Fact Sheets

Study Session on Water Quality Issues

April 20, 2007

Santa Clara Valley Water District

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

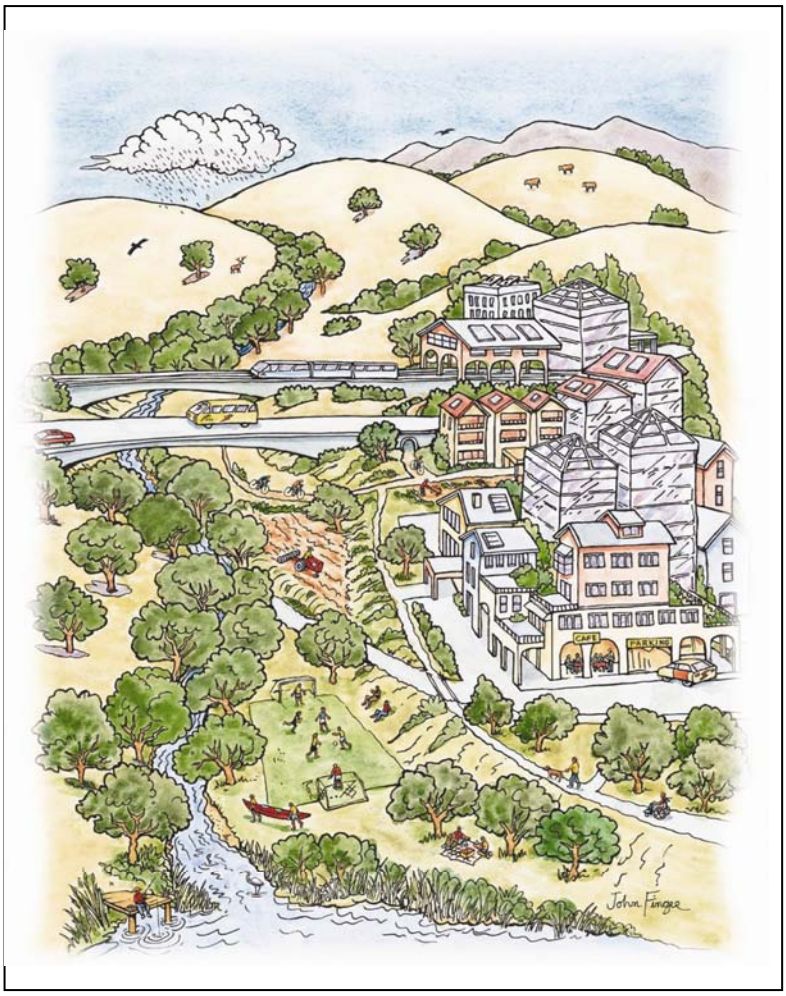
What is a Watershed?

Fact Sheet #1
Slides 2 and 9

Watersheds are geographic areas in which water, solids, sediments and dissolved materials drain and flow to a common water body. In Santa Clara County, common water bodies may include larger creeks, groundwater basins and San Francisco or Monterey Bay.

The Santa Clara Watershed Basin is bounded by the Santa Cruz Mountains on the west, Diablo Mountains on the east, the part of Menlo Park that drains toward San Francisquito Creek on the north and the bottom of Coyote Valley on the south. All of the Santa Clara Watershed Basin flows to the San Francisco Bay south of the Dumbartin Bridge. Water south of Coyote Valley flows to the Monterey Bay.

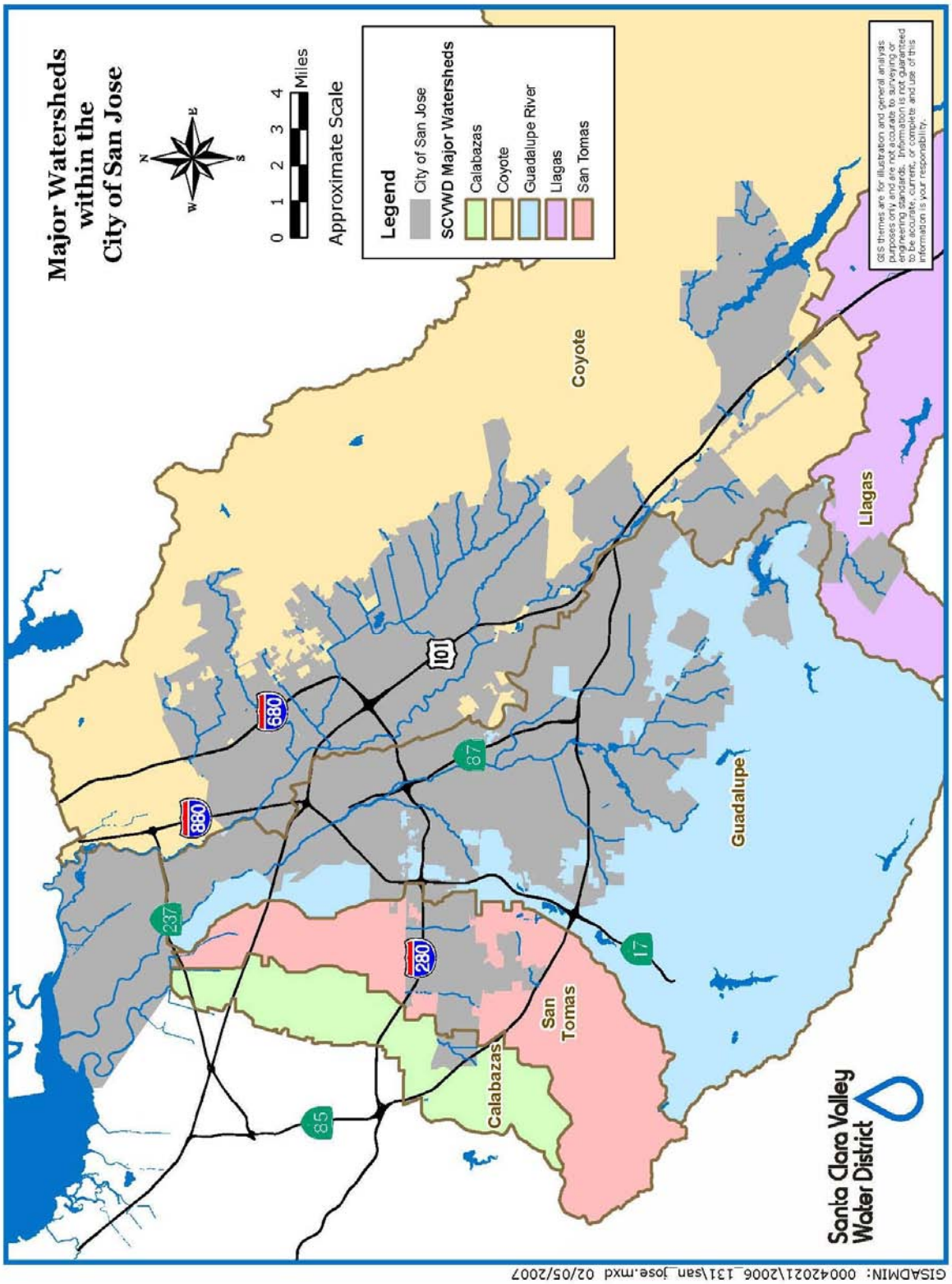
Watersheds include wetlands, riparian areas and uplands. Watersheds can be thought of as the fundamental building blocks of the landscape serving as natural "consolidators" of all activities affecting water quality, runoff and infiltration, hydrology, stream and wetland habitats, aquatic species, and other resources and conditions.



Different types of water within a watershed, including surface water in the form of streams, lakes, and reservoirs, imported water and recycled water, and groundwater stored in the basin aquifers, are all connected. Watersheds serve the important function of collecting the local source water for streams, reservoirs, wetlands, estuaries, and the groundwater basin. Watersheds also collect and cleanse water supplies, as they filter through buffer areas and the ground, and provide key economic and recreational activities throughout Santa Clara County. Finally, healthy watersheds play a critical role in supporting forests, agriculture, fisheries and essential wildlife habitat.

Sustaining and maintaining watersheds may present challenges as urbanization can cause impacts to both the volume and quality of the runoff and the groundwater basin. These include impacts to local surface water quality as runoff gathers contaminants, increased erosion and sedimentation in the streams due to an increase in the frequency of flood events and peak flows, and impacts to the quality and quantity of groundwater resources.

Protection of watersheds must consider uplands, riparian areas, floodplains, wetlands, lakes, streams and the estuary. Upland protection is necessary to minimize excessive sediment transport downstream, minimize pollutant inputs into streams and protect other hydrologic features.


Major Watersheds within the City of San Jose
N
W
E
S
0 1 2 3 4 Miles
Approximate Scale
Legend
City of San Jose
SCVWD Major Watersheds
Calabazas
Coyote
Guadalupe River
Llagas
San Tomas
GIS themes are for illustration and general analysis purposes only and are not accurate to surveying or engineering standards. Information is not guaranteed to be accurate, current, or complete and use of this information is your responsibility.
Coyote
Llagas
Guadalupe
San Tomas
Calabazas
101
680
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237
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17
85
Santa Clara Valley Water District
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SANTA CLARA BASIN

WMI

WATERSHED MANAGEMENT INITIATIVE

FACT SHEET

NUMBER 1

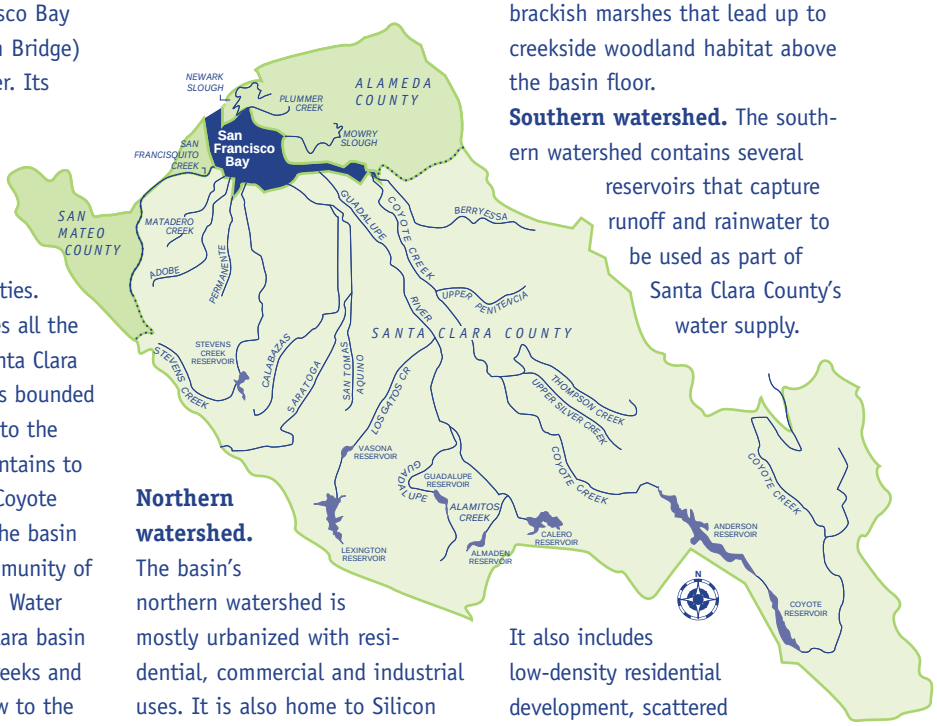
A PUBLICATION FOR THE SANTA CLARA BASIN WATERSHED MANAGEMENT INITIATIVE • Revised August 2003

MISSION:

To protect & enhance the watershed, creating a sustainable future for the community and the environment.

