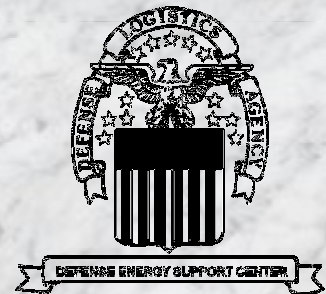


# *Norwalk Tank Farm Update*

*Defense Energy Support Center-  
Los Angeles  
Presented to the Norwalk Tank Farm  
Restoration Advisory Board*

*April 27, 2000*



# Presentation Overview

## Topics to be Covered

- Central Plume Remediation
- Biodegradation Estimation Process



# Central Plume Remediation

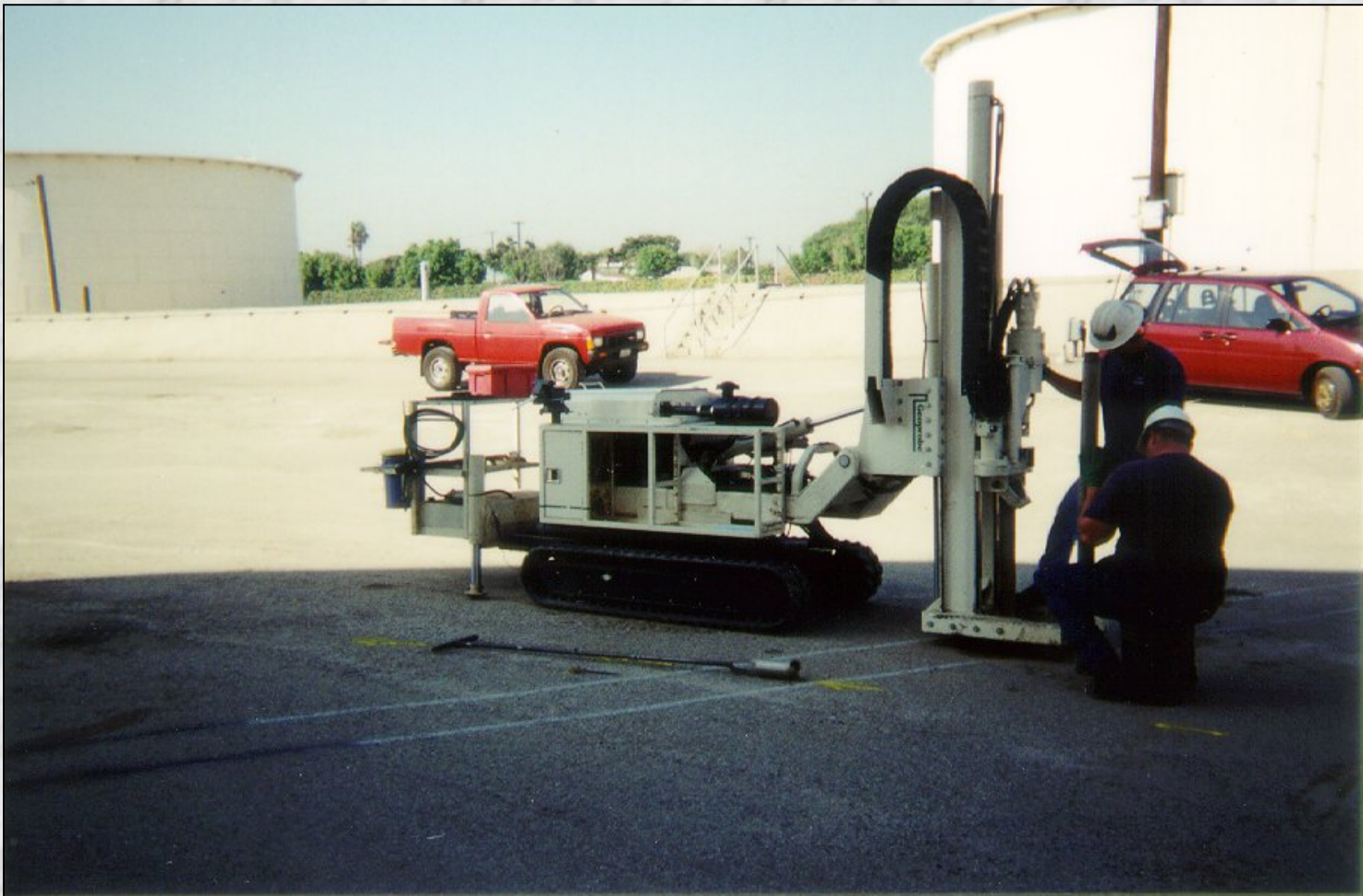
- System performance since April 1996
  - Approx. 115,571 gallons recovered and destroyed
    - 53,848 free product recovered
    - 60,891 soil vapor extraction
  - Approx. 89,500 gallons biodegraded
  - 23M gallons of water treated
  - 739 gallons of dissolved phase recovered

