



U.S. DEPARTMENT OF
ENERGY

L-Basin Used Nuclear Fuel Program Update

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enterprise·srs

Purpose

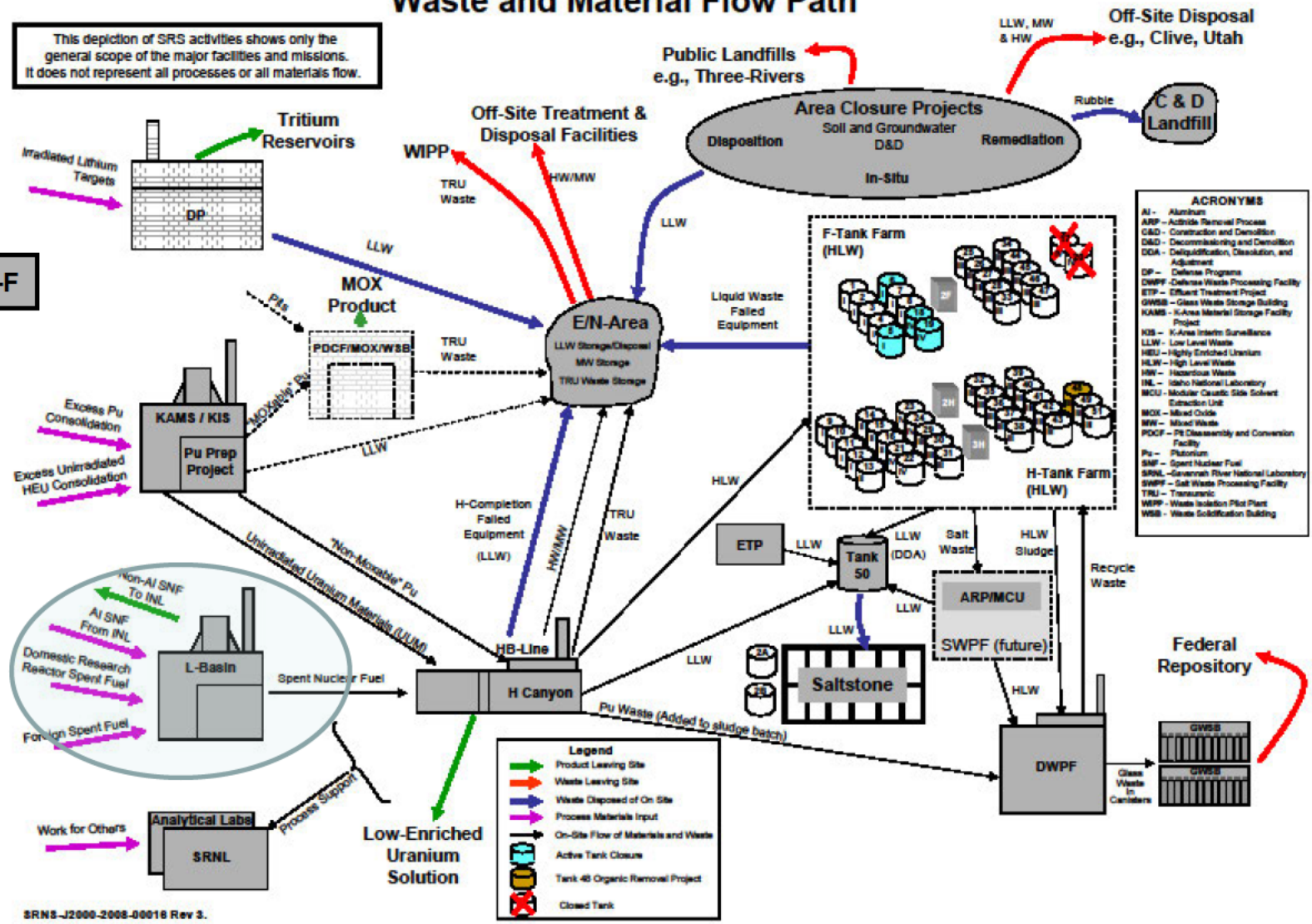
- To provide an update on the Used Nuclear Fuel program and to fulfill the Nuclear Materials Committee 2013 Work Plan item



Savannah River Site Waste and Material Flow Path

This depiction of SRS activities shows only the general scope of the major facilities and missions. It does not represent all processes or all materials flow.

