

# COMMUNITY WATER DIALOGUE

## FAQ | PAJARO VALLEY WATER SUPPLY AND AQUIFER OVERDRAFT



### WHAT IS “GROUNDWATER” AND HOW DOES IT RELATE TO AN “AQUIFER”?

Groundwater is subsurface water that occurs below the water table within geologic formations that are saturated (all pore spaces filled with water rather than air). Groundwater moves in unpredictable ways in a type of capillary action. Most groundwater exists in tiny pore spaces between grains of rock or sediment that make up aquifers, which are geologic formations that can store and transmit water in usable quantities. There may be several aquifers at different depths below a piece of land.

### HOW ARE THE AQUIFERS IN THE PAJARO VALLEY STRUCTURED?

There are multiple aquifers in the Pajaro Valley, the Alluvial, Aromas sand, and Purisima. Groundwater is pumped from either the Aromas or the Purisima aquifer, with the Purisima at greater depth. See Figure 1.

The “Aromas Sands” formation lies atop the Purisima formation. The Aromas allows water to percolate or move through it more easily (sandier). Near the mouth of the Pajaro River, the Purisima formation can be found at approximately 800 to 900 feet below the surface. Like the Aromas Sands formation, the Purisima formation rises toward the north; its topmost layers become more shallow, and the formation is exposed at the surface in the Soquel-Aptos area.

Although the formation is water bearing to the north, few water wells have tapped the Purisima formation in the Pajaro Valley because the overlying formations have yielded water of good quality. Beneath the Pajaro Valley, the Purisima formation receives recharge both from the overlying Aromas sands and from areas to the north of the Pajaro Valley.

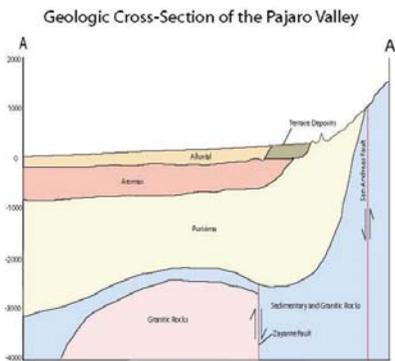


FIGURE 1

### WHAT IS AQUIFER OVERDRAFT?

This is a condition in which the amount of water pumped from the aquifer over the long term exceeds the sustainable yield of the basin. In addition, overdraft can occur even if there is no net imbalance between annual inflows and outflows, if pumpage is distributed in such a way as to lead to problems (for example, being concentrated along the coast). Overdraft conditions along the coast can lead to saltwater intrusion.

### HOW DO WE KNOW THE PAJARO VALLEY AQUIFERS ARE BEING OVERDRAFTED?

The aquifer in the Pajaro Valley provides more than 90 percent of the water used by residents, businesses and farmers.

The PVWMA measures groundwater pumping at all wells in the district. In the past decade, pumpage has varied from 52,000-62,000 acre-feet per year, depending on the amount of rainfall. See Figure 2. Nevertheless, the total amount of water pumped has been trending upwards.

The US Geological Survey recently completed a new model of the basin, incorporating all available data. According to this model, the aquifer is being overdrawn by 12,300 acre feet per year on average. In the fall of 2010, roughly 50% of the Pajaro Valley basin had groundwater levels at or below sea level. See Figure 2.

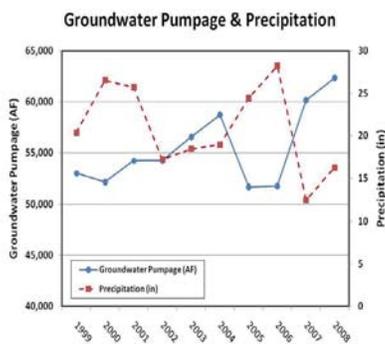


FIGURE 2

### WHO MONITORS AND MANAGES THE AQUIFER OVERDRAFT IN THE PAJARO VALLEY?

In 1980, after over a century of pumping, the groundwater basin was designated by the California Department of Water Resources (DWR) as one of eleven California basins with “critical conditions of overdraft.” In 1984, the Pajaro Valley Water Management Agency (PVWMA) was created legislatively by the state to manage existing and supplemental water supplies in order to prevent further increase in, and to accomplish continuing reduction of, long-term overdraft of groundwater.

### HOW MUCH OF A ROLE DOES AGRICULTURE PLAY IN THE AQUIFER OVERDRAFT SITUATION?

Currently, about 84% of the total water used in the valley is used by agriculture, and almost all of that demand is supplied by groundwater. Therefore the largest potential water savings are from reduced agricultural use.

