 2. Chemical analysis, expanded schedule (Tier III)

SCHEDULE	CONSTITUENTS
2750	Major Inorganics
2710	Trace Elements
2755	Nutrients, NAWQA
2613	Dissolved Organic Carbon (DOC), NAWQA
2020	VOC, NAWQA
4024	MTBE+, NAWQA
2003	Pesticides, NAWQA
4200	Lab Filter Pesticide Sample
1433	Wastewater, NAWQA
1142	D, O-18
1565	Tritium, USGS
1369	Radon
1263	Radium Gross alpha/beta or 1262
	Perchlorate And Other Constituents, as appropriate
Coliphage	Coliphage
E-Coli	E-Coli
	Field Parameters

Notes: Field parameters include: conductance, temperature, dissolved oxygen, alkalinity, pH.  
 Other constituents include “emerging contaminants” such as pharmaceutical products, N-nitrosodimethylamine (NDMA), 1-4 dioxane, chromium (total and VI).

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### **6. GAMA Program Results Reporting**

The GAMA Program is committed to facilitating interagency communication and data sharing. However, the program is also sensitive to the needs of local water agencies in reporting water quality data.

Preliminary results will be discussed with participants at the local Groundwater Basin Assessment “Wrap-Up” meetings. In addition, once approved, the GAMA data will be provided to the relevant local water agencies. The SWRCB and USGS will post a summary data report on the program Internet site, to be followed by the Groundwater Basin Assessment report. Prior to publicly posting any data to the Internet, the SWRCB and USGS will work closely with the local water agencies to ensure that the GAMA data is communicated in a manner, which is acceptable to all stakeholders. Local water agencies will be notified prior to public release of any data and reports and additional technical presentations are available, if desired.

The SWRCB is also working to include the GAMA data in a centralized, internet-accessible database (currently Geotracker). This database will be accessible to program participants via password protection using appropriate security and screening measures. The goal is to provide access to groundwater quality related data including existing groundwater water quality data – i.e. DHS public supply well data, GAMA data, and data relevant to potentially contaminating activities, so that the data may be collectively analyzed to adequately assess groundwater quality and make determinations about threats to groundwater resources.

*Desired Outcome:* Discuss the reporting of GAMA Program results.

### **7. Timeline**

The USGS will present the specific timeframe for sampling, analysis and reporting. In addition, participants will schedule a date for the North San Francisco Bay Region “Wrap-Up Meeting” to discuss groundwater basin assessment status and preliminary results.

### **8. Existing Water Quality Information and Data**

An important aspect of the GAMA Program is to maximize the use of existing groundwater data and information. Augmented with additional groundwater monitoring, existing data (such as the DHS public supply well water quality data) will be used to complete the groundwater basin assessments.

The USGS has extensive knowledge of regional and local hydrogeology and water quality. Additionally, the GAMA Program requests that participants help to identify existing data and information on local groundwater resources, covering such topics as:

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<b>Existing Groundwater Data Identification</b>	
<u>Key Groundwater Studies</u> <ul style="list-style-type: none"> <li>• Local, Basin, or Regional Scale</li> <li>• Hydrogeologic Studies</li> <li>• Water Quality</li> <li>• Water Use/Management</li> <li>• Other</li> </ul>	<u>Well Construction/Locational Data</u> <ul style="list-style-type: none"> <li>• Public Supply Wells</li> <li>• Domestic Wells</li> <li>• Monitoring Wells</li> <li>• Abandoned Wells</li> <li>• Other</li> </ul>
<u>Groundwater Quality Data</u> <ul style="list-style-type: none"> <li>• Public Supply Wells (coordinating with DHS)</li> <li>• Domestic Wells</li> <li>• Monitoring Wells</li> <li>• Other</li> </ul>	<u>Water Quality Issues/Concerns</u> <ul style="list-style-type: none"> <li>• Known local, basin-wide, or regional groundwater issues/concerns</li> <li>• Key contamination issues (potentially contaminating activities, contaminant plumes, chemicals of concern, etc.)</li> <li>• Special hydrogeologic conditions</li> <li>• Other</li> </ul>

*Desired Outcome:* Identification of existing groundwater quality information and data for the North San Francisco Bay region.

**9. Wrap-up, Meeting Evaluation, and Adjourn**