

Florida State University

Cooperative Activities with
U.S. Department of Energy

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Institute for International Cooperative
Environmental Research

Florida State University

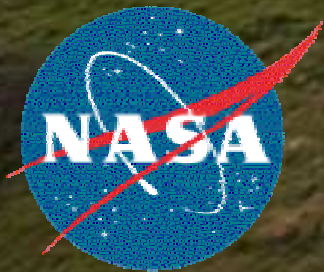
Overview

- DOE HQ funding for technology identification & evaluation
- Interagency DNAPL Consortium
- JCCEM - Joint Coordinating Committee for Environmental Management (Russia)
- JCCES - Joint Coordinating Committee for Environmental Systems (Poland)
- International Symposia series

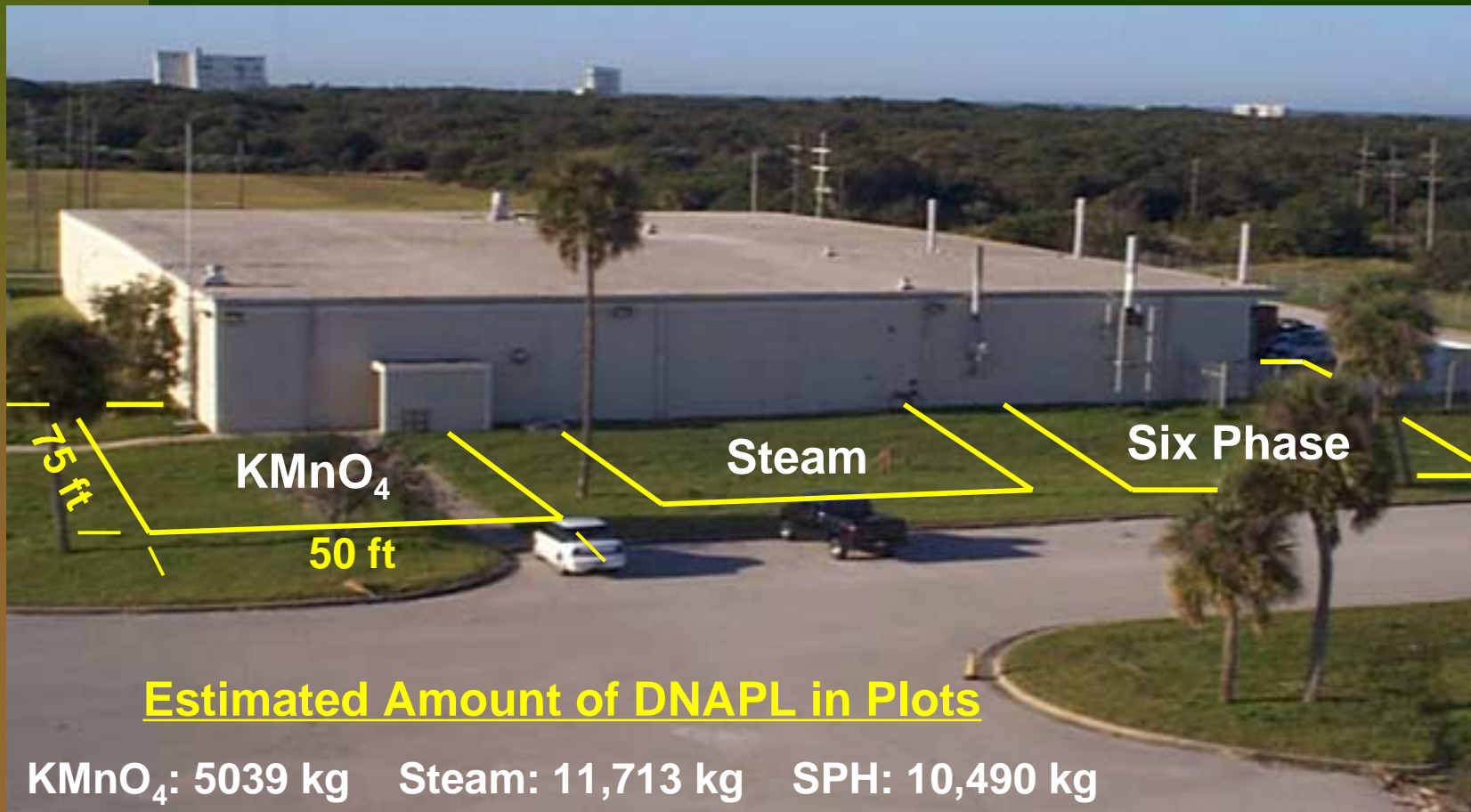
Interagency DNAPL Consortium

DNAPL SOURCE REMOVAL AT LAUNCH COMPLEX 34
CAPE CANAVERAL, FLORIDA

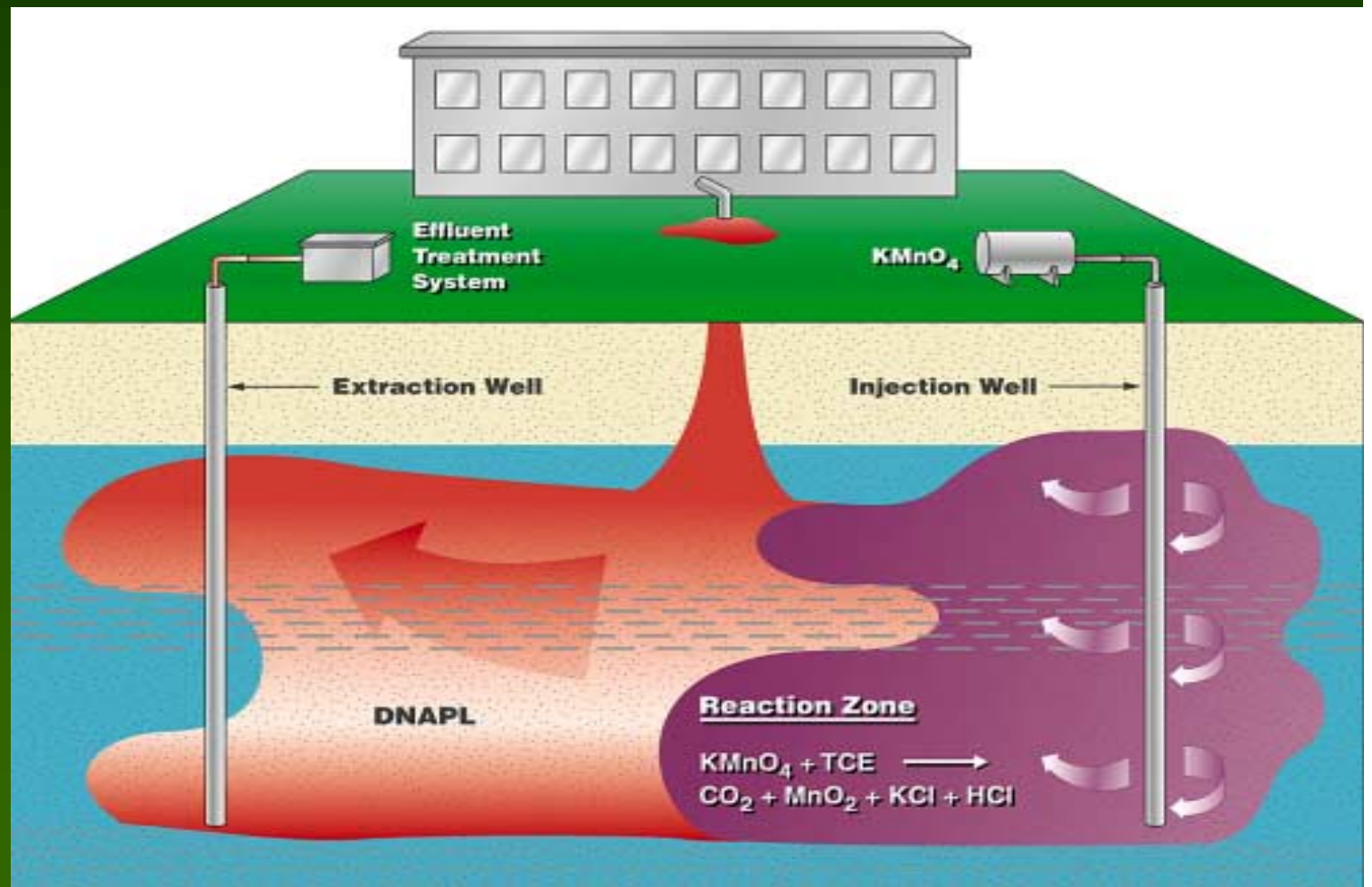
Side-by-Side, Field Scale Demonstration of Three Technologies



