



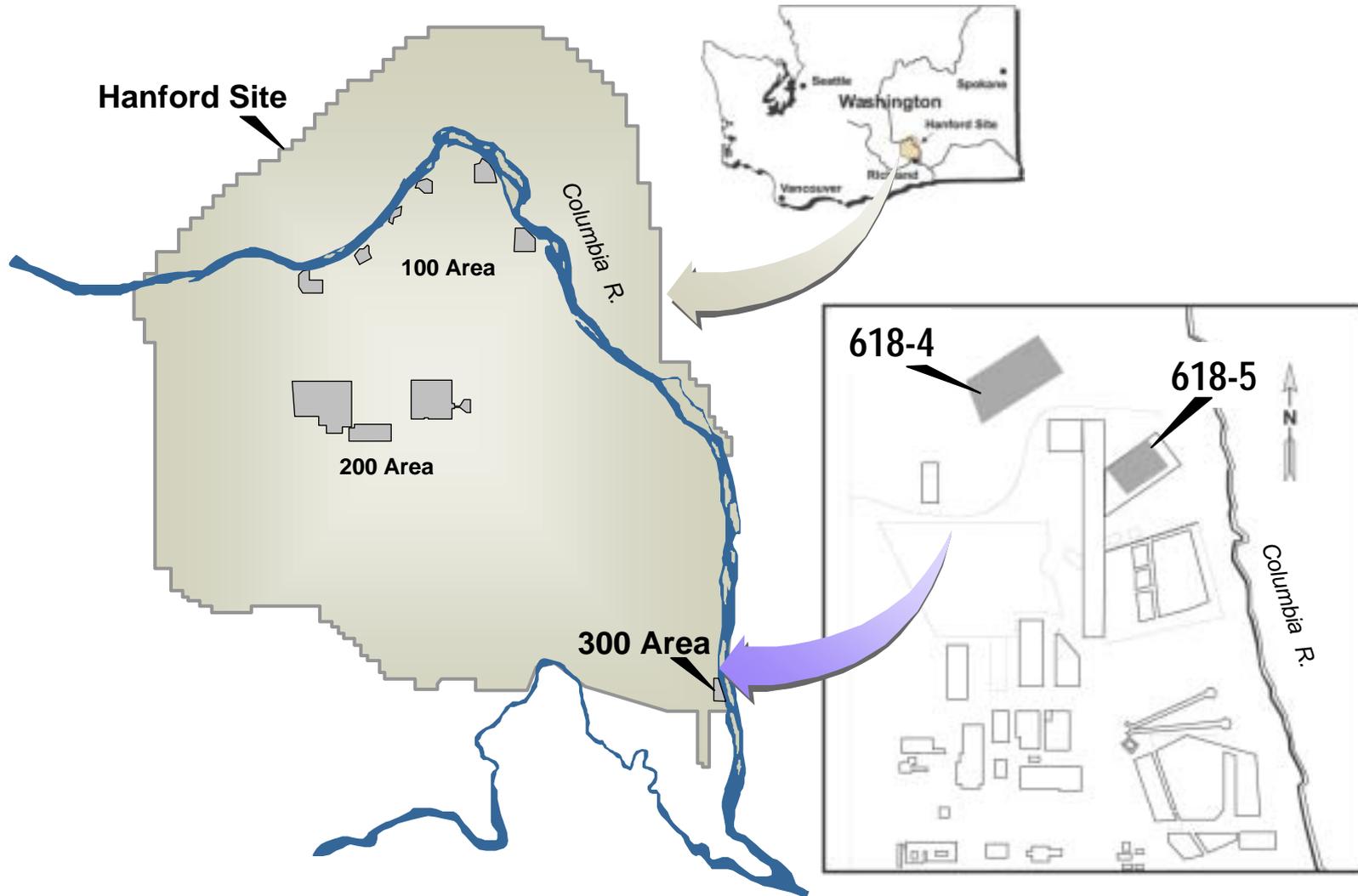
Hanford 618-4 and 618-5 Burial Ground *Lessons Learned*

