
*Buried Waste at the Subsurface Disposal Area
CAB Presentation
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Brief Background and History of the Subsurface Disposal Area and Buried Waste



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History of the Subsurface Disposal Area (SDA)

- The RWMC disposal site known as the SDA was established in 1952 and now occupies 97 acres within the fence boundary with waste occupying approximately 35 acres
- Accepted waste from Rocky Flats, INL operations, and other generators
- Disposal of transuranic waste was discontinued in 1970 in favor of retrievable storage
- Advanced Mixed Waste Treatment Project began processing stored waste and shipping to Waste Isolation Pilot Plant (WIPP) in March 2004
- Demonstration of waste retrieval in Pit 9 in February 2004
- Began buried waste exhumation in Pit 4 in January 2005



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Buried Waste in the SDA (Past Disposal Practice)



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Stored Waste at the Advanced Mixed Waste Treatment Project



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Waste Shipments to the SDA

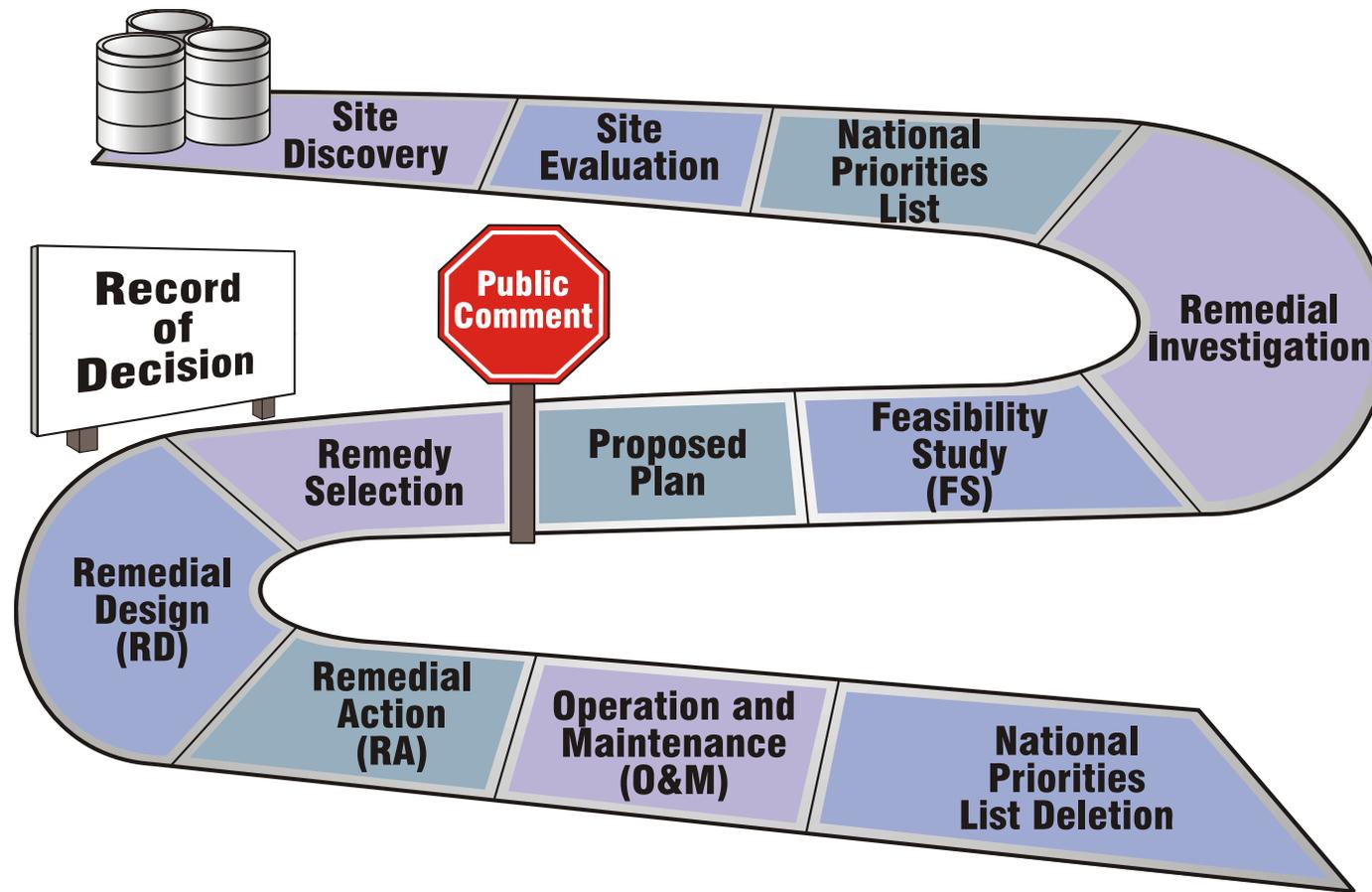
- 30,000 waste shipments made to the SDA
 - 2,300 shipments from Rocky Flats Plant
- Approximately 241,000 m³ of waste disposed of
 - 73,000 m³ from Rocky Flats Plant
- Nearly 425,000 containers of waste
 - 230,000 containers from Rocky Flats Plant



