

Threatened Coastal Wetland Protected by Bio Clean Environmental

Custom Upflow Filter Protects Carlsbad's Agua Hedionda Lagoon

The Situation

Carlsbad, CA – Just blocks from the beautiful beach lays one of the most successful shopping experiences in Southern California, The Carlsbad Premium Outlets, which is set just in front of the world famous Flower Fields at Carlsbad Ranch. This high traffic area, located on Paseo Del Norte between Cannon Rd. and Palomar Airport Rd., is prime location for new development.

When discussion of developing the seven acre plot of land directly across the street from the outlets and flower fields, the City of Carlsbad was concerned with how the current stormwater runoff condition would be addressed. The current condition is as follows: two 48 inch pipes run from east to west under Paseo Del Norte from the Premium Outlets into an open drainage channel located on the potential development site. The runoff flows through the channel across the site then along the I-5 Freeway, Cal Trans Property, which eventually empties out in the Agua Hedionda Lagoon just north of Cannon Drive.

Gary Lipska, Aquaterra Engineering, contacted Greg Kent, President of Bio Clean Environmental, in the Fall of 2008 to discuss possible solutions.



The Challenge

The runoff that currently flows through the seven acre potential development site needs to be treated prior to flowing into the lagoon as it currently does. The design of the system needs to provide treatment for the 85 percent of storm events generated by the large upstream drainage area. The runoff from that area is conveyed through two 48 inch pipes. One of the main challenges was designing an effective treatment system without generating additional head loss. Also, due to minimal pipe fall an offline treatment option was not possible.



About Bio Clean

Bio Clean Environmental, Inc. has been in the stormwater filtration industry since 1998, providing highly efficient pollutant-reducing systems to the western region including California and Hawaii. Based out of Oceanside, CA, the company leads the industry in system quality, design and dependability. Bio Clean meets and exceeds the strict and ever changing water quality regulations to keep our environment clean and our water safe. For more information on Bio Clean, visit www.biocleanenvironmental.net

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Runoff from the Premium Outlets, Flower Fields at Carlsbad Ranch and the surrounding area could contain high levels of pollutants. These pollutants include sediments, hydrocarbons, grease & oil, metals, bacteria and nutrients, as well as fertilizers, pesticides and sediments from the flower field.

In order for the California Regional Water Quality Control Board and the City of Carlsbad to approve the new development the owner and strategic property advisors of the project would need to comply with a set of stringent regulations that were set forth to protect the surrounding bodies of water, under section 303(d) along with the general stormwater permits for new construction.

The Solution

The design staff at Bio Clean custom designed an Upflow Water Polishing Unit to handle the stormwater runoff from the two underground pipes. The location of the Upflow Filter is at the East side of the future development site, where the current pipes discharge runoff. This Upflow Filter, a six feet by 6 feet concrete box, accepts two 48 inch pipes and is designed to eliminate additional head loss.

This treatment device forces stormwater runoff that enters the chamber up through the filter material. The head pressure forces water up, therefore, eliminating the clogging that downward flow filters encounter. The water polisher utilizes up flow media filtration (BioMediaGREEN). The Bio-MediaGREEN filter is capable of removing over 85% of super fine TSS based on a 20-micron particle size along with 69% of dissolved phosphorus. The filtered runoff from the

flower fields then flows west through a pipe underground to its outlet located adjacent to the I-5 Freeway.

The Result

With the approval of this treatment design in February of 2009 this seven acre plot of land is the future home of Carlsbad Paseo. This new development will include high end retailers and well know restaurants. The Upflow Filter design provides treatment to several of the surrounding acres.

Prior to the installation of the Upflow Filter no treatment was implemented to protect the surrounding bodies of water. The 400-acre Agua Hedionda Lagoon is one of the most threatened coastal wetlands along the California coastline. Sediment and bacteria are the two highest impairments to this lagoon under section 303(d). Treating

these impairments along with other pollutants will allow the sensitive ecosystem and various sporting activities to continue thriving.

Implementing this Upflow Filter technology provides higher treatment, higher rate of filtration and longer life

of filter media. By extending the life of the media it reduces future maintenance costs. Another benefit of this type of treatment design is that it does not rely on gravity which sometimes promotes clogging of the filter yet again reducing the maintenance time frequencies and costs.

