



Las Virgenes Municipal Water District...

providing potable water, recycled water,
wastewater treatment and biosolids composting.



4232 Las Virgenes Rd, Calabasas, CA 91302 ~ (818) 251-2200 ~ LVMWD.com

Commitment to Service

Every day, the employees and leadership at Las Virgenes Municipal Water District (LVMWD) ensure the delivery of safe, clean, dependable water and environmentally protective wastewater treatment services in a cost-effective manner. LVMWD provides services to the cities of Agoura Hills, Calabasas, Hidden Hills, Westlake Village and neighboring unincorporated areas of Los Angeles County.

Taking nature's lead, LVMWD works to make the most of water resources by bringing water "full circle." After potable water is delivered to your home and used, the wastewater is collected and extensively treated to be beneficially used as recycled water for irrigation; the biosolids are then processed into "Class A - Exceptional Quality" garden compost.

Services Provided

- Potable Water**
- Wastewater Treatment**
- Recycled Water**
- Biosolids Composting**

LVMWD's service area has no local source of drinking water; all supplies must be imported from Northern California through Metropolitan Water District of Southern California (MWD), one of the world's largest water wholesalers. Originating in the High Sierras, water is transported more than 400 miles through the State Water Project's California Aqueduct entering the LVMWD service area at the east end of Calabasas. Water is then distributed throughout the District by more than 400 miles of water pipe. Reliable water service in LVMWD's mountainous area is challenging, requiring 25 storage tanks and 24 pump stations to serve District customers.

About 20 percent of the potable water served to LVMWD customers is reused in our community to irrigate highway greenery, golf courses, school grounds and other public and commercial landscapes. This recycled water is produced through extensive treatment of wastewater and is delivered through 68 miles of water lines, three storage tanks, two reservoirs and four pumping stations.

LVMWD provides wastewater (sewer) services to most residents throughout its service area, with a system of 57 miles of trunk sewer lines (from 8-inches to 48-inches in diameter) and two lift stations which pump wastewater over the mountains to the treatment facility.

The final step in LVMWD's "full circle" of water reuse is biosolids composting. Solids remaining from the water reclamation process are treated to become a rich soil amendment. Similar to the product sold at garden stores, this high-grade soil amendment is distributed free for home use, each Saturday morning.

LVMWD Facts and Figures

Established

1958

Governance

Five member board of directors, publicly elected by geographic division

Service area

122 square miles

Population Served

Approximately 75,000 residents of Agoura Hills, Calabasas, Hidden Hills, Westlake Village, and neighboring unincorporated Los Angeles County are served potable water. In addition, the Las Virgenes-Triunfo Joint Powers Authority (JPA) serves some 30,000 customers with sanitation services.

Customer connections

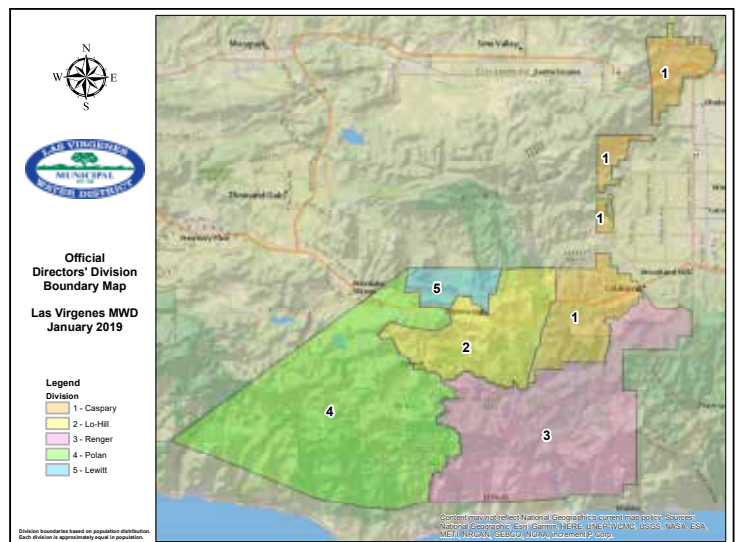
Potable Water	
Residential	18,753
Commercial	842
Recycled Water	658

