Conductive Multi-Linear drainage geocomposites for improved QA/QC of leachate double-lined ponds

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The oil industry uses double-lined ponds incorporating a leak detection drainage layer for the storage of their produced water. They also need to verify that the Action Leakage Rate (ALR) is not exceeded. A typical cross-section is shown in Figure 1.

During the construction of the ponds, the quality controls done by the geomembrane installer are concentrated mainly on the welds between geomembrane rolls but the panels themselves also need to be controlled for leaks. Electrical Leak Location (ELL) survey is then required on both liners during construction to detect and repair any defect. The use of ELL survey must be anticipated during the design of the pond as it requires specific construction considerations. Especially, an electrically conductive layer is required under the primary liner to run the ELL survey. A typical cross-section is given in Figure 1.

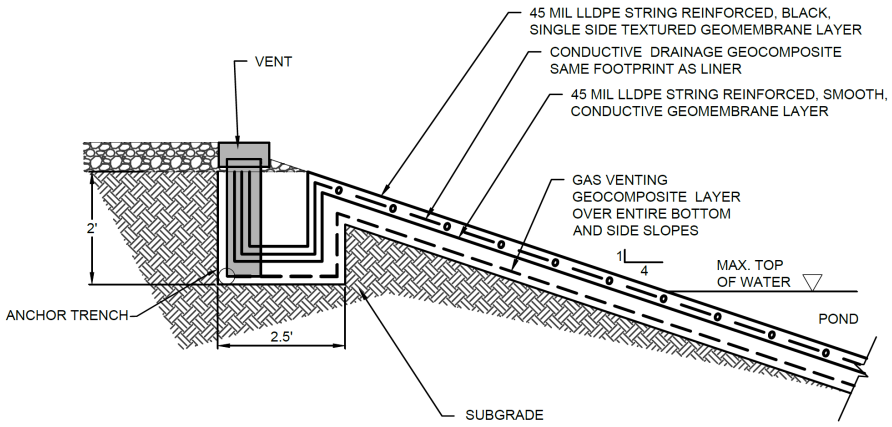

Figure 1. Typical cross section of the ponds

Reinforced Polyethylene (RPE) geomembrane is often used as liner when left exposed in ponds for the following reasons:

- High resistance to UV degradation
- Very chemical-resistant, LLDPE with excellent cold crack performance
- Excellent puncture resistance

The RPE geomembrane can be preassembled in large panels before being shipped to the site (see figure 2). This decrease the construction time and increase the quality of the panel weldings.

Figure 2. RPE geomembrane installation

A conductive multi-linear drainage geocomposite is used as leak detection layer between the two liners to allow ELL survey on the primary liner (see figure 3). This composite offers filtration, drainage, mechanical protection and electric conductivity functions in a single product and a single installation.

Figure 3. Draintube Conductive installation

Unlike other solutions like conductive-backed geomembrane, the conductive multi-linear drainage geocomposite is compatible with all ELL methods (arc test, water puddle, dipole, etc.). This point is critical as an ELL survey may require the use of several methods on the same structure. It also ensure that future ELL surveys can be done even during pond operations if any unanticipated event occurs.

Last but not least, the use of preassembled RPE membrane and conductive multi-linear drainage geocomposite together increases on-site safety by reducing the number of welds to be made and by handling light and flexible materials.