LATA/Parallax Portsmouth, LLC

5-Unit and 7-Unit Groundwater Investigations Update

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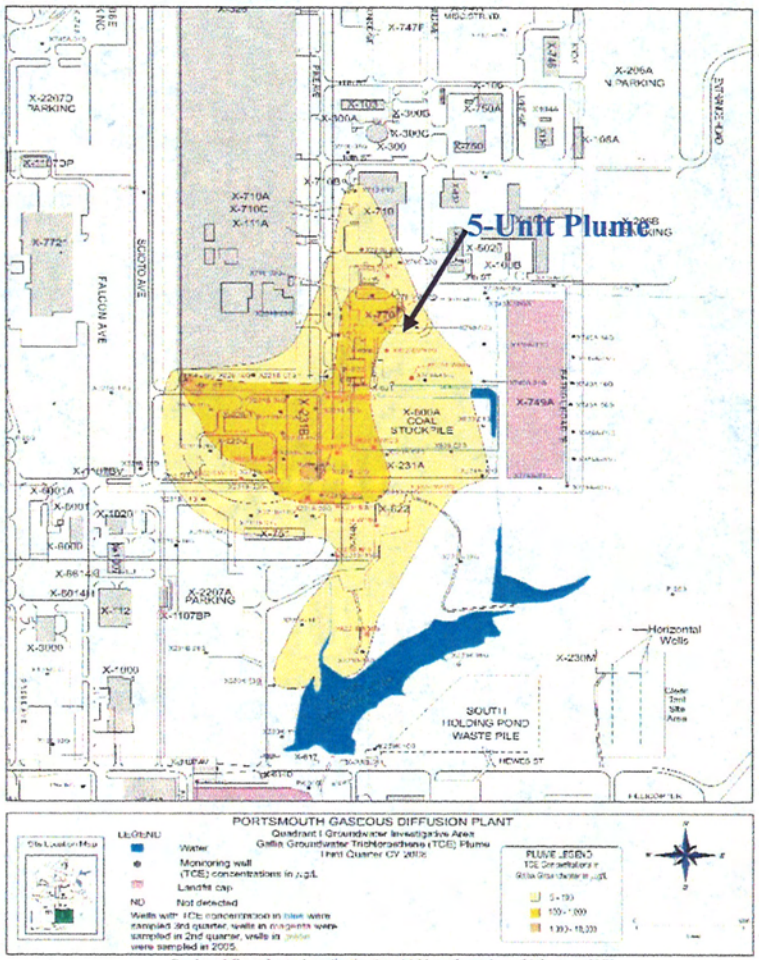
LATA/Parallax ER Operations Manager
February 3, 2009