Water served 2018-19

Potable	19,294 acre feet
Recycled	4,868 acre feet

Budget 2019-2020

\$85.2 million



Facility Quick Facts

Las Virgenes Reservoir	<p>Purpose Primarily used to meet peak summer water demand. Can be used as a back-up water supply for emergency or planned service interruptions by MWD, providing up to three months of water for LVMWD customers.</p> <p>Location City of Westlake Village, Los Angeles County.</p> <p>Size Stores nearly three billion gallons of water. Surface area – approximately 160 acres. LVMWD owns nearly 360 acres of watershed land surrounding the reservoir.</p>	<p>History Designed and built from 1970 to 1972, filled by 1974.</p> <p>Features Created by two earthen dams built on a bedrock foundation. Main dam is 160 feet high, 2,000 feet long, 20 feet wide at the top, and 750 feet wide at the bottom. Saddle dam is 50 feet high, 750 feet long, 20 feet wide at the top, and 425 feet wide at the bottom. Inlet/outlet tower: A single concrete structure, with five inlet/outlet valves set at different depths. These valves allow the plant operator to draw water from varying levels in the reservoir.</p>
Westlake Filtration Plant	<p>Purpose Necessary to disinfect and filter water from Las Virgenes Reservoir before it is served to customers.</p> <p>Location At the Las Virgenes Reservoir in Westlake Village.</p> <p>History Completed in 1990 at a cost of \$9 million to meet federal and state regulations for drinking water quality.</p>	<p>Features A 20,000-square-foot facility capable of disinfecting and filtering up to 18 million gallons per day (mgd). Uses 12 diatomaceous earth (DE) filters as the primary treatment process. Disinfection is accomplished using chloramination. 5-million gallon Torchwood Tank</p>
Tapia Water Reclamation Facility	<p>Purpose Treats wastewater, transforming it into high-quality recycled water. Enables beneficial reuse of limited state water resources while reducing dependence on imported water.</p> <p>Location Along Malibu Canyon Road in unincorporated Los Angeles County.</p> <p>History Constructed at a low point in the Malibu Creek watershed, allowing wastewater to flow by gravity to the treatment facility, reducing the need for pumps, infrastructure and energy use. Built in 1965 with a capacity of 0.5 million gallons per day (mgd). Expanded in 1968 to a capacity of 2 mgd; 1972 to a capacity of 4 mgd; 1984 to a capacity of 8 mgd; 1986 to</p>	<p>a capacity of 10 mgd; the current capacity of 16 mgd. Began water recycling in 1972.</p> <p>Features Tapia currently treats an average of 9.5 million gallons of wastewater per day. Six aeration tanks, each 160 feet by 30 feet and 15 feet deep, with 540 air injectors capable of adding 2,100 cubic feet of air/minute. Twelve filters for tertiary treatment, each with a surface area of 253 square feet and a four-foot-deep bed of anthracite coal over one foot of gravel. An on-site, state-certified water quality laboratory, which ensures that recycled water leaving Tapia meets all state and federal health and safety requirements. The laboratory also monitors water quality in Malibu Creek as part of LVMWD's commitment to watershed stewardship.</p>
Rancho Composting Facility	<p>Purpose Transform biosolid waste into U.S. EPA "Class A - Exceptional Quality" compost. Provide long-term, environmentally-beneficial disposal for biosolids removed from wastewater during treatment at Tapia.</p> <p>Location Las Virgenes / Lost Hills Road intersection in Calabasas.</p> <p>History Began operation in November 1994, as the first in-vessel composting facility in Los Angeles County.</p> <p>Capacity Each year the compost facility saves enough landfill space to fill a football field to a height of one story.</p>	<p>Processes about 120,000 gallons of biosolids per day. Produces almost 11,000 cubic yards of compost annually. Disposes nearly all solids separated from wastewater at the Tapia Water Reclamation Facility.</p> <p>Features One of the most advanced, automated biosolids composting facilities in the world. Enclosed processing for efficient odor control. Three anaerobic digesters; each 80 feet in diameter and 50 feet high. Two centrifuges, each with a 250-gallon-per-minute capacity for dewatering. Half acre biofilter, which uses natural processes to control odors.</p>



Las Virgenes Reservoir provides LVMWD customers with an “insurance policy” against emergencies, temporary supply interruptions and water shortages.

