Integrity
MUNICIPAL SYSTEMS

PROJECT PROFILE:
Palomar Commons, Carlsbad, CA

Integrity Municipal Systems' I-BOx®6000 Biological Odor Control System Eliminates Severe Odors at the Palomar Commons Shopping Center in Carlsbad, California

The Cities of Vista and Carlsbad share ownership of the Buena Outfall Interceptor Sewer, which routes sewage approximately 7.5 miles through two pump stations and force mains to the Encina Wastewater Authority (EWA) Water Pollution Control Facility (WPCF).

Located next to a sewer main along the Outfall Interceptor is the high-profile Palomar Commons Shopping Center, which consistently attracts heavy daytime foot traffic. A carbon adsorber odor control system was installed and connected to the sewer main to eliminate odor issues and prevent a negative impact on public health and nearby businesses. The carbon adsorber odor control system, while initially inexpensive to procure, had very high operating costs for the removal and disposal of spent activated carbon media as well as its replacement with fresh carbon media, adding up to tens of thousands of dollars per year. The carbon adsorber odor control system was ineffective at handling the odors for any significant period of time because the inlet hydrogen sulfide (H_2S) concentrations were very high, ranging from 200 to 300 ppm. This situation became a source of irritation for the nearby community, and neighbors voiced their frustrations in numerous complaints filed with the City of Carlsbad.

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Andrew Jamison
Project Manager
Jamison Engineering Contractors

The City of Carlsbad needed a sustainable, environmentally-friendly odor control solution with a proven technology offering maximum value measured by performance, reliability, capital, installation, maintenance, and operating costs. A critical objective was to ensure that the population at the Palomar Commons Shopping Center was protected from any odors.

After technology analyses and long-term cost considerations, an innovative, environmentally-friendly and sustainable hybrid biological odor control system from Integrity Municipal Systems, LLC (IMS) was selected. The system features superior performance, compact plug-and-play design, long lasting inert media, minimal routine maintenance and low operating costs.

I-BOx® 6000 Biological Odor Control System

The I-BOx® 6000 biological odor control system is pre-assembled, piped, wired, and factory-tested for easy installation and fast start-up at the jobsite. The packaged biological odor control system consists of an FRP air exhaust fan, FRP dual-stage odor control vessel, water and nutrient feed panel, nutrient tank and electrical control panel.

The fan operates continuously and pulls foul air from the process area into the biological odor control system for treatment before releasing to the atmosphere. The system is composed of two distinct process stages. Stage 1, where primary treatment occurs, is designed to remove primarily hydrogen sulfide (H_2S) 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. Stage 2 is a polishing stage used to remove any remaining hydrogen sulfide as well as other odorous organic compounds.

An intermittent water irrigation system is incorporated into the biological system design to provide the Stage 1 media with adequate moisture. Nutrients are also trickled over the media to enhance and sustain the biological activity. The nutrients are commercially available fertilizers stored in an integral nutrient tank and dosed into the system by a nutrient pump mounted in the water and nutrient feed panel. Water and acidic sulfate byproducts washed from the media leave the system through the drain piping at the bottom of the vessel and are returned to the sewer main.

After delivery to the jobsite, the biological odor control system was installed and started up in just a few short hours. With inlet H_2S concentrations consistently ranging between 150 to 250 ppm, the system has maintained more than 99 percent hydrogen sulfide removal efficiency since being placed in operation. Community odor complaints have been eliminated. Minimal maintenance keeps operating cost low. The I-BOx® 6000 biological odor control system solved the odor control problem at the Palomar Commons Shopping Center and provides the City of Carlsbad with a reliable, efficient, cost-effective and sustainable odor control technology. Andrew Jamison, Project Manager of Jamison Engineering Contractors, Inc., said, “The installation process of the odor scrubbing unit went very smooth with no difficulties or time delays. The documentation was thorough and there were no complications encountered with the design and function of the unit.”

Table 1: SYSTEM DESIGN PARAMETERS

System Design Information	
Model	I-BOx® 6000
Design Air Flow Rate	580 cfm
Number of Units	1
Avg. Inlet H_2S Concentration, ppm	150 ppm
Peak Inlet H_2S Concentration , ppm	200 ppm
Minimum H_2S Removal Efficiency	99%*
System Dimensions	
Length	8’-6"
Width	6’-0”
Height (SSH)	6’-10”
Shipping Weight	10,000 lbs.
Operating Weight	11,000 lbs.
Nutrient Tank and Metering Pump	
Nutrient Tank Capacity	28 gal
Nutrient Metering Pump Flow Rate	3 gpd
Water Feed	
Solenoid Frequency	Every 30 minutes
Solenoid Valve Open Duration	3 minutes
Flow Rate	6 gpm

** The minimum H_2S removal efficiency is 99% or an outlet concentration of 0.1 ppm, whichever is greater.*

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