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## Shoreline Cleaner Process using CytoSol Biosolvent made from Vegetable Oil

The CytoSol Process was developed under USDA grants to facilitate the recovery of spilled heavy petroleum from oiled shorelines in ecologically sensitive marine and aquatic habitats. The process uses a "Biosolvent" formulated with methyl esters of vegetable oils, along with nutrients to enhance the biodegradation of residual hydrocarbons. The methyl esters have a strong solvent activity capable of dissolving weathered crude oil from shoreline habitats including marshes. CytoSol is non-volatile, has low toxicity and contains no surfactants or distillates. The dissolved oil/CytoSol mixture is rinsed off with a low-pressure ambient temperature water deluge. The product acts to "lift and float" the dissolved oil onto the water surface for easier recovery with conventional skimmer and boom technologies. Recovered oil/CytoSol mixtures can be recycled as burner fuel. We can provide EPA marine toxicity studies and case history field trials involving the cleaning of crude oil from oiled mussel beds, oiled marsh plants, oiled creek beds and oiled shorelines along the San Francisco Bay. In 1997, CytoSol Biosolvent was listed on the NCP Schedule of Products and licensed by OSPR in California as a shoreline cleaner. Product is already staged in Louisiana.

### Materials Required

Bulk and intermediate sized containers of CytoSol Biosolvent staged at key service ports for response personnel. 5,000 gallons of CytoSol are currently staged in 275-gallon totes in New Orleans, Louisiana. 150,000 gallons of additional CytoSol product is available within the Louisiana region within 24 hours. Larger volumes can be mobilized as required to respond to shoreline cleaning and de-con activities from Texas through the Florida coasts.

### Equipment Required

Product can be sprayed from response vessels onto slick or mats of stranded oil. Low pressure hand powered sprayers and/or 12 volt low pressure sprayers with dispenser wands. Shallow draft marine vessels and skiffs. Skimmers and oil recovery booms to collect bulk crude oil released by the CytoSol Process. Oil recovery secondary containment. Oil absorbent boom and pads for collection of residual hydrocarbons. Recovered oil tanks and containers to transport the collected oil-CytoSol mixture back to ports or barges for recycling.

### Expertise Required / Expertise Offered

Shoreline cleaning personnel trained to apply CytoSol Biosolvent and to recover released oil using a gentle water deluge. Product handling and application training provided by CytoCulture's team headquartered at our Response Center with Rapid Energy Services in Lafayette. CytoSol was deployed by the O'Brien Group during the 2007 San Francisco Bay spill for the de-con of oiled response vessels in the water as well as for cleaning up oiled boom, pumps and equipment.

SEE [www.cytoculture.com](http://www.cytoculture.com) and [www.rapidenergyservices.com](http://www.rapidenergyservices.com) for technical publications, contact information & videos of field demonstrations. CytoCulture runs a microbiology laboratory to monitor bacteria populations in shoreline sediments. The CytoSol Process can be integrated with the Proteus 168 technology to accelerate the biodegradation of residual contaminants in sediments after bulk oil recovery.

*The unique combination of using the CytoSol Biosolvent to recover stranded oil and then facilitating the biodegradation of residual hydrocarbons left on shorelines should achieve the highest rate of habitat restoration possible.*

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