

ENERGY

SECONDARY
PRIMARY



JWPCP
Joint Water Pollution Control Plant

PUMPING

DIGESTION

BIOSOLIDS

PRIMARY

OCEAN MONITORING

SECONDARY

OUTFALLS

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INTRODUCTION



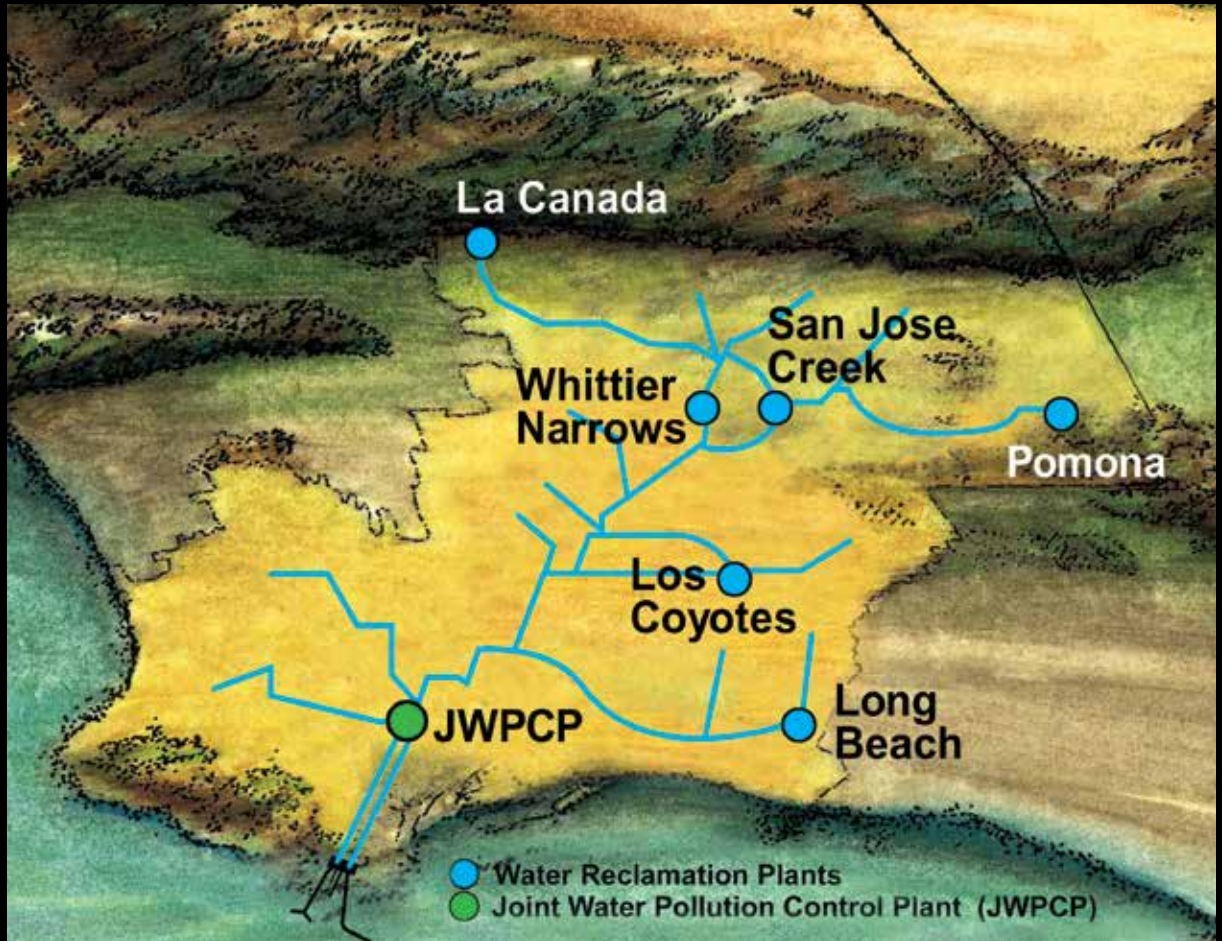
The Joint Water Pollution Control Plant (JWPCP), located in Carson, began in 1928 as a relatively small wastewater treatment facility to serve the growing population of Los Angeles County. Today, over 4.8 million residents and many businesses and

industries depend on this 382-acre facility, one of the largest in the world, to clean their wastewater. The JWPCP is capable of treating 400 million gallons per day (mgd) of wastewater and performs a critical role in the protection of public health and our environment.

