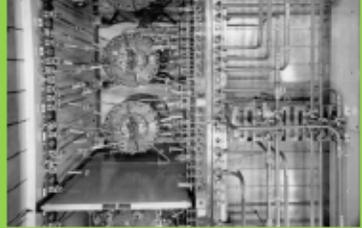




U.S. DEPARTMENT OF
ENERGY



Presentation to the NWTRB

SNF Processing at H-Canyon and the H-Canyon Roadmap

October 29, 2014

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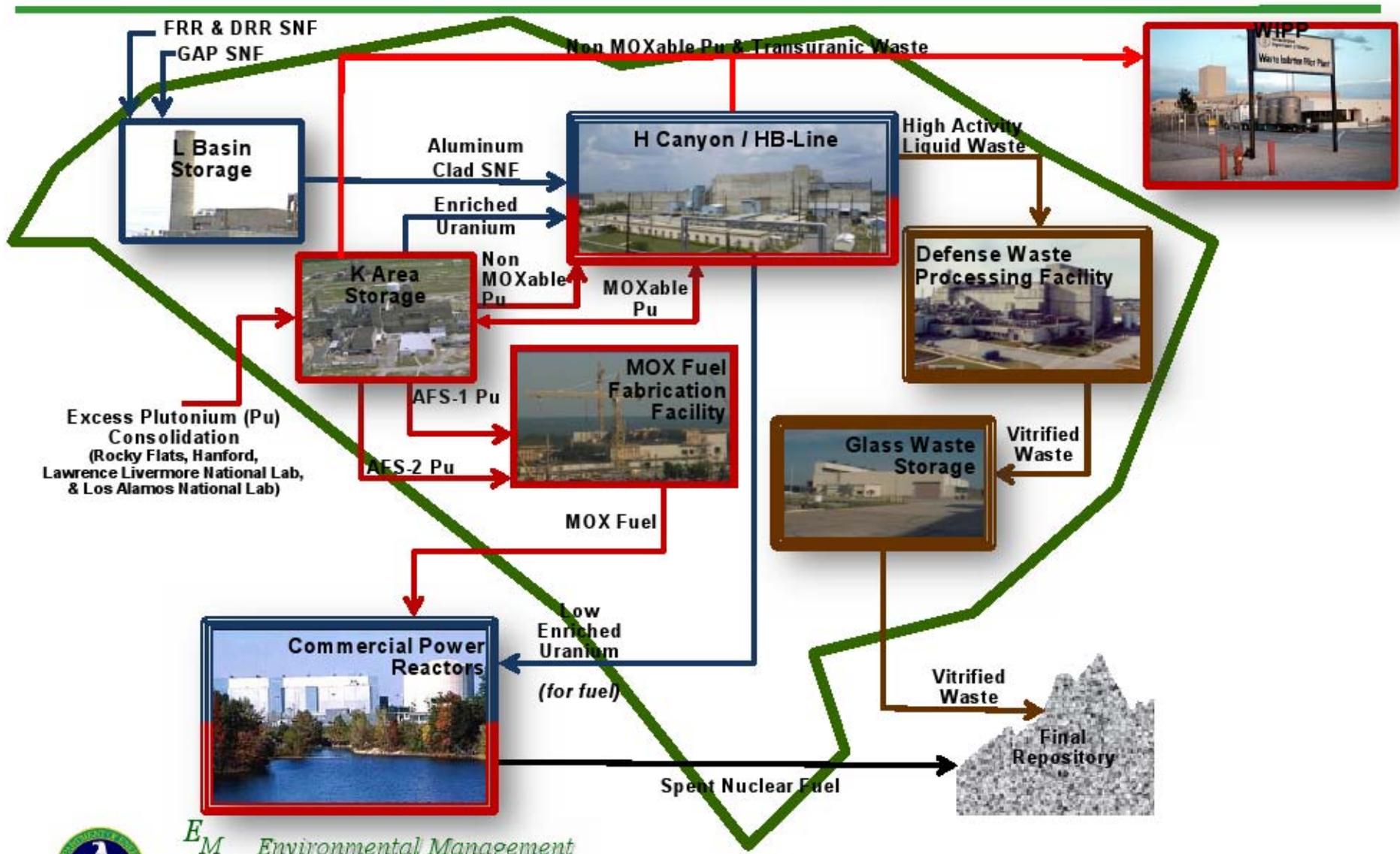
Aerial View of H Area



