

## **Hottpad: Results from a Field Demonstration Project for Treatment of Heavy Oil Sludge and Oil-Impacted Soil**

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**Background/Objectives.** Smoldering combustion is a novel and more sustainable remediation process than conventional thermal alternatives, where the contaminants within a porous matrix are the fuel for thermal oxidation treatment. The treatment process is self-sustaining following a short duration, low energy input 'ignition event'. Provided a sufficient flux of air is supplied, the energy of the reacting contaminants is used to pre-heat and initiate combustion of contaminants in the adjacent matrix material, propagating a flameless combustion front through the contaminated media. The process is very robust and well-suited for treatment of oily wastes or oil-contaminated soils with many potential applications to the oil and gas and chemical manufacturing industries.

**Approach/Activities.** Chevron Energy Technology Company and Savron collaborated to develop an ex situ application of smoldering combustion applied in a simple soil pile configuration. Termed Hottpad (Heated Overland Thermal Treatment Pads), the process uses a series of pads which are fitted with resistive heaters, air distribution system, and trafficable grates (rated for 50 tons). The Hottpads can be joined together to create small to very large treatment areas on which contaminated soils or soils mixed with oily wastes can be placed and treated. The first full-scale demonstration of this technology was conducted at a former refinery site in southeast Asia to treat heavy oil hydrocarbon wastes and oil impacted soil.

**Results/Leasons Learned.** The treatment costs for the Hottpad technology were found to be lower than for the dig and haul remedy proposed for the site. The Hottpad system also had additional value advantages including: smaller carbon footprint, simple operations, reduction of vehicle traffic associated with dig and haul, modular and transportable, and small physical footprint allowing it to be used on site. This presentation will present the design, operational features and performance of the full-scale field demonstration of the Hottpad technology.