The JWPCP is owned and operated by the Sanitation Districts of Los Angeles County (Sanitation Districts). This public agency provides environmentally sound, cost-effective wastewater treatment and solid waste management for 78 cities and unincorporated areas, totaling over half of Los Angeles County. The JWPCP is an integral part of the Sanitation Districts' wastewater treatment system. The plant combines wastewater treatment with innovative resource recovery, intensive environmental monitoring programs, and a sensitivity to the surrounding community to create a state-of-the-art facility.



JOINT OUTFALL SYSTEM



The JWPCP is not an isolated wastewater treatment plant; it is a key component of a network of seven treatment plants and over 1,200 miles of trunk sewers known as the Joint Outfall System (JOS). The JOS is a unique system that provides regional wastewater treatment for Los Angeles County, covering an extensive area that includes 73 cities and unincorporated county territory. The six water reclamation plants in the JOS provide a high level of treatment, producing a recycled water that is used at hundreds of sites throughout the county.

The JWPCP is the hub of the JOS. It is the largest facility on the system. It provides centralized processing of solids removed during wastewater treatment for all of the JOS plants, producing electricity and reusable biosolids in the process. The treated water from the JWPCP is sent to the Pacific Ocean through a network of tunnels and outfall pipes that eventually extend approximately two miles off the Palos Verdes Peninsula to a depth of approximately 200 feet.

Partial secondary treatment of wastewater begins. Flow treated to secondary level ramps up to 200 mgd over a two-year time period.

1983-86

IMPROVED TREATMENT



The Sanitation Districts sign a Consent Decree with the federal and state governments, the Natural Resources Defense Council, and Heal the Bay, committing to full secondary treatment by December 31, 2002.

1994

GOING ALL THE WAY



In 2002, the Sanitation Districts complete the largest single construction effort ever undertaken by the agency. The JWPCP achieves full secondary treatment, on schedule and under budget. The plant continues the Sanitation Districts' tradition of providing cost-effective, high-quality wastewater management for Los Angeles County.

21ST CENTURY

SERVING PRESENT AND FUTURE GENERATIONS



A WINDOW IN TIME

The Sanitation Districts are formed. The construction of the backbone trunk sewer of the JOS and the JWPCP, the first treatment plant, begins.

1925

STARTING A LEGACY



The JWPCP begins operations and is capable of handling 2 mgd. The treated wastewater is sent to Bixby Slough. Beneficial use of biosolids begins when dried solids from the plant are sold as fertilizer.

1928

TREATMENT BEGINS



A 6-mile tunnel from the JWPCP to the Palos Verdes shoreline and a connecting outfall, extending offshore, have been completed. The plant utilizes primary treatment, and the treated water is sent directly to the ocean. The JWPCP is capable of handling 23 mgd. Biogas from the digesters is used to generate all the power necessary to operate the plant.

1938

EXPANDING TO THE PACIFIC



As Los Angeles County undergoes rapid growth, so does the JWPCP. The plant increases in size by 435 percent to handle the post-war industrial and population explosion. Another tunnel and two more ocean outfalls are built, and the plant reaches a capacity of 225 mgd.

1947-58

POST-WAR BOOM



In 1972, the Clean Water Act is passed and attention is focused on further improving the environment. The Sanitation Districts boost ocean monitoring and research, and investigate methods to improve treatment at the JWPCP. In the late 1970s, the discharge of suspended solids to the ocean is greatly reduced as advanced primary treatment begins and improved solids processing equipment is started up.

1970s

PLANT AND OCEAN PROGRESS



The JWPCP works with the residents in the local community to form a Citizens Advisory Committee to lower the effects of the treatment plant on its neighbors. This creates a positive relationship between the plant and its neighbors that continues today.