# Central Plume Remediation System

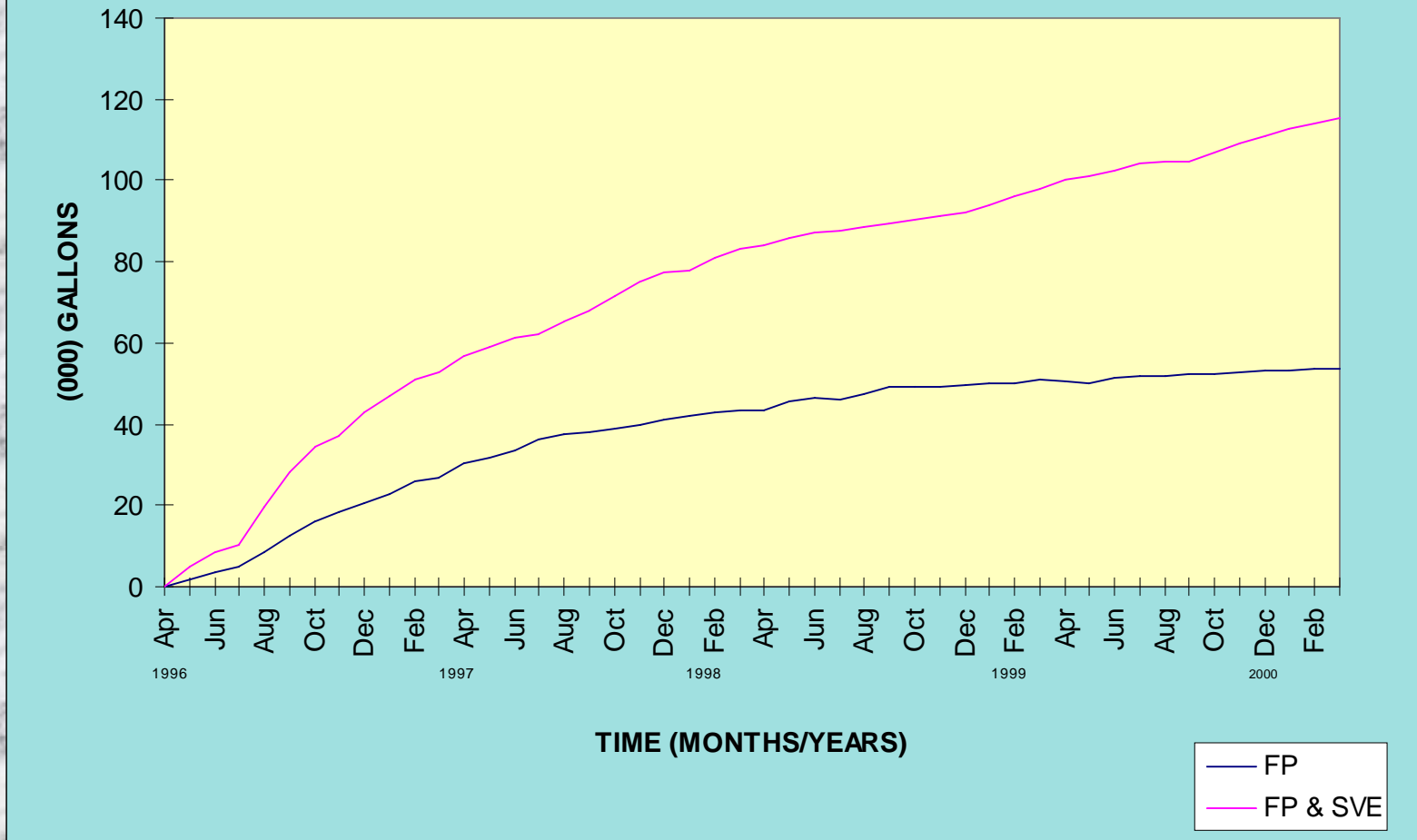




# Biosparge Well Installation



## HYDROCARBONS & FREE PRODUCT - CENTRAL PLUME





# Biodegradation Estimation Process

- Through a series of respirometry tests in the central, east-central, and north-central areas of the Tank Farm, we know that the indigenous bacterial population within the soil can be stimulated to consume hydrocarbons

# Biodegradation Estimation Process, continued

- The basis for determining the amount of biodegradation is the measurement of oxygen reduction/depletion and the carbon dioxide increase/enrichment caused by the bacteria
- Naturally-occurring bacteria (micro-organisms) present in the soil use oxygen to convert hydrocarbons (food) to carbon dioxide and water



# Biodegradation Estimation Process, concluded

- Collect samples from the vapor stream prior to entry into the thermal oxidizer
- Determine the oxygen deficit in the subsurface by comparing to ambient air
- For every 1.5 molecules of oxygen consumed, 1 molecule of carbon dioxide is produced
- Not an EXACT scientific calculation