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## Comparison for Hydrocarbon Contaminated Soils Bioremediation Vs. TS MaxClean™

**Typical Scenario:** Developer wants to redevelop an area of land for a residential project, but the land is contaminated with elevated petroleum hydrocarbons from former industrial usage of the land (e.g. 1000s mg/kg). This needs to be removed or cleaned to an acceptable concentration (e.g. below 50mg/kg) before the developer can build the houses and associated infrastructure.

Bioremediation	TS MaxClean™
<p><b>Typical Process:</b></p> <p>Investigation to delineate extent of contamination (areal extent and depth).</p> <p>Excavation of contaminated soils and placement in biopiles, which need to be covered in liners to control moisture content and filled with air tubes to promote air circulation, and seeded with nutrient solution to promote bacterial activity to digest the hydrocarbons.</p> <p>Monitored by sampling an analysis over several MONTHS until acceptable results achieved.</p>	<p><b>Typical Process:</b></p> <p>Investigation to delineate extent of contamination (areal extent and depth).</p> <p>Excavation of contaminated soils (if deep contamination) or rotivation of soils if shallow contamination with simultaneous spray application of <b>TS MaxClean™</b>. Continued mixing of soils (ex-situ or in-situ) with application of TS Maxclean to ensure contact between all contaminated soils and solution.</p> <p>Monitored by sampling an analysis over several DAYS until acceptable results achieved.</p>

### Advantages of TS Maxclean method over conventional bioremediation.

Both techniques require a similar amount of plant and equipment and earthworks activity and both techniques will achieve the desired result over time, but the TS MaxClean™ approach achieves total clean-up in a matter of few days, whereas bioremediation can take months. Consequently, the development gets completed (and profits realised) much faster and associated land-take and plant hire can be completed much faster too.

Furthermore, successful bioremediation requires careful control over conditions such as moisture content, nutrient levels, airflow and temperature (and is considerably slower in colder weather). **TS MaxClean™** utilises a catalysed ambient chemical reaction and is not sensitive to any of these variables so works under all conditions at any time of year in all climatic regions.

The overall effect of adopting a **TS MaxClean™** solution over a conventional bioremediation solution is total source removal and demobilisation of plant in a matter of days – it's a simple materials management and spray application operation, which for shallow and surface contamination can be done *in-situ*. This translates to substantial cost-savings over bioremediation and earlier realisation of development profit

**UK Office : +44 1279 902 345**  
Titan Source 1, LLC  
Weston Business Centres, Parsonage Road.  
Takeley, Essex, CM22 6PU, UK

**USA Office: 225.772.4411**  
Titan Source 1, LLC  
6313 Equity Dr. Baton Rouge, LA  
70809, USA