

## **The use of Oleophilic Bio-Barriers to prevent sheens at hydrocarbon contaminated sites**

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**Abstract.** Historic subsurface releases of petroleum liquids can result in sheens at groundwater-surface water interfaces (GSIs), an express violation of the Clean Water Act. Remediation technologies such as organoclay barriers, sediment caps, and adsorbent booms are not always effective and can be costly to implement. In response to this problem, Colorado State University (CSU), Chevron, and ARCADIS have developed and patented the Oleophilic Bio-Barrier (OBB). By its oleophilic nature, the OBB holds petroleum hydrocarbon until such time that it can be degraded. The open interior of the OBB facilitates delivery of oxygen via periodic inflow of aerobic surface water and atmospheric air, driven by tidal cycles, which promotes biodegradation. This improves the longevity of the OBB treatment as compared to options that solely rely on sorption. Current preliminary field demonstrations are ongoing in Maydown, Northern Ireland, and Portland, Oregon. Furthermore, a full-scale design is being developed in Rensselaer, NY. OBB and sediment samples from these sites have been analyzed to quantify how much hydrocarbon contamination is sorbing onto the OBB. This data and that from future field studies will determine the efficacy of the technology in preventing sheens and can be used for improvements to the OBB design. Microbial analysis performed will elucidate how the OBB can affect aerobic communities and reduce contaminant levels due to biodegradation. Further laboratory work will examine how the OBB facilitates contaminant transport mechanisms. Establishing the OBB proof of concept will allow for this technology to be offered as a cheaper alternative to current sheen remediation options.