REGIONAL SETTING The Santa Clara Basin

The Southern San Francisco Bay (south of the Dumbarton Bridge) is a unique body of water. Its shallow depths, limited freshwater inflow and slow currents make it very sensitive to environmental impacts from natural and human activities. The Southern Bay receives all the water runoff from the Santa Clara Basin watershed, which is bounded by the Diablo Mountains to the east, the Santa Cruz Mountains to the south and west and Coyote Reservoir to the south. The basin is home to a diverse community of about 1.7 million people. Water from land in the Santa Clara basin drains to storm drains, creeks and rivers which, in turn, flow to the Bay. Fresh water also flows from the three South Bay wastewater treatment plants in Palo Alto, Sunnyvale and San Jose.



Northern watershed. The basin's northern watershed is mostly urbanized with residential, commercial and industrial uses. It is also home to Silicon Valley, where high-tech industries employ thousands of people. The watershed's edge is lined with sloughs, salt ponds and salt and brackish marshes that lead up to creekside woodland habitat above the basin floor.

Southern watershed. The southern watershed contains several reservoirs that capture runoff and rainwater to be used as part of Santa Clara County's water supply. It also includes low-density residential development, scattered agricultural and grazing lands, abandoned mines and undeveloped and preserved open space.

WHAT IS The WMI?

To provide an opportunity for local stewardship of the watershed, the Santa Clara Basin Watershed Management Initiative (WMI) was initiated in 1996 by the U.S. Environmental Protection Agency, the State Water Resources Control Board and the San Francisco Bay Regional Water Quality Control Board. In the past, specific issues affecting watersheds have been addressed by separate regulatory actions, resulting in a "patchwork" approach. The WMI aims to coordinate existing regulatory activities on a basin-wide scale, ensuring that problems are addressed efficiently and cost effectively.

Stakeholders. In addition to federal, state and local regulators, the WMI also includes representatives from business and industrial sectors; professional and trade organizations; environmental, resource conservation and agricultural groups; and local public agencies. These stakeholders have a vested interest in future watershed management and health and are committed to maintaining an open dialogue for improving basin conditions. Stakeholders help manage the WMI through monthly Core Group meetings to determine priorities and apply resources to meet agreed on goals (see Goals on back).

GOALS

Recognizing the importance of sustained dialogue and a community-supported process, WMI stakeholders developed the following goals:

- Ensure that the WMI is a broad, **consensus-based** process.
- Ensure that **necessary resources** are provided for WMI implementation.
- **Simplify compliance** with regulatory requirements **without compromising** environmental protection.
- **Balance the objectives** of water supply management, habitat protection, flood management and land use to protect and enhance water quality.
- **Protect and/or restore** streams, reservoirs, wetlands and the Bay for the benefit of fish, wildlife and human uses.
- Implement the **Watershed Action Plan** and ensure that it is continuously improved with current scientific information.

WMI Watershed Management Plan. Since its inception, the WMI has prepared three documents comprising the Watershed Management Plan:

1. The "Watershed Characteristics Report" describes land use, natural resources, water management and the cultural, organizational and regulatory setting of the Santa Clara Basin. (Updated Summer 2003)

2. The "Watershed Assessment Report" describes selected beneficial uses and stakeholder interests based on existing data in three watersheds (Guadalupe River, San Francisquito Creek and Upper Penitencia Creek). Its appendices include technical memoranda on segmentation, limiting factors and suspected causes of limiting factors, and "lessons learned." (Completed March 2003)

3. The "Watershed Action Plan" discusses environmental protection programs in strategic objectives for the Santa Clara Basin and next steps for the WMI, described in the context of a vision for the Basin. (Completed August 2003)

These documents are available from the WMI project coordinator or on the WMI website: **www.scbwmi.org**

WATERSHED-BASED STEWARDSHIP PLANNING

One of the challenges the WMI addresses is navigating across political boundaries and embarking on watershed-based stewardship planning. The Santa Clara Basin faces constant challenges to preserving or enhancing creekside habitat and protecting floodplain areas. The miles of stream ecosystems disconnected from their floodplains are increasing, while opportunities for preserving natural creekside habitat and recreational corridors are decreasing.

The WMI is beginning to use Watershed Stewardship Planning to provide the framework for a scientific-based approach to assess watershed needs: systematically addressing multiple objectives and promoting a better understanding about the trade-offs/balances in planning, designing and constructing projects within each watershed. The ultimate goal is to bring the wisdom of local groups together to optimize protecting beneficial uses in each stream and watershed, considering the limited resources available.

Geographically based Watershed Stewardship Plans will assist local land use planning efforts in protecting watersheds and water resources. These plans are intended to identify areas of the watershed that are particularly sensitive, from either an environmental or water resources management perspective. The Plans will also identify projects that will help protect these sensitive areas and manage our water resources. Identifying opportunity areas will ensure that the restoration efforts that are part of a specific project mitigation can be located in places that maximize the resource benefit to the watershed as a whole, not just the project footprint itself.

A fresh approach. The WMI is a new way of doing business that will effectively coordinate a variety of agencies and stakeholder interests. This effort is vitally important because of the many jurisdictional boundaries that overlie the basin. The WMI will meet these challenges to preserve and protect our unique environmental heritage.

For more information on the Santa Clara Basin Watershed Management Initiative, please contact the WMI Project Coordinator at 650-494-3819,or check out our web site at www.scbwmi.org

Printed on recycled paper using soy-based inks. Available in large-print and audio formats upon request. August 2003/1K

WMI SIGNATORIES

PUBLIC AGENCIES

California Department of Fish & Game
City of Cupertino
City of Palo Alto
City of San Jose
City of Santa Clara
City of Sunnyvale
Guadalupe-Coyote Resource Conservation District
San Francisco Bay Regional Water Quality Control Board
San Francisquito Creek Joint Powers Authority
Santa Clara County
Santa Clara County Open Space Authority
Santa Clara Valley Transportation Authority
Santa Clara Valley Urban Runoff Pollution Prevention Program
Santa Clara Valley Water District
US Army Corps of Engineers
US Environmental Protection Agency
USDA Natural Resource Conservation Service

BUSINESS/TRADE ASSOCIATIONS

California Restaurant Association/Dairy Belle Freeze
Home Builders Association of Northern California
San Jose Silicon Valley Chamber of Commerce
Santa Clara County Cattlemen's Association
Santa Clara County Farm Bureau
Silicon Valley Manufacturing Group

ENVIRONMENTAL AND CIVIC GROUPS

Audubon Society, Santa Clara Valley Chapter
CLEAN South Bay
Greenbelt Alliance
Leagues of Women Voters of Santa Clara County
Salmon and Steelhead Restoration Group
San Francisco Bay Bird Observatory
San Francisquito Watershed Council
Sierra Club, Loma Prieta Chapter
Silicon Valley Pollution Prevention Center
Silicon Valley Toxics Coalition
Western Waters Canoe Club

SANTA CLARA BASIN

WMI

WATERSHED MANAGEMENT INITIATIVE

FACT SHEET

NUMBER 3

A PUBLICATION FOR THE SANTA CLARA BASIN WATERSHED MANAGEMENT INITIATIVE • Revised August 2003

MISSION:

To protect & enhance the watershed, creating a sustainable future for the community and the environment.

SANTA CLARA BASIN Watershed Action Plan

Context. In August 2003, the Watershed Management Initiative (WMI) team concluded its seven-year Watershed Management Planning process, and produced three key documents:

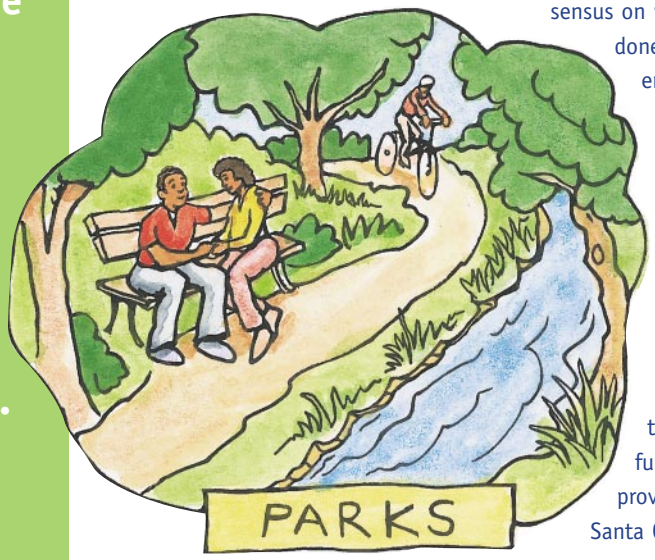
1. The updated "Watershed Characteristics Report" describes land use, natural resources, water management and the cultural, organizational and regulatory setting of the Santa Clara Basin.

2. The "Watershed Assessment Report" describes selected beneficial uses and stakeholder interests based on existing data in three watersheds: Guadalupe River, San Francisquito Creek and Upper Penitencia Creek. Its appendices include technical memoranda on segmentation, limiting factors and suspected causes of limiting factors, and "lessons learned."

3. The "Watershed Action Plan" discusses environmental protection programs in seven areas and outlines eight strategic objectives for the Santa Clara Basin and next steps for the WMI, described in the context of a vision for the Basin.

Process for Creating the Watershed Action Plan. The Santa Clara Basin WMI team started Watershed Action planning at a retreat in January 2002 and by August 2002 had compiled a working draft of the Watershed Action Plan (Plan).

To create the Plan, subgroups of stakeholders first developed 112 "Action Worksheets." The Action Worksheets defined the WMI stakeholders' universe of common concerns and represented preliminary consensus on what is to be done to protect and enhance Santa Clara Basin watersheds. A Technical Advisory Group, composed of stakeholder technical staff, helped prepare the Plan, with funding jointly provided by the Santa Clara Valley Water District and the cities of San Jose, Palo Alto and Sunnyvale.

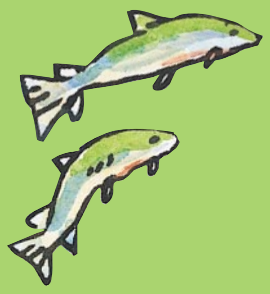


Content. The Plan has four goals:

- Outline a comprehensive approach to preserving and enhancing the watershed and communicate this to WMI stakeholders, decision-makers, potential funders and the public.
- Provide guidance to the WMI by coordinating and phasing actions the WMI is doing or can do to protect and enhance the watershed.
- Identify specific actions that agencies, organizations and individuals are doing and can do to protect and enhance the watershed, and describe these in the context of the comprehensive approach.
- Describe a process and criteria for phasing implementation of actions.