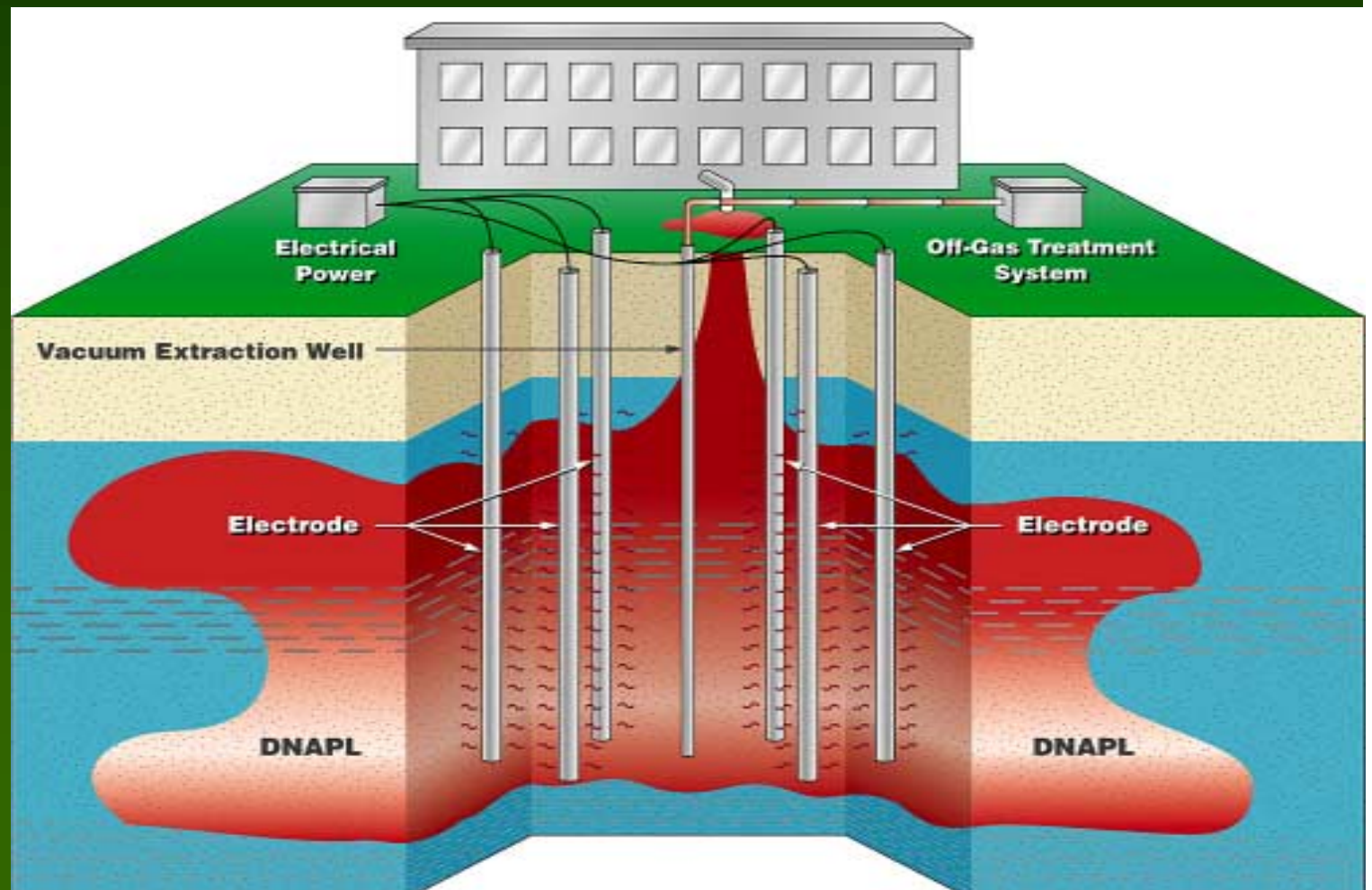
Demonstration Layout



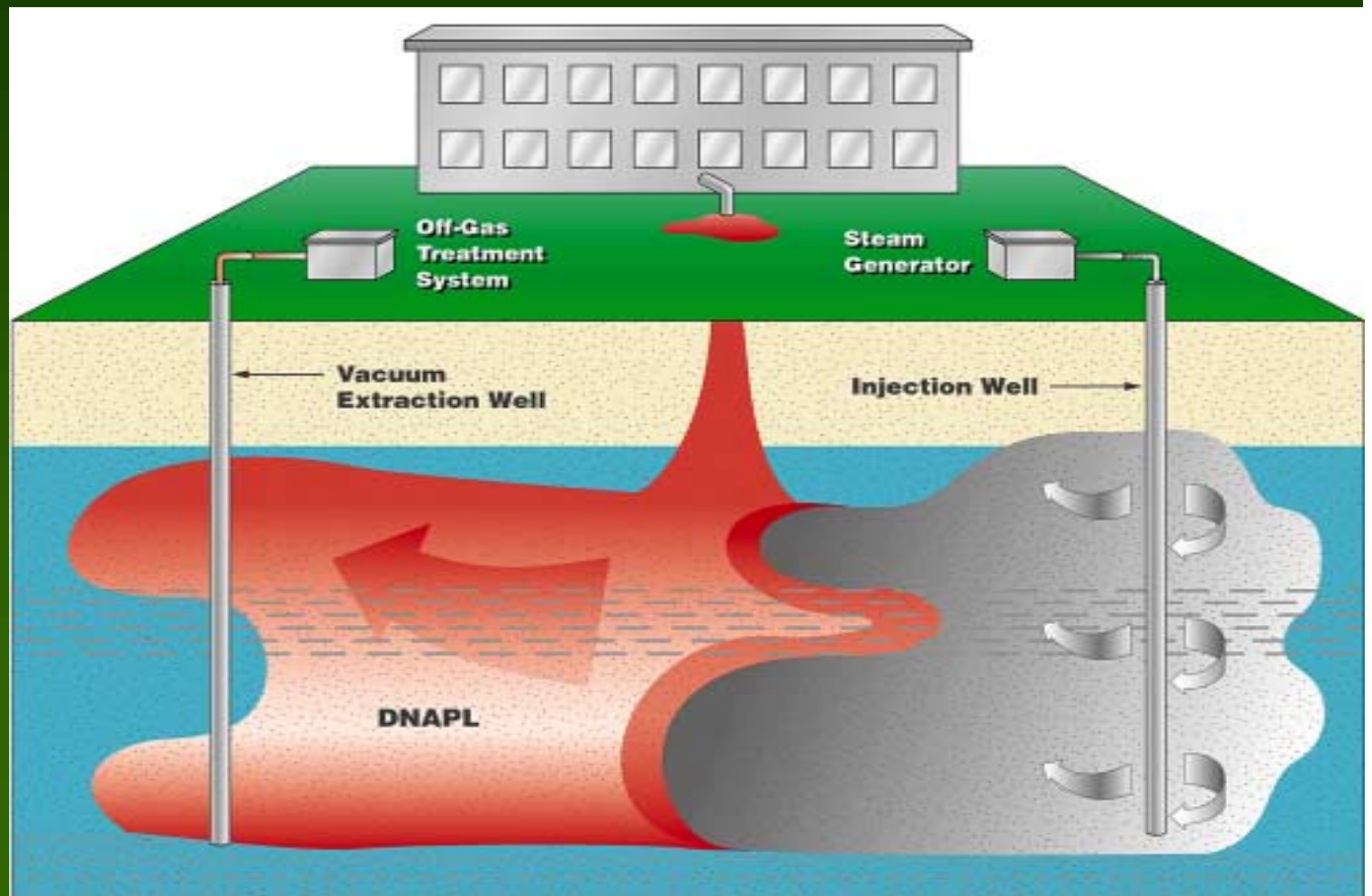
Chemical Oxidation - KMnO_4



Six Phase Heating



Steam Injection



IDC Summary



Selected Three Technologies
Oxidation
Six Phase Heating
Steam Injection



Completed Oxidation Deployment



Completed Six Phase Soil Heating Deployment
Post-Demo Characterization (October 2000)



Steam Injection Deployment (November 2000)



Cost and Performance Analysis Ongoing

Joint Coordinating Committee for Environmental Management (JCCEM)

- Agreement between DOE-EM and Russian MINATOM
- Research & Development
 - ◆ Tanks, D&D, Spent Nuclear Materials
- 10-15 projects per year
- Goal is deployment to DOE complex

Joint Coordinating Committee for Environmental Systems (JCCES)

- Agreement: DOE-EM and Polish Institute for Ecology of Industrial Areas (IETU)
- Research & Development
 - ◆ SubCon Focus Area
- 2 major areas of research
 - ◆ Remediation of organics from soil
 - ◆ Remediation of inorganics from soil
- Goal is deployment to DOE complex

Bioremediation of Organics

- Initial area of mutual interest/expertise
- Collaborative effort among DOE EM, FSU, Ames Lab, SRTC & IETU
- Cooperation with private oil refinery
- Innovative design & application
- Collaboration between DOE & Polish scientists
- Current deployment as bioreactor