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The CERCLA (Superfund) Process



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Remedial Investigation/Baseline Risk Assessment (RI/BRA)

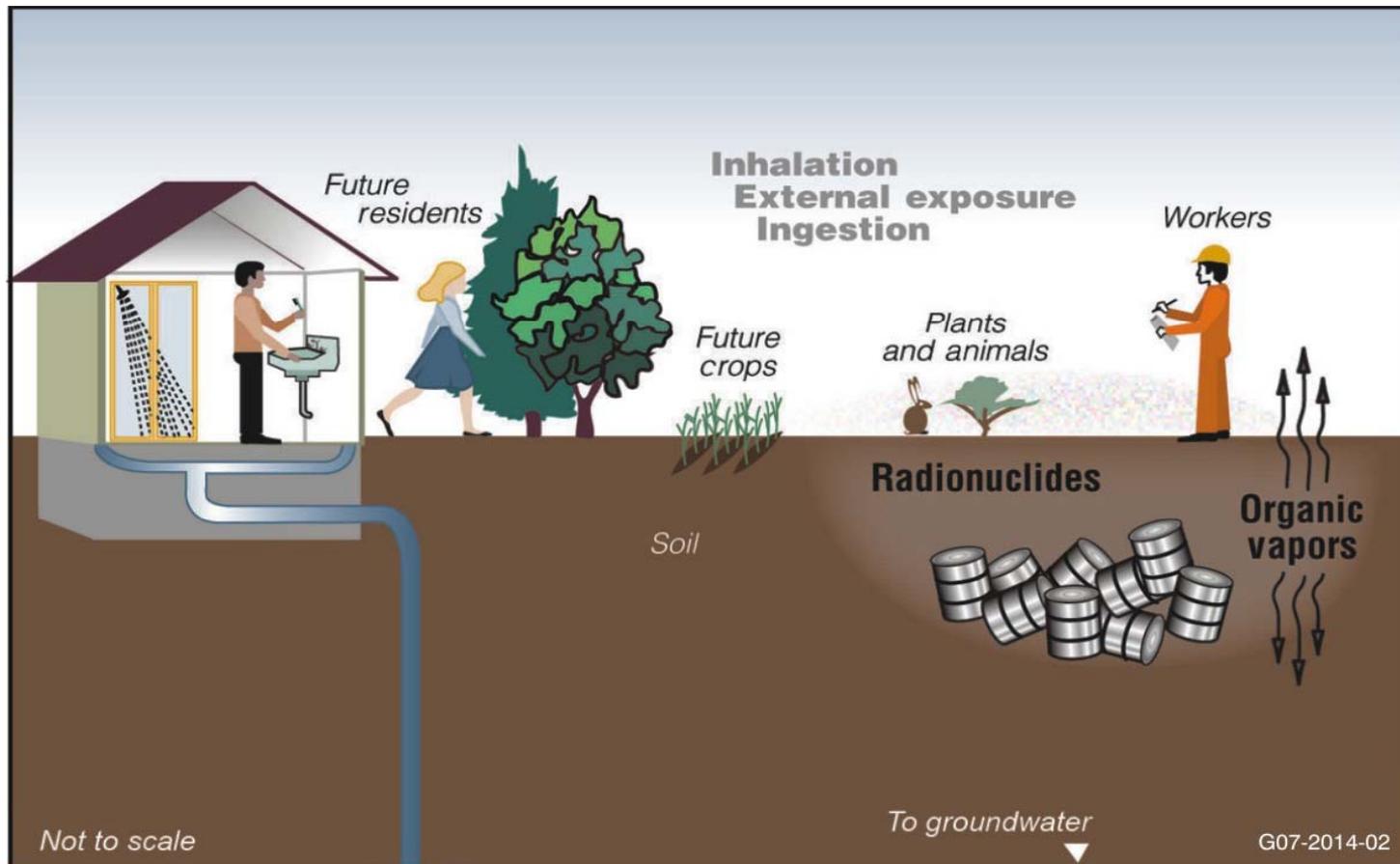
- The RI/BRA presented site characterization information and risk predictions associated with buried waste in the SDA
- The RI/BRA represented more than 10 years of characterization and assessment of hazards in the SDA
- The RI/BRA provides decision-makers with a basis for determining whether additional remedial action at the SDA is necessary
- The RI/BRA determined that the Baseline Risk (without remediation) is unacceptable
 - Twelve radionuclides and six nonradionuclides pose unacceptable risk to human health and the environment based on a 1,000-year simulation period