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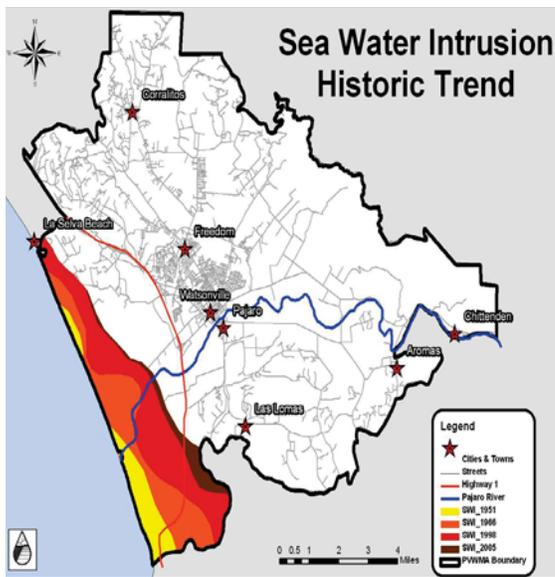


FIGURE 3

### WHAT IS SALTWATER INTRUSION AND WHAT CAUSES IT?

Saltwater intrusion is when groundwater levels are below sea level due to overdraft conditions within the groundwater basin and create a landward gradient allowing seawater to intrude into the freshwater aquifer. Inland water levels equal to sea level are not sufficient to prevent intrusion because seawater is denser than groundwater and can still migrate inland even if water levels are equal.

### IS THERE EVIDENCE OF SALTWATER INTRUSION IN THE PAJARO VALLEY?

Saltwater intrusion into the valley's aquifers was first documented in the 1950s. It is measured by collecting water samples from wells and calculating the amount of chlorides. In the map prepared by the PVWMA, the yellow area along the coast shows the extent of saltwater intrusion in 1951, the orange area its extent by 1966, the red area by 1998, and the brown area by 2005. As one can see from the map, the saltwater has moved several miles inland, past Hwy 1 down in the Springfield area. See Figure 3.

According to PVWMA, long-term rates of seawater intrusion in 2005 averaged about 200 feet per year of movement eastwards, or 10,000 additional acre-feet per year, in the Pajaro Valley. In 1982, they estimated the saltwater at 50,000 acre-feet and in 1997 at 200,000 acre-feet.

### HOW DOES SALTWATER INTRUSION IMPACT AGRICULTURE?

Because of saltwater intrusion, many wells along the coast are contaminated with saltwater and not viable for agriculture use, although this is very uneven due to the unpredictable ways that groundwater moves through the aquifers. Many agricultural users along the coast now rely on recycled water from Watsonville obtained through the Coastal Distribution System.

### WHAT HAS THE PVWMA DONE TO ADDRESS THE PROBLEM IN THE PAJARO VALLEY?

The PVWMA partnered with the City of Watsonville to introduce the Watsonville Area Water Recycling Project as part of the agency's long-term plan to meet the water needs of the region. This recycling project provided nearly a quarter of the water needed to halt seawater intrusion on coastal lands and is a cost-effective way to maximize local resources before turning to other supplemental sources. The recycled water is distributed through the Coastal distribution system and has been delivering water since April of 2009. See Figure 4.

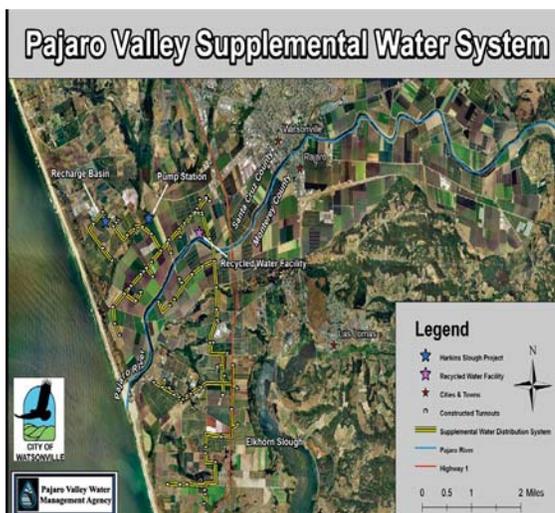


FIGURE 4

In addition, the PVWMA is working with partners on the Harkins Slough managed aquifer recharge project which adds additional water each year into the aquifer.

### WHAT ARE ADDITIONAL PROPOSALS TO SOLVE THE OVERDRAFT?

PVWMA recently drafted the 2012 Basin Management Plan to provide an updated framework of practical projects and programs that contribute to the efficient and economical management of existing and supplemental water supplies. The BMP Committee, a group of stakeholders in the community provided project recommendations to the agency to prevent further increases in and continued reduction of long-term overdraft and to ensure sufficient water supplies for present and projected needs in the Pajaro Valley.

There are numerous recharge projects moving forward in the Pajaro Valley. Developed through partnerships with landowners, growers, UCSC, NRCS, RCDSCC and others, these recharge basins infiltrate water back into the aquifer through capturing stormwater runoff or management of water inputs. See Figure 5.

Community Water Dialogue is a group of stakeholders in the Pajaro Valley focused on a solutions based approach to collaborative action to address the water issue. See next page for more information.