Portsmouth Site Specific Advisory Board, Environmental Remediation Committee

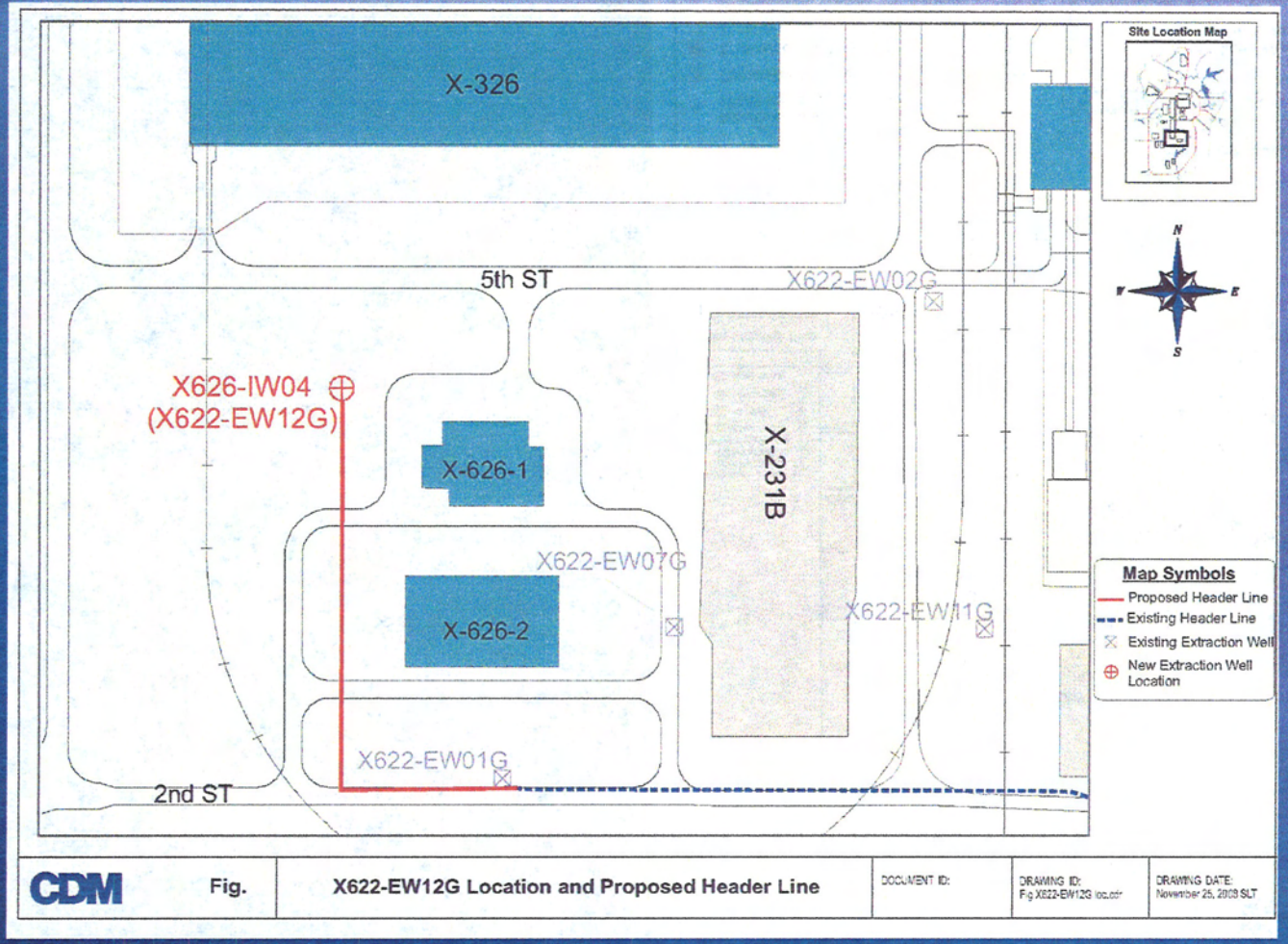
5-Unit Plume Area

5-Unit Groundwater Plume Area at