1978

A GOOD NEIGHBOR



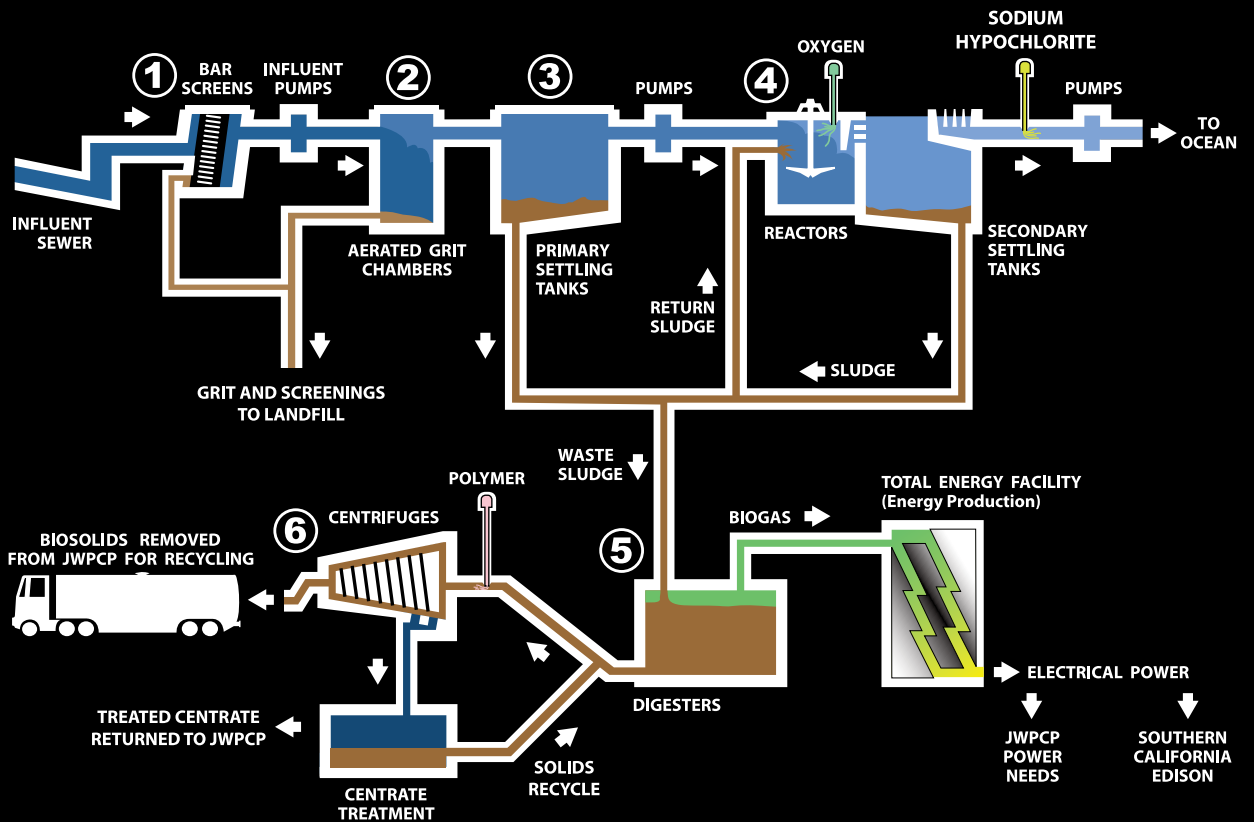
WASTEWATER TREATMENT



Nature has been purifying sewage since the beginning of time. Lakes, streams, and rivers are the earth's purification system. The Sanitation Districts have borrowed nature's technology and simply put the river into a concrete box. Next to nature, the Sanitation Districts' wastewater treatment system is one of the largest in the world.

The wastewater first flows through bar screens that remove large objects (Item 1 on flow diagram). These objects are removed and disposed in a landfill. The incoming flow then goes into a grit chamber (Item 2). Each day, approximately 15 tons of grit and sand settle to the bottom in these tanks and also go to the landfill. From there, the wastewater goes into primary treatment.

