

## What is the Recycled Water Irrigation and Groundwater Study?

The Santa Clara Valley Water District initiated this multi-year study in 2007 to advance water district policies of aggressively protecting groundwater and supporting recycled water development in Santa Clara County.

The Santa Clara Valley has relied on groundwater for drinking water, businesses and agriculture needs since 1854. Groundwater is water found in aquifers, geological formations below the ground surface. The Santa Clara Valley overlies an aquifer system within the county.

The water district actively manages groundwater to augment the water supply and to protect it from contamination or threats that would jeopardize this essential local resource.

The goal of this study was to evaluate the potential effects of recycled water used for irrigation on groundwater quality and to identify best management practices to protect groundwater quality.

The study included laboratory testing of soils irrigated with recycled water and an 18-month field study at a site using recycled water for irrigation. More than 40 water quality constituents were tested in both the recycled water used for irrigation and in shallow groundwater at the study site. The report was completed in August 2011 and is available on the water district website.

## Why did the Santa Clara Valley Water District conduct this study?

The water district initiated this study to help determine how to expand the use of recycled water while protecting groundwater quality. The expansion of recycled water in Santa Clara County helps provide a reliable and sustainable water supply. Water demands are projected to increase in the next 20 years. Many regions of California are increasingly interested in developing recycled water use as it is a locally controlled, drought proof water supply.



*Recycled water has been used for irrigation in Santa Clara County for more than two decades.*

In conducting this study, the District took a proactive and careful approach to the expanded use of recycled water to ensure groundwater quality is maintained. This study is just one part of a broader district program to monitor, manage and protect groundwater supplies.

## What were the study findings?

In general, the study found that some areas of the groundwater basin are more susceptible to changes in water quality if recycled water is used for irrigation. These include areas where groundwater is shallow or areas lacking significant clay deposits.

During the field study, there was no significant change in groundwater quality observed following irrigation with recycled water for most constituents monitored. However, some changes in shallow groundwater quality were noted including the presence of a few constituents not previously found in shallow groundwater at the site. A common byproduct of the water disinfection process, N-Nitrosodimethylamine (NDMA), was detected in groundwater 30 feet below the surface at trace levels, 3 to 4 parts per trillion (ppt) during the study. Subsequent sampling at the site has indicated NDMA levels up to 8.5 ppt. The shallow groundwater tested at the field study site is not used for drinking purposes. Most drinking water wells draw water from more than 100 feet below the ground surface, whereas groundwater in this study was measured at 30 feet.

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## What is NDMA?

NDMA is a semivolatile organic chemical that is listed as a priority pollutant by the U.S. Environmental Protection Agency (EPA). NDMA is no longer manufactured or used in pure form, except for research. NDMA was formerly used in the production of liquid rocket fuel and a variety of other industrial applications. NDMA is an unintended byproduct of water treatment. It has also been reported as present in some food, beverages, prescription drugs, and tobacco smoke.

The EPA has classified NDMA as a probable human carcinogen. NDMA is highly mobile in soil, with the potential to leach into groundwater.

## What is the safe level of NDMA in drinking water?

There is no state or federal standard for NDMA in drinking water. California has a public health goal of 3 ppt for NDMA in drinking water. NDMA levels above 10 ppt in drinking water sources must be reported to local governing bodies and the state Department of Public Health (DPH). When NDMA reaches 300 ppt or greater, DPH recommends removing the supply as a drinking water source.

## Does the water district test for NDMA?

NDMA is not a regulated constituent in drinking water, and therefore, monitoring is not required. Nevertheless, the district has sampled its treated water for NDMA on multiple occasions since 1999 and it has not been detected. In 2010, the district established an annual sampling program for NDMA in treated water.

Available data for Santa Clara County indicates that NDMA is rarely detected in deep drinking water

aquifers or treated surface water. This includes data from water suppliers and data collected through special studies. All known detections have been less than 10 ppt, which is the DPH notification level.

At this time, the district's regional groundwater monitoring program does not routinely test for NDMA. Data from water suppliers and special studies by state agencies over the span of the last 27 years have shown only one occurrence in deep drinking water aquifers where most groundwater is extracted. The groundwater monitoring program is reviewed on a regular basis and is updated as needed to effectively assess groundwater quality.

## What is the water district doing to address the study findings?

The results of this study suggest that best management practices and/or changes in recycled water treatment may be warranted when irrigating with recycled water over sensitive parts of the groundwater basin. The district is working with recycled water producers on next steps for technical work, monitoring, and other actions needed to protect groundwater quality.

The district is currently constructing an advanced water treatment facility which will improve recycled water quality for the San Jose/Santa Clara area. Advanced treatment produces highly purified water that will be blended with existing recycled water to expand irrigation and industrial uses. The new recycled water blend will have lower levels of NDMA and other constituents and will improve recycled water quality for irrigation and other uses. This will help reduce the potential for impacts to groundwater quality.

The water district is committed to providing safe, clean and reliable sources of water and will continue to study and invest in robust treatment technologies that can reduce or remove contaminants.

## Contact us

For more information, contact **Vanessa De La Piedra** at **(408) 265-2607, ext. 2788**, or visit our website at [www.valleywater.org](http://www.valleywater.org) and use our **Access Valley Water** customer request and information system. With three easy steps, you can use this service to find out the latest information on the project or to submit questions, complaints or compliments directly to a district staff person. On our website, you can also subscribe to our monthly newsletter, Valley Water e-News.