The Plan also proposes "strategic objectives" for aligning, coordinating, and integrating

continued on back



A SCIENTIFIC APPROACH

The WMI is laying the groundwork for "adaptive management" of Santa Clara Basin watersheds. Adaptive management is the process of implementing policy decisions as scientifically driven management experiments that test predictions and assumptions in management plans, and then use the resulting information to improve the plans. The WMI will focus on three general tasks:

1. Provide a stakeholder forum for watershed related issues for the Santa Clara Basin

2. Bring consensus-based recommendations to decision-makers

3. Provide a forum for watershed outreach and education, and encourage public support and action to preserve and enhance watersheds.

the programs in each area. It lists "next steps" that the WMI may undertake to promote each strategic objective.

These objectives include:

1. Incorporate the WMI Vision into General Plans and a Specific Area Plan to protect and enhance watersheds.

2. Promote drainage systems that detain or retain runoff to protect streams from flash runoff, erosion and pollutants, and to protect from downstream flooding, while preventing groundwater pollution.

3. Integrate planning of floodplains and riparian corridors to affect the future Santa Clara Basin landscape.

4. Integrate water resources planning to focus and coordinate local water conservation and recycling policies and programs.

5. Develop Habitat Conservation Plans/Natural Community Conservation Plans to protect and enhance habitats for endangered, threatened and special status species, focusing on creating and maintaining protected habitat areas.

6. Promote a comprehensive, integrated, stakeholder-based planning process for expanding the Don Edwards San Francisco Bay National Wildlife Refuge.

7. Use integrated multi-objective planning and adaptive management for in-stream projects and programs to continue to develop and improve watershed stewardship planning processes.

8. Coordinate water quality assessments and regulatory requirements to support an iterative process responsive to addressing priority pollution problems.

These strategic objectives were extracted from 112 action worksheets developed by the stakeholders in the planning process. Stakeholders will be able to access these action worksheets from the website for future references.

FROM PLANNING To Implementation

Formal presentations for adopting the Watershed Action Plan to governing bodies of the signatory entitities are scheduled to begin in the fall of 2003. As the WMI transitions from planning to implementation, the WMI stakeholders are reviewing their organizational structure to determine what would best allow them to complete their new implementation mission. They are also reviewing their connection and linkage with other regional efforts within the watershed. To begin implementing the strategic objectives, the WMI team has identified priorities and current opportunities and is now developing a one-year workplan.

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Sierra Club, Loma Prieta Chapter
Silicon Valley Pollution Prevention Center
Silicon Valley Toxics Coalition
Western Waters Canoe Club

Stormwater Pollution Control Measures for New Development

Fact Sheet #3
Slides 4, 12, and 34

Why Control Stormwater Pollution from New Development?

New development projects provide an opportunity to integrate the management of stormwater runoff and control pollutants from entering our creeks at the earliest stages of planning. During the development and redevelopment process, two important changes occur. First, vegetated pervious (accepts water through it) ground cover is converted to impervious (doesn't accept water) surfaces such as paved streets, driveways, rooftops, and parking lots. Vegetated soil can both absorb rainwater and remove pollutants, providing an effective natural purification process. Impervious surfaces can neither absorb water, so a greater volume of water runs off, nor remove pollutants, so the natural purification characteristics of the land are lost.

Secondly, development can create new pollution sources and increase levels of existing pollution sources such as automotive wastes, metals like copper and nickel, excess sediment, pesticides, pet wastes, and trash to name a few. As rain runs off the land, it collects pollutants while passing over impervious surfaces. The runoff typically enters a storm drain system that rapidly conveys it, untreated, to a creek or river where it can impact the aquatic ecosystem.

Because of these changes, the stormwater runoff leaving newly developed or redeveloped areas can have a considerably greater impact than pre-development runoff from the same area. A comprehensive approach to stormwater management and controlling pollution from new development includes appropriate site design, source control, and treatment measures.

It's Federal Law

Urban stormwater runoff is a significant source of pollution to the nation's waters. In 1987, Congress began to address this problem by requiring municipalities with storm drain systems to obtain National Pollutant Discharge Elimination System (NPDES) permits. This resulted in local requirements for control of runoff from development projects.

Post-Construction Urban Runoff Management -- City Policy 6-29

The City adopted Policy 6-29, *Post-Construction Urban Runoff Management*, in 1998 in response to the new and redevelopment stormwater treatment requirements in the City's 1996 Stormwater NPDES permit. The policy has been updated several times, most recently in 2006, to reflect the increasingly stringent NPDES permit requirements. The policy requires all projects that create or replace 10,000 square feet or more of impervious surface area to incorporate stormwater treatment measures that are engineered based on the amount of impervious surface on the site. The policy also establishes minimum treatment and source control measures for all land uses, such as gas stations, auto wrecking yards, and loading docks, which are deemed likely to have polluted runoff, regardless of the amount of impervious surface area created or replaced.

Riparian setback and vegetated swale at Tully Branch Library

Site Design

The goal of focusing on site design is to either prevent or reduce the adverse impacts of stormwater pollutants. Site design measures include techniques such as protection of natural resources including open space and generous setbacks from adjacent creeks and rivers and/or reduction of impervious surfaces when planning the layout of a development or redevelopment project. Some of the many ways to reduce water quality impacts through good site design include:

- Reduce impervious surface area;
- Drain rooftop downspouts to lawns or other landscaped areas;
- Incorporate structured parking facilities;

Smart Growth projects exhibit good site design measures when they take advantage of existing infrastructure, are served well by public transportation, and incorporate structured parking facilities.

Source Control

Covered vehicle fueling at Maybury Yard

Source control measures are structural controls or operational practices that are designed to prevent or limit pollution generation from a source so that pollutants do not contact stormwater. Standard source control structural measures include covering trash enclosures, loading docks, and fueling islands the area, installing a berm to prevent runoff, and connecting the drains in covered parking and vehicle washing areas to the sanitary sewer system. Typical sources include areas used for chemical storage, industrial processing, vehicle washing, fueling and maintenance, and trash enclosures.

Stormwater Treatment Measures

Stormwater treatment measures are structural facilities designed to remove pollutants from stormwater before it reaches the storm drain system, creeks, and the Bay. The decision to select a particular stormwater treatment measure should be based on land use type and activity, expected pollutants of concern, effectiveness at removing those pollutants, site constraints like drainage area, slope, soils, depth to groundwater, capital cost, and ease of maintenance and maintenance costs.

Some typical treatment measures include:

- Detention Basins
- Vegetated Swales
- Bio-Retention Planter Boxes
- Green Roofs
- Porous Pavement
- Mechanical Units

Detention Basin at Alum Rock Library

Controlling Pollutants

Fact Sheet #4
Slides 4, 13, and 14

What Are the Key Pollutants and Why Are They So Hard to Control?

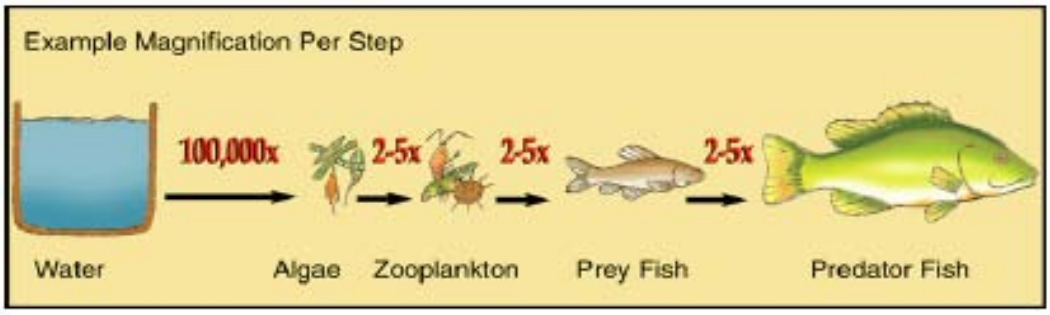
Pollutants are materials that can do harm to the environment and/or endanger human health. In the watershed, pollutants can sicken or kill fish and wildlife, degrade natural habitats, or compromise the health of people who swim in the water or eat the fish they catch. The San Francisco Bay Regional Water Quality Control Board (Water Board) evaluates water quality data, identifies which pollutants (often referred as priority pollutants) are causing impairment to the San Francisco Bay, determines appropriate water quality limits for these priority pollutants, and develops regulatory requirements including a framework of programs and activities to be implemented by wastewater and stormwater agencies to meet those water quality limits.

Priority Pollutants Identified by the Water Board

- Mercury
- PCBs
- Copper
- Nickel
- Dioxins
- Pesticides
- Sediment
- Trash

Pollutants in stormwater can be very difficult to control because they often come from widely disbursed or poorly identified sources. Copper, for example, is a common component in automobile brake pads, and is distributed widely as the pads wear. Many pollutants, such as PCBs, are "legacy pollutants"-- compounds that are no longer produced or used yet they persist in the environment. Records are often poor or non-existent as to how and where such "legacy pollutants" were used, making it difficult to track sources.

Some pollutants bioaccumulate (increase in concentration in the body's tissue) as they travel up the food chain from smaller to larger animals. This means that very small amounts of the pollutants in the environment can result in high levels in fish and wildlife. This is especially true for mercury, PCBs, dioxins, and many pesticides.



What Are We Doing About Pollutants?

Total Maximum Daily Load (TMDL)

When a creek, river, lake, or other body of water is "impaired" by a pollutant, that is, when a specific pollutant is causing harm to the life using the water, the federal Clean Water Act requires that a Total Maximum Daily Load (TMDL) study be done to determine the sources of the pollutant and a plan be made to reduce the amount of the pollutant so that the water body can recover. Often, too little information is available to make a reasonable plan, so the stormwater agencies participate in special studies or collaborate in regional efforts to help supply the needed data.

Monitoring in Coyote Creek

Monitoring

The City and the District are part of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Countywide Stormwater Program), which conducts stormwater monitoring watershed-wide. SCVURPPP visits and monitors portions of the Santa Clara Valley's streams and creeks every year, collecting and analyzing samples for pollutants in accordance with its multi-year monitoring plan. Although participation in the SCVURPPP satisfies most of the stormwater monitoring requirements, co-permittees such as the City and the

District also take action individually to implement programs to help control mercury, PCBs, copper, pesticides, and other pollutants.

What is Sediment?

Sediment is soil, sand, and other debris washed from streets and land into creeks and rivers. Erosion of sediments is a natural process, but human activities like construction can generate excess sediment laden with pollutants that impact the storm drain system and our creeks and Bay.

Erosion and Sediment Control

Since most pollutants stick to dirt and sediment, measures to control sediment help keep pollutants out of creeks and the Bay. Erosion and sediment control requirements for municipal activities, construction, and new and redevelopment effectively minimize the amount of sediment-bound pollutants getting into stormwater and into the creeks.

Source Reduction

Reducing use and proper disposal of items containing pollutants is an effective means to keep them out of the watershed. Recycling programs can help control mercury, which can be found in fluorescent light bulbs, thermometers, switches, and other devices. Copper releases are minimized through activities such as discouraging the use of architectural copper, encouraging the use of low-copper brake pads, and low-copper pool maintenance.

Fluorescent lamps for recycling at the Central Service Yard

Additionally, careful use of Best Management Practices (BMPs) in agency operations minimizes our own releases of potentially harmful chemicals. The City's Environmentally Preferred Purchasing Program works to ensure that products purchased and used by the City are environmentally sound and avoid harmful chemicals whenever possible.