J W P C P F L O W D I A G R A M

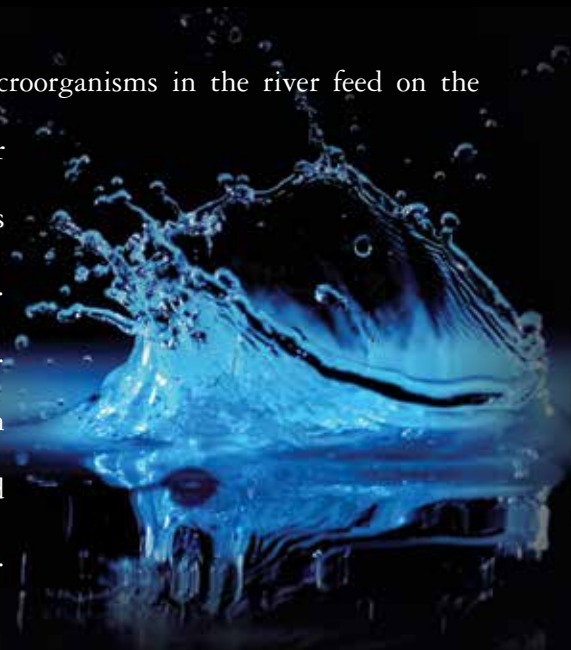


To understand primary treatment, let's look at nature. If sewage or dirty rain runoff enters a river, heavy particles settle to the bottom while lighter materials stay suspended and are carried away by the current. At the JWPCP, long concrete tanks replace the river (Item 3). The settled and floatable materials (primary sludge and skimmings) are pumped to digestion tanks for further treatment. The remaining wastewater, containing mostly dissolved organic materials, moves to the second phase of treatment.

As the dirty water in the river flows downstream, naturally occurring microorganisms in the river feed on the dissolved organic materials. The river's rapids allow oxygen to enter the water so the organisms can breathe. At the JWPCP, the river's cleaning action takes place in large covered reactors where the wastewater is mixed with pure oxygen. The oxygen is produced by an on-site cryogenic oxygen generation system. The same microorganisms from nature grow in the wastewater as they feed on the organic materials in these tanks, and are separated from the treated water and returned to the reactors. This is called secondary treatment (Item 4).

The treated water is then disinfected with a chlorine compound, as in a swimming pool, in order to meet bacteriological standards in the ocean. This protects swimmers and consumers of raw shellfish. The treated water is pumped through tunnels to the Pacific Ocean and discharged from outfalls that extend approximately two miles off the Palos Verdes Peninsula to a depth of approximately 200 feet. The outfalls produce a dilution in excess of 150 parts seawater to 1 part treated wastewater, further lessening any impact on the ocean.

The solids removed from the primary and secondary treatment processes are sent to large covered tanks called digesters (Item 5). Here, bacteria, in the absence of oxygen, feed on the organic materials and produce a methane-rich gas known as biogas. After the digestion is complete, the remaining solids are pumped into centrifuges (a spin dry process) to remove as much water from the solids as possible (Item 6). This treatment process produces biosolids that are suitable for reuse. Throughout the entire treatment plant operations, the facilities and programs necessary for the control of odors are of primary importance.



RESOURCE RECOVERY

The Sanitation Districts have a long history of taking what others consider waste and recovering resources from it. As far back as 1938, the biogas from the digesters was used to fuel internal combustion engines that turned electrical generators and pumps. This system furnished all of the power requirements for the JWPCP at that time. Today, the biogas is used to fuel a power plant that produces enough electricity to power all of JWPCP's electrical equipment. The biogas is also used for



digester heating, emergency pumping, and building heating and cooling. Any surplus electricity is sold to the local power company.

Innovation has long marked the biosolids management practices of the Sanitation Districts. Reuse of biosolids at the JWPCP began in 1928

when Kellogg Supply, Inc., first collected dried biosolids from the JWPCP and sold it as fertilizer. Biosolids produced at the JWPCP are currently land applied as a soil amendment, disposed at a sanitary landfill, and composted off-site at four different facilities. One of these is the Inland Empire Regional Composting Facility, which is co-owned by the Sanitation Districts. This facility is the largest fully-enclosed composting facility in North America.





Total Energy Facility (above)



Inland Empire Regional Composting Facility (IERCA, above)

OCEAN MONITORING

Since 1970, the Sanitation Districts have conducted an expanded ocean monitoring and research program to understand the environmental effects of the JWPCP discharge on the ocean, measure natural variations, and ensure protection of public health and the environment. This program includes biological, chemical, and oceanographic studies in all the different habitats that exist off Palos Verdes. In the inshore reefs, Sanitation Districts' biologists, using SCUBA gear,



study the diverse communities of the kelp forests and rocky reefs. Offshore, the animals living in the soft sea floor sediments are studied, and any pollutant levels are monitored. The fish communities are also studied, as well as any contaminant levels in their tissues. Sanitation Districts' staff measure the levels of bacteria in the discharge to the ocean and at the shoreline daily, as well as those in the kelp beds, to ensure that all public health standards for swimming and shellfish harvesting are met. The patterns of water movement are studied to better understand the dynamic environment in which the wastewater is discharged. The ocean outfall system is inspected annually by divers and a remotely operated vehicle, in order to ensure structural integrity and safe operation.