Located in the hills just south of Westlake Village, the reservoir can hold a three-month supply of treated drinking water for customers. The total capacity is approximately 9,500 acre-feet. (An acre-foot equals 325,851 gallons, about enough water to serve two average families in and around their homes for one year.) The reservoir was created to assure reliable drinking water delivery to LVMWD customers during peak seasonal demand. The reservoir is also a “back-up” during scheduled shutdowns for maintenance, in times of drought, or in the event of earthquakes and other emergencies. Las Virgenes Reservoir played an important role after the 1994 Northridge Earthquake, when service from MWD was interrupted. Within hours, water

from the reservoir was flowing while residents in nearby communities were without water for as long as a week.

With only one source of drinking water serving our arid area, a local storage facility is critical. All drinking water served to LVMWD customers is imported because local water supplies are scarce and of poor quality. Supplies are purchased from the Metropolitan Water District of Southern California (MWD). This water originates as snowpack in the High Sierras and is transported more than 400 miles

through the State Water Project, which is owned and operated by the Department of Water Resources.

Water delivered and stored in Las Virgenes Reservoir is treated potable water from MWD. To help protect water quality, LVMWD owns 360 acres of land immediately surrounding the reservoir.

Water is drawn from the reservoir through a concrete tower with inlet and outlet valves located at five different depths, allowing operators to select the highest quality water to be pumped into the adjacent treatment plant.





Westlake Filtration Plant adds a layer of safety to the water served from Las Virgenes Reservoir.

Potable water stored in the reservoir has been treated extensively by MWD. However, once potable water has been in an open reservoir, whether previously treated or not, federal and state regulations require additional disinfection and filtration before it is served to customers.

Water from the reservoir is pumped to a concrete tank, called a raw water reservoir. It is then treated by 12 filtration units using diatomaceous earth (or DE) as a filter media. DE consists of microscopic plant skeletons called “diatoms.” Each diatom has hundreds of jagged edges that interlock with other diatoms to form a tightly woven filter capable of “catching” extremely small materials. Algae, which can cause taste and odor problems, is the primary material removed from reservoir water. The filtration plant’s process is mostly automated, but it can be manually operated if necessary.

Disinfection is accomplished using chloramines, which maintain the safety and quality of water as it travels

through the distribution system. Chloramine disinfection is preferred for water with organic materials present because it does not produce potentially harmful disinfection by-products.

Westlake Filtration Plant can process as much as 18 million gallons of drinking water per day. Water processed at the plant is tested regularly and consistently meets or surpasses all state and federal drinking water standards.

Westlake Filtration Plant only operates when water is drawn from the reservoir in the summer months, when there are planned maintenance shutdowns by MWD or in the event of emergencies. The plant, however, is always in “standby mode” and can be online within hours. While in operation, the filtration plant is controlled by highly skilled treatment plant operators and a complex automated monitoring system, to ensure safe and consistent water quality.

Filtration tanks use DE as filter media. These 12 filters can process up to 18 mgd.





Tapia Water Reclamation Facility ~ Recycling Wastewater for Irrigation

Tapia Water Reclamation Facility (TWRf) applies state-of-the-art technology to transform wastewater into high-quality recycled water that is used to irrigate public and commercial landscaping such as golf courses, school grounds, highway medians and parks.

Wastewater is potable water that has been used in a home or business. The water that goes down a drain enters the wastewater collection (sewer) system. The wastewater travels through a series of collection pipes in the LVMWD service area, traveling mainly by gravity to the TWRf.

Wastewater entering TWRf is 99% water and 1% solids and inert materials. The first step is to remove the inert materials. Larger items, like rags, loose change and plastics are removed by passing the waste stream through a vertical slatted bar screen. Finer materials (egg shells and coffee grounds) are removed in a grit chamber. Here, the flow is slowed and air is injected to keep small, organic particles suspended while the heavier, inert materials fall to the bottom. The items removed from the wastewater to this point go to a landfill.