Outreach and Regional Collaboration

Outreach and regional collaboration in monitoring and science are the cornerstones in the City's and District's efforts to control pollutants. Moreover, the City and the District, through SCVURPPP, participate in regional efforts to better understand sources and the ultimate fate of pollutants. This is done through direct involvement with regional groups and programs such as the Bay Areas Stormwater Management Agencies Association (BASMAA), the San Francisco Bay Regional Monitoring Program (RMP), the California Stormwater Quality Association (CASQA), and others.

What Are the Next Steps?

As control measures and natural degradation are slated to bring some pollutants under control, attention will turn to other pollutants. For example, phasing out diazinon and other pesticides and replacing them with pyrethroids reduces the problems caused by diazinon but may cause problems of their own. Other compounds, such as PBDEs, are used widely and effective as flame retardants in garments and other products, but they are emerging in increasing concentrations in the environment. Additional concerns include the chronic problem of trash, and a wide suite of emerging contaminants that may disrupt endocrine systems of wildlife.

The City and District will continue to work collaboratively with the Regional Water Board, regulated partners, non-governmental organizations, and other stakeholders to assess the magnitude of the problems posed by existing and emerging pollutants, and to develop and implement strategies for minimizing the urban portion of their impacts on the environment.

Santa Clara Valley Water District
Clean, Safe Creeks and Natural Flood Protection

Fact Sheet #5
Slides 4, 5, and 15

In November 2000, voters in Santa Clara County approved (by a two-third majority) the *Clean, Safe Creeks and Natural Flood Protection Plan* (Plan) via a ballot measure which included the approval of a special parcel tax. The 15 year Plan will end in 2015. Development of the Plan involved more than three years of cooperative effort between District staff and the community to identify the most pressing needs for the county. As part of approving the ballot measure, an Independent Monitoring Committee was created to measure the District's progress toward achieving the objectives outlined in the plan.

The Plan is part of the District's comprehensive flood protection and stream stewardship program and incorporates the following four outcomes mandated by the voters:

1) Homes, schools, businesses, and transportation networks are protected from flooding,
2) There is clean, safe water in our creeks and bays,
3) Healthy, creek and bay ecosystems are protected, enhanced or restored as determined appropriate by the Water District board, and
4) There are additional open spaces, trails, and parks along creeks and in the watersheds when reasonable and appropriate.

This fact sheet focuses on outcome (goal) 2: "There is clean, safe water in our creeks and bays" and on the District's financial support for local programs that reduce and prevent pollution in the county streams. This goal has the following objectives:

1. Activities to Reduce Pollutants from Urban Runoff as a Co-Permittee with Other Local Agencies and Expand the Program to Uvas/Llagas Watersheds

Goals: This activity focuses on reducing pollutants in the cities of Gilroy and Morgan Hill by providing funding to support the municipalities' efforts related to their Storm Water Management Plans.

Key Elements: The elements related to the Storm Water Management Plan include public education, illicit discharge detection and elimination, construction site stormwater runoff control, post construction stormwater management, and pollution prevention for municipal operations.

Total Funding: The total funding for this activity for the 15-year plan is $600,000.

2. Impaired Water Bodies Improvement

Goals: This activity focuses on reducing or preventing additional impairment of water bodies in Santa Clara County.

Key Elements: The District supports the Regional Water Quality Control Board and the Environmental Protection Agency regulations in reducing pollutants (mercury, diazinon, copper, zinc, PCBs and selenium) in the waterways. To that end, the District has developed an Impaired Water Bodies Improvement Plan that is updated annually. Guadalupe River watershed has been ranked as high priority for use of this activity's fund since the District has the ability to reduce mercury to a certain extent via mitigation measures at reservoirs or within the bed and bank of the creeks on District's rights-of-way.

Total Funding: The total funding for this activity in the 15-year plan is $15,900,000.

3. Neighborhood Creeks Frequently Inspected and Cleaned of Litter and Graffiti

Goals: This activity includes providing 60 creek cleanup events (4 per year), responding to requests to remove litter and graffiti within 5 days, and providing or repairing additional safety fence around creeks as needed.

Key Elements: The District has Memorandum of Understanding with the City of San Jose for trash prevention and removal. The District also has an MOA for graffiti cleanup with the City of San Jose, and verbal agreements with other cities in Santa Clara County. Two volunteer cleanup efforts, California Coastal Cleanup Day, and the National Rivers Cleanup Day, are organized by the Creek Connection Action Group. This group includes the District, the County of Santa Clara and the City of San Jose. Through these programs and its own efforts, the District works in partnership to remove trash, debris, and graffiti throughout Santa Clara County.

Total Funding: The total funding for this activity in the 15-year plan is $15,000,000.

4. Partnership with the County on General Surface Water Quality Protection Programs and Outreach

Goals: This activity includes the District's support of the Green Business Program managed by Santa Clara County's Integrated Waste Management Division. The activity also includes funding to support the Santa Clara Valley Urban Runoff Pollution Prevention Program.

Key Elements: Activities promoted by the Green Business Program include environmental compliance, pollution prevention, water conservation, energy conservation, and recycling and waste reduction. Through the Green Business Program, the District was able to contribute toward the certification of 100 businesses throughout the county to date. Funding from the Clean Safe Creeks and Natural Flood Protection Program is also now used to support approximately 1/3 of the District's share of the budget for the Santa Clara Valley Urban Runoff Pollution Prevention Program.

Total Funding: The total funding for this activity in the 15-year plan is $5,850,000.

Santa Clara Valley Urban Runoff Pollution Prevention Program
What is SCVURPPP?

Fact Sheet #6
Slides 4 and 15

The Santa Clara Valley Urban Runoff Pollution Prevention Program ("SCVURPPP," or "Program") is an association of thirteen cities and towns in Santa Clara County, the County of Santa Clara, and the Santa Clara Valley Water District (District). These agencies are co-permittees, sharing a common permit to discharge stormwater into the South San Francisco Bay. The Program incorporates regulatory, monitoring, and outreach measures aimed at reducing pollution in urban runoff to the "maximum extent practicable" to improve the water quality of South San Francisco Bay and the streams of Santa Clara Valley. The Program received the 2006 EPA National Stormwater Management Award, the 2006 3rd place NAFSMA Excellence in Communication Award, and the 2007 NAEP National Environmental Excellence Award.

Organization and Management

The Program is organized, coordinated, and implemented in accordance with a Memorandum of Agreement (MOA) signed by all 15 co-permittees. The MOA details the responsibilities of each co-permittee and a cost-sharing formula for joint expenditures. Annual Program costs are approximately $3.3 million with the City and the District each providing approximately $1 million. The Program's Management Committee, consisting of one designated representative from each co-permittee, meets monthly to discuss and make decisions regarding Program business. EOA, Inc. is contracted to provide Program management services.

The Program's Urban Runoff Management Plan (Plan) consists of an area-wide plan and individual agency plans describing what the Program will do, with co-permittees acting individually and collectively, to reduce urban runoff pollution. The Plan describes the goals and objectives of the Program and its various elements, such as monitoring and watershed management measures. The Plan also contains model performance standards that are modified as appropriate to fit local conditions and are implemented by the co-permittees.

A Brief History of SCVURPPP

June 1990 – Phase 1 Permit

The Program receives the first Phase 1 municipal stormwater permit in the nation.

1995 and 2001 – Re-issuance

The Program's permit is reissued twice, with each permit containing more stringent requirements.

October 2001 – New and Redevelopment

The Water Board amends the permit to include expanded requirements for controlling pollutants from new and redevelopment activities (Provision C.3).

July 2005 - Hydromodification

The Water Board amends the permit to phase implementation of treatment controls on small projects and to approve key provisions of the Program's Hydromodification Management Plan (HMP).

February 2005 - MRP

The Program, along with 76 other agencies, begins working with the Water Board to develop a Bay Area-wide Stormwater Permit, known as the Municipal Regional Permit (MRP).

What SCVURPPP Does

Regulatory Guidance and Advocacy

The Program provides regulatory interpretation and guidance to co-permittees on the Stormwater Permit and other legal and regulatory issues that affect the Program. Recently, the Program has been very active in the Municipal Regional Permit (MRP) process, representing co-permittee interests at BASMAA and with the Regional Water Board. SCVURPPP gives its co-permittees the ability to speak with one voice on regional issues that impact stormwater management.

Multi-year Monitoring Program

The Program monitors and assesses surface water quality in the Santa Clara Basin. This multi-year program includes biological, chemical, and physical assessments of urban and upstream waterways. The annual sampling efforts are designed to assess the magnitude and sources of pollution and identify physical habitat problems associated with urban runoff. Additional important components of the program are to detect long term trends, comply with NPDES permit provisions, integrate with state and regional programs, and communicate results to the public.

Outreach and Education

The Program implements the Watershed Watch campaign. This award-winning campaign consists of general media outreach, participation in local public and school events, and partnerships with local businesses and trade organizations.

Watershed Watch
Protect Our Creeks And Bay
www.mywatershedwatch.org

The Program also implements targeted outreach and education activities concurrently with Watershed Watch. Activities such as *The Musical Watershed* elementary school assembly program, *Watershed Watchers* grant to the Don Edwards National Wildlife Refuge Environmental Education Center in Alviso, integrated pest management outreach to restaurants and commercial landscapers, and coordination with region-wide media and outreach efforts fulfill permit requirements to work to change specific behaviors which negatively impact water quality and to increase public understanding and appreciation of creeks and the Bay.

Report Coordination and Submittal

The Stormwater Permit requires two annual submittals to the Water Board. The Program coordinates the development and submittal of the Program wide and each individual co-permittee's annual work plan, and the fiscal year annual reports. The work plan is submitted in March, and reflects planned activities for the upcoming fiscal year which starts on July 1. The Annual report is submitted in September and reflects completed and in-progress activites from the previous fiscal year ending on June 30.

City of San José and Santa Clara Valley Water District

Trash Prevention & Removal MOA

Fact Sheet #7
Slides 4, 5, and 15

Why Trash in Creeks is a Problem

In 2001, San Francisco Bay Regional Water Quality Control Board staff issued a report recommending that all urban creeks, lakes, and shorelines be placed on a monitoring list to track the threat of trash impairment to water quality.

Trash impairment in creeks is a serious concern to both the City of San José (City) and the Santa Clara Valley Water District (District). Trash is a pollutant that may impact both the aesthetic quality and beneficial uses of our creeks and waterways. Trash can form large accumulations in creeks, which may hamper recreational use, impact water quality, and potentially cause flood-control problems. Trash accumulates in creeks several ways, including illegal dumping, homeless encampments, and deposits from wind or through urban storm sewer systems.

San José prides itself on being a large city that also strives to be a clean city. As such, the City employs a variety of strategies to minimize and collect litter and debris. The mission of the District is a healthy, safe and enhanced quality of living in Santa Clara County through comprehensive management of water resources in a practical, cost-effective, and environmentally sensitive manner. The City and the District have partnered to address this growing concern.

Joint Effort to Address Trash in Creeks

The City and the District entered into a Memorandum of Agreement, or MOA, for trash prevention and removal in creeks and waterways within the City of San José. Both the City and the District view clean creeks as a priority. The "Trash MOA" has improved our ability to pool resources to address trash in creeks in an efficient and cost-effective manner.

