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The Need for Secondary Containment

Recent rules and regulations have focused on preventing and detecting leaks in underground tanks and piping. However, in many stations, tank and pipe leaks are not the major source of environmental contamination. Instead, contamination can occur in uncontained areas of the fill, under the dispenser and at the submersible pump area. Containment in these areas can reduce environmental damage due to accidental releases.

A New Technology is Born

Form-in-place secondary containment systems were developed to help prevent contamination in three key areas: at below grade fills, around unprotected submersible pumps and the open areas under dispensers. The unique aspect of the form-in-place system is they can be installed without removing existing equipment such as dispensers and without shutting down the service station.

For more information regarding these form-in-place systems, contact:

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Upgrading Below Grade Fills

Figure 1



Below grade fills currently in use at many service stations, especially the older stations are located below the surface of the pavement. They have spill protection and meet current EPA requirements. However, an annular space exists between the spill containment device and the pavement. This annular space is a conduit for contamination to reach the soil from spills that either overflow the spill containment device or occur when disconnecting the fuel transfer hose, or enter from the driveway.

An example of an upgrade of a below grade fill to at-grade status is shown in Figures 1 - 4. In the Figure 1, the spill containment device cover ("toilet seat") is removed from the spill container and the annular space between the containment bucket and access manhole is cleared of debris and all metal surfaces are prepared for coating in a safe manner. The annular space is filled with a gasoline resistant PTI paste material to form a flexible bowl to channel spills into the containment bucket as shown in Figure 2. It is important that the bowl created be flexible as movement of the spill bucket relative to the pavement could otherwise cause a breach in the containment.

Figure 2



To complete the installation, the existing cover is replaced with a new water resistant cover system shown in Figures 3 and 4.

Figure 3

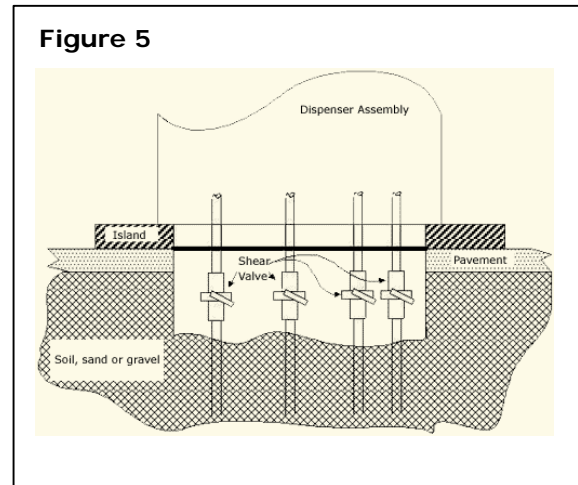


Figure 4

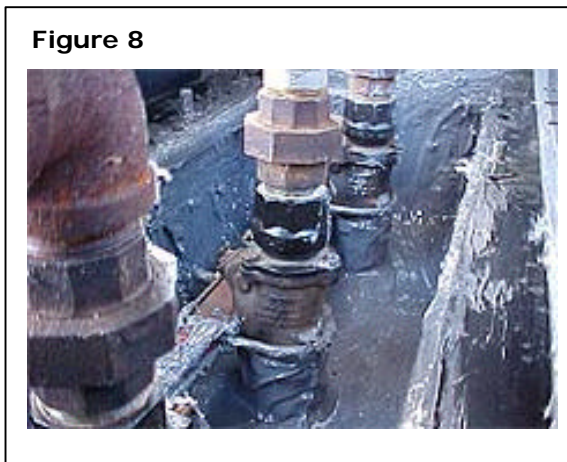
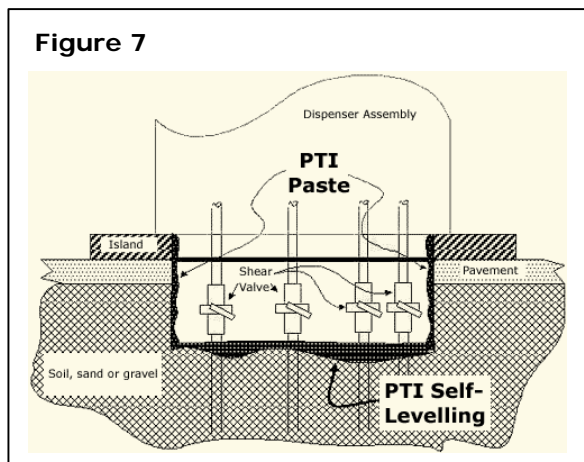


Form-in-Place Dispenser Pans

Most fuel dispensers at service stations and other fueling areas are set on a concrete pad with associated underground piping attaching to the dispenser from below. The area under the dispenser is often unprotected and any spill or leak will fall directly to the soil beneath resulting in contamination of soil and/or groundwater. This unprotected area is illustrated in Figures 5 & 6.



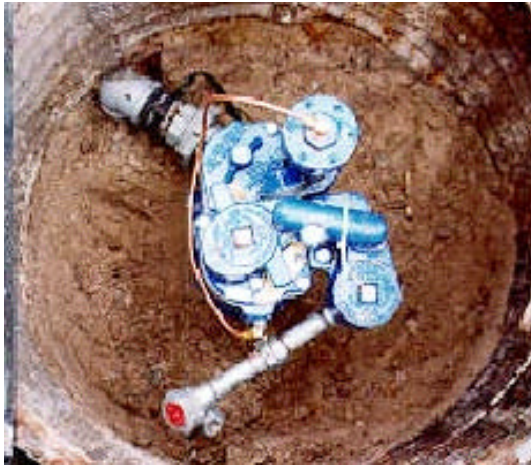
Adding conventional containment systems requires that the dispenser be taken out of service and removed from the island, the piping disconnected, concrete cut to fit the new containment box and the box be installed. The form in place dispenser pan is installed with the dispenser in place and without shutting down the station. The method utilizes the existing framework of the dispenser to form the pan. All surfaces and penetrations are specially prepared and treated. The sides of the pan are formed using a flexible material to seal all cracks, holes, and gaps in the existing side structure regardless of construction. The dispenser pan is completed by pouring a firm, but flexible floor as shown in the schematic in Figure 7. A picture of an actual completed pan is shown in Figure 8.



Form In-Place Submersible Pump Containment Sump

Many submersible pumps located at service stations or other fueling areas are set into the underground storage tank with the pump head and fittings exposed directly to the ground. This area is unprotected and any releases will directly contaminate soil and/or groundwater. A typical example of such a pump is shown in Figure 9.

Figure 9



The form-in-place sump is installed while the pump remains in operation. Sidewalls of the in-place containment sump are formed using fiberglass panels with a predetermined diameter. The fiberglass panels are placed in the existing sump and fastened together to form a tank-like structure as shown in Figures 10 and 11. All joints and penetrations are sealed with a special flexible material. Pouring a flexible floor completes the sump. Alternatively, the sump can be extended to grade level if this is required. The completed sump is shown in Figure 11. Note that a small annular space is left between the new sump and the existing culvert to allow surface water that enters to drain to the ground.

A water resistant lid assembly is put in place below grade level to keep water out of the new sump.

Figure 10



Figure 11