the Portsmouth Gaseous Diffusion Plant



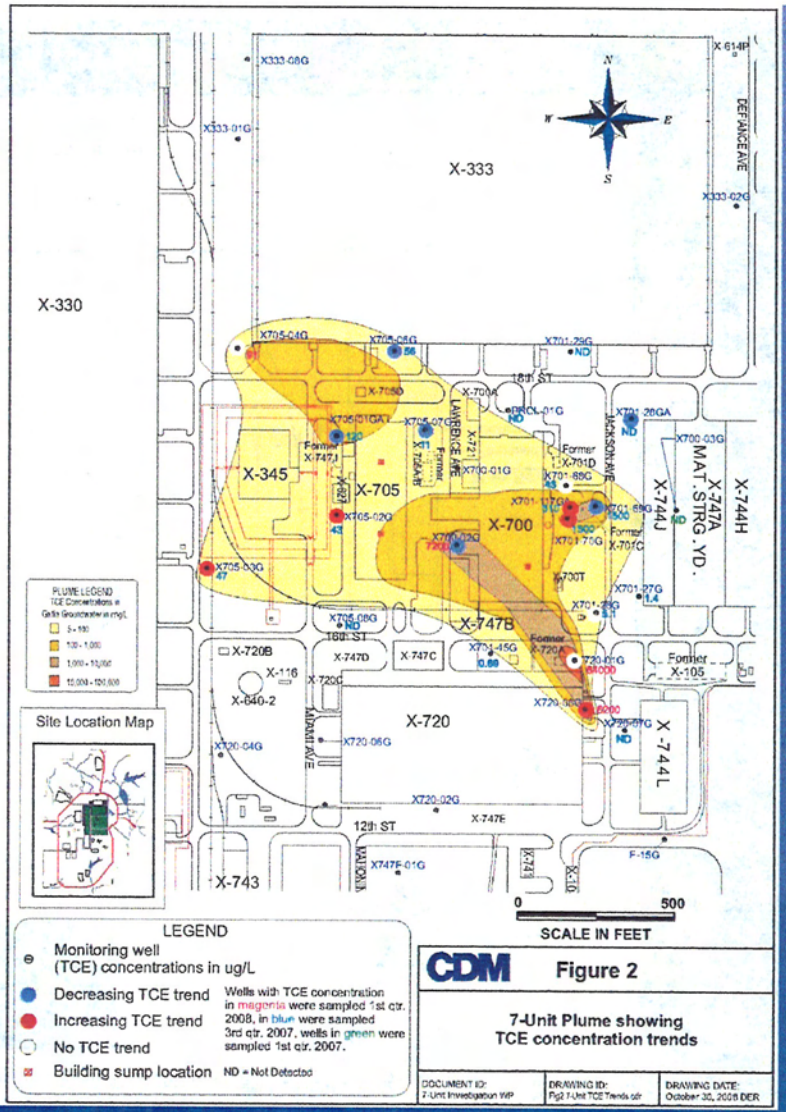
Quadrant I Groundwater Investigative Area; trichloroethene plume third quarter 2006.