Scope of the Trash MOA

I. Perform partnered cleanups

Identify and implement clean up projects that fall outside the scope of the City and District's routine trash-removal activities, based on agreed-upon criteria for identifying projects and the responsibilities of each agency. The annual work plan stipulates the number of partnered cleanup projects to be undertaken (typically three).

II. Identify existing coordination efforts

Review existing trash prevention and cleanup programs and strategies in both the City and the District, and identify where the agencies can most effectively coordinate trash prevention and removal programs.

III. Specify improvements & new initiatives

Review and recommend improvements to existing programs, coordination tactics, and identify new activities to be undertaken as part of this agreement, such as pre-cleanup outreach and the use of enforcement.

IV. Coordination

Coordinate with other trash-related programs and activities, including the Trash Ad Hoc Task Group of the Santa Clara Valley Urban Runoff Pollution Prevention Program and the Santa Clara County Trash Technical Advisory Committee (TAC).

Both the City and the District employ diverse strategies to minimize and collect litter and debris. The MOA allows both parties to target resources in areas that have serious trash accumulations and are not addressed by regular litter management efforts.

Since its inception in September 2004, the Trash MOA has resulted in seven partnered cleanups to remove approximately 24.5 tons of trash, debris and hazardous wastes from segments of the Guadalupe River, Los Gatos Creek, and Coyote Creek.

Waterway	Tons Removed	Types of Debris Removed
Coyote Creek:	**19.26**	• Garbage • Illegally dumped large items (e.g.: appliances and furniture) • Hazardous waste (e.g.: batteries, oil, tires) • Trash rafts • Abandoned cars
Between Quinn Avenue and Tully Road	4.5	
At Montague Expressway	1.5	
Between Oakland Road and Ridder Park Drive	1.33	
Between East Julian Street and Washington Street	2.17	
Between Tully Road and Yerba Buena Avenue	9.76	
Guadalupe River, between S. Bascom Avenue & Southwest Expressway	**2.5**	
Los Gatos Creek, between Lincoln Avenue & the Interstate 280 Bridge	**2.77**	
Total:	**24.53**	

Short- and Long-Term Solutions

The Trash MOA is a successful partnership, providing valuable service by removing tons of trash and hazardous wastes from our creeks. Partnered cleanups are but one facet of larger efforts to address trash. Trash in creeks and in our community is a societal issue. It encompasses a broad array of issues, of which water quality is but one of many. Short-term solutions like cleanups are only a small part of the global issue. The City and the District are focused on reducing trash and its impacts on our waterways within each agency's means and jurisdictional limits.

City of San José
General Plan Policies

Fact Sheet #10
Slides 4, 24-26, and 52-63

San Jose 2020

- The General Plan represents the City's official policy regarding the future character and quality of development, and establishes goals and policies as the framework for decision-making on both private and public projects.
- The General Plan includes polices that are both directly and indirectly related to the protection of water resources.
- Protection of water resources is vital to the ecological and economic health of the region and its residents.
- Water is a finite resource and local water resources should be protected from pollution as much as possible.
- The City's planning and regulation of urban development directly affects water resources.

Water Resources Policies

- The City, in cooperation with the Santa Clara Valley Water District, should restrict, or carefully regulate, public and private development in watershed areas, especially in those necessary for effective stream flow and for the prevention of excessive siltation.
- The City should encourage the Santa Clara Valley Water District to restrict public access and recreational uses on land adjacent to rivers, creeks, freshwater wetlands, and other significant water courses when water quality could be degraded.
- The City should protect groundwater recharge areas, particularly creeks and riparian corridors.
- When new development is proposed in areas where storm runoff will be directed into creeks upstream from groundwater recharge facilities, the potential for surface water and groundwater contamination should be assessed and appropriate preventative measures should be recommended.
- The City shall require the proper construction and monitoring of facilities storing hazardous materials in order to prevent contamination of the surface water, groundwater and underlying aquifers. In furtherance of this policy, design standards for such facilities should consider high groundwater tables and/or the potential for freshwater or saltwater flooding.
- The City should establish policies, programs and guidelines to adequately control the discharge of urban runoff and other pollutants into the City's storm drains.
- The City should take a proactive role in the implementation of the Santa Clara Valley Urban Runoff Pollution Prevention Program.
- For all new discretionary development permits for projects incorporating large paved areas or other hard surfaces (e.g., building roofs), or major expansion of a building or use, the City should require specific construction and post-construction measures to control the quantity and improve the water quality of urban runoff.

Policies that Support Water Resources Protection

Greenline/Urban Growth Boundary No urban development should extend outside of the Greenline/Urban Growth Boundary which separates those lands planned and reserved for urban uses from those that should remain rural in character.

Urban Design Private development should include adequate landscaped areas. Landscaped areas should utilize water efficient plant materials and irrigation systems. New development projects should include the preservation of ordinance-sized and other significant trees.

Hillside Development Clustering of residential development in hillside areas should be encouraged to minimize exposure of development to environmental hazards and maximize the preservation of natural resources in the hillsides.

Solid Waste Solid waste landfills should be designed and operated in a manner that protects surface water and ground water aquifers from contamination from leachate.

Parks and Recreation The development of public and private recreational uses in rural and hillside areas should be low intensity and sensitive to…water resources, natural habitats. The City encourages the County and other public agencies to accept dedications of open space lands of regional significance, including watersheds, wildlife habitats, wetlands…The City also encourages private entities to preserve open space lands.

Scenic Routes The natural character of Rural Scenic Corridors should be preserved by incorporating mature stands of trees, rock outcroppings, streams…and other such natural features into project designs.

Woodlands, Grasslands, Chaparral and Scrub The City should preserve and protect oak woodlands, and individual oak trees, to the greatest extent feasible. The City should encourage appropriate reforestation and planting projects in hillside areas.

Riparian Corridors and Upland Wetlands Creeks and natural riparian corridors and upland wetlands should be preserved whenever possible. New public and private development adjacent to riparian corridors should be consistent with the provisions of the Riparian Corridor Policy Study. The City encourages appropriate native plant restoration projects along riparian corridors, upland wetlands, and in adjacent upland areas.

Bay and Baylands The City should continue to participate in the Santa Clara Valley Non-Point Source Pollution Control Program and take other necessary actions to formulate and meet regional water quality standards which are implemented through the National Pollution Discharge Elimination System Permits and other measures.

Species of Concern Consideration should be given to setting aside conservation areas in the Bay and baylands, along riparian corridors, upland wetlands, and hillside areas to protect habitats.

Urban Forest The City encourages the maintenance of mature trees on public and private property as an integral part of the urban forest. Prior to allowing the removal of any mature tree, all reasonable measures which can effectively preserve the tree should be pursued.

Soils and Geologic Conditions In order to prevent undue erosion of creek banks, the City should seek to retain creek channels in their natural state, where appropriate.

Air Quality The City should take into consideration the cumulative air quality impacts from proposed developments and should establish and enforce appropriate land uses and regulations to reduce air pollution consistent with the region's Clean Air Plan and State law.

Hazardous Materials The City should require proper storage and disposal of hazardous materials to prevent leakage…The City should incorporate soil and groundwater contamination analysis within the environmental review process for development proposals. When contamination is present on a site, the City should report this information to the appropriate agencies…

Hazardous Waste Management All proposals for hazardous waste facilities shall be consistent with the plans and policies of air and water quality regulatory agencies (i.e., Air Quality Management District, Regional Water Quality Control Board, and this City). Proper storage and disposal of hazardous wastes shall be required to prevent leaks…and to prevent materials from combining to form hazardous substances and wastes.

General Plan Update

The current vision for the future growth and development of the city are captured in the San José 2020 General Plan, which was adopted by City Council in 1994.

Per recent City Council direction an extensive early outreach effort to all segments of the city is underway to identify possible topics for evaluation during the proposed comprehensive General Plan update process.

The City Council is expected to consider formally initiating the General Plan update process in May 2007.

Treatment Control Measures

Fact Sheet #13
Slides 4, 23, 26-30, and 44-45

How do Treatment Control Measures for Development Projects Work?

Stormwater treatment control measures are structural facilities designed to remove sediment and pollutants from stormwater before it reaches the storm drain system, creeks, and the Bay. The decision to select a particular stormwater treatment measure should be based on land use type and activity; expected pollutants of concern; effectiveness at removing those pollutants; site constraints like drainage area, slope, soils, and depth to groundwater; ease and cost of maintenance; and capital cost.

What is Sediment?

Sediment is soil, sand, and other particulates which can be washed from streets and other impervious surfaces into storm drains and ultimately creeks and rivers. Pollutants such as metals and pesticides also bind to sediment. Stormwater treatment control measures that are effective at removing sediment also effectively remove other sediment-bound pollutants.

Detention Basin & Swales

These types of stormwater control measures are appropriate for suburban locations where space, soil type, and depth to ground water are not an issue.

Detention basins are depressions in the landscape, usually at the lowest elevation on a given site that have been designed to detain stormwater runoff for a minimum amount of time, usually 48 hours, to allow sediment and associated pollutants to settle. They can also be used to provide flood and/or flow control by including additional storage area and/or modifying the outlet structure.

Detention Basin at Alum Rock Library

Vegetated Swale in Parking Lot

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey stormwater runoff flow to a discharge point such as the storm sewer system. Swales are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil, and/or infiltration in the underlying soils. They trap sediment and associated pollutants, promote infiltration, and reduce the flow velocity of stormwater runoff.

Bioretention Planter Boxes and Green Roofs

Both of these measures can be especially helpful in urban infill areas where space for stormwater treatment measures is limited, a high groundwater table is present, or the soil type is not conducive to infiltrating stormwater.

Planter Box/ Infiltration

Bioretention planter boxes function as a filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of organic layers of mulch and soil, planting soil, plants, and an underdrain system. Bioretention facilities collect and filter stormwater runoff by allowing pollutants to settle and filter out as water percolates through a specifically designed soil matrix. These treatment measures can reduce flow rates and volumes in addition to reducing pollutant loadings.

Green Roofs are vegetated areas placed on rooftops. They are constructed of a lightweight soil media underlain by a drainage layer and a high quality impermeable membrane that protects the building structure. The soil is planted with a specialized mix of plants that can thrive in the sometimes harsh, dry, high temperature conditions on the roof and tolerate short periods of inundation from storm rainfall events. Green roofs control stormwater runoff, erosion, and pollution by filtering, absorbing, and detaining rainfall.

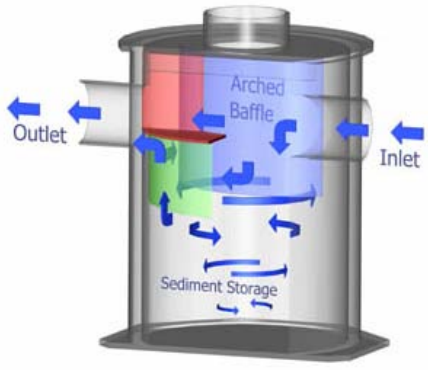
Green Roof
Kaiser Permanente (Oakland)

Porous Pavement and Mechanical Units

Materials, such as porous pavement and manufactured stormwater treatment units are relatively new types of stormwater treatment control measures. Both are also appropriate for urban infill sites.

