

THE HERON

Las Gallinas Valley Sanitary District est. 1954

Fall 2014

Sewage Impact THEN and NOW

Then 1955: Organic Matter — Toilet Paper — Soap — Shampoo — Detergent

Now 2014: Organic Matter — Toilet Paper — Soap — Shampoo — Detergent
80,000 New Chemical Compounds — Nutrients — Personal Care Products — Regulations
Aging Infrastructure — Endocrine Disrupting Compounds — Pharmaceuticals
Improved Detection Methods — Inflow and Infiltration
Metals — Plastic Micro Beads

Wastewater Characteristics, Aging Infrastructure and New Regulations Require the District to Upgrade Plant

The wastewater coming into the Las Gallinas Valley Sanitary District (LGVSD) wastewater treatment plant is much different today than it was 60 years ago. "The makeup of wastewater has changed dramatically from what it was when these treatment facilities were constructed," said General Manager Mark Williams. "Back then it was basically human waste and toilet paper, vegetable materials, soap and detergent. Now, with modern chemicals, personal care products, pharmaceuticals, and wipes, to name a few, being discharged down the drain, we are having to adjust and use newer technology."

Today's wastewater and treatment requirements are also drastically different than they were 60 years when the LGVSD treatment plant was built. While a portion of the infrastructure has been upgraded, critical portions of the treatment facility have outlived their useful age. District leaders have deferred maintenance and replacement of the secondary treatment facility, but time is running out. "We try to pull all the life we can from every piece of

equipment," said General Manager Mark Williams. "In some cases in the past this strategy was taken too far and now the bill is due."

The existing system of trickling filters that perform secondary treatment is more than 50 years old and "is not capable of meeting current or future regulations. It is subject to catastrophic failure," said Williams. Currently, the District is under order from the San Francisco Bay Regional Water Quality Control Board to limit the amounts of certain pollutants in its wastewater. A modern activated sludge system for secondary treatment is being considered to replace the trickling filters, which will be energy efficient, will allow the District to meet the stricter regulations that are coming and will reduce potentially harmful discharges into the Bay.

The Las Gallinas Valley Sanitary District (LGVSD) provides sewer service to 30,000 residents who rely on the District to collect and treat their sewage in a safe and efficient manner. The District has an excellent

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Adapting Treatment to Address New Concerns

Many chemicals are being discovered in water and wastewater that previously had not been detected, or are being detected more accurately. These are referred to as "contaminants of emerging concern" (CECs) because the risk to human health, aquatic life and the environment may not be known. CECs include pharmaceuticals, personal care products (PPCPs) and perfluorinated compounds among others. Perfluorinated compounds are substances with special properties that have many manufacturing and industrial applications—providing oil, stain, grease, and water repellency. They are used to make non-stick surfaces on cookware; waterproof, breathable membranes for clothing; and can be toxic to the environment.

Like all wastewater districts in the Bay Area, LGVSD is coming under increasingly stringent requirements for pollutant removal, going beyond the traditional pollutants. According to Ray Goebel, a consulting engineer for LGVSD, new compounds are now being regulated

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Help Protect the Environment

Mercury Thermometer Exchange Program and Fluorescent Bulb and Battery Recycling Program

The Las Gallinas Valley Sanitary District encourages all residents to participate in this **free** exchange program that protects the environment from toxic chemicals that are present in everyday products. The following household items can be dropped off or exchanged, at no cost, at the District Office, 300 Smith Ranch Road, San Rafael:

Exchange your old mercury thermometer for a new digital one. It's free!



— Did you know that one bead of mercury can poison all the fish in a 45-acre lake? Residents can bring old, mercury-filled thermometers to our main office and exchange them for new digital thermometers.

Free Fluorescent and CFL Drop Off



— Fluorescent tubes and compact fluorescent light bulbs

contain small amounts of mercury vapor. When dumped in the trash they can release mercury, leading to air and water pollution. Homeowners can drop off your old unbroken fluorescent tubes and CFLs to our treatment plant.