The wastewater is then pumped to the primary sedimentation tanks. Primary treatment is a separation process using gravity, where the solids in the wastewater are allowed to settle to the bottom of the tank. Oil and grease, which are lighter than water, float to the surface. Large paddles skim the water surface and the bottom of the tanks to remove these materials, which are pumped to the Rancho Las Virgenes Composting Facility.

Secondary treatment is a biological process. The wastewater flows to aeration tanks to be “cleaned up” by beneficial microorganisms. This is similar to the natural water-purification cycle, but is accomplished in less time. As in nature, microorganisms remove contaminants and clean the water as they feed, grow and multiply. Oxygen is added by injecting air into the tanks, which helps speed the process.

The partially treated wastewater then flows to the secondary sedimentation tanks, where the microorganisms are allowed to settle out. They are collected and returned to the aeration tanks, to work on another batch of wastewater. Meanwhile, the liquid portion goes on to the next step - tertiary treatment.

Tertiary treatment is a filtration process designed to remove any remaining extremely small particles. Chemicals are added to “flocculate”, or clump the particles together, making them easier to filter out. The water is then disinfected with sodium hypochlorate. After sufficient “contact time” the sodium hypochlorate is “neutralized”.

TWRf has a capacity to process up to 16 million gallons of wastewater per day, but currently averages about eight million.

By recycling wastewater to California’s stringent Title 22 standards, TWRf provides an additional “source” of water to local communities. About 20 percent of all the water delivered by LVMWD has been recycled for irrigation use. During the hot summer months, irrigation consumes all the recycled water TWRf produces, with the added benefit of reducing the demand for potable water.

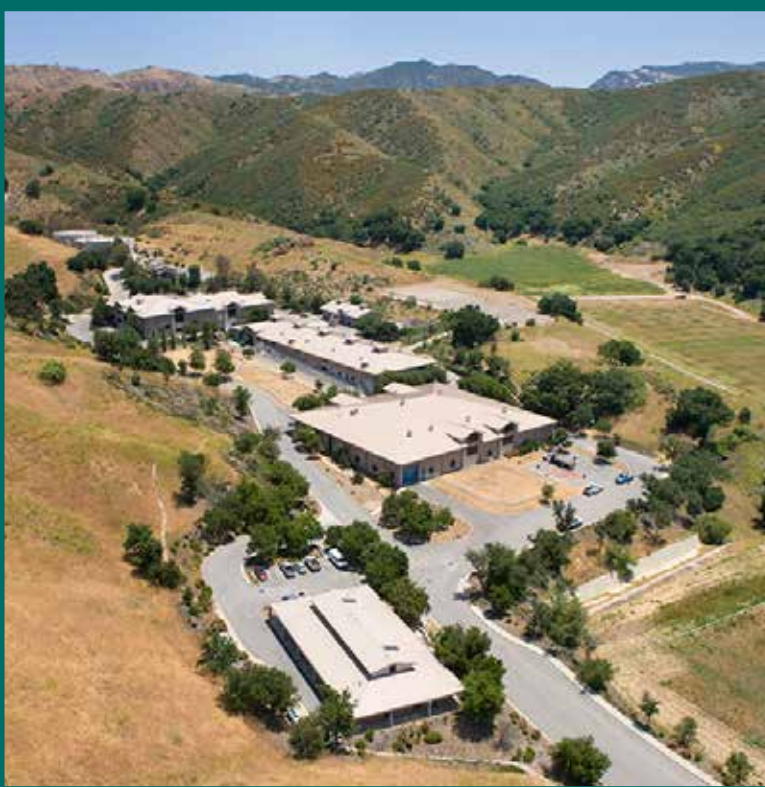
Also at TWRf, an on-site, state-certified water quality laboratory conducts testing to assure that all potable and recycled water served by LVMWD meets stringent state and federal health standards. The laboratory also monitors water quality in Malibu Creek, as part of the JPA’s commitment to watershed stewardship.