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Summary of Remedial Investigation/Baseline Risk Assessment



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Feasibility Study (FS) Framework

- Outlines objectives and remediation goals – How we measure effectiveness
- Identifies cleanup technologies – What technologies could potentially be used on this problem
- Develops alternatives – What groups of technologies should be evaluated
- Analysis of alternatives – Detailed evaluation based on standard 9 criteria
- Comparative analysis – Compares relative advantages and disadvantages of the alternatives



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Alternatives Evaluated in the Feasibility Study

- No action
- Surface barrier
- In situ grouting
- Partial retrieval, treatment, and disposal
- Full retrieval, treatment, and disposal



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Common Elements of the Alternatives

Each alternative includes:

- An engineered surface barrier
- Continued operation of the Organic Contaminants in the Vadose Zone (OCVZ) system
- Long-term surveillance and maintenance
- Long-term monitoring
- Long-term institutional control



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Selecting the Preferred Alternative

- Many combinations of technologies and implementation methods are possible
- The five assembled alternatives allow for complete analysis by including the range of options
- The selected remedy can be made up of options from more than one alternative
- Allows for selection of desirable attributes from more than one alternative



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Buried Waste Litigation Summary

- The issue was the interpretation of the language in the Settlement Agreement regarding retrieval and shipment of transuranic waste at the INL out of the state of Idaho
- Eight years of litigation on the transuranic waste issue resulted in an agreement approved July 3, 2008 by the U.S. District Court
- The agreement is referred to as the *Agreement to Implement*



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Agreement to Implement - Highlights

- Implements the May 2006 Court Order on buried transuranic waste
- Agrees that transuranic waste located in the SDA is primarily found in six waste streams
- Identified all waste streams that need to be removed
 - Rocky Flats series 741 sludge
 - Rocky Flats series 742 sludge
 - Rocky Flats series 743 sludge
 - Rocky Flats filters/pre-filters
 - Rocky Flats graphite waste
 - Uranium oxide
- DOE is required to retrieve no less than 6,238 m³ of targeted waste from 5.69 acres within the SDA
- Compliance will be measured by no less than 7,485 m³ of targeted waste packaged for shipment out of the state of Idaho



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Agreement to Implement - Highlights

- The defined pit areas will be fully excavated
- If DOE is unable to recover the volume in the Agreement from the 5.69 acres, DOE will continue to excavate in additional defined areas until the volume is reached
- Any transuranic waste retrieved from the SDA prior to 12/31/17 will be shipped out of the state by 12/31/18
- Any transuranic waste retrieved from the SDA after 12/31/17 will be shipped out of the state within 365 days from retrieval
- The Agreement will be coordinated with the Record of Decision for Waste Area Group (WAG) 7 (OU 7-13/14)



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OU 7-13/14 Record of Decision

The Record of Decision Selected Remedy is **consistent with the Agreement to Implement:**