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618-10 and 618-11 Burial Grounds Workshop

Location of Burial Grounds



Aerial of 618-4 & 5 Burial Grounds



618-4 and 618-5 Burial Ground History

618-4 Burial Ground

- **Hanford Operated from 1955 through 1961**
- **Little Information available on what was disposed**
- **Partially excavated in 1998 when drums (chips in oil/uranium oxide) were encountered**
- **260 / 30-gal Depleted Uranium in oil over-packed**
- **78 / 55-gal Uranium oxide drums over-packed**
- **Additional drums still remaining in burial ground**
- **Treatment Technology was not available to address chips in oil (metals, PCBs, and organics)**

618-4 and 618-5 Burial Ground History

618-5 Burial Ground

- **Hanford Operated between 1945 through 1962**
- **1987 Geophysical Surveys identified waste outside of burial ground and extended boundary**
- **Used as a burn pit**
- **Test Pits excavated in 1992 identified lead bricks, steel pipe, wood debris and garbage**
- **Based on 618-4 Burial Ground, 618-5 Burial Ground was identified as an analogous site**



**300 Area Remedial
Action Project**
618-4 Burial Ground
February 2002



Hanford's Environmental Restoration Project
Remedial Action Project
Department of Energy Bechtel Hanford, Inc.

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Removal Rigging and Drum Sampling