X-326 New Extraction Well



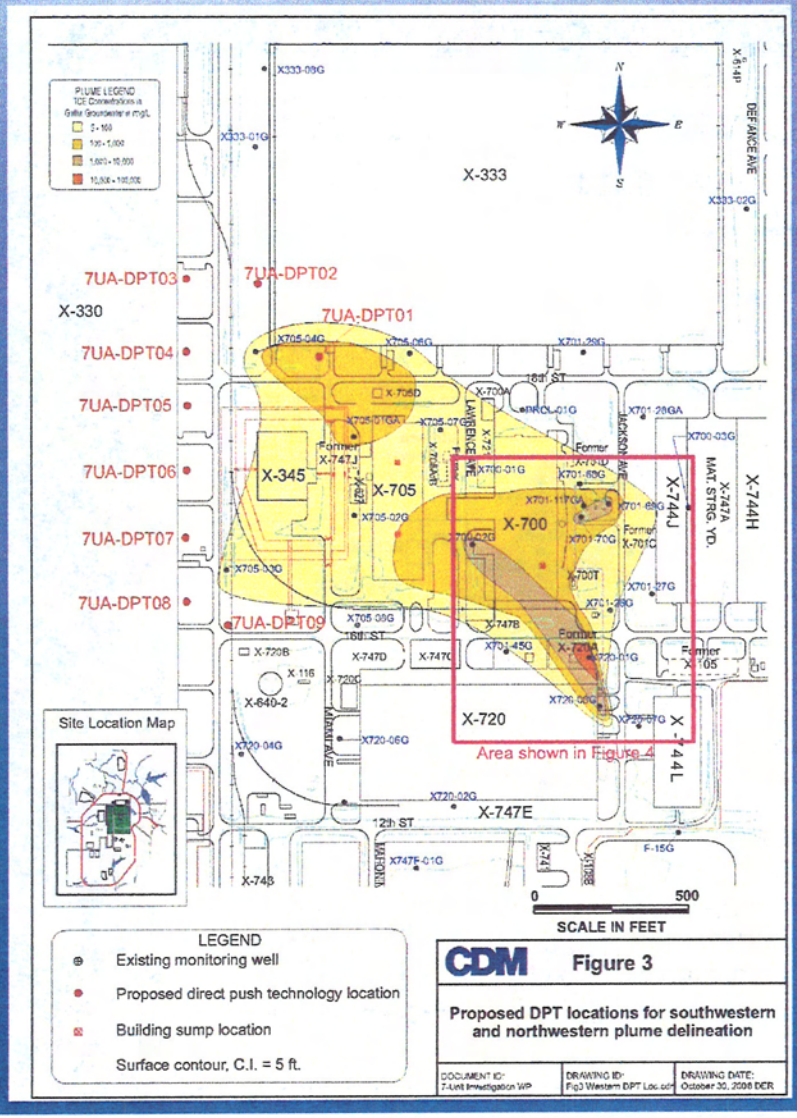
7-Unit Plume Area

7-Unit Groundwater Plume Area at the Portsmouth Gaseous Diffusion Plant



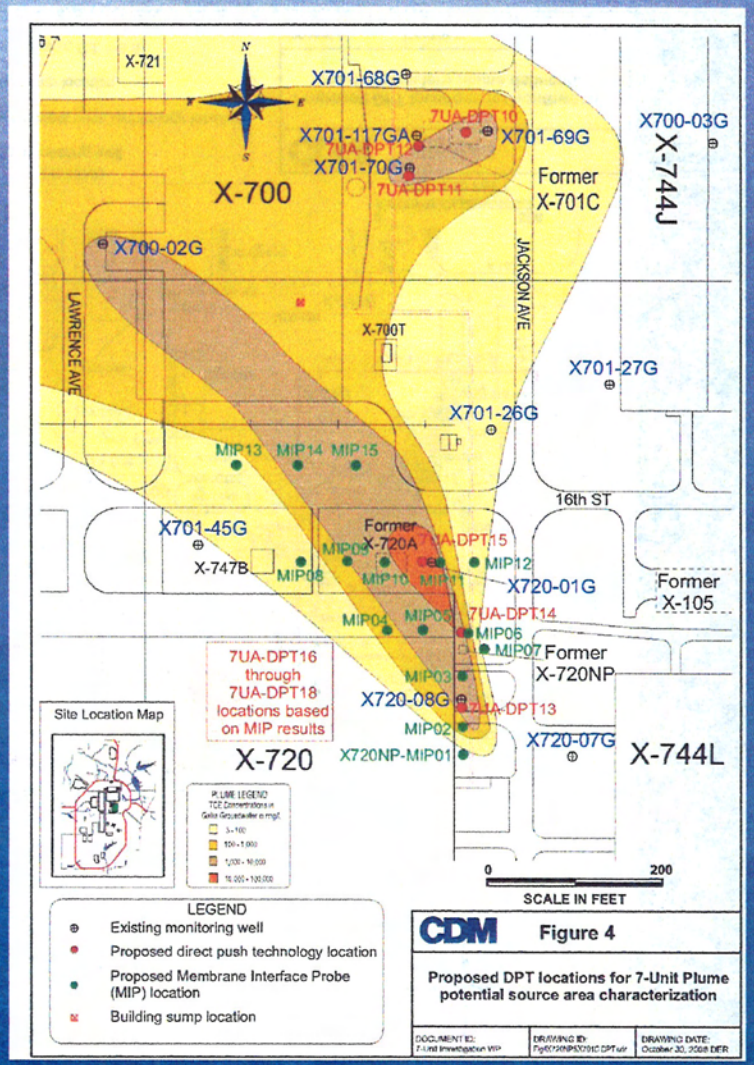
Sampling Locations

7-Unit Groundwater Plume Area at the Portsmouth Gaseous Diffusion Plant



Potential Source Area

7-Unit Groundwater Plume Area at the Portsmouth Gaseous Diffusion Plant



Small UF_6 Cylinder Disposition Project

LATA/Parallax Portsmouth, LLC
January 5, 2009

Project Summary

- Cylinders being processed and disposed of in this project contain various amounts of Uranium Hexafluoride (UF_6)
- This UF_6 was used as feed stock in the enrichment process and has been stored for years in various buildings onsite