- Awards received by Tapia include:*
- U.S. Environmental Protection Agency Operations and Maintenance Excellence Award - 1988
 - Statewide Plant of the Year - 1989, 1995
 - Los Angeles Area Plant of the Year - 1972, 1974, 1983, 1985, 1994
 - Association of California Water Agencies Environmental Achievement Award - 1989, 1995, 2003
 - National Environmental Awards Council Outstanding Operations, Maintenance and Total Reuse

Tapia Water Reclamation and Rancho Las Virgenes Composting facilities are operated under a Joint Powers Authority (JPA) between LVMWD (located in western Los Angeles County) and Triunfo Sanitation District (located in eastern Ventura County). The two agencies provide wastewater service for some 100,000 residents over a 150 square mile area, as well as recycled water and biosolids composting.



Rancho Las Virgenes Composting Facility ~ Putting Wastewater By-products to Good Use



Rancho Las Virgenes Composting Facility (RLV) provides for the beneficial reuse of biosolids removed during wastewater treatment at the Tapia Water Reclamation Facility, converting them to nutrient-rich soil amendment.

Traditionally, options for biosolids disposal included landfills or trucking to agricultural areas to spread on land – both of which have become costly and limited due to public opposition and new regulations.

In service since 1994, RLV uses a composting process to transform biosolids into a nutrient-rich soil amendment. The biosolids are transported to RLV from TWRF through four miles of underground pipelines.

Processing begins in three anaerobic digesters that provide a warm oxygen-free environment in which the natural decay process is accelerated, some of the harmful bacteria are neutralized and odors are reduced. This process takes about 25 days to complete.

The next step is to dewater the solids. As much as 75 percent of the remaining water is removed. This liquid, called centrate, is returned to TWRF to again be run through the treatment process. The remaining solids form a dense cake, which is mixed with ground wood chips or sawdust. The added texture helps air flow through the product and allows the composting process to take place.

Using in-vessel composting, the mixture is mechanically “churned” and moved along bays. During this period, helpful microbes feed on organic materials in the mix, raising the temperature to about 130°F. The heat stabilizes the material and further neutralizes potentially harmful bacteria which remain, while maintaining the right temperature for beneficial, “composting” microbes to do their work. Air is blown through the mixture to keep it from overheating and to provide oxygen to the microbes.

It takes about 18 days for the mixture to travel the length of the processing bays. By the time it reaches the end, it has become a light and consistently textured compost. The mixture is allowed to cure for about 15 to 30 days, at which time it is ready for distribution.

State and federal safety tests are conducted throughout the process and again on the finished compost, to assure it is ready for use and that it meets the stringent EPA standards for Class A - Exceptional Quality garden compost, meeting all requirements for use on lawns and gardens, including vegetables grown for human consumption.

Free household supplies of Rancho Las Virgenes Compost are available for pickup. Bulk supplies can be arranged. For more details, visit LVMWD.com.



Awards received by RLV include:

- L.A. area EPA Plant of the Year awards - 1995, 2003
- Excellence in Community Outreach for Compost and Biosolids processing
- U.S. EPA Clean Water Act Recognition Award
 - Exemplary Biosolids Management
 - Public Acceptance Activities