The Sanitation Districts use the Ocean Sentinel (a 66-foot ocean research vessel), two smaller sampling boats, a remotely operated vehicle, and the Sanitation Districts' Water Quality Laboratories and Marine Biology Laboratory, located at JWPCP, to conduct this extensive program. Diverse ocean survey capabilities, sophisticated laboratory analysis of samples collected, and the resulting reports of the state of the Palos Verdes marine environment are all part of the Sanitation Districts' Ocean monitoring and research program.

In addition to its own monitoring and research program, the Sanitation Districts have been a member agency of the Southern California Coastal Water Research Project (SCCWRP) since it was formed in 1969. A joint powers public agency, SCCWRP conducts environmental research assessing the condition of the Southern California coastal environment. Its studies, many of which are conducted jointly with the Sanitation Districts and other agencies, provide a way to view the Sanitation Districts' findings in context of a larger picture of Southern California's ocean environment.



Since the early 1970s, improved treatment at the JWPCP and extensive control of industrial wastes at their sources have resulted in marked improvements in conditions off the Palos Verdes Peninsula. Kelp forests, absent prior to 1974, have been restored to their former extent and health. The bottom fish community has recovered to its natural state. There are still some changes evident within the communities of animals living within the sediments near the outfalls. Most notably, the sediments were contaminated by industrial discharges of DDT and PCBs to the sewer system prior to 1970. These discharges were banned from the sewers when they were discovered, and the solids from the outfall helped to slowly cover the DDT on the ocean floor in succeeding years. However, the effects of the DDT have remained a concern. These effects, which result from the persistence in the sediments of pollutants whose discharge ceased decades ago, grow less with each passing year and will be even further reduced through a proposed EPA remediation program. These are examples of the effectiveness of the steps taken by the Sanitation Districts to ensure that the quality of the treated wastewater produced at JWPCP is protective of the diverse communities of plants and animals that live in the ocean waters off the coast of Palos Verdes.

P H O T O S A B O V E F R O M L E F T

Deploying a remotely operated vehicle for ocean outfall survey, diver biologist conducting surveys of reefs, biological community living on outfall pipe, bridge of the Districts' research vessel *Ocean Sentinel*, kelp forest canopy, marine biologist analyzing sample of sea floor life.

COMMUNITY



The JWPCP has a long history of working with and giving back to the community that lives around the plant. In 1978, the JWPCP Citizens Advisory Committee (CAC) was formed to discuss odor and dust problems associated with plant operations. The CAC is a group of neighbors who reside around the JWPCP and represents more than 20,000 homes within a one-mile radius of the plant. The CAC meets with Sanitation Districts' staff quarterly to discuss issues concerning the JWPCP and the surrounding community. Input from the CAC has helped to guide the Sanitation Districts in tailoring their operations and community enhancement programs to make the JWPCP a better neighbor.

The Sanitation Districts, with the help of the CAC, have always looked for ways to give back to the local community. One way to accomplish this is to allow buffer lands around the JWPCP to be developed into uses that will benefit the neighbors. The Wilmington Boys and Girls Club was built on JWPCP buffer land, as was the Wilmington Jaycees Athletic Complex. Both of these facilities provide recreational opportunities for the neighborhoods around the plant. In addition, the Sanitation Districts worked with the City of Carson to facilitate the private development of a portion of the JWPCP buffer property into a commercial shopping center that serves the local community. The Sanitation Districts improved a 17-acre marshland located on JWPCP property to better support freshwater marsh and riparian habitat. To enhance community aesthetics, the Sanitation Districts have undertaken





an extensive effort to improve the grounds surrounding the JWPCP. Landscaping, utilizing pleasing materials and color schemes, is used to screen the JWPCP along public travel routes. Sidewalks have been installed along portions of the plant perimeter and around the Wilmington Jaycees Athletic Complex, along with parkway planting strips, to beautify the exteriors of both.

Extensive odor and dust control measures have been implemented over the years to reduce the impacts of the JWPCP's operations on the neighbors. A 24-hour telephone hot-line was established to allow the neighbors a convenient way



to report any concerns. The Sanitation Districts will continue to work with the CAC and the surrounding community to coexist in harmony and be a good neighbor.



SUMMARY



White Point, Palos Verdes Peninsula

The Sanitation Districts' JWPCP will continue to be improved to meet the needs of the citizens of Los Angeles County and the surrounding community in an environmentally sound, cost-effective manner. The ocean monitoring staff will continue to study the local marine environment to ensure the protection of our natural resources, and the JWPCP staff will continue to work with the CAC and the neighbors to make the area a better place to live.

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