

Chapter 1 Introduction

The State of California adopted the Recycled Water Policy in 2009 that requires Salt and Nutrient Management Plans (Plans) be developed to manage salts, nutrients, and other significant chemical compounds on a watershed- or basin-wide basis. The Policy specifies that Plans are to be developed in a cooperative and collaborative manner among water and wastewater agencies and other salt and nutrient stakeholders. The Plans are intended to help streamline the permitting of new recycled water projects while ensuring compliance with water quality objectives and protection of beneficial uses. This Plan development has been led by the City of Santa Rosa (City) for the Santa Rosa Plain Subbasin (Study Area; see Figure 1-1) to address protection of beneficial uses of groundwater and to help meet the overall water supply needs of the region. Cities and districts participating in funding the development of this Plan include the Cities of Cotati, Santa Rosa, Sebastopol, and Rohnert Park; Town of Windsor; and the Sonoma County Water Agency (SCWA) on behalf of the Airport-Larkfield-Wikiup Sanitation Zone.

This Plan is presented in ten chapters, as follows:

- Chapter 1 introduces the Plan
- Chapter 2 summarizes the stakeholder process used to inform stakeholders and to guide development of the Plan
- Chapter 3 summarizes the existing groundwater quality in the basin
- Chapter 4 lists the goals in the basin for the use of recycled water and storm water
- Chapter 5 describes the process for developing implementation measures such as Best Management Practices (BMPs)
- Chapter 6 presents the methodology and results of salt and nutrient loading analyses
- Chapter 7 presents the methodology and results of the groundwater quality trend analysis
- Chapter 8 describes the Groundwater Monitoring Plan for future monitoring activities
- Chapter 9 describes the process for implementing the Plan
- Chapter 10 provides conclusions

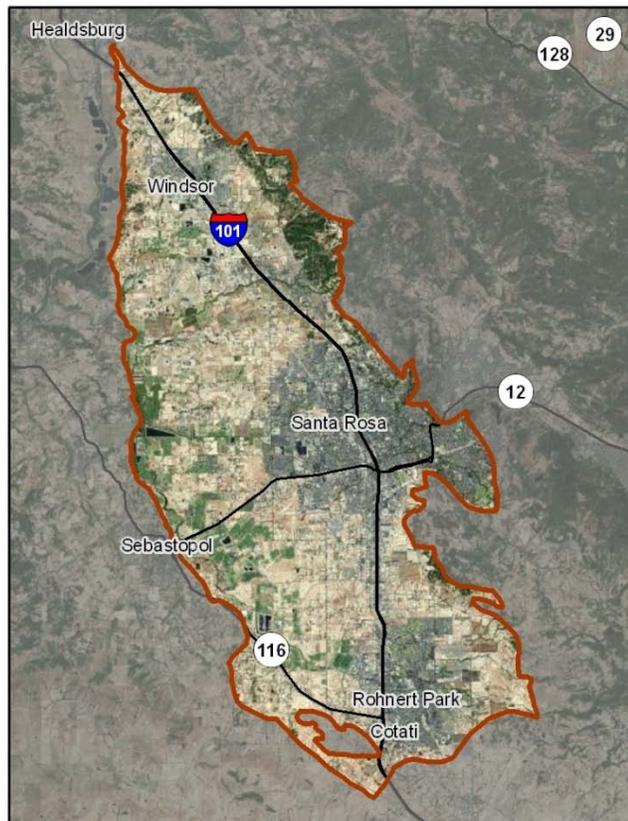


Figure 1-1: Location of Study Area

1.1 Purpose Statement

The purpose of this Salt and Nutrient Management Plan is to:

- Determine if the groundwater basin is impaired or threatened to be impaired by nutrients or salts in the future;
- Identify management practices to protect groundwater from nutrient and/or salt sources that threaten groundwater; and

- Identify a monitoring program to evaluate the effect of salt and nutrient sources on groundwater.

This includes analysis of the existing land uses and practices, as well as potential impacts from future usage of recycled water. This document has also been developed to meet the state-mandated requirements of the Recycled Water Policy.

1.2 Regulatory Background

1.2.1 Resolution 68-16

Resolution 68-16, the *Statement of Policy with Respect to Maintaining High Quality Waters in California*, was adopted by the State Water Resources Control Board (SWRCB) in 1968. The policy is the driving force behind the analysis and planning required for Salt and Nutrient Management Plans. This policy has two primary parts:

- 1) *Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*
- 2) *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.* (State Water Resources Control Board, 1968)

This resolution is incorporated into all Regional Water Quality Control Plans and is termed the Antidegradation Policy as it requires that existing high water quality be maintained to the maximum extent possible.