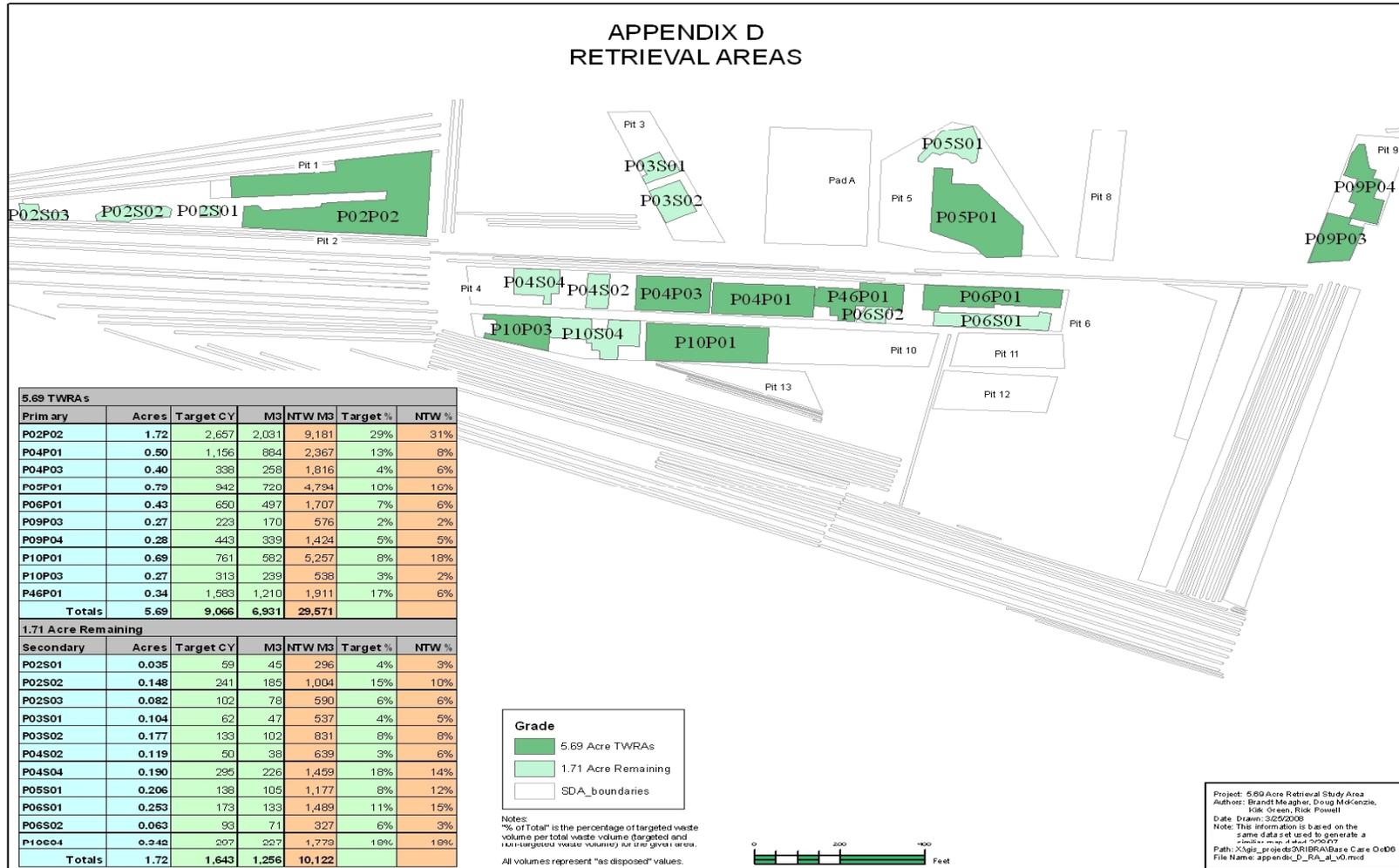
- **Retrieve targeted waste from 5.69 acres of pit areas**
- **Added the retrieval of Series 742 sludge**
- In situ grouting of specific locations (approximately 0.2 acres) for protection against migration of TC-99 and I-129
- Mitigate subsidence of pits and Pad A to establish a foundation for a surface barrier and enhance long-term barrier performance
- Cover the entire SDA with an evapotranspiration barrier to reduce infiltration and inhibit transport of contaminants to the surface by plants and animals; gas collection system prevents buildup of vapors in the vadose zone
- Continue the vapor vacuum extraction to remove and treat solvent vapor from the vadose zone and inhibit transport of organic compounds into the aquifer
- Maintain long-term monitoring, surveillance and maintenance, and institutional controls
- Require 5 year agency reviews of the remedies to assure they continue to meet cleanup objectives
- Cost approximately \$808.9M (NPV) (\$1.3B current dollars) and would take 20 years



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Retrieval Areas



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What is Targeted Waste?