Background: Cylinder Disposition – Phase I

- Phase I of the Small Cylinder Project consisted of disposal of cylinders that were clean and empty or contained Resource Conservation and Recovery Act (RCRA) empty heel quantities of UF_6 (<3% by weight)
- Approximately 1,250 cylinders were identified to be processed as part of Phase I.
  - Approximately 800 were clean empties
  - Remaining ~450 contained heel quantities of UF_6

Background: Cylinder Disposition – Phase I

- Treatment
  - IES technicians introduced a Magnesium Hydroxide (Milk of Magnesia) solution into the cylinders which neutralized the UF_6.
  - The resulting solution was mixed with mortar mix and solidified inside the cylinders, thereby disabling the cylinders for future use.
  - The cylinders were loaded into B-25 boxes and shipped to (NTS) for disposal.

Cylinder Disposition – Phase II

- Phase 2 of the Small Cylinder Project will dispose of the cylinders with greater than heel quantities of UF_6
- Three different populations of cylinders have been identified as part of Phase 2:
  - Approximately 34 cylinders will be transferred to Uranium Disposition Services, LLC (UDS) at a later date for processing
  - Approximately 127 cylinders have been transferred to the United States Enrichment Corporation (USEC) for recovery of the cylinder contents
  - Approximately 300 cylinders will be processed by LPP and disposed of as waste. These cylinders were determined not to contain recoverable amounts of uranium

Cylinder Disposition – Phase II

- Currently all but a small number of cylinders to be processed by USEC have been transferred to them for processing. Discussions are ongoing in relation to the process of treating the few remaining cylinders.
- The majority of the cylinders transferred to USEC have been emptied and returned to LPP. These are being stored and awaiting stabilization at a later date.

Cylinder Disposition – Phase II

- Phase 2 cylinder stabilization is currently scheduled to begin in May 2008 and will be performed by IES.
- The same in situ (in place) stabilization process discussed for Phase I will be utilized for all cylinders emptied by USEC and for any other cylinders containing heel quantities of UF_6 that fall under the scope of the contract with the Department of Energy.

Cylinder Disposition – Phase II

- For cylinders with greater than heel quantities of UF_6, an external stabilization process will be followed:
  - Cylinders will be heated under controlled conditions to the point where the UF_6 is sublimated, or turned into a gaseous state
  - The sublimated UF_6 will be drawn off and reacted with Potassium Hydroxide to neutralize it
  - The resultant solution will be mixed with mortar and solidified
  - The cylinder then will be stabilized as described previously and disposed of with the containers of concreted uranium salts produced by the external stabilization
- Once stabilized, the waste will be shipped to NTS in B-25 boxes for disposal