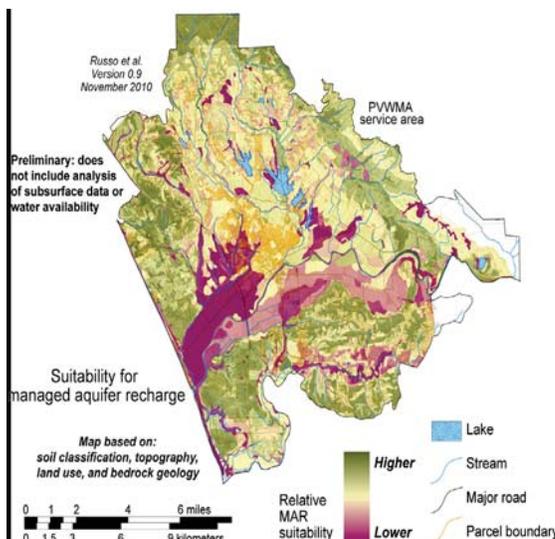


FIGURE 5

# COMMUNITY WATER DIALOGUE

## FAQ | PAJARO VALLEY COMMUNITY WATER DIALOGUE

### WHAT IS THE PAJARO VALLEY COMMUNITY WATER DIALOGUE?

In response to the serious aquifer overdraft issue, the Community Water Dialogue (CWD) was created in July 2010 and has included a wide variety of stakeholders, including landowners, growers, academia, nonprofits, rural residents, government representatives, and environmental leaders. Fifty to sixty members of this group have met quarterly since its formation. The solutions-based approach of the CWD has had the effect of uniting people around this common challenge and all of its members agree to the fundamental principles of the effort:

- 1) A commitment to protect the Pajaro Valley as an important agricultural resource
- 2) Recognition that the solution will not be an importation pipeline
- 3) A willingness to pursue diverse strategies which entail costs and sacrifices in order to bring our aquifer into balance

### WHAT IS THE PURPOSE OF THE PAJARO VALLEY COMMUNITY WATER DIALOGUE?

The primary goal of the CWD is to address the imbalance of water supply and demand through individual and collaborative action, helping to ensure agricultural viability in the Pajaro Valley. To achieve this goal the CWD's structure is broken into 6 different subgroups; a central Planning Committee, a Communications Committee, a Land Management and Irrigation Best Practices working group, an Aquifer Recharge working group, a Big Projects working group, and a Money and Metrics working group. All subgroups ultimately communicate with the whole community at the quarterly meetings.

### WHAT HAS THE PAJARO VALLEY COMMUNITY WATER DIALOGUE ACCOMPLISHED?

In the past two years, the Community Water Dialogue has led many efforts to address the water supply and aquifer overdraft issue in the Pajaro Valley. These include:

1. Fostering Collaboration and Ensuring Broad Representation. From the beginning, the CWD has had consistent involvement and support of 50-60 people from a broad variety of stakeholders.
2. Reorienting the Pajaro Valley Water Management Agency (PWWMA). The PWWMA has turned to the CWD as a collaborator and forum for developing solutions. Input and participation from CWD members on the Ad Hoc Basin Management Planning (BMP) Committee has assisted PWWMA's long-term planning process.
3. Implementing Successful Collaborative Projects. The CWD has launched collaborative projects to reduce water use through conservation and efficiency and to increase aquifer recharge:

- Wireless Irrigation Monitoring Network

Through the Land Management and Irrigation Best Practices working group the CWD developed the Wireless Irrigation Network effort (Project WIN) to help growers improve irrigation efficiency. This project involves a network of communication towers set up to transfer data from growers' soil tension probes to provide them with real time information for improved irrigation decision-making. Early adopters are seeing 15-30% water savings with little or no yield loss. Creating this central network of towers drastically reduces the investment required by growers to utilize the probes, encouraging more widespread adoption of this technology.

- Managed Aquifer Recharge

CWD partners have just completed construction on the first small-scale "managed aquifer recharge" (MAR) pilot project designed to improve water supply. The participants included Driscoll's Berries and Reiter Affiliated Companies, along with the Resource Conservation District of Santa Cruz County (RCDSCC), USDA - NRCS, the University of California at Santa Cruz (UCSC), California State University Monterey Bay (CSUMB), and landowners. Location-specific strategies were tested for routing runoff, minimizing siltation, cycling nutrients, and achieving other water quality benefits as excess surface flow (rainfall) is percolated into underlying aquifers. Monitoring and quantification of improvements (amount of water put into aquifers, benefits to water quality) will be essential components of these projects.

**TO GET INVOLVED: email [pwwatercommitment@yahoo.com](mailto:pwwatercommitment@yahoo.com)**

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## RESOURCES

ACTION PAJARO VALLEY  
[www.pajarowatershed.org](http://www.pajarowatershed.org)

FARM BUREAUS  
[www.sccfb.com](http://www.sccfb.com)  
[www.montereycountyfarmbureau.org](http://www.montereycountyfarmbureau.org)

UC SANTA CRUZ RECHARGE PROJECT  
[es.ucsc.edu/~afisher/RechargeInitiative/index.htm](http://es.ucsc.edu/~afisher/RechargeInitiative/index.htm)

RESOURCE CONSERVATION DISTRICTS  
[www.rcdsantacruz.org](http://www.rcdsantacruz.org)  
[www.rcdmonterey.org](http://www.rcdmonterey.org)

PWWMA  
[www.pwwma.dst.ca.us](http://www.pwwma.dst.ca.us)