

Integrity Municipal Systems' I-BOx® 6000 Biological Odor Control System Removes Odors from the Laguna SOCWA Lift Station

The City of Laguna Beach, incorporated in 1927, is a small coastal city located in Southwest Orange County in Southern California. The City provides water and wastewater services to a customer base of over 22,000 residents, operating a sanitary sewer system that includes 85.71 miles of gravity sewers, 2,674 manholes, 9.44 miles of force mains, and 25 lift stations.

The Laguna Southwest Orange County Wastewater Authority (SOCWA) lift station, built in 1981, is the City's second largest lift station and pumps about one million gallons of Laguna Beach's wastewater daily, first to the Bluebird SOCWA lift station and then on to the 6.7 MGD Coastal Treatment Plant located in Laguna Niguel.

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Hannah Johnson, Project Manager
City of Laguna Beach

After decades in service, the Laguna SOCWA wet well at the lift station became dilapidated, and a full reconstruction began in 2016. The project included a hybrid manhole/junction structure that would also serve as the bypass wet well during the rehabilitation work. Upon completion of the wet well rehabilitation, the temporary sewage bypass pumping system was removed and normal lift station operation was restored.

However, the construction work started in December 2016, including replacement of pipelines on Forest Avenue next to the lift station in Downtown Laguna Beach, caused residents and community members to complain of the odor. Odor control was needed both for long-term improvements and to address the immediate need during rehabilitation.

With a reputation for reliable odor control and with the best overall value measured by performance, capital, installation, maintenance and operating costs, Integrity Municipal Systems, LLC (IMS) was selected to provide a new biological odor control system (OCS). The IMS biological odor control system, I-BOx® 6000, was pre-assembled, piped, wired, and factory

tested to facilitate installation and start-up at the jobsite. The packaged biological odor control system consisted of an FRP air exhaust fan, FRP odor control vessel, water and nutrient feed panel, nutrient tank, and electrical control panel. All I-BOx® components were mounted together on the low-profile vessel deck for easy operator access and maintenance. The control panel was remote-mounted on a wall next to the odor control system, outside of the hazardous Class 1, Division 2, Group D area.

The packaged biological odor control system is a once-through system equipped with a fan that operates continuously and pulls the odor-laden air from the wet well and surrounding manholes into the biological odor control system for treatment prior to release to the atmosphere. The system is composed of two treatment stages. Stage 1, the biological process stage, is designed to remove primarily hydrogen sulfide (H₂S) by providing an environment promoting the natural growth of acidophilic, sulfur-oxidizing bacteria. The first stage media is an inert, porous, mineral-expanded clay material designed to resist compaction and degradation from the acidic sulfates of the biological oxidation of the hydrogen sulfide.

The first stage operates with an independently controlled irrigation system to provide the biological media with adequate moisture to sustain bacterial growth and remove toxic byproducts. The irrigation process is controlled by a programmed timing sequence that



I-BOx® 6000, City of Laguna Beach

System Design Parameters

actuates a solenoid valve located on the water supply piping. Nutrients are also trickled down over the media to enhance and sustain the biological activity. The nutrients are housed in an integrated nutrient tank and are dosed into the system by a nutrient pump mounted in the water and nutrient feed panel.

Integral to the system is a pelletized coal-activated carbon second stage that removes any remaining hydrogen sulfide and other odorous organic compounds and polishes any sharp H₂S spikes breakthrough through Stage 1. After treatment in Stage 2, the cleaned air is discharged to the atmosphere through the stack at the top of the unit.

While the biological odor control system was being manufactured, IMS was able to very quickly - within a few days - deliver to the City two temporary activated carbon adsorber systems. They were immediately deployed at the wet well and the manhole, successfully ensuring that the nearby business community was protected from any odors.

IMS delivered the biological odor control system within the City's expectations. Following successful installation of the biological odor control system by the contractor, IMS performed commissioning and operator training. The I-BOx® 6000 biological OCS solved the odor control problem at the Laguna SOCWA lift station, providing the City of Laguna Beach with a reliable, efficient, cost-effective, and sustainable odor control technology.

Hannah Johnson, Project Manager of the City of Laguna Beach, expressed her appreciation of IMS' support and professionalism: "The IMS team is highly experienced and provided dedicated customer service every step of the way during our odor control improvements project. Our odor control unit installation and commissioning went seamlessly. We've received positive feedback from members of the community about how much the unit has improved the nuisance odors."

Odor Control System Design Information	
Design Air Flow rate	850 cfm
Biological OCS Model	I-BOx® 6000
Avg. Inlet H ₂ S Concentration, ppm	20 ppm
Peak Inlet H ₂ S Concentration, ppm	100 ppm
Minimum H ₂ S Removal Efficiency	99.0%*
Biological Odor Control System Dimensions	
Length	8'-6"
Width	6'-0"
Height (SSH)	6'-8"
Shipping Weight (Vessel)	10,000 lbs.
Operating Weight	11,000 lbs.
Nutrient Tank and Metering Pump	
Nutrient Tank Capacity	30 gal
Nutrient Metering Pump Flow Rate	0.2 gpd
Water Feed	
Solenoid Frequency	Every 30 minutes
Solenoid Valve Open Duration	1 minute
Flow Rate	6 gpm

*The minimum H₂S removal efficiency is 99.0% or an outlet concentration of 0.1 ppm, whichever is greater.