Safety: Cylinder Disposition – Phase II

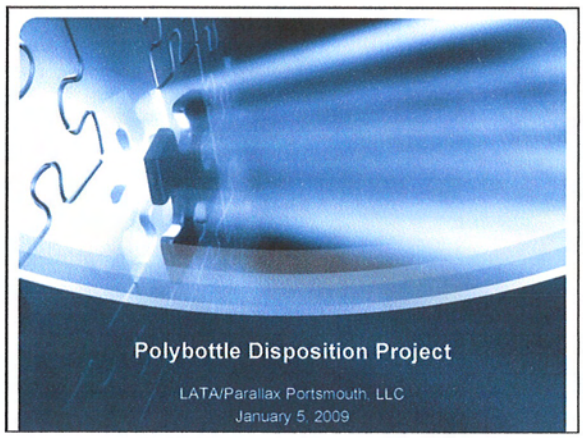
- Multiple safeguards will be in place to prevent inadvertent release of HF gas or criticality during processing:
  - Stabilization work will be performed inside a stainless steel Perma-Con enclosure inside the X-345 facility
  - IES will utilize High Efficiency Particulate Air (HEPA) filtered ventilation systems both on the enclosure where work is being performed as well as locally when performing breaching evolutions
  - A high volume ventilation scrubber system is used during handling of all cylinders inside the processing enclosure. This system utilizes drums of activate alumina to neutralize any gaseous HF that may be produced when cylinders are being processed.

Safety: Cylinder Disposition – Phase II

- Safeguards (continued):
  - Only one cylinder at a time will be heated, the tank where the neutralization reaction takes place will be emptied, and the contents will be solidified following the processing of each cylinder. This will reduce the possibility of inadvertent criticality.
  - Many of the valve operations and monitoring activities associated with the heated processing system will be performed remotely. This action would serve to minimize personnel exposure in the event of an accidental release.

Cylinder Disposition – Phase II

- Project is scheduled to be completed by the end of September 2009
- Waste shipping activities will be ongoing as cylinders are processed and should conclude shortly after processing is finished



Project Background

- Cylinders used to store highly enriched uranium (HEU) were washed by the United States Enrichment Corporation (USEC) to remove uranium compounds.

Project Background

- Wash solution is stored in plastic "Polybottles"
  - Polybottle is a container for safe geometry for uranium liquids
    - Prevents criticality
    - Stored and moved in a controlled fashion

Project Background

Right: This is a cart used to transport polybottles between locations. The location of the six (6) casings on the cart maintains the spacing specifications necessary for safe transport.

Left: The orange lines on the floors designate the path for safe cart travel when working with polybottles. The white lines designate the placement areas for safe operations.

Project Background

- What is in the polybottles?
  - Acids from rinsing residual uranium from cylinders (Nitric acid and water)
  - Uranium materials of <10% enrichment up to 95 grams

Project Work Scope

- To characterize, treat (if required) and dispose of 781 polybottles and their contents by September 30, 2009
- No uranium recovery
- Solidification in 55 gallon drums
- Ship material by truck to Nevada Test Site for final disposal

Project Work Scope

- Polybottles are presently stored on-site in a safe geometric configuration based on container type, spacing and inspections.

Regulatory Guidelines

- Sampling for acid and heavy metals.
  - Results will determine if DOE will need to request a Resource Conservation and Recovery Act (RCRA) temporary treatment authorization from the Ohio Environmental Protection Agency (OEPA).
  - Treatment process optimization, if required
    - Meet Land Disposal Restrictions (LDR) requirements and Waste Acceptance Criteria (WAC) (not a mixed waste)

Project Safety

- There are 2 primary safety concerns involved with this project
  - Spilling of material on to the floor
    - Addressed by floor treatment with a chemically resistant epoxy paint. Berms also are in place to contain material.
  - Release of vapors from mixing of product
    - Addressed by self-contained HEPA ventilation hoods placed directly over the work area.

Project Safety

- Personal and air monitoring will be conducted by Industrial Hygiene and Radiation Control Technicians during the solidification process
- Personal protective equipment (respiratory and clothing protection) will be provided as required.

*Image is representative of the equipment expected to be used on project

Project Status

- Preparing Areas
  - Chemical resistant epoxy paint
  - Rack installation
  - Process area (HEPA ventilation hoods)
- Work Package Development
  - Readiness assessment
- Container movement
- Sampling and analysis
- Material solidification

Project Status

- Bench scale testing
  - Sample and analysis
  - "Tweak" process if required
- Production
  - Verification
- Shipment to NTS