Free Battery Drop Off

— Household batteries contain at least 22 toxic elements including mercury, lead, cadmium, and more. Recycle your old household batteries by dropping them off at the District's main office.

If you have questions about the free drop-off program, please call (415) 472-1734.

Programs limited to households only.

Roots and Sewer Laterals Don't Mix Well

One of the main causes for sewer backups is tree and large shrub roots that cause damage to sewer lines and private sewer laterals. Repairing root damage to a sewer lateral can be expensive for homeowners. Some of these problems can be avoided by not planting trees near sewer laterals or lines, or by planting appropriate trees and shrubs that are less likely to cause problems for your sewer lateral and for the sewer lines maintained by the Las Gallinas Valley Sanitary District (LGVSD).

A private sewer lateral is the underground line that runs from your home to the sewer main. It is the property owner's responsibility to keep the sewer lateral in good condition. Sewer lateral repairs can be costly for homeowners. Once the lateral enters the sewer main, it is the District's responsibility to maintain the condition of the pipe.

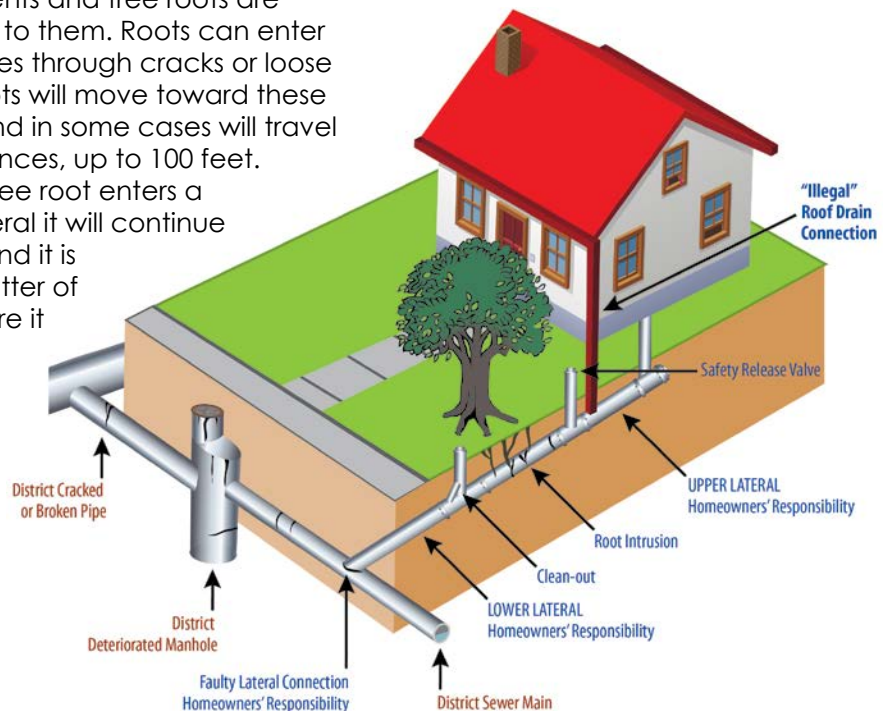
Depending on the age of your home, your sewer lateral may be made of clay, cast iron, or plastic. Over time, settling ground, earthquakes, roots, and other disturbances of the ground will make sewer pipes susceptible to root intrusion.