Porous pavement materials include porous concrete, porous asphalt, and permeable pavers. These pavements provide a stable, functional surface like traditional paving systems, but also allow water to percolate through the material and infiltrate into the ground. This allows for a reduction of impervious surface and also provides treatment by filtering the stormwater runoff through the pavements sub-base before reaching an underdrain system and ultimately the storm sewer.

Porous Pavement Parking Lot
Congregation Sinai (San Jose)



Vortex Separator
Courtesy of Aqua Shield

Mechanical units come in an array of types and sizes, both with and without filter media such as perlite and zeolite and are made by various manufacturers. One of the most common is a vortex or hydrodynamic separator; which has a curved interior to move water in a centrifugal fashion. They are flow-based devices that collect water and remove trash, large sediment particles, and oil and grease by settling or through a screen filter. They can be readily designed to be placed within the storm drain pipe system, making them a good alternative for urban areas where space is a concern; however, they are generally considered not as effective at removing fine sediment and pollutants as the other types of treatment measures described in this fact sheet.

New Development Control Measures: Hydromodification

Fact Sheet #14
Slides 4, 33-50, and 60-62

What is Hydromodification?

Hydromodification is the change in runoff flow patterns from a site (or the changes in the hydrograph), such as that caused by additional impervious surfaces. Such changes can cause erosion of creek and river beds due to sudden or increased stormwater runoff flows. In addition to large storms, flows from smaller storms become more significant contributors to erosion in areas with substantial impervious surfaces.

Erosion is a serious issue in San Jose's waterways because it damages infrastructure in the creeks; cuts away banks and vegetation; damages or destroys fish habitat and spawning areas; adversely affects property values and community aesthetics; and is extremely costly to taxpayers to repair.

Land development can affect the pattern of stormwater runoff from a site by:

- Increasing the impervious area,
- Decreasing natural vegetation,
- Changing grading and soil compaction, and
- Creating new drainage patterns.

The result of these changes is:

- Decreased infiltration of stormwater,
- Increased volume, duration, and frequency of stormwater flows; and
- Increased connectivity of impervious surface areas and runoff to creeks.

Overall, these effects can cause creek and river channel erosion and harm beneficial uses of the waterway. The Stormwater Permit requires permittees to manage increases in stormwater flows from development projects where those flows can cause increased creek erosion. This can be accomplished by implementing flow control measures on individual sites, by collectively managing such flows using an off-site or regional facility such as a detention basin, by addressing the flow increase within the creek itself, or a combination of these measures.

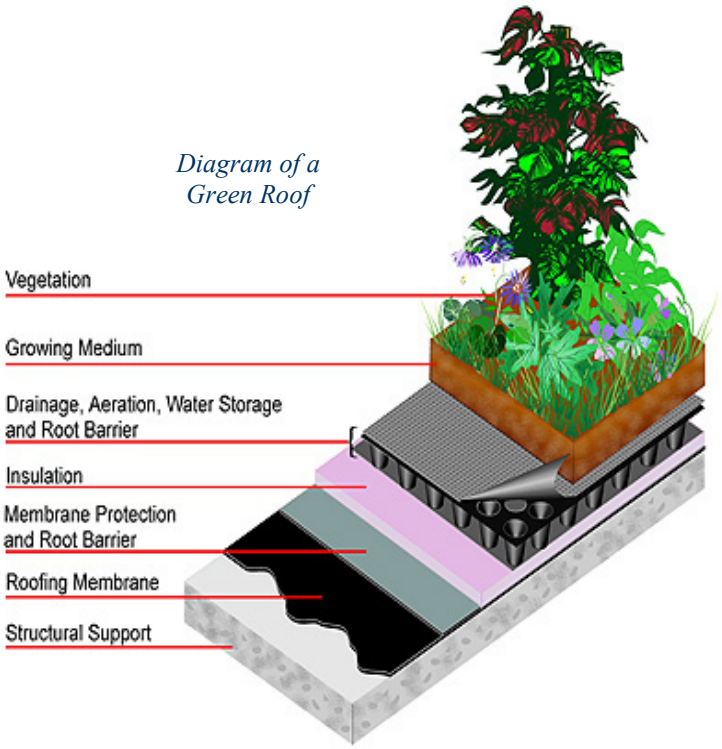
On-Site Hydromodification Controls

On-site controls are designed to detain stormwater flows on a project site such that runoff leaving the site would mimic the runoff conditions before the project was installed. On-site control measures must be properly sized, and typically occupy between 2 and 6% of a project area, depending on the soil type, topography, and the amount of open and impervious surface on the site.

Some on-site hydromodification controls include:

- Detention basins;
- Underground vaults; and
- Green roofs.

Diagram of a Green Roof



Off-Site and Regional Controls

Off-site and/or regional controls are appropriate for projects located in a drainage area where a control measure, such as an appropriately designed detention basin, already exists or can be constructed to capture the stormwater flow from the development project prior to release to the local waterway.

These types of measure are appropriate for large development projects that encompass many acres, such as the Coyote Valley Specific Plan (CVSP) Area. The current design for the Coyote Valley Specific Plan includes a large central lake that will not only serve flood detention purposes, but also as a hydromodification measure to prevent further erosion in Coyote Creek.

Detention Basin in Saratoga

Off-site or regional controls may also be appropriate for areas that include many potential scattered development parcels, such as North San Jose or Evergreen. It is important that the location for an off-site flow control facility be identified during the planning process. The result should be that the stormwater runoff from the new development would be conveyed to the facility prior to release to the local waterway.

Additionally, San José recently amended the Parkland Dedication Ordinance in January 2007 to allow parks to accommodate dual recreational and stormwater detention uses, provided the design allows for appropriate

recreational uses and ease of maintenance. The proposed project on the Hitachi site in South San Jose is being designed to include two parks that will serve as both a recreational and stormwater function.

In-Stream Controls

In-stream hydromodification measures involve changes to the creek itself, typically in the form of widening the channel to accommodate the higher levels of flow and/or including channel meanders to slow the velocity of the flows, which prevents creek bank erosion. Generally, in-stream measures are feasible in locations where development is set back at least 100 feet from the top of the creek bank such as the stretch of Thompson Creek between Quimby and Aborn Roads. However, there are parts of the City where there is not adequate distance between adjacent development and the creeks to allow for feasible in-stream erosion control projects.

Typical in-stream controls include:

- Streambed widening,
- Installation of energy dissipaters such as rip rap,
- Including channel meanders that mimic the natural streambed, and
- Riparian Plantings.

The City and District are working together to develop a process to facilitate in-stream controls in appropriate areas that will not only prevent future erosion resulting from new development projects, but may also address existing erosion issues.

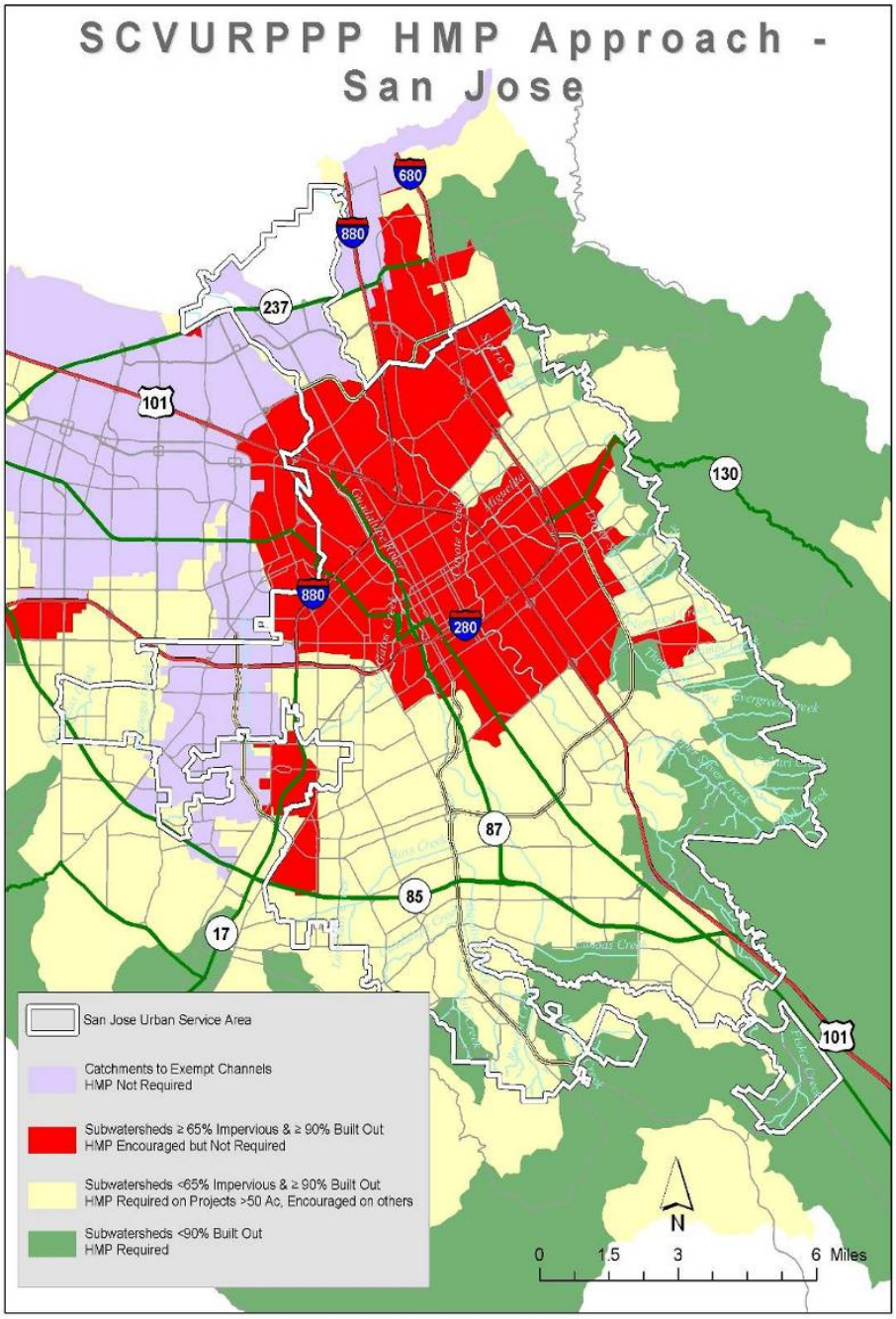
Managing Hydromodification: City Policy 8-14

Santa Clara County's Urban Runoff Pollution Prevention Program (Program) was the first stormwater permit holder in Bay Area to be issued hydromodification requirements. In response, the Program issued and adopted its Hydromodification Management Plan (Plan) Final Report in July 2005. This technical basis for the Plan has been used as a model for other Bay Area stormwater programs' Hydromodification Management Plans.

City Council adopted City Policy 8-14 entitled Post-Construction Hydromodification Management on October 18, 2005. The purpose of the Policy is to establish a framework, consistent with the current Plan, for incorporating measures into the City's development review and approval process to control hydromodification impacts from new and redevelopment projects where hydromodification is likely to cause increased erosion, silt pollutant generation or other impacts to beneficial uses of local rivers, streams and creeks.

The Policy requires projects of certain sizes to include hydromodification control measures depending on their location in the City. A map accompanies the policy (see page 4) to let developers know whether their project is in an area that requires a Hydromodification Plan.

