



TSI DC RR *Rhodococcus ruber* Bioaugmentation Culture[®] for 1,4-Dioxane

Terra Systems TSI DC RR *Rhodococcus ruber* Bioaugmentation Culture[®] is added to the groundwater at sites where the native microorganisms are not present, are not in sufficient quantity, where the native population does not express all of the required functional genes for 1,4-Dioxane reduction, or when the client wants to decrease the remediation time frame for the biodegradation of 1,4-Dioxane.

Key Communication Points

- TSI DC RR *Rhodococcus ruber* Bioaugmentation Culture[®] is an enriched natural bacteria culture that contains microorganism of the genus *Rhodococcus ruber*.
- TSI DC RR[®] *Rhodococcus ruber* contains *Rhodococcus ruber* at greater than 1E9 cells/mL.
- It can be used at sites where bacteria capable of complete 1,4-dioxane biodegradation are not present or there is a need to decrease the remediation time frame.
- The *Rhodococcus ruber* culture is aerobic and requires a cometabolic substrate (propane) and greater than 1 mg/L of dissolved oxygen to biodegrade 1,4-Dioxane.
- Because the TSI DC RR *Rhodococcus ruber* Bioaugmentation Culture[®] is aerobic, it can not be applied at the same time as reductive dechlorination of chlorinated solvents. The aerobic treatment can be performed before reductive dechlorination (with substrate injection and bioaugmentation with a dechlorinating culture to treat the chlorinated solvents), after reductive dechlorination has been conducted, or downgradient of the chlorinated solvent plume. For sites without PCE, it may be possible to cometabolically biodegrade 1,1,1-TCA, TCE, DCE, VC, and 1,4-Dioxane under aerobic conditions with the additions of oxygen and propane.
- **Key Benefits of TSI DC RR *Rhodococcus ruber* Bioaugmentation Culture[®]**
- The TSI DC RR *Rhodococcus ruber* Bioaugmentation Culture[®] has been proven to be effective for the complete degradation of 1,4-Dioxane.



Terra Systems QA/QC

- With every shipment, we include a QA/QC sheet for the actual batch that the customer receives. Included are the date manufactured, batch# and the concentration of *Rhodococcus ruber* (cells/mL).

The TSI DC RR[®] Bioaugmentation Culture is cost effective and is typically a minor component of the total remediation project cost. At sites where the *Rhodococcus ruber* is present, but at low numbers or poorly distributed, bioaugmentation can be used to reduce the treatment time.

Bioaugmentation can also reduce the time required to grow the *Rhodococcus ruber* population to effective cell densities. Therefore, future costs can be reduced.

- The TSI DC RR[®] Bioaugmentation Culture is not genetically modified or engineered.
- The TSI DC RR[®] Bioaugmentation Culture is certified to be free of known human pathogens.
- Each purchase comes with free technical phone support from an experienced Terra Systems microbiologist.
- The TSI DC RR[®] Bioaugmentation Culture has rigorous quality control procedures in place to ensure that each shipment is of the highest quality, stable, safe, effective and free of chlorinated volatile organic compounds.
- The TSI DC RR[®] Bioaugmentation Culture is shipped overnight in specially designed stainless steel containers that prevent exposure to air and are safe & easy to handle.
- A senior level microbiologist is also available to be on-site to support the successful application at \$1,200 per day plus travel expenses