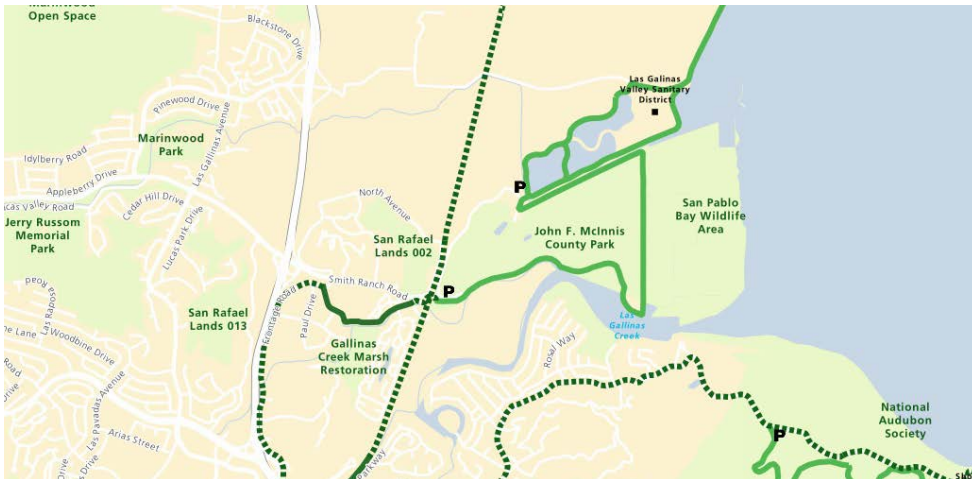
Sewer laterals are filled with water and nutrients and tree roots are attracted to them. Roots can enter sewer pipes through cracks or loose joints. Roots will move toward these cracks, and in some cases will travel long distances, up to 100 feet. When a tree root enters a sewer lateral it will continue to grow and it is only a matter of time before it

becomes completely blocked. Signs that a sewer is becoming blocked include multiple slow flowing drains in sinks or showers, gurgling sounds from a toilet bowl, and wet spots around floor drains. LGVSD maintains 105 miles of sewer lines within the District and these can also be damaged by tree and large shrub roots. Some lines are on private property on District "easements." If you know there is an easement on your property, please contact the District before planting any trees or shrubs near the easement.

The Association of Bay Area Governments offers a Sewer Smart Planting Guide (www.sewersmart.org/plantguide.html) that will help you avoid sewer problems caused by roots. The Society of Arboriculture also offers helpful resource at www.treesaregood.org/treecare/resources/Avoiding_Conflicts.pdf

The District has developed a Private Sewer Lateral Rehabilitation Assistance Program that provides customers with funds at a low interest rate to pay for needed lateral repairs: www.lgvsd.org/doing-business/sewer-lateral-assistance/. If you have any questions about a sewer easement or sewer laterals, contact the District at 415-472-1734.





Hiking, Biking, Views on Bayside Trails

At the LGVSD Treatment Plant, four miles of public trails are open to walkers, bird watchers and cyclists. There they can enjoy wildflower displays, bird and wildlife watching, and the serenity of unobstructed views of San Pablo Bay and its

surrounding hills and wetlands.

Our 383-acre reclamation area includes 200 acres of pasture irrigation fields, two treated wastewater storage ponds and a freshwater pond with three islands that are

popular with nesting birds. The area provides homes for wildlife and migrating and resident birds including raptors, blue herons, clapper rails, egrets and pelicans.

The District's 3.5-mile trail is part of the Bay Trail, which is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. It will connect the shoreline of all nine Bay Area counties, link 47 cities, and cross the major toll bridges in the region. To date, approximately 338 miles—about 70 percent of the total length—have been completed.

To see how LGVSD paths relate to the San Francisco Bay Trail system, please visit the Bay Trail website, which includes interactive maps, at www.baytrail.org.

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record of protecting the public health and operating its sewer facilities in an environmentally friendly and fiscally responsible manner. For many years, the Board and Staff have tried to be prudent and extend the life of facilities and equipment. Now, major replacements are needed.

The District Board and Staff are currently reviewing long-range improvements that will be needed to meet current and new regulations and replace aging infrastructure. As discharge and pollutant regulations become increasingly stringent, the District will be required to make significant upgrades to its treatment facilities and sewer collection system. Studies are under way to refine costs and schedules and it is anticipated that a sewer rate adjustment will be considered by the LGVSD board in the spring of 2015.