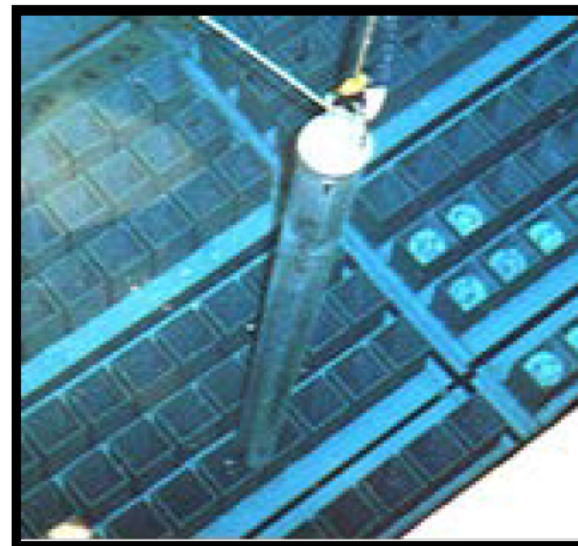
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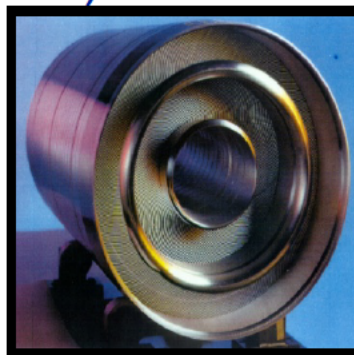
L-Basin Stored Fuels and Capacities

- L-Bundled fuel
 - Typical FRR/DRR Material Test Reactor Fuel Assemblies
 - ~90% full
 - 3181 bundles
 - Processing vs Racks need date 2016



- High Flux Isotope Reactor (HFIR) Fuel Racks (100% full, 120 cores)