618-5 Burial Ground - *October 2002*







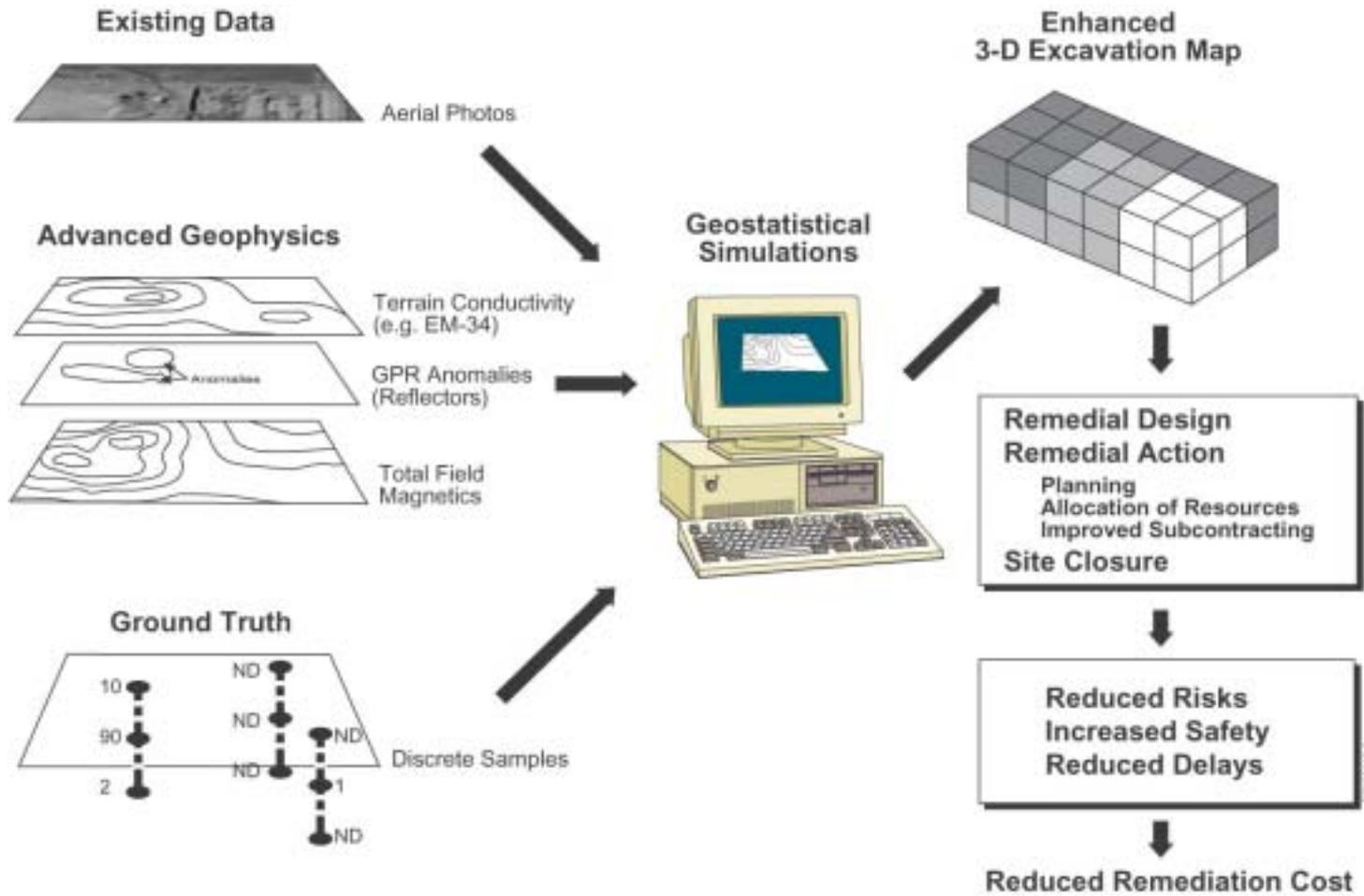






Technology Deployments

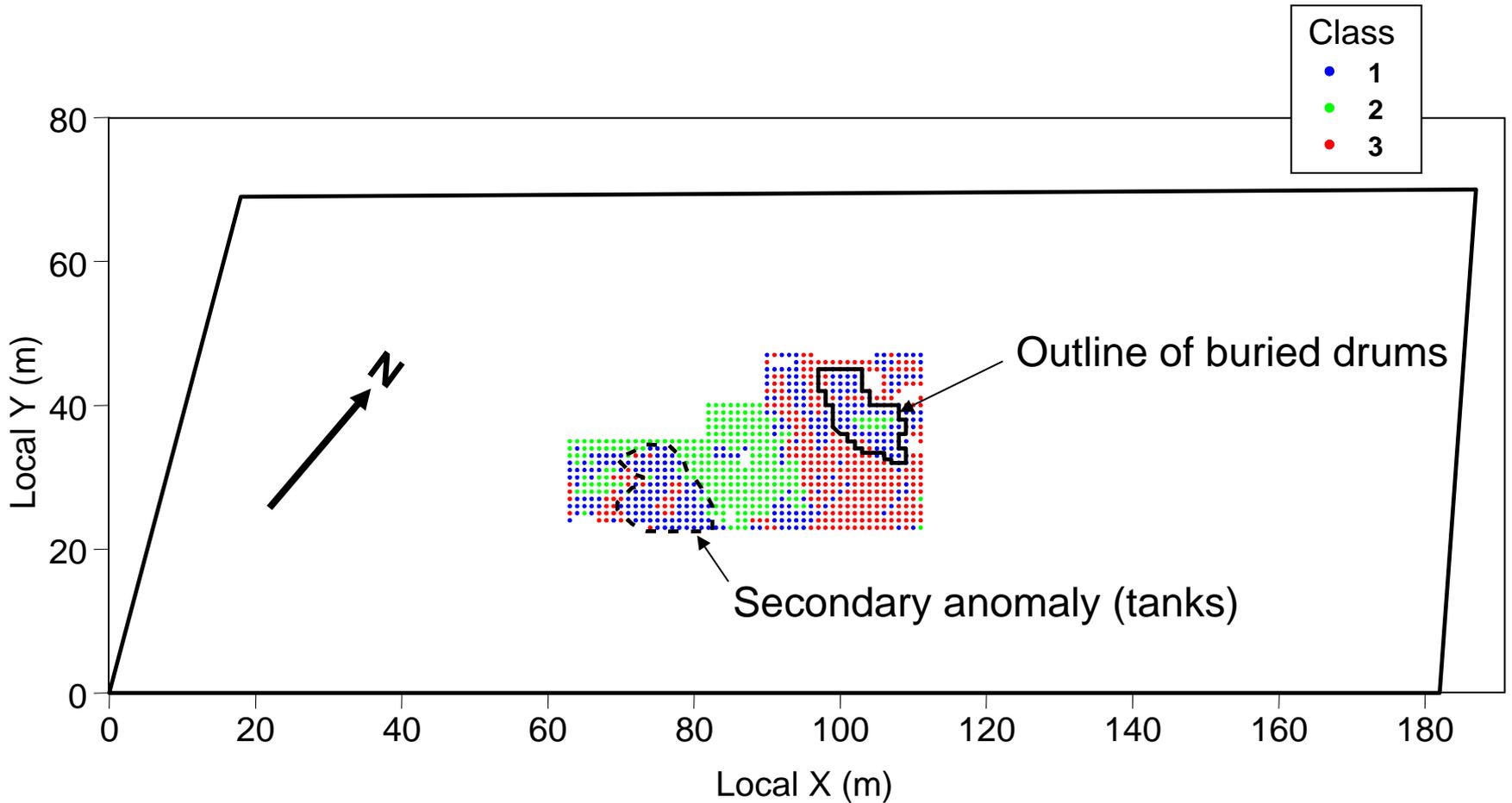
- **Enhanced Site Characterization System**
- **ISOCS**
- **Developed map for 618-5 Burial Ground that predicted no drums**