1.2.2 Regional Water Quality Control Plan

Regional Water Quality Control Plans (Basin Plans) are mandated by both the Federal Clean Water Act (CWA) and the State Porter-Cologne Water Quality Act (Porter-Cologne). These plans address the protection of beneficial uses, develop water quality objectives, and direct the implementation of programs to achieve water quality objectives.

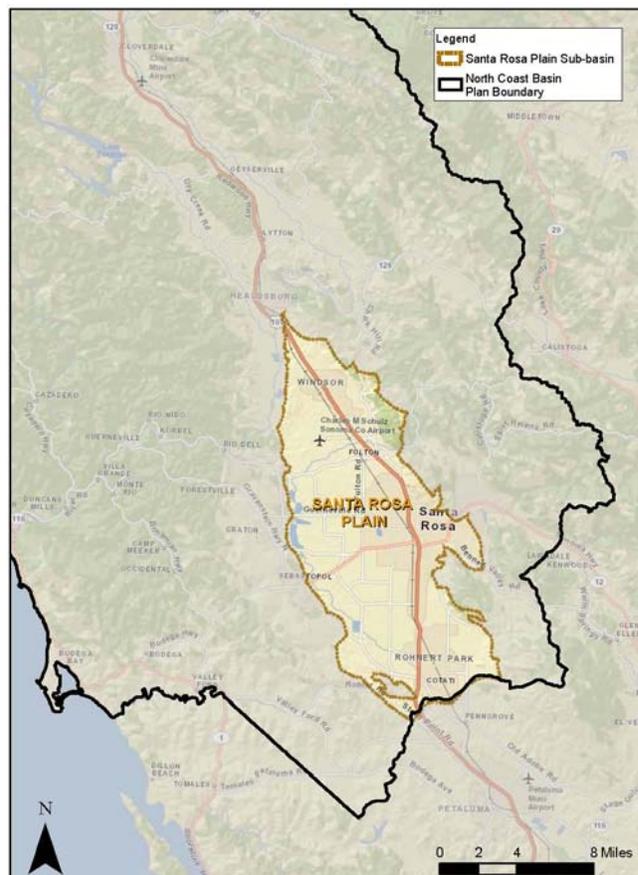


Figure 1-2: Basin Plan Area in Relation to Study Area

The Basin Plan for the Santa Rosa Plain is the *North Coast Regional Water Quality Control Plan* (Regional Water Quality Control Board, North Coast, 2011). The Basin Plan covers an area of greater extent than the groundwater subbasin, as shown in Figure 1-2, and provides the water quality objectives that will serve as an important threshold for the goals and implementation measures developed in this Plan.

Basin Plan Beneficial Uses and Water Quality Objectives

The Basin Plan establishes the following beneficial uses for all groundwater within the Basin Plan boundaries:

- Existing Beneficial Uses
 - Municipal and Domestic Supply,
 - Agricultural Supply,
 - Industrial Service Supply,
 - Native American Culture, and
 - Freshwater Replenishment,
- Potential Beneficial Uses
 - Industrial Process Supply and
 - Aquaculture.

These designated beneficial uses are the basis for the designation of Water Quality Objectives within the Basin Plan, as follows:

Tastes and Odors

Groundwaters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. Numeric water quality objectives have been developed by the State Department of Health Services and U.S. EPA. These numeric objectives, as well as those available in the technical literature, are incorporated into waste discharge requirements and cleanup and abatement orders as appropriate.

Bacteria

In groundwaters used for domestic or municipal supply (MUN), the median of the most probable number of coliform organisms over any 7-day period shall be less than 1.1 MPN/100 ml, less than 1 colony/100 ml, or absent (State Department of Health Services).

Radioactivity

Groundwaters used for domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 5, Section 64443, Table 4 and listed in Table 3-2 of this Plan.

Chemical Constituents

Groundwaters used for domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64435 Tables 2 and 3, and Section 64444.5 (Table 5) and listed in Table 3-2 of this Plan.

Groundwaters used for agricultural supply (AGR) shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use. Numerical objectives for certain constituents for individual groundwaters are contained in Table 3-1. As part of the state's continuing planning process, data will be collected and numerical water quality objectives will be developed for those mineral and nutrient constituents where sufficient information is presently

not available for the establishment of such objectives. (Regional Water Quality Control Board, North Coast, 2011)

The Water Quality Objectives are further summarized in Table A-1 in Appendix A of this Plan.