Santa Clara Valley Urban Runoff Pollution Prevention Program
Hydromodification Management Plan
In San Jose

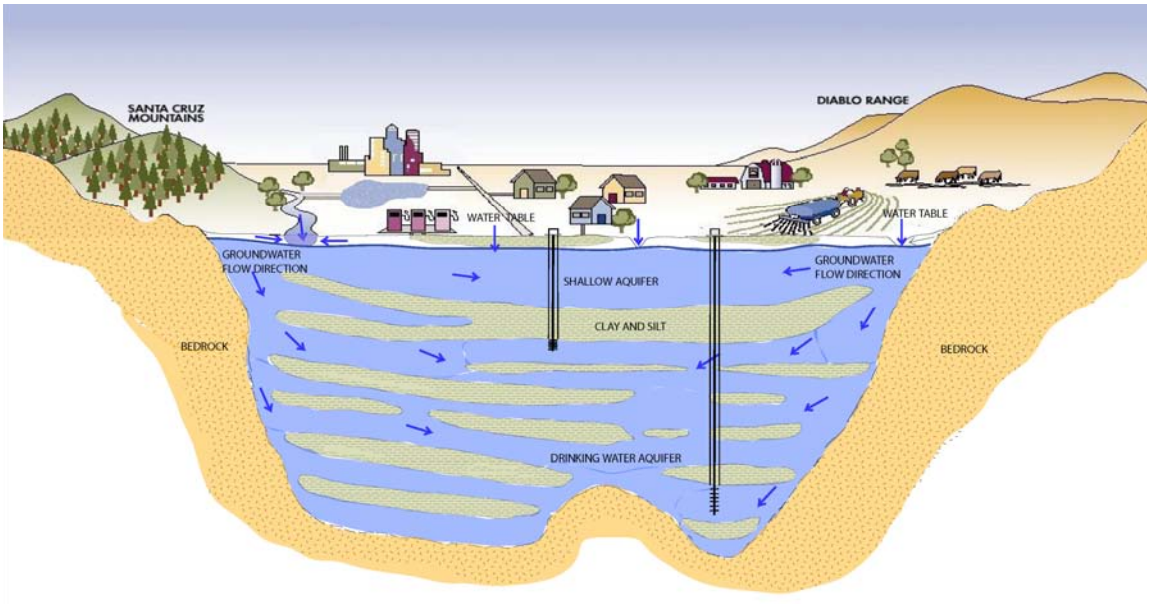


Groundwater Basics

Fact Sheet #15
Slides 6, 12, and 53-56

What is Groundwater?

Contrary to what many people think, groundwater is rarely found in underground rivers or lakes. Instead, groundwater is water that flows slowly through small pores and cracks in soil, sand, and rock beneath the earth's surface. Groundwater is stored in water-bearing formations known as aquifers, which are typically composed of sands and gravels. As water seeps down through an aquifer, it eventually encounters low permeability units such as clays or bedrock that restrict the water's vertical movement. Water collects on top of these low permeability areas and fills all the pore spaces between grains of sand and gravel. The top of this saturated zone is called the water table. Aquifers that are located below a protective low permeability zone of clay or rock are known as confined aquifers. Conversely, unconfined aquifers have no significant clays or silts to restrict the downward movement of water. Groundwater is typically accessed using wells.

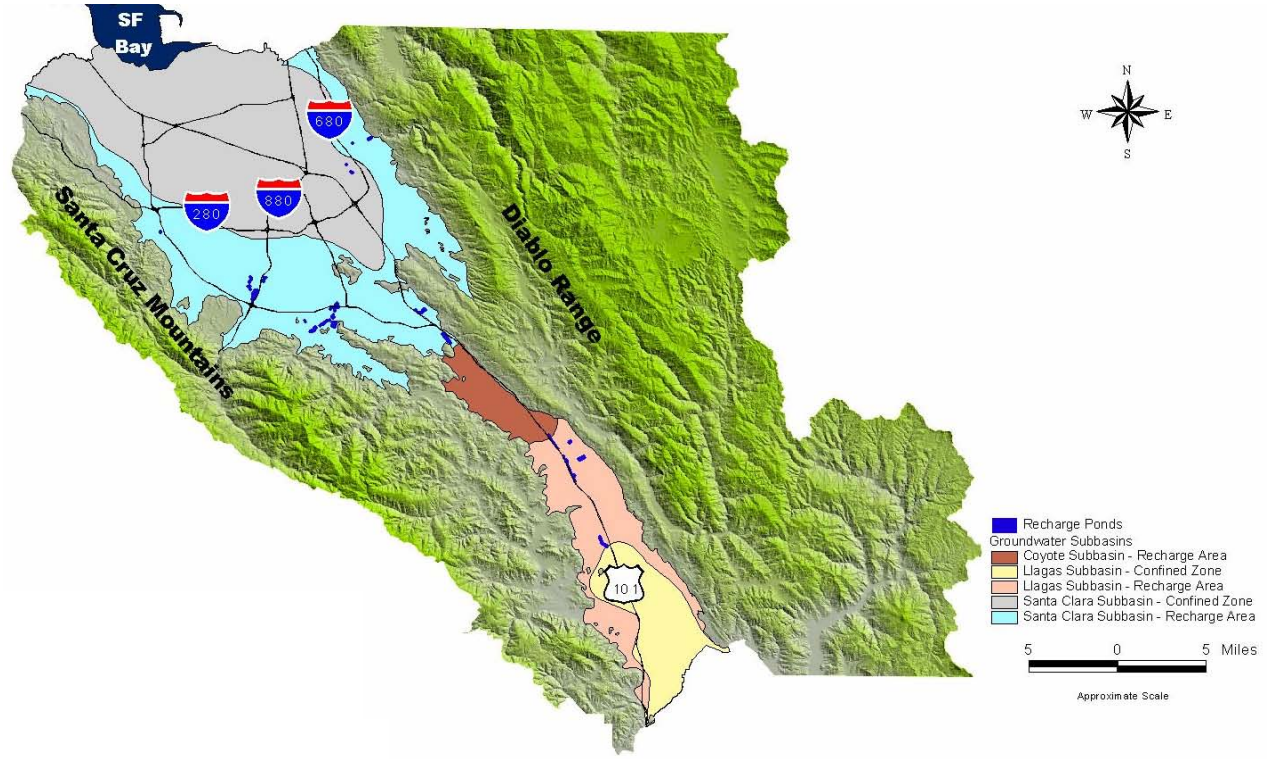


Why is Groundwater Important?

Throughout the world, the majority of available fresh water is in the form of groundwater. Over 98% of the world's total supply of drinkable water is groundwater. In Santa Clara County, nearly half of all water used comes from groundwater. Similar to the surface watershed, with its large basin draining to the San Francisco Bay and the subbasins draining to individual creeks and rivers, there are groundwater subbasins within the County. The local groundwater subbasins have vast storage capacity, estimated to be three times the capacity of all the District's 10 surface reservoirs combined. This allows the District to store excess water in local subbasins so that groundwater can be withdrawn when additional supplies are needed.

Where Does Groundwater Occur in Santa Clara County?

There are three interconnected groundwater subbasins within the County: the Santa Clara, Coyote, and Llagas Subbasins. Local aquifers are composed of sands, gravels, and silts that have washed down into the valley floor from the Santa Cruz Mountains and the Diablo Range. Thick clay units in both the Santa Clara and Llagas Subbasins separate confined and unconfined aquifers. The Coyote Subbasin is generally an unconfined aquifer.



How is Groundwater Replenished?

Groundwater recharge occurs when surface water percolates through soil and/or rock to replenish groundwater aquifers. Recharge areas are land areas that contribute water to an aquifer. Groundwater recharge occurs naturally through deep percolation of rainfall, seepage through streambeds, seepage from surrounding hills, subsurface flow from adjacent groundwater basins, and leakage from pipelines. Unconfined aquifers are replenished directly by the vertical infiltration of surface water, whereas confined aquifers are recharged by subsurface inflow from the unconfined areas at the edges of the subbasins.

Groundwater recharge is critical for ensuring a reliable water supply, storing water for use during droughts and shortages, and preventing land subsidence and salt water intrusion, which are very costly to the community. As natural recharge in Santa Clara County is not sufficient to replenish the amount of groundwater pumped annually, the District manages an active artificial recharge program in the unconfined aquifer areas.

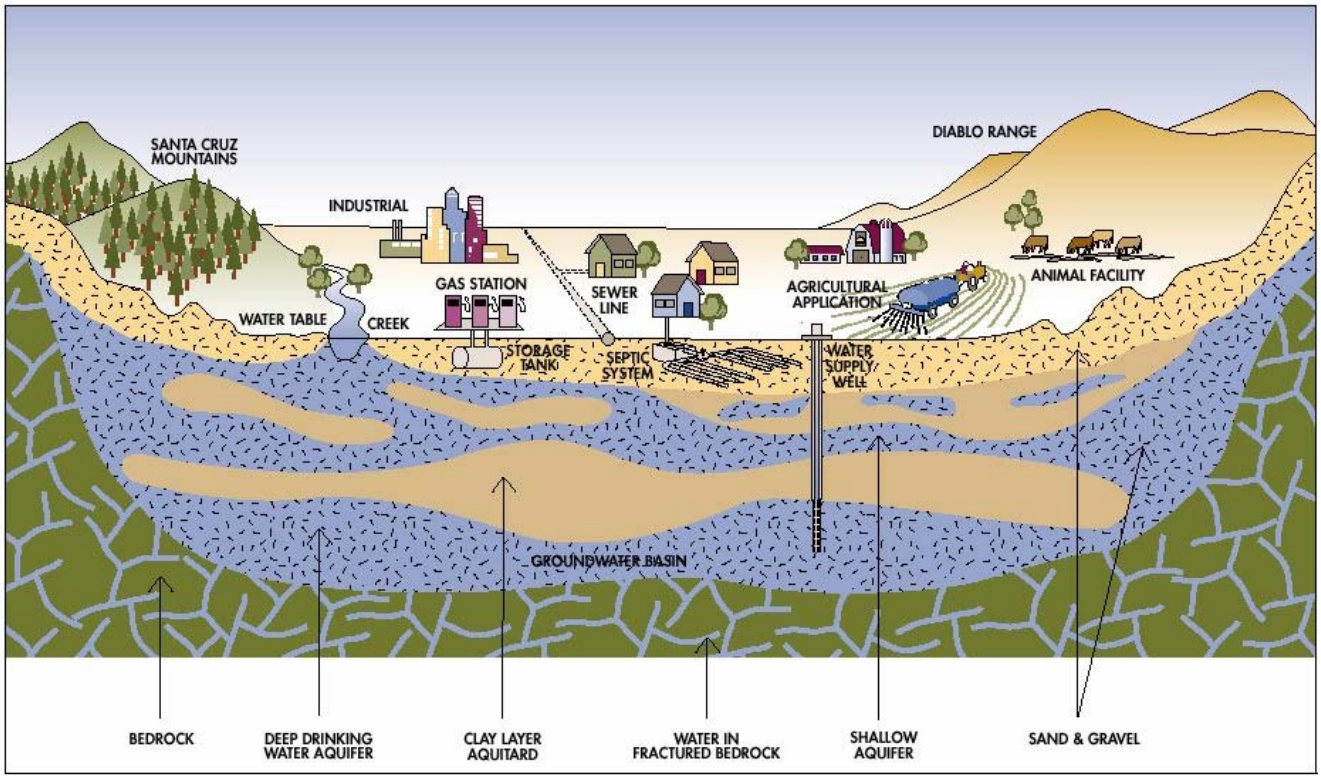
Groundwater Quality

Fact Sheet #16
Slides 6 and 61-64

What Controls Groundwater Quality?

