

Oxygen Release Compound, ORC®

Uses in Biopiles

Excavated soil contaminated with aerobically remediable hydrocarbons, can be treated in "biopiles". In this process, contaminated soil is simply piled up over a manifold of piping designed to deliver forced air. With the right balance of nutrients, water and air, an adapted microorganism population can effect bioremediation. The role for ORC is apparent where forced air delivery of atmospheric oxygen is not practical. This will occur for several reasons:

- 1) The soil is a heavy clay and forced air "channels" in preferential flow paths leaving dead zones where remediation is limited or non-existent.
- 2) The local air quality regulations prohibit the use of forced air which volatilizes pollutants.
- 3). Active systems involving pumps are undesirable, because space is limited, the site is remote or there is a risk of vandalism.

Also, the degradation of hydrocarbons by introducing air are subject to the "law of asymptotes." This means that the rate of degradation falls on a half-life curve (logarithmic decay), such that it becomes incrementally more difficult to degrade contaminants over time. Under these conditions, it will take as long to go from 600 ppm to 300 ppm, in a latter phase of clean-up, as it does to go from 10,000 ppm to 5,000 ppm in an initial phase. The same active systems must still run to complete the task, so ORC has widespread potential use as a *polishing agent*. This allows the last portion of contamination to occur *passively* with minimal oversight. ORC can also be used at the beginning of the process while soil is being excavated - in preparation for the construction of an air-fed biopile. For lower levels of contamination an initial ORC treatment, applied at the initial phase, may be adequate.

Regenesis has performed several field trials to establish the useful role of ORC in soil bioremediation. In experiments with Dow Chemical, an application of ORC was 60% more efficient, on an equal oxygen basis, compared to calcium peroxide in the remediation of TPH. Due to pH considerations, CaO₂ can only be applied at levels about an order of magnitude less than that for ORC. Also, in a separate in-house study, a crude oil contaminated soil supplemented with ORC showed a 7,000 ppm reduction in 200 days.

[Technical Bulletin Index](#)||[Regenesis Home Page](#)