Preventing Sewer Overflows

In addition to the treatment upgrades, the District must take action to prevent sewer overflows that occur during wet weather events. A sewer line in Terra Linda

will be expanded, including a deeper pump station and buried creek crossing, which will be the first of a phased approach to address potential the sewer overflows.



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Expanding capacity in the sewer lines will be done in parallel with ongoing efforts to reduce sources of inflow and infiltration (I&I) into the collection system, which is the source of high wet weather flows. I&I is caused by aging and deteriorating private sewer laterals and District sewer mains and manholes. During wet weather, massive amounts of storm water percolates into the soil, enters the laterals and pipes mixes with sewage, and can overwhelm sewer pipelines and treatment plants, leading to spills and backups

into homes, streets and the Bay. One of the goals of the secondary treatment expansion is to handle wet weather flows.

Other Improvements

Also under review is the replacement of the co-generation engine with a micro-turbine that will meet new air quality standards. The system could include a biogas fueling station that could be used to fuel the District's larger vehicles. Also on the list of important projects is sediment removal from Miller Creek, which is threatening to block the District's treatment plant discharge point. The sediment in the creek is the result of urban development in the creek's upstream watershed.

A detailed list of project alternatives and costs will be reviewed by the District Board and a multi-year rate increase will be considered. "We will continue to be diligent and try to minimize the impact to rate-payers as much as we can," said Williams. "Customers can help by being careful about what gets put down the drain. But, even if you are doing the right thing, we must address chemicals and compounds in the waste stream regardless."

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that were not in existence when the District's plant was constructed. "Now, we're talking about removal of constituents that are present at very low levels, but are now detectable," he said. "The plants were never designed for that."

Many CECs are not removed with conventional wastewater treatment, and even the upgrades planned for the LGVSD plant will not remove all CECs. "But it will improve the removal process and will set the stage for meeting future removal requirements," said Goebel. "We want to set the stage for more advanced treatment should it be necessary in the future."

One of the motivating factors in the LGVSD plant upgrades is to minimize discharges to S.F. Bay and improve water quality. In the future, the District hopes to increase its recycled water program and explore more uses for the water. "Whether you are doing recycled water or bay discharge, this water has to be of a very high quality," said Goebel.

One example of a problematic CEC is permethrin, an insecticide with a wide range of applications, including use as a human and veterinary pharmaceutical for insect infesta-

tions. The District has had difficulty meeting toxicity standards, and it is believed that permethrin, which is toxic to aquatic life at very low levels, is responsible. It is expected that a new modern treatment process will do a better job of removing permethrin and other CECs. Continued testing and investigation is ongoing, but Goebel said it is indicative of how everyday products end up in the water and wastewater stream.



Prescription drugs and over-the-counter medicines are among the CECs that are not entirely removed during treatment.

"We need to be aware the products we are using in everyday use can be toxic in a treatment plant and in the environment and toxic in extremely low concentrations," he said. "Treatment plants may remove 90 percent but that last 10 percent can be toxic. Just because it is a consumer product and it's safe for people doesn't mean it's safe in the environment. People need to be aware of the products they use and

that they are using them wisely." In 2010, a Scientific Advisory Panel provided the State Water Resources Control Board with guidance on developing monitoring policies for CECs in Recycled Water. The panel found that while many CECs are potentially present in recycled water, the detection of many of these chemicals is so recent that robust methods for their quantification and toxicological data for interpreting potential human or ecosystem health effects are unavailable.

Other Factors Affecting Treatment

New regulations for wastewater treatment plants require a much greater level treatment for a variety of chemicals, including endocrine disrupting compounds. Endocrine disruptors are chemicals that may interfere with the body's endocrine system and produce adverse developmental, reproductive, neurological, and immune effects in both humans and wildlife. Improved detection methods are able to detect these compounds in very low concentrations.

The District's aging infrastructure must be upgraded to meet these new regulations, including improvements to prevent inflow and infiltration (I&I). See page 3 for more details.