

The logo for PermaFix environmental services. It features the word "PermaFix" in a bold, sans-serif font, with "Perma" in grey and "Fix" in black. Below it, the words "environmental services" are written in a smaller, black, sans-serif font. To the right of the text is a blue graphic consisting of a small circle with a dot in the center, surrounded by three concentric circles of increasing size, resembling a ripple effect. A red curved line arches over the top of the text.

PermaFix[®]
environmental services

Waste Management '07

Perma-Fix Environmental Services,
Inc.

Bill Smart

Director, Business Development

The Company

- Perma-Fix is a small business (<500 employees) that is publicly traded;
- Currently operates 9 TSDFs across the U.S.;
- With 20+ years of experience in Hazardous Waste treatment and Mixed Waste treatment.



Our Capabilities

- Provide treatment services for:
 - Non-hazardous; Hazardous;
 - Low-level Radioactive; and Mixed Wastes
- Each of our three Nuclear Services facilities operate under its own Radioactive Materials License and RCRA Part B Permit.
- Each facility undergoes annual DOECAP audits as well as other client or industry sponsored audits (e.g., NUPIC)

Perma-Fix/M&EC

Located in Oak Ridge at the East Tennessee Technology Park is our largest treatment facility with the most comprehensive mixed waste treatment capabilities available in the U.S.

Treatment Processes

- Stabilization/Solidification
- Vacuum Assisted Thermal Desorption
- PCB treatment
- Mercury treatment <260 ppm, >260 ppm, elemental
- Wastewater Treatment
- Lab Pack Depack & processing
- Debris treatment including Macroencapsulation and Solvent Extraction.



Perma-Fix/DSSI

Located in Kingston, TN, DSSI offers thermal treatment of radioactive and mixed liquids and semi-solids to ensure organic waste contaminants are destroyed and metals are bound to meet LDR criteria.

Treatment Processes:

- Combustion processing – using an energy recovery industrial boiler
- Solidification/stabilization
 - Neutralization
 - Deactivation
- Liquefaction to enable combustion of semi solids
- Awaiting PCB destruction permit
- IMERC – Mercury Incineration



Perma-Fix of Florida

Located in Gainesville, FL this facility offers mixed, low-level radioactive, and hazardous waste treatment and thus is our most versatile turnkey facility. In addition, we operate a R&D laboratory that develops treatment solutions for complex waste streams.

Treatment Processes:

- Fuels blending (radioactive and non-radioactive)
- Stabilization and Solidification
- Debris Treatment
- Oxidizer deactivation
- Neutralization
- Treatability Studies
- PCB storage
- Mercury <260ppm treatment



Troublesome Waste Table – What Has Been Accomplished		
“Orphan” Waste Category ¹	Waste form	Generator
Mercury Waste	soil/sludge containing >260 ppm mercury, organics, and PCBs	Oak Ridge, TN Bechtel Jacobs Company LLC
Organic Liquid Stabilization	140,000 gallons of sodium bearing mixed waste liquids required onsite stabilization to meet NTS WAC due to high activity; Waste liquid resulted from HLW retrieval and vitrification activities at West Valley Demonstration Project;	West Valley Nuclear Operating Company
High Activity Thermal Treatment	Organic Non Debris with Dose rates up to 70mR/hr on package surface with inner package dose rates exceeding 100mR/hr;	Fluor Hanford
Reactives, Pyroforics	Variety of reactive and pyrophoric chemicals from the accelerated clean up project	Rocky Flats Environmental Technology Site
Uranium & Thorium Chips	555 containers of depleted uranium chips in oil and contaminated soil and oil excavated from the Hanford 618-4 burial ground;	Bechtel Hanford
TSCA Waste	PCB Remediation Waste from accelerated cleanup project	Bechtel Jacobs, Oak Ridge Site
Alpha MLLW	evaporator system sludges, residues, and used water filters; Waste had been mixed with diatomaceous earth absorbent and in many cases compacted; Extensive activity and dose rate issues;	ETEC Boeing (Rocketdyne)
Beryllium	Beryllium contaminated waste	Rocky Flats Environmental Technology Site
TRU Other	506 cubic meters of legacy MLLW contaminated with Pu-239; Organic and inorganic contaminated soil, elemental Hg lab packs, >260 ppm, <260 ppm Hg;	Lawrence Livermore National Laboratory
Oil with Metals	Oil with metals are routinely thermally destroyed via combustion	Multiple DOE & Commercial sites
Inorganic Liquid	>130,000 gallons of F-Canyon Depleted Uranyl Nitrate (DUN) waste for Westinghouse Savannah River Company. DUN, a byproduct of nuclear material production, contained significant quantities of Pu-239 that exceeded Class A disposal limits and thus required disposal at NTS;	Westinghouse Savannah River Company

[1] Waste stream categories are as identified in the report from the Department of Energy, Office of Technical Program Integration, EM-22 “Mixed Waste Focus Group”.



New PCB Treatment Capabilities

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- Perma-Fix/DSSI initiated a demonstration test (June 6, 2006) authorized by USEPA and TDEC to prove that combustion at DSSI can provide an “alternative” treatment and disposal outlet for PCB liquids and semi-solids;
- Permit expected by mid 2007 offering alternative to DOE TSCAI.



Boiler at DSSI

Mercury Treatment Capabilities

- Amalgamation - Elemental Hg;
- Stabilization - <260 and >260ppm Hg;
- Thermal –
 - Retort using VTD
 - Combustion at DSSI (IMERC)



Disposal Capabilities

- **Perma-Fix has experience shipping treated waste to:**
 - **Government disposal facilities:**
 - Nevada Test Site (Certified Generator for LLW and MLLW)
 - DOE Hanford Site
 - EMWMF Oak Ridge CERCLA Cell
 - **Commercial disposal facilities:**
 - EnergySolutions Clive, UT
 - EnergySolutions Barnwell, SC
 - Waste Control Specialists, TX
 - US Ecology, WA

Perma-Fix North West

- Perma-Fix is acquiring PeCo's
- Anticipated date – April 5, 2007



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Summary

- **DSSI - Liquid PCB Destruction**
- **M&EC- Solid PCB Destruction**
- **Perma-Fix North West – April 5, 2007**

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