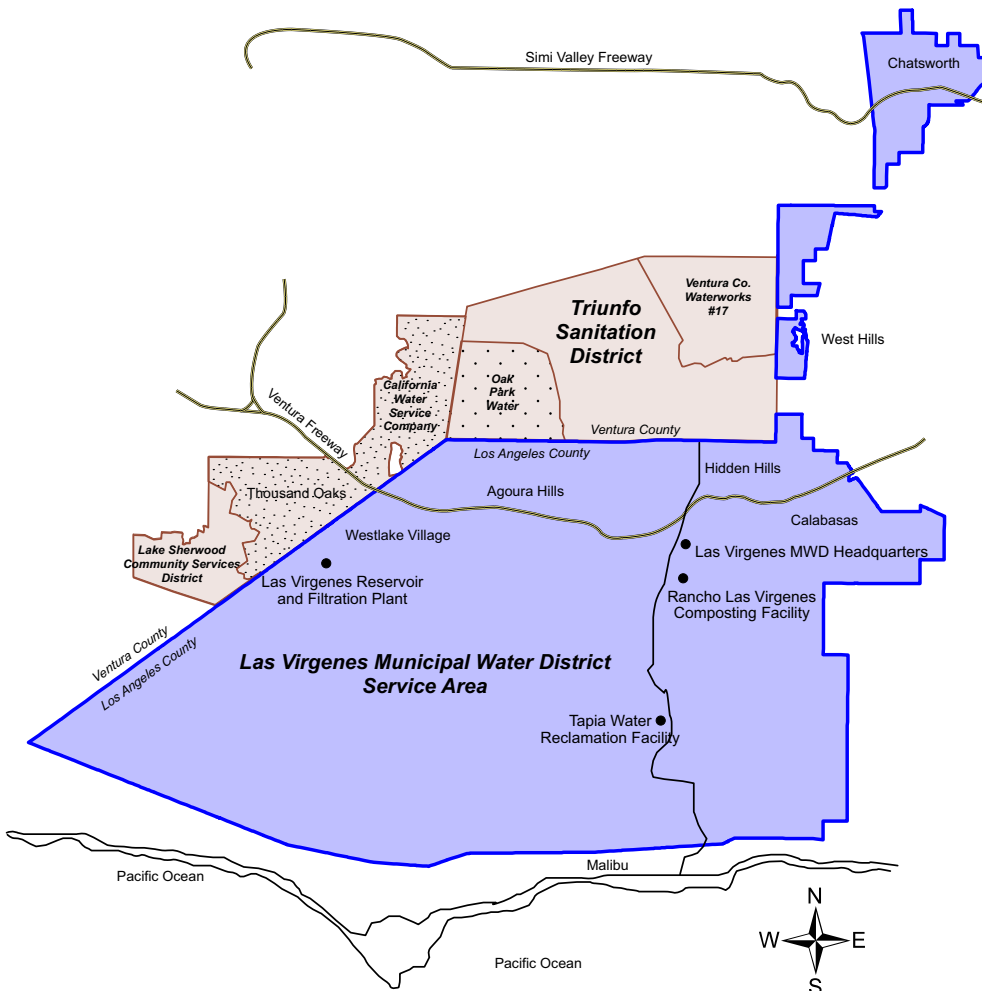
U.S. Composting Council Member

RLV is compliant with Seal of Testing Assurance Requirements

Serving Our Community

LVMWD conservation programs help customers save water with rebates for water-saving devices. LVMWD also helps customers conserve water through landscaping workshops, brochures on conservation practices and daily website updates of plant irrigation needs. LVMWD's educational programs include facility tours, in-class presentations, water awareness lesson plans, exhibits and demonstrations, water-themed school performances and books on water topics donated to local libraries.

Customer service is available 24 hours a day for emergencies that may occur after business hours or on weekends.



Facility Tours

Tours of facilities described in this publication are offered to the public throughout the year.

If you are interested in finding out where your drinking water comes from, or how wastewater is recycled, you can find the answers and more during one of these FREE educational and entertaining tours.

Tours include a chance to meet other residents, a presentation on current water issues, on-site visits to our facilities and a question and answer period.

Register online at LVMWD.com, or call (818) 251-2200 during business hours.

Las Virgenes Municipal Water District Board of Directors

Division 1

Charles Caspary, Secretary

Division 2

Linda Lo-Hill, Treasurer

Division 3

Lee Renger, Director

Division 4

Leonard E. Polan, Vice President

Division 5

Jay Lewitt, President

MWD Representative

Glen Peterson

General Manager

David W. Pedersen, P. E.

District Counsel

Olivarez Madruga Lemieux O'Neill, LLP

You may direct communications to LVMWD Board members by sending an e-mail to:
board@LVMWD.com

Board meetings are scheduled at 9 a.m. on the first and third Tuesday of each month.

Las Virgenes - Triunfo JPA meets first Monday of the month at 5 p.m.

Check the website for meeting and agenda information.

Customer Service - (818) 251-2200
After hours emergency - (818) 251-2100

Construction & Drought Hotline - (818) 251-2180

Report Water Waste:
StopTheWaste@LVMWD.com

Rancho Las Virgenes
Composting Facility

**Free Compost & Recycled Water
Pickup**

Saturdays 8 a.m. to 1 p.m.

Rebate Information
LVMWD.com/Rebates



4232 Las Virgenes Rd
Calabasas, CA 91302
LVMWD.com