- 741 Sludge: Fairly homogenous solid of salt precipitate containing plutonium and americium oxides, and organic constituents
- 742 Sludge: Fairly homogenous solid of salt precipitate containing plutonium and americium oxides, metal oxides, and organic constituents
- 743 Sludge: Organic liquid waste solidified into a paste-like or grease-like form using calcium silicate
- Graphite Waste: Broken molds and other graphite waste (e.g., graphite scarfings) containing residual plutonium



What is Targeted Waste?

- Filters / pre-filters: Discarded high-efficiency particulate air filters contaminated with transuranic radionuclides
- Uranium Oxide: Depleted uranium from roasting uranium at high temperatures, primarily in the form of uranium oxide, with some uranium metal possible
- Other waste streams mutually agreed by the Parties, as the result of operational experience or process knowledge, to routinely be recognizable as Transuranic Waste



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Public Participation

- DOE informed the CAB and the Tribes on the preferred alternative to solicit their input in October and November 2007
- The public comment period began on Oct 22, 2007
- The Snake River Alliance requested an extension of the public comment period which was granted
- The public comment period ended on Dec 21, 2007
- Public meetings were held in Boise (Nov 13), Twin Falls (Nov 14), and Idaho Falls (Nov 15)
- 160 people attended the three meetings
- Consideration of the public comments reflected in the Record of Decision (ROD) and are included as an Appendix
- 231 formal comments were provided and considered



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Proposed Plan – Meetings and Comments Summary

- Open House public meetings were held in Boise, Twin Falls and Idaho Falls
- Approximately 160 people attended these meetings
- DOE received 231 formal comments on the Proposed Plan
 - 119 supported the preferred alternative (52%)
 - 12 supported containment alternatives (5%)
 - 69 supported full retrieval (29%)
 - 31 were miscellaneous or neutral (14%)



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Summary of Major Comments from the Public

- Majority expressed agreement with the preferred alternative. Felt it was an appropriate balance of CERCLA criteria and was science-based
- Those that supported the full retrieval felt the preferred alternative was not protective of the environment
- Concerned about the relationship between the ROD and the 1995 Settlement Agreement
- Wanted to see the technical basis for the selection of 4.8 acres to area to be retrieved from
- Wanted more information on the long-term monitoring
- Wanted more information on the grouting and surface barrier



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Summary and Issues

- The radioactive and hazardous waste landfill (SDA) is very well characterized.
- Stored waste and buried waste are separate problems.
- CERCLA process was followed to determine risks, develop alternatives and select a preferred alternative
- Significant Public involvement was conducted
- Technical and political issue with litigation factors
- Removal actions of targeted waste are underway and are successful.
- The final remedy includes continued vapor extraction, a surface barrier, continued monitoring and institutional control.



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Waste Retrieval



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Generating New Waste Packages for Shipment off-site



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Progress to Date (8/31/10) on Targeted Waste Retrievals

- ARP I (Pit 4) (.50 acres)
 - Completed exhumation in March 2008
- ARP II (Pit 4/6) (.34 acres)
 - Completed exhumation in June 2009
- ARP III (Pit 6) (.43 acres)
 - Exhumed .38 acres
 - Completed exhumation in October 2009
- ARP IV (Pit 5) (.79 acres)
 - Started exhumation in January 2010



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Progress to Date (8/31/10) on Targeted Waste Retrievals

- Targeted Waste Drum status
 - 1.70 acres exhumed (29.9% of total)
 - 4,195 m³ packaged (20,168 drums) (56% of total)
 - 3,072 m³ shipped out of the state of Idaho (14,769 drums) (41%)



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Path Forward for Targeted Waste Retrievals

- **ARP IV (ARRA funded for retrieval operations)**
 - Pit 5 area (.79 acres)
 - Retrieval Operations: Jan 10 to Mar 11
- **ARP V**
 - Pit 9 area (.55 acres)
 - Retrieval Facility under construction
 - Start retrieval operations in December 2010
- **ARP VI (ARRA funded design, construction and start of retrievals)**
 - Pit 4 west (.40 acres)
 - Retrieval Facility under construction
 - Start retrieval operations in December 2010
- **ARP VII (ARRA funded design and construction)**
 - Pit 10 west (.27 acres)
 - Retrieval Facility under construction
 - DOE-ID small business contract
 - Complete construction in September 2011



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