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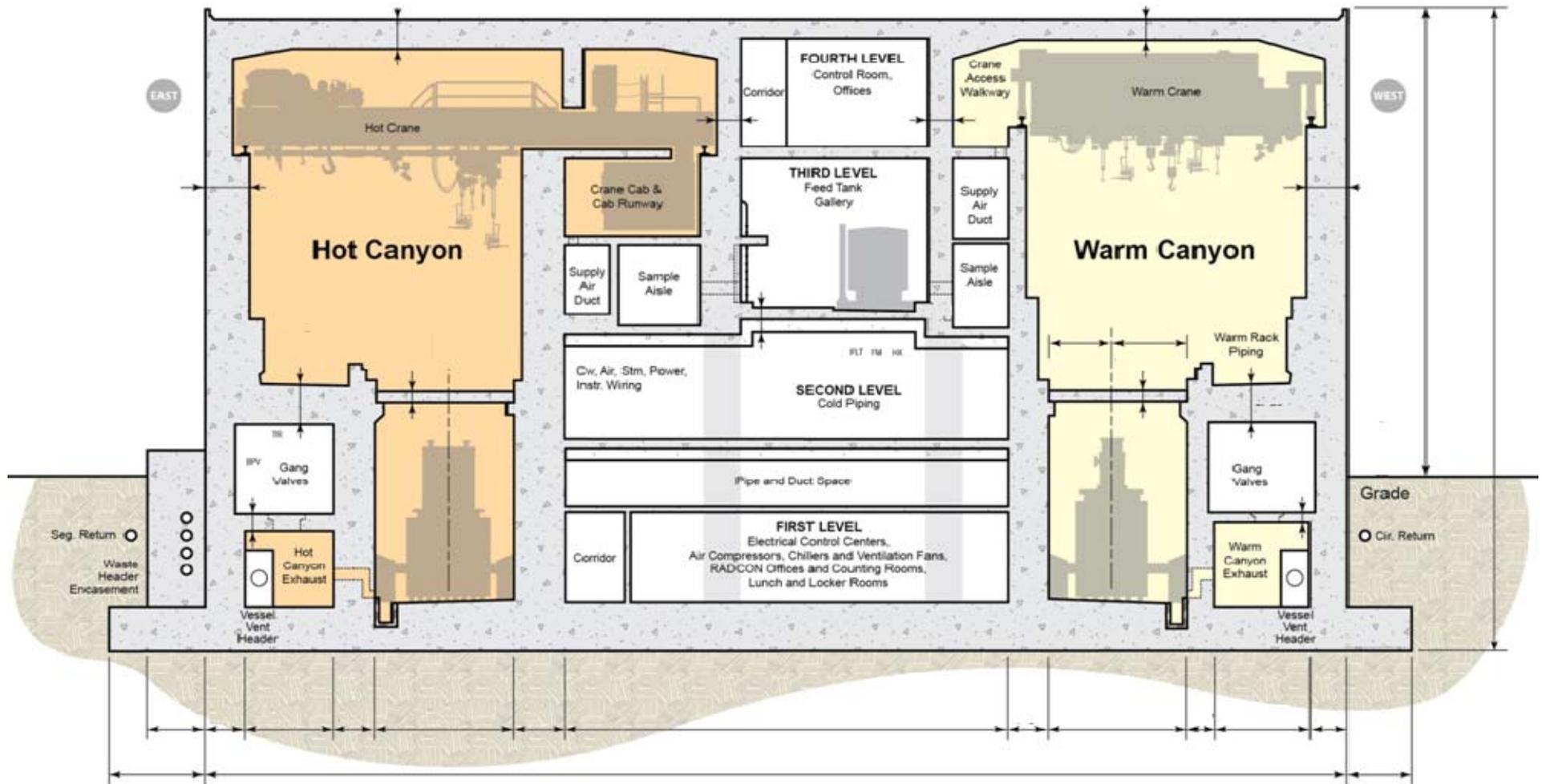
Nuclear Materials Disposition Process