Enhanced Site Characterization System

- **Started as an EM-50 ASTD Funded Project 1998**
- **Scope consisted of taking off the shelf technologies (GPR, EM, Remote Sensing) integrated data from geo-statistical program**
- **Results would be a better map of underground anomalies**
- **Fairly accurate in determining location and number of drums remaining in 618-4 BG**
- **Developed map for 618-5 BG that predicted that no cache of drums probably would not be encountered**

618-4 Mapping Results



In Situ Object Counting System (ISOCS)

- **Portable germanium detector, spectroscopy analyzer, shielding, and computer station**
- **Non-intrusive, real-time radio-nuclide isotopic identification**
- **Used to verify uranium forms in drums excavated from 618-4 Burial Ground**
- **Benefits cost, schedule, and safety**

ISOCS



Lesson Learned

*“Safely keep the waste moving
and keep it moving safely”*

- Design/Planning
- Procurement
- Remediation

Lessons Learned

- **Design**
 - **Characterization vs. observational approach**
 - **Area of Contamination (AOC)**
 - **Audible Safety Analysis (generic vs. specific)**
 - **Air monitoring (multiple sites vs. specific sites)**
 - **Fire hazards analysis (pyrophorics and combustibles)**
 - **Analytical**
 - **What are you sampling for? (site closure vs. waste management)**
 - **How much sampling?**
 - **How fast can you get data? And at what cost?**

Lessons Learned

- **Design**
 - **Emergency Preparedness**
- **Procurement/Mobilization**
 - **Subcontract Strategy (prescriptive vs. performance)**
 - **Unit cost vs. Lump sum**
 - **Submittals**
 - **Reduce number of submittals**
 - **Field approval for some submittals**
 - **Define expectation for required documentation prior to mobilization**

Lessons Learned

- **Remediation**
 - **Manage your boundaries (Exclusion Zones, CA's, RBA's)**
 - **Staging piles efficient way to perform primary and secondary sorting**
 - **Production rate difficult to predict**
 - **Difficult to predict amount of treatment required (i.e. Land Disposal Restricted Material)**
 - **Staging piles provide surge capacity for excavation and sorting**

Lessons Learned

- **Remediation**
 - **Know thy waste streams**
 - **Data**
 - **Waste Acceptance Criteria requirements**
 - **Waste Profiles**
 - **Having right plan and controls addresses anomalies**
 - **Good plan = teamwork and good implementation**
 - **Teamwork key to employee concerns and safety**
- **It ain't over, till it's over**