Users

Groundwater users within the basin represent a diverse range of geography and interests. Users include public water suppliers, private water companies and their customers; agriculture; ranches; dairies; commercial and industrial areas; and private rural residential well owners.

1.2.3 Recycled Water Policy

The purpose of the Recycled Water Policy is to increase the use of recycled water from municipal wastewater sources that meets the definition in Water Code Section 13050(n), in a manner that implements state and federal water quality laws. When used in compliance with the policy, Title 22, and all applicable state and federal water quality laws, the State Water Quality Control Board (State Water Board) finds that recycled water is safe for the approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved use (State Water Resources Control Board, 2009).

The Recycled Water Policy requires that salt and nutrient plans be completed and proposed to the Regional Water Quality Control Board (Regional Water Board) within five years from the date of the policy. It also discusses the basic requirements of the salt and nutrient management plans; landscape irrigation; recycled water groundwater recharge projects; antidegradation; constituents/chemicals of emerging concern; and incentives for the use of recycled water.

1.3 Water Needs

Existing water needs in the Santa Rosa Plain include urban and agricultural uses. In the Santa Rosa Plain, urban users are focused in the cities of Cotati, Rohnert Park, Santa Rosa, Sebastopol and the Town of Windsor. These users utilize a mix of groundwater, surface water, and recycled water to meet their water needs. Groundwater is an important component for urban, rural and agricultural users.

As shown in 2010 Urban Water Management Plans (UWMPs), groundwater supplies are projected to continue to be an important component of water supply portfolios in the future (Santa Rosa, City of, 2011; Rohnert Park, City of, 2011; Sonoma County Water Agency, 2011; Windsor, City of, 2011). The 2010 UWMPs also show that recycled water usage is expected to increase by 2035. Recycled water is an important source of water for irrigation in the basin that is locally controlled, reliable and environmentally responsible. Using recycled water for irrigation also limits the need to release recycled water into local waterways.

In addition to the groundwater, surface water, and recycled water sources, conservation plays an important role in meeting the Santa Rosa Plain's water needs. The public water suppliers have implemented projects and programs to increase water conservation in their service areas. Santa Rosa, SCWA, Rohnert Park, and Windsor are signatory to the California Urban Water Conservation Council (CUWCC) *Memorandum of Understanding (MOU) Regarding Urban Water Conservation* dated September 1997, and are implementing the CUWCC Best Management Practices (BMPs). The water suppliers use or plan to use a variety of methods to encourage water conservation, including conservation-oriented water rate structures, water surveys, retrofits, rebates, and public education. Additionally, Santa Rosa and Rohnert Park are projected to meet both the 2015 and 2020 water use targets required by the Water Conservation Act of 2009.

Maintenance of good quality groundwater that can meet beneficial uses without expensive treatment is important to meeting future needs at a fair price for all users. Implementation of this Plan is a key step toward meeting these future needs.

1.4 Groundwater Management within the Basin

1.4.1 Santa Rosa Plain Groundwater Basin Study

As part of a technical study program intended to enhance current knowledge regarding groundwater resources within Sonoma County, the United States Geological Survey (USGS) initiated a multi-year cooperative study of groundwater resources within the Santa Rosa Plain Groundwater Basin in 2005. The cooperative study is being conducted by the USGS in partnership with the SCWA, the County of Sonoma, the Cities of Santa Rosa, Rohnert Park, Sebastopol and Cotati, the Town of Windsor, and California-American Water Company. The study has four principal elements: (1) a comprehensive geographic information system (GIS) to compile, analyze and visualize hydrologic and related data; (2) collection of new data, with a focus on water-quality sampling; (3) data interpretation and hydrogeologic characterization – including refining hydrologic budgets, and updating conceptual models of the groundwater flow system based on the new data and the results of ongoing USGS geologic and geophysical studies in the basin; and (4) the development of a fully-coupled numerical surface water/groundwater flow model for Santa Rosa Plain. Results from the study will provide stakeholders with tools to assist in evaluating the hydrologic impacts of future climate-change scenarios and alternative groundwater management strategies for the basin. Additionally, the study could potentially form the technical foundation for a local non-regulatory groundwater management planning process. The study will be published in 2013.

