International Collaboration on Addressing Dioxin Contamination in Vietnam

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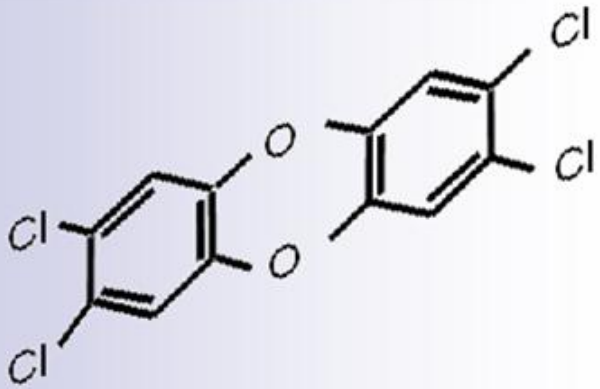
Dioxin Research and Remediation Project



Vance S. Fong, P. E.

U.S. Environmental Protection Agency

The Pacific Southwest Region

Operation PACER IVY

- The 1971 PACER IVY operation and storage areas have been indicated on the satellite images for Bien Hoa Airfield, Da Nang Airfield and Tuy Hoa Airfield.

Milestones

- 1995: Normalization: U.S. – Vietnam bilateral relations
- 2000: EPA and HHS & GVN met in Singapore
- 2001: EPA & VAST-initiate Project 2
- 2002: Research MOU
- 2003: Technology Conference in Hanoi
- 2004: Dioxin Lab and screening techniques
- 2005: Soil/sediment Sampling in Da Nang
- 2006: First JAC
- 2006: DOD Workshop
- 2006: Joint Statement
- 2007: Interim Action
- 2007: DOD Workshop
- 2007: Second JAC

Collaborators

USA

- USEPA
- HHS/NIEHS
- HHS/CDC
- HHS/OGHA
- DOD
- DOS

Vietnam

- VAST
- MOD
- MOH
- Office 33 (MONRE)
- MOFA

Objectives

- Advance science to reduce environmental dioxin exposure by strengthening research capacity on dioxin in US and Vietnam
- Promote U.S. – Vietnam environmental research collaboration

Objectives

- Develop Laboratory capacity to analyze environmental samples with high degree of accuracy
- Demonstrate cost effective methods for rapid site characterization
- Share information on technologies for remediation of contaminated areas
- Conduct pilot project at Danang Airport to test capabilities

Results

- Established VAST-EPA AO Joint Research Laboratory
- Established working relationship between EPA & MOD, MONRE, VAST

Results

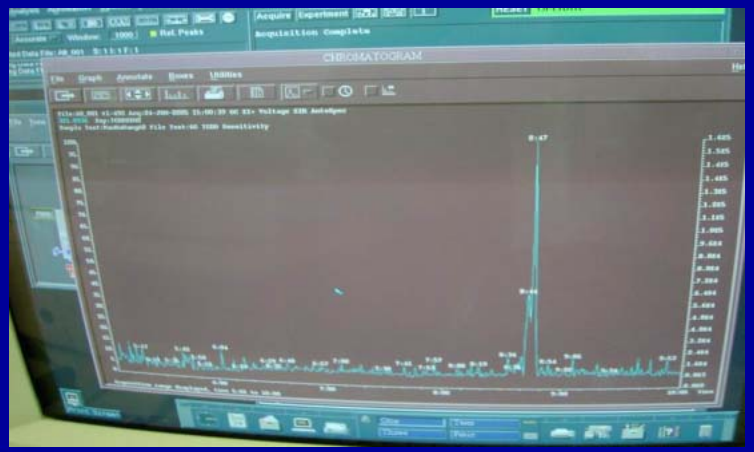
- Trained VN scientists in sample collection of dioxin contaminated soil & pond sediment