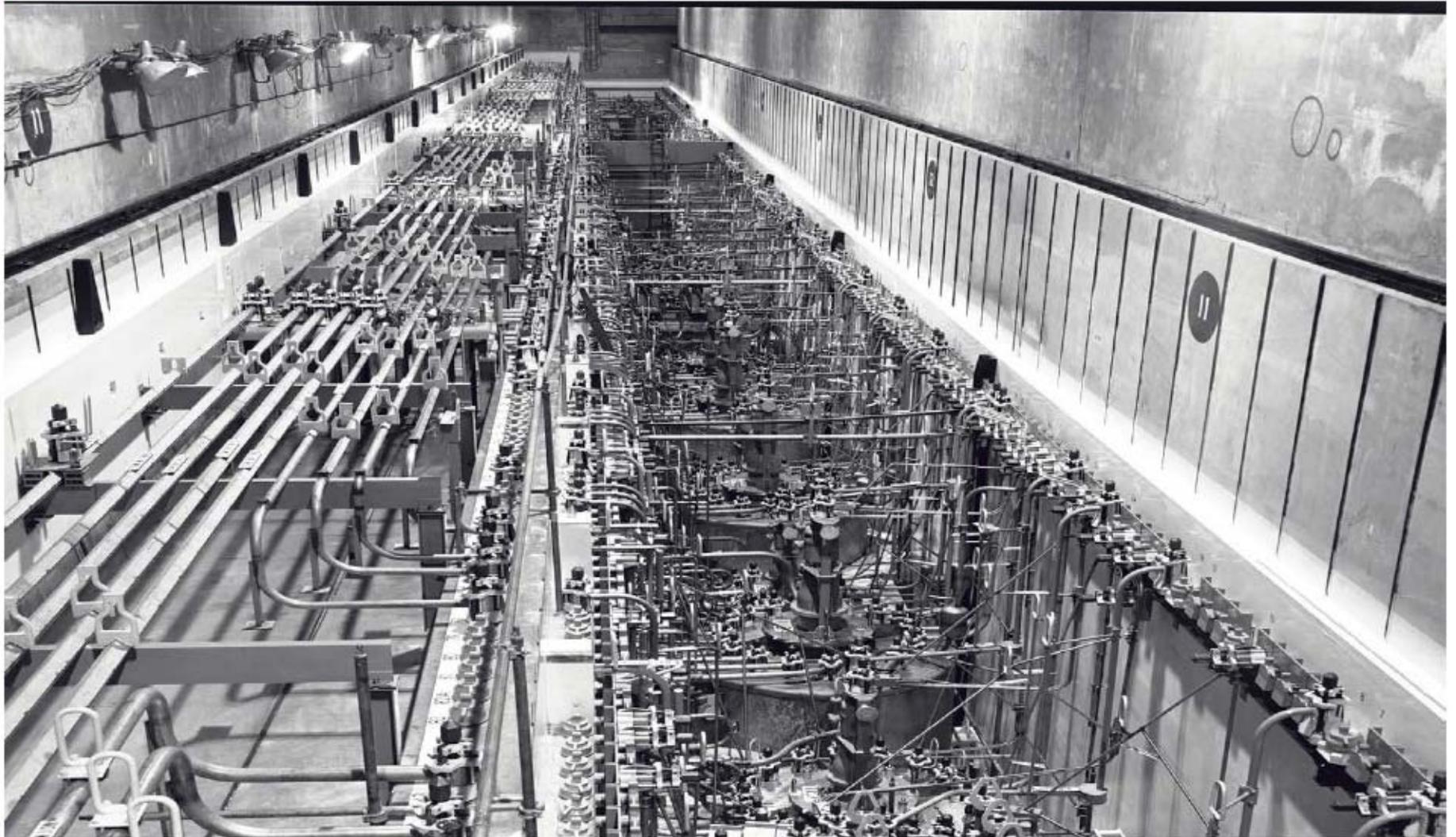
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H-Canyon - Cross Section



