

Reducing Pollutant Runoff from a Municipal Parking Lot

PROJECT DESCRIPTION

The City of Dayton project captures runoff that drains from a municipal parking lot—storing the City of Dayton’s garbage trucks—and reduce pollutants that could drain to the Mad River. The trucks have hydraulic operated systems that use hoses and fittings. Despite regular maintenance, leaks from these trucks are probable. The city, through a competitive bid process, chose to install a BaySaver Separator System that filters out pollutants before they reach the river. The parking facility drains an area of approximately 3.5 acres.

Project Details

The BaySaver is made up of two standard pre-cast manholes and the BaySaver separator unit. The two manholes allow pollutants to be removed and stored. The separator unit directs the flow of water to provide the most efficient treatment possible. The BaySaver “3K” system was selected because it can treat 7.8 cubic feet per second of stormwater or a 2-inch-per-hour storm event over the 3.5-acre area.

The primary manhole is generally installed in-line with the storm drain and can be used as a multiple inlet structure. The storage manhole acts as a secondary treatment device to collect oils, fine sediments, and floatables. It is a key component

of the system and stores pollutants to prevent their re-suspension. The main part of the system is the separator unit and trapezoidal weir. The separator unit is the device that controls the influent flow through the two manholes.

Water enters the system’s primary manhole through the inlet pipe. Gravel and sand immediately fall to the floor of the primary manhole. Water, flowing into the manhole, carries floatables and fine sand. It is skimmed off the surface and sent into the storage manhole. When water enters the storage manhole from the submerged inlet pipe, oils and other floatables rise to the surface, while sediments settle to the floor. These contaminants remain trapped off

line and are not re-suspended during larger flows. The water flowing into the manhole displaces clean water from the center of the column, which is forced back up the return pipe to the storage manhole for secondary treatment. During extreme flows, the water is directed through the system to avoid re-suspension of materials that have already been collected and to prevent flooding upstream in the system.

Benefits

The BaySaver unit not only reduces potential pollutants from running off the parking area and flowing into the Mad River, it is cost-effective. Maintenance is less frequent and labor intensive than previously employed methods.

Water Quality Results

The separator system was cleaned and serviced after functioning for four months. A Vactor vacuum truck removed the stormwater, sludge, and oil from both manholes. The truck was then taken to the City’s wastewater treatment plant. Approximately 6.6 gallons of oil were collected in the storage manhole and nearly a cubic yard of sediment was removed from both manholes, which implies that the BaySaver Unit is working effectively.

Lessons Learned

Some minor issues were encountered during installation. The parking lot’s drainage system is intertwined with several other utilities. The initial installation site was moved downstream about 50 feet when an unmarked electrical line was discovered. Other concerns included a high-pressure water line that ran near the excavation and a sanitary sewer line that ran under the storm sewer. After accounting for these concerns, the separator system was installed downstream of the parking lot. The installation itself went smoothly.

Costs

The BaySaver Unit, including installation, totaled \$47,212.



Construction of the Separator System shows the excavation site at the parking facility.



The primary manhole is installed in-line with the storm drain (left unit) alongside the storage manhole (right unit).



Both manholes are capped, and backfill aggregate is installed around each unit.



The BaySaver Separator System shows final backfill, with grading and surfacing to be completed.



Right: Runoff from the City of Dayton’s parking facility for garbage trucks drained into the adjacent Mad River, home to abundant aquatic life and recreational opportunities. A new separator system has reduced the amount of solid and liquid contaminants entering the river.