- 100% full
- 120 Cores



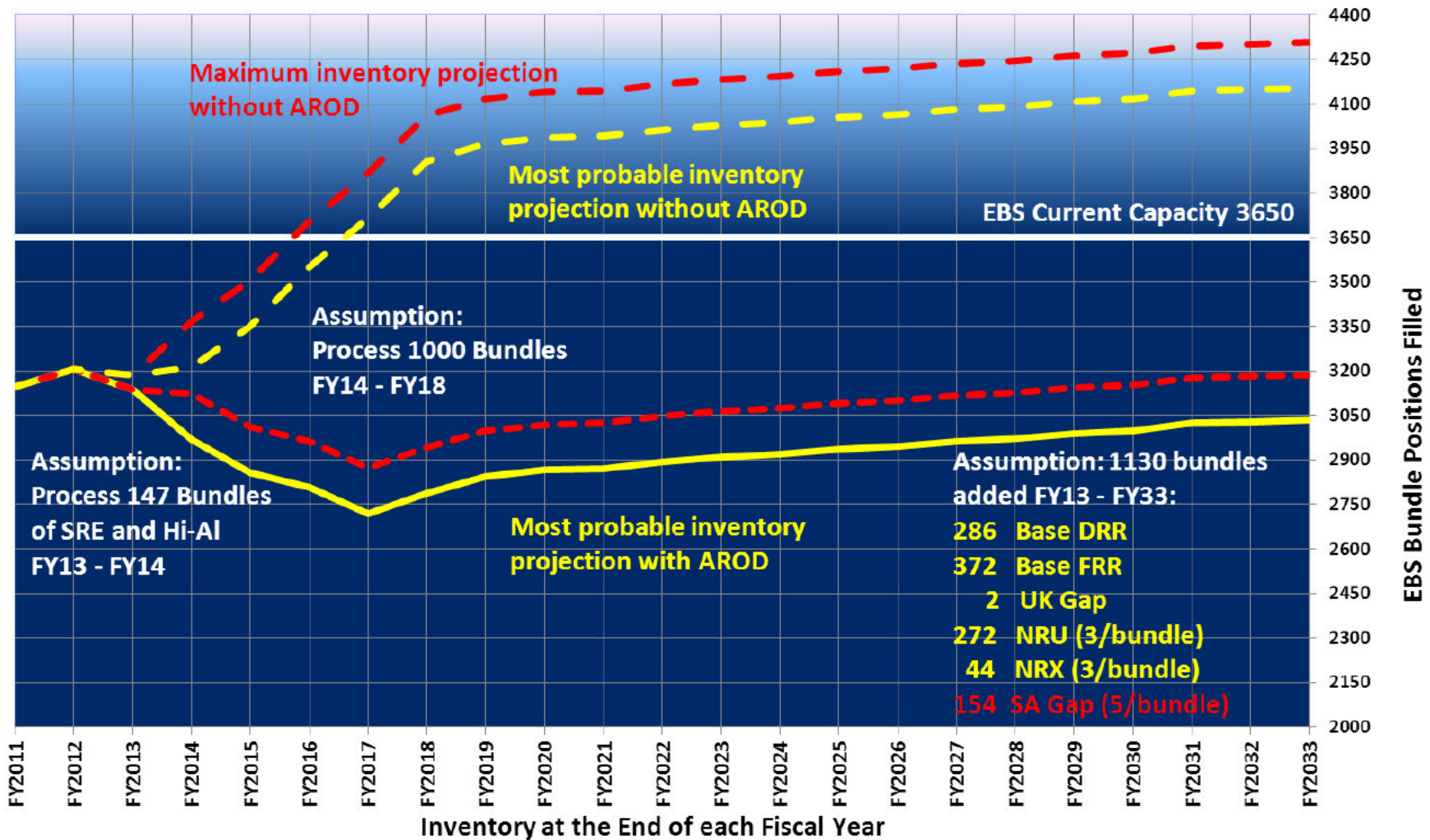
- Isolation Cans

- Over 400 individual isolation cans
- 12 oversized cans (contain a portion of the 400)



L-Basin Life Expectancy

- Implementation of the Enriched Uranium Disposition Project would have resulted in L-Basin being emptied by around 2019.
- SRNL analyzed how long basin and fuel could be stored safely in wet condition. Report showed at least an additional 50 years if certain activities are completed to confirm assumptions in the analysis.
- Augmented Monitoring and Condition Assessment Program (AMCAP) developed January 2012 to address these activities.
- The recent Amended Record of Decision signed on 3/26/2013 allows for processing of up to 1000 bundles of used nuclear fuel and 200 High Flux Isotope Reactor Cores. This eliminates the need for any new rack space in L-Basin.



- Most Probable Inventory with AROD: FRR/DRR + UK Gap + NRU/NRX
- - - Maximum Inventory with AROD: FRR/DRR + UK Gap + NRU/NRX + SA Gap
- • • Maximum Inventory without AROD: FRR/DRR + UK Gap + NRU/NRX + SA Gap
- - - Most Probable Inventory without AROD: FRR/DRR + UK Gap + NRU/NRX

4/3/2013



Augmented Monitoring and Condition Assessment Program

- Periodic examination of bundled fuel
- Assessment of fuel in Oversized Isolation Cans (DNFSB TECH Report 38 addresses)
- Basin Structural Integrity (core samples from C-Basin taken and stored)
- Continue Existing programs:
 - Basin Water Chemistry
 - Corrosion Evaluation
 - Structural Integrity
 - Aging Facility Management Assessments
 - Infrastructure Maintenance



Core Sample from C-Basin

DNFSB TECH REPORT 38

- Issued in January 2013
- Addresses a Subset of stored fuels vulnerable to oxidation
 - Declad / damaged
 - Intentionally cut
- ~400 sealed & vented cans stored in:
 - 12 oversized isolation cans
 - ~200 bundles
- Stainless steel & zirconium clad items that cannot be disposed of by processing in H-Canyon
- Experience handling / repackaging degraded fuels & failed containers
- Challenges include:
 - Structural integrity of fuel / container
 - Risk of basin contamination & cleanup
 - Undefined disposition path



Oversize Can



**Fuel can loading into
Oversize Can**

Other L-Basin Issues

- “Cobwebs” – bacterial growth identified on the tops of the fuel bundles underwater in FY11



- L-Area Basin Isolation System (LABIS) – Isolation system to open up the Oversized isolation cans and perform repackaging/examination without impacting entire basin water
- Dry Storage – Conceptual strategy developed work deferred in FY13



Summary



- The recent processing decision (up to 1000 bundles and 200 HFIR cores) eliminates the need for new storage racks
- Used Nuclear Fuel in L-Basin will continue to be stored safely
- A disposition path for the remaining fuel in L-Basin will be determined in the future