Natural interactions between water, the atmosphere, rock minerals, and surface water control groundwater quality. Groundwater quality is affected by naturally occurring sources, such as iron and minerals, and by man-made compounds released into the environment. In highly urbanized areas such as the Bay Area, there are numerous threats to groundwater resulting from commercial, industrial, and residential development including urban runoff, industrial chemicals, and underground storage tanks. Residential and agricultural use of nitrogen-based fertilizers and pesticides can also impact groundwater quality. Examples of some land use activities with the potential to impact groundwater quality are discussed in an accompanying fact sheet.

The physical properties of an aquifer, such as thickness, rock or sediment type, and location, play a large part in determining whether contaminants from the land surface will reach the groundwater. The properties of the contaminant also have a role – some contaminants are easily dissolved in water and are highly mobile in groundwater. Prevention is the key to groundwater protection. Because groundwater moves slowly within the earth and many contaminants bind to aquifer sediments, restoration of a contaminated aquifer is difficult and may require years, decades, or even centuries.



Is Our Groundwater Safe?

Groundwater quality in Santa Clara County is generally very good. The water from most wells within the county meets drinking water standards without the need for treatment. The high quality of local groundwater is notable, especially when compared to other groundwater basins with similar water supply and land use stresses. Our good groundwater quality is due in part to favorable geologic conditions. Silt and clay deposits that overlie significant portions of our groundwater basins help to retard the movement of contaminants into deeper drinking water aquifers. However, because these low permeability units are not absolute barriers; we must remain vigilant in our protection of this important natural resource.

Drinking water aquifers continue to be threatened by chemical spills, leaking underground storage tanks, urban runoff, inefficient agricultural applications, and biological pathogens from sewers, septic systems, and animal facilities. These threats can be exacerbated by the presence of improperly constructed or abandoned wells, and wells located too close to a potential contaminant source such as a septic system. These wells act as vertical pathways, allowing chemicals and pathogens on the surface or in shallow aquifers to migrate into our deeper drinking water aquifers.

Who Protects Groundwater Quality?

The quality of groundwater can affect not only our health, but also the economy, and overall quality of life. Preserving the quality of water supplies is more cost-effective than treating contaminated or degraded water. Many agencies have a role in protecting the quality of our groundwater supply, as described below.

Agency	**What do they do?**
United States Environmental Protection Agency	• Develop and enforce regulations to implement environmental laws enacted by Congress • Research and set national standards for a variety of environmental programs • Oversee investigation, and remediation of Superfund sites
California Regional Water Quality Control Boards	• Develop water quality plans for groundwater and surface water • Enforce requirements on domestic, and industrial waste dischargers • Oversee investigation and remediation at contaminant release sites
California Department of Health Services	• Regulate public water systems • Establish drinking water standards

	• Oversee water recycling projects
Agency (continued)	**What do they do?**
California Department of Toxic Substances Control (Department of the California Environmental Protection Agency)	• Oversee investigation and remediation at contaminant release sites • Oversee and enforce hazardous waste handling, transport, storage, and disposal regulations • Evaluate soil, water, and air samples taken at sites, and develop new analytical methods
County of Santa Clara Department of Environmental Health	• Ensure wells serving fewer than 15 homes comply with drinking water regulations • Act as local oversight agency for leaking underground storage tank cleanup
Land use agencies (local cities and the County of Santa Clara)	• Review proposed development and redevelopment plans to ensure compliance with local regulations, and the protection of natural resources
Santa Clara Valley Water District	• Serve as groundwater management agency for Santa Clara County • Permit and inspect wells and other deep excavations • Monitor groundwater to assess current conditions and trends • Implement groundwater protection programs including outreach
Water retailers	• Ensure water delivered to homes and businesses meet applicable water quality standards

What is the Public's Role in Protecting Groundwater?

Keep in mind that we live on top of our drinking water. Everyone has a role in protecting our water supplies. Remember, ***if you don't want to drink it, don't put it on or in the ground!*** If you have a private well, create a zone of protection around your well and have your water tested annually.

Groundwater Vulnerability

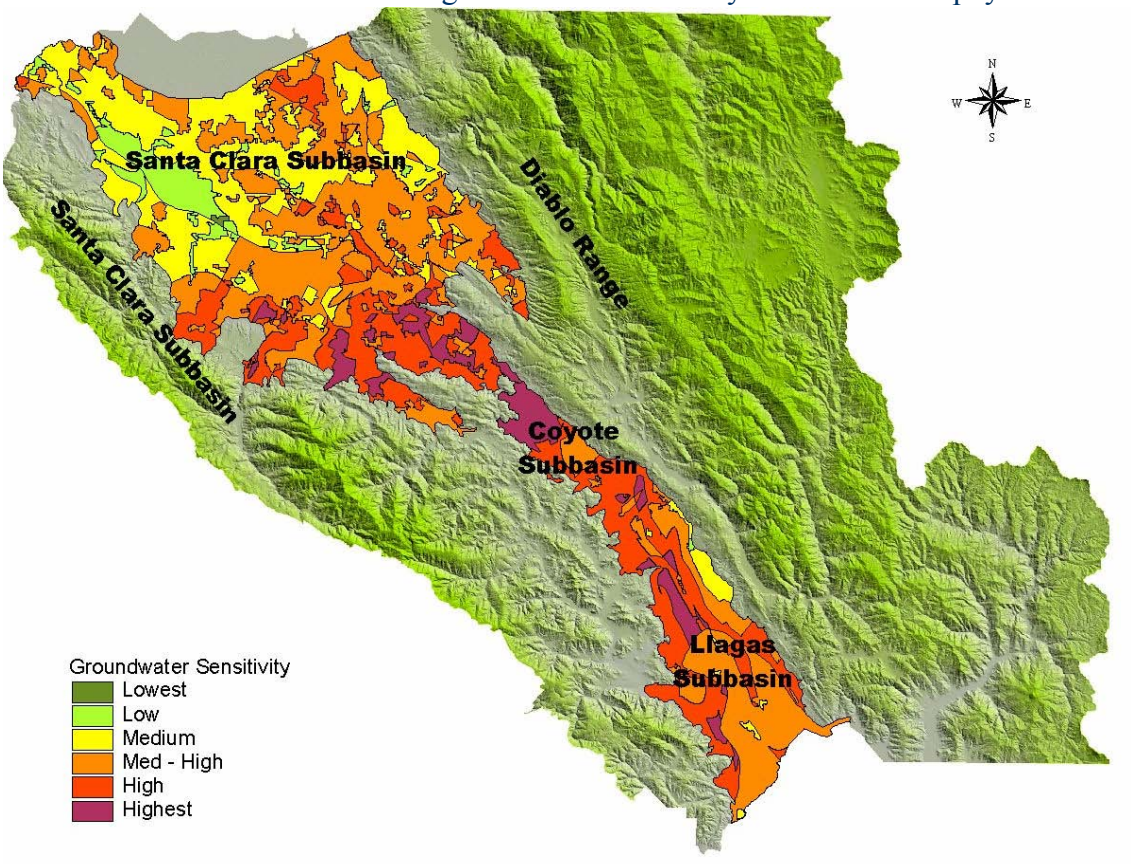
Fact Sheet #17
Slides 6 and 61-64

How Do We Determine the Vulnerability of Groundwater to Contamination?

The California Department of Health Services has developed the Drinking Water Source Assessment and Protection Program (Assessment Program) as a means for water suppliers to protect drinking water quality. As part of this program, water suppliers identify activities that have the potential to contaminate drinking water, determine the vulnerability of drinking water sources to contamination, and may implement source water protection programs.

Under the Drinking Water Source Assessment and Protection Program, once the possible contaminating activities have been identified, a vulnerability analysis is conducted to determine the types of activities to which the drinking water source is most vulnerable. The analysis considers the ability of natural geologic materials to prevent the movement of contaminants and considers the type and proximity of activities that could release contaminants. Although the Assessment Program is effective in identifying potentially contaminating activities and creating a zone of protection around water supply wells, it is generally limited to areas in close proximity to a well.

In 1999, the District completed a basin-wide evaluation of the sensitivity of groundwater to contamination using the United States Environmental Protection Agency's DRASTIC method, which evaluates how well an aquifer is protected from surface contamination based on its intrinsic or hydrogeologic characteristics. This method determines groundwater sensitivity based on seven physical properties that affect water and contaminant movement to and within aquifers: Depth to water, net Recharge, Aquifer media, Soil media, Topography, Impact of the vadose zone, and hydraulic Conductivity. These seven factors form the acronym DRASTIC. The map below shows the relative sensitivity of groundwater to contamination using the DRASTIC method.



The District is working to develop an updated basin-wide analysis of groundwater vulnerability, which considers both inherent aquifer sensitivity and the potentially contaminating activities occurring at the land surface. This analysis will highlight areas where additional groundwater protection efforts are needed and will be useful to land use planners reviewing development proposals.

High Risk Land Use Activities

Activities that threaten groundwater quality include fuel storage, dry cleaning, solvent storage, auto repair, improperly maintained septic systems, and inefficient agricultural practices. Chemicals can leach directly to groundwater through spills, or they can be dissolved in infiltrating water that reaches groundwater. Abandoned wells and other vertical conduits like dry wells can also provide a direct pathway for contaminants to travel from the surface or shallow aquifers into drinking water aquifers. In Santa Clara County, land use ranges from highly urban in the north to semi-rural in much of the south, so not only are the threats to groundwater quality numerous, they are also varied.

Identifying Potentially Contaminating Activities

Developing an inventory of potentially contaminating activities can:

- Identify past, present, and proposed activities, including transporting, storing, manufacturing, producing, using, or disposing of potential contaminants, that may pose a threat to drinking water.
- Provide information on the proximity of these activities to the drinking water source.
- Provide an effective means of educating the local public about potential problems.

Potentially contaminating activities are ranked from very high risk to low risk based on the general nature of activities and the contaminants associated with them, not on facility-specific management practices. Examples of potentially contaminating activities with "very high" and "high" potential for drinking water contamination are shown in the table below.

Very high potential risk	**High potential risk**
• Automobile-related activities • Gas stations • Chemical/petroleum processing/storage • Dry cleaners • Metal plating/finishing/fabricating • Plastics/synthetics producers • Airports – maintenance/fueling areas • Landfills/dumps • Septic systems • Wastewater treatment plants • Animal feeding operations • Underground storage tanks • Injection wells/dry wells/sumps	• Electrical/electronic manufacturing • Fleet/trucking/bus terminals • Home manufacturing • Machine shops • Photo processing • Sewer collection systems • Illegal activities/unauthorized dumping • Grazing • Pesticide/fertilizer/petroleum storage • Agricultural drainage • Wells – agricultural, irrigation • NPDES/WDR permitted discharges • Non-regulated tanks