1.4.2 Santa Rosa Plain Groundwater Management Plan

A Steering Committee was formed in April 2010 to direct the preparation of a Groundwater Management Plan for the Santa Rosa Plain. The Steering Committee is comprised of local public agencies, residents and private well owners, environmental groups, resource agencies and local foundations, and was convened to address groundwater stakeholder concerns, oversee a public education and outreach effort and develop recommendations. Following recommendations of the Steering Committee, a Basin Advisory Panel began meeting in December 2011 and will lead the development of a groundwater management plan over an estimated two year period. The groundwater management planning effort will rely upon information and tools being developed by the USGS as part of the Santa Rosa Plain groundwater study. The Basin Advisory Panel consists of 25-30 members representing key groundwater interests: Agriculture (Dairies, Farmers & Grape Growers and Wineries); Business / Developers; Environmental; Government (Tribal, State, County, and Cities); Public Health; Rural Residential Well Owners; and Water Supply & Groundwater Technical Expertise.

1.5 Relationship to Forthcoming USGS and Groundwater Management Planning Efforts

This Plan was developed within a framework of interconnected efforts that work to manage the quantity and quality of water resources in the Santa Rosa Plain. Ongoing efforts at the time of writing include, among others:

- Total Maximum Daily Load (TMDL) process for the Laguna de Santa Rosa, Russian River, Mark West Creek, and Santa Rosa Creek
- Development of a Stormwater Management and Groundwater Recharge Scoping Study for the Laguna/Mark West Creek Watershed
- Development of a multi-aquifer groundwater flow model for Santa Rosa Plain
- Development of a Groundwater Management Plan for the Santa Rosa Plain

These efforts can inform future updates of the Plan and can benefit from the information contained in this document.

Most notable of upcoming efforts are the development of the groundwater flow model and the development of the Groundwater Management Plan. The groundwater flow model is being developed by the USGS and will incorporate the latest available data into the GSFLOW platform to simulate coupled groundwater/surface water flow in the watershed by simultaneously simulating flow across the land surface, within subsurface saturated and unsaturated materials, and within streams and lakes. When completed and made available publically, the USGS study will also provide much more rigorous and up-to-date groundwater budget and groundwater flow information which can be used in the future to update the technical analysis.

The Groundwater Management Planning effort encompasses broader goals than the Salt and Nutrient Management Plan, yet contains several shared components, such as monitoring. The Groundwater Management Plan will describe existing water resources, layout goals and objectives for management of the basin, include a monitoring program and data protocols, and will identify management components and an implementation approach. When completed, the Groundwater Management Plan will provide more detailed basin information by housing the USGS Study information and looking further at water quality trends. The monitoring program element of the Plan will provide an opportunity to learn more about the groundwater quality in the basin.

1.6 Scope of This Plan

This Plan is intended to be the springboard for monitoring of salts and nutrients in a more comprehensive manner across the Study Area and for implementing management measures, if needed, to continue to meet Water Quality Objectives. Given the limited data set that was used to assess existing and future conditions, the monitoring aspect of this Plan is a crucial next step. The general monitoring framework included as Chapter 8 of this Plan is a foundational monitoring plan that provides an overview of the types of wells to be monitored (and in some cases, installed). A detailed Monitoring Plan will need to be developed, after finalization of this Plan, to pinpoint the locations for monitoring well installation based on a comprehensive siting exercise, and to determine the exact number of wells to be monitored.

This Plan was developed to look at salts and nutrients entering the groundwater subbasin at a regional-scale; it was not designed to look at localized issues, such as identification of individual parcels with higher loading values. Relative loading is assessed at a fine-scale given data availability, but management measures identified in this report are applicable for particular land use categories, not at an individual parcel level. Additionally, this Plan has been developed as a regulatory document to meet requirements of the SWRCB's Recycled Water Policy. The focus of salt and nutrient management plans, including this Plan, is on managing salinity and nutrients in groundwater, not on addressing impacts to surface waters from these constituents, except where due to interaction with groundwater. Impacts to surface waters are handled through other regulations, such as National Pollutant Discharge Elimination System (NPDES) permitting, Waste Discharge Requirements, TMDLs, and others.

As noted above, the dataset used for analyzing existing water quality and degradation potential was based on available information. One limitation of available data is that well information and construction details are not available for most wells within the dataset, including important details such as total depth, screened interval, owner, and the precise location. Wells designated as public supply wells were assumed to be within the deep zone of the aquifer, and few shallow wells have data available. Those shallow wells with available data are typically monitoring wells, which tend to be shallower than private wells. Because of its role in providing municipal supply and the lack of data in the shallow zone, the deep zone is the focus of the water quality and degradation potential analysis. Since the shallow aquifer also provides water for private wells in the rural areas, and would exhibit earlier signs of increasing salinity and nutrients, data collection (including monitoring) in the shallow aquifer is a critical element of implementation so that degradation potential in the shallow zone can be analyzed as part of the Plan update.