After



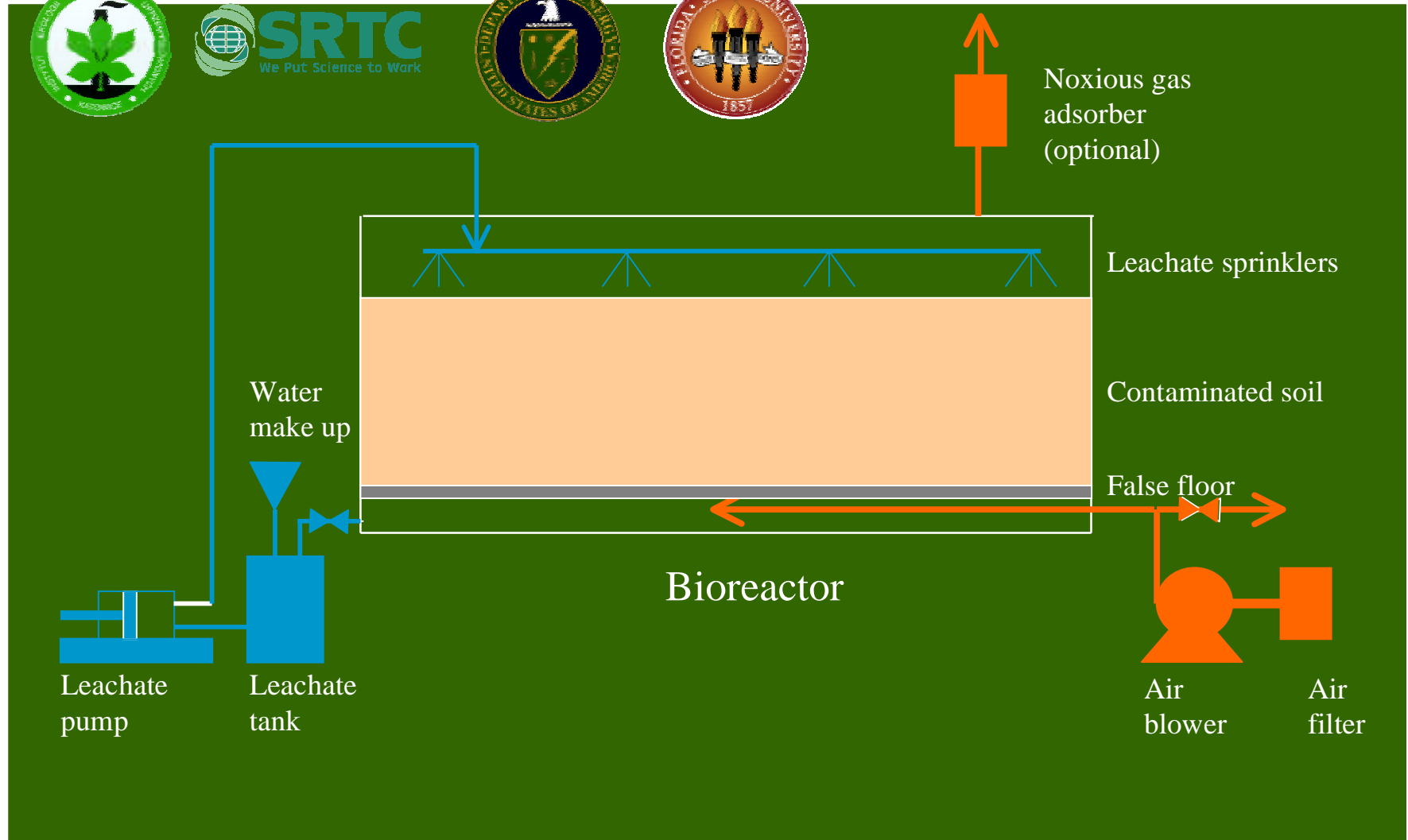
Biopile



Before



Bioreactor Schematic



Phytoremediation of Inorganics

- No method for large-scale removal of moderate levels of contamination
- Metals (Pb, Hg) are common contaminants throughout DOE complex
- Historic area of regional expertise
- Opportunities for deployments with DOE
- Collaboration with Edenspace

Full scale deployment



Chlorophyll Fluorometer



JCCES Summary

- Bioremediation deployment
 - ◆ Bioreactor for mixed waste/soil
- Phytoremediation deployment
 - ◆ Lead contaminated soil
- Chlorophyll fluorometer
 - ◆ Southern Sector TCE seep zones
 - ◆ D-area TCE plume
 - ◆ Constructed wetlands metals site

International Symposia Series

- 5 biennial symposia since 1992
- DOE is a sponsor
- International environmental scientists
- Identification of innovative technologies
- Opportunities for cooperation

Prague 2002
September, 2002





Questions?