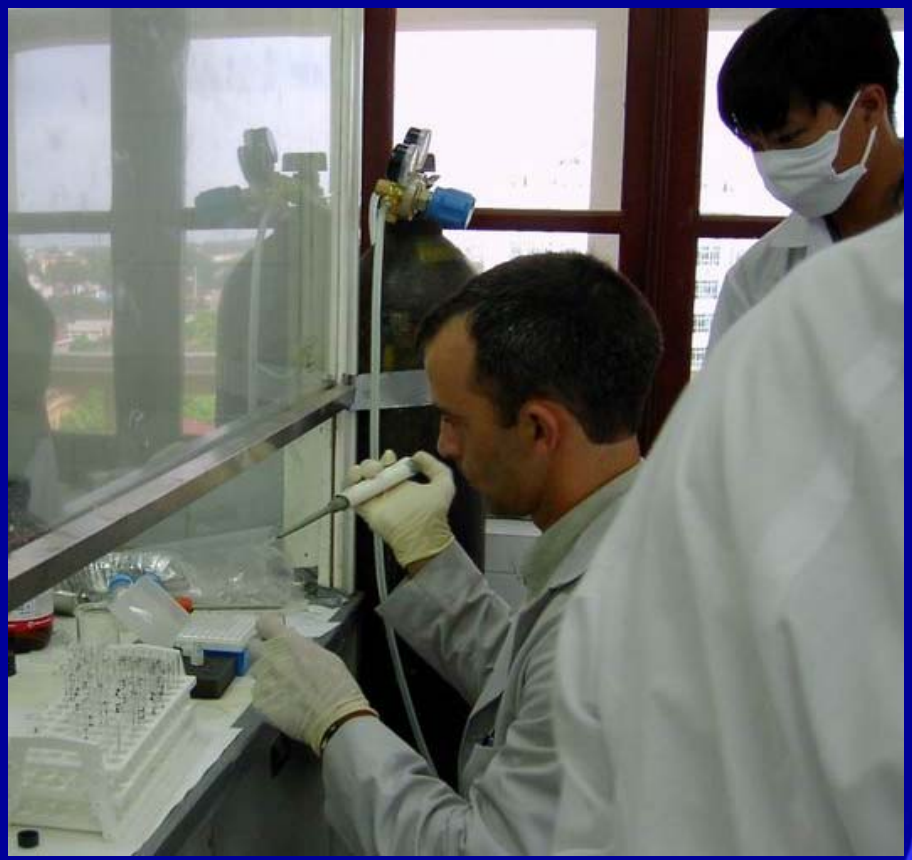
Results

- Provided laboratory equipment (GC/MS & others), glassware, reagents for sample cleanup, preparation and analysis
- Trained VN scientists to extract and clean up soil and sediment samples for analysis of dioxins

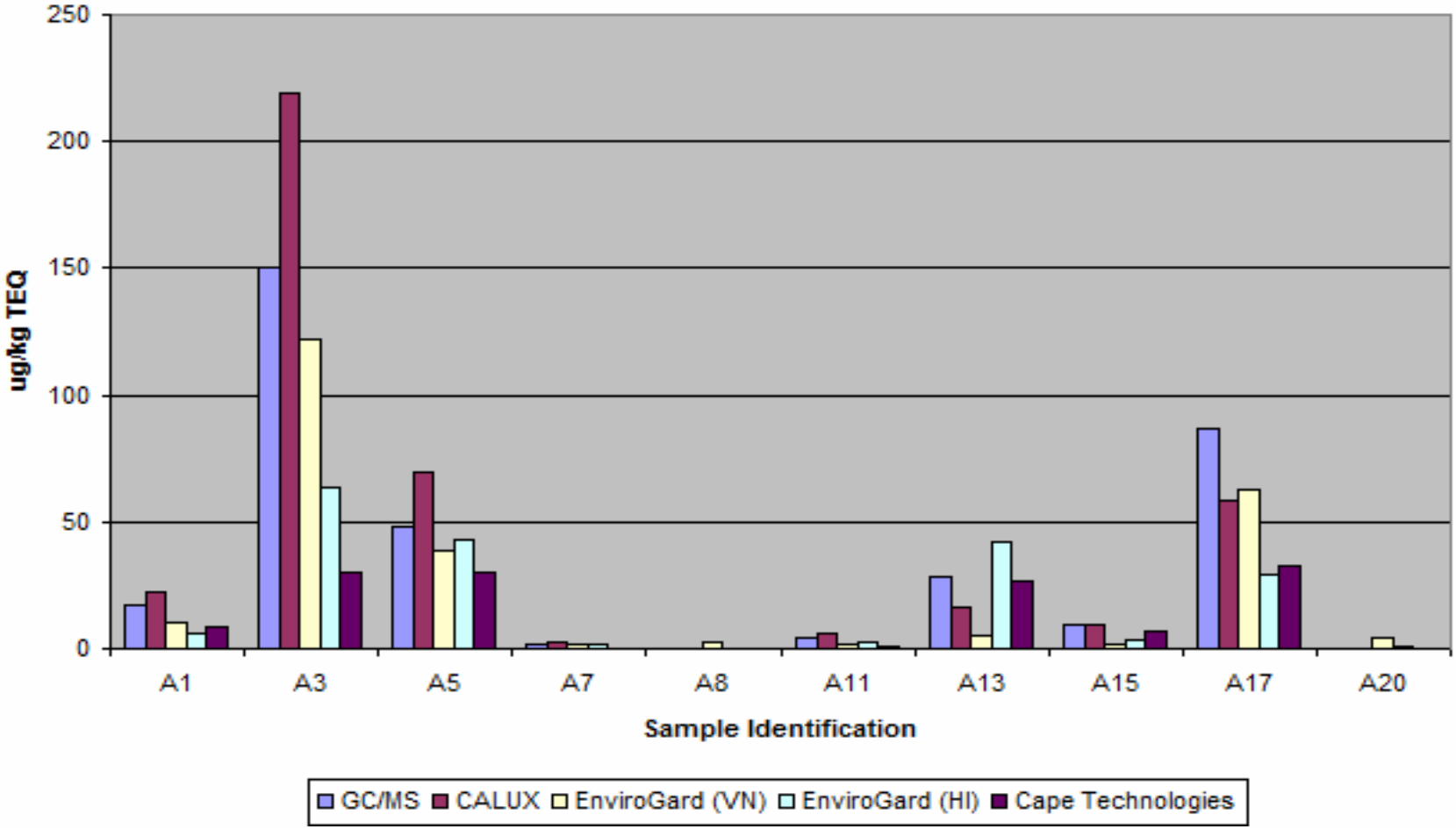
Results

- Compared findings of immunoassays and Ah-receptor based methods with more traditional analyses (HR/GC/MS)





Comparison of Dioxin TEQ Data



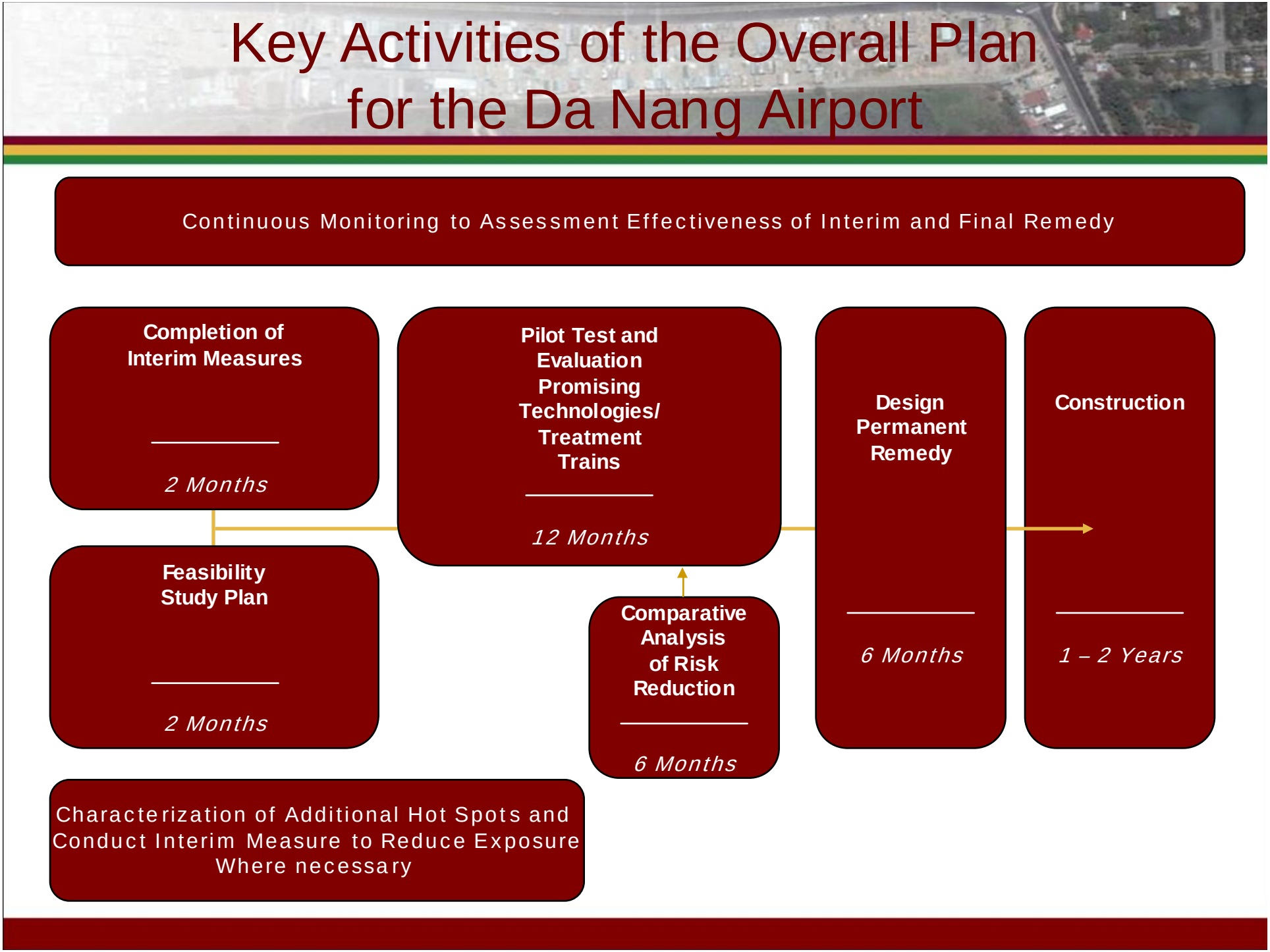
Results

- Collected more than 300 soil/sediment samples from known contaminated area near runway and the adjacent pond

Existing Environmental Data

Interim Containment Measures

Key Activities of the Overall Plan for the Da Nang Airport



Long-Term Remediation Technologies

Technology	Definition	Status
Thermal	High temperatures breakdown the dioxin molecule into carbon dioxide, water, and chlorine gas (which must be managed by a scrubber unit).	PROVEN, $$$$
Solidification/ Stabilization	Mixtures immobilize the dioxin in a matrix that can withstand erosion and migration.	PROVEN; $; easy to implement
Physical/Chemical	Chemicals detoxify the dioxin by removing the chlorine molecules or act to separate it from the contaminated media.	PILOTED with success
Bioremediation	Use microorganisms to breakdown dioxin into non-toxic waste products.	UNPROVEN; $; promising pilots underway
Containment	Physical barriers to sequester contaminated soils; Regular monitoring	PROVEN $$

Recent Developments

- Improved collaborations & communication between Governments on issue of AO
- Greater involvement of NGOs
- $3M USD appropriated (FY07)
- New environmental data from Hatfield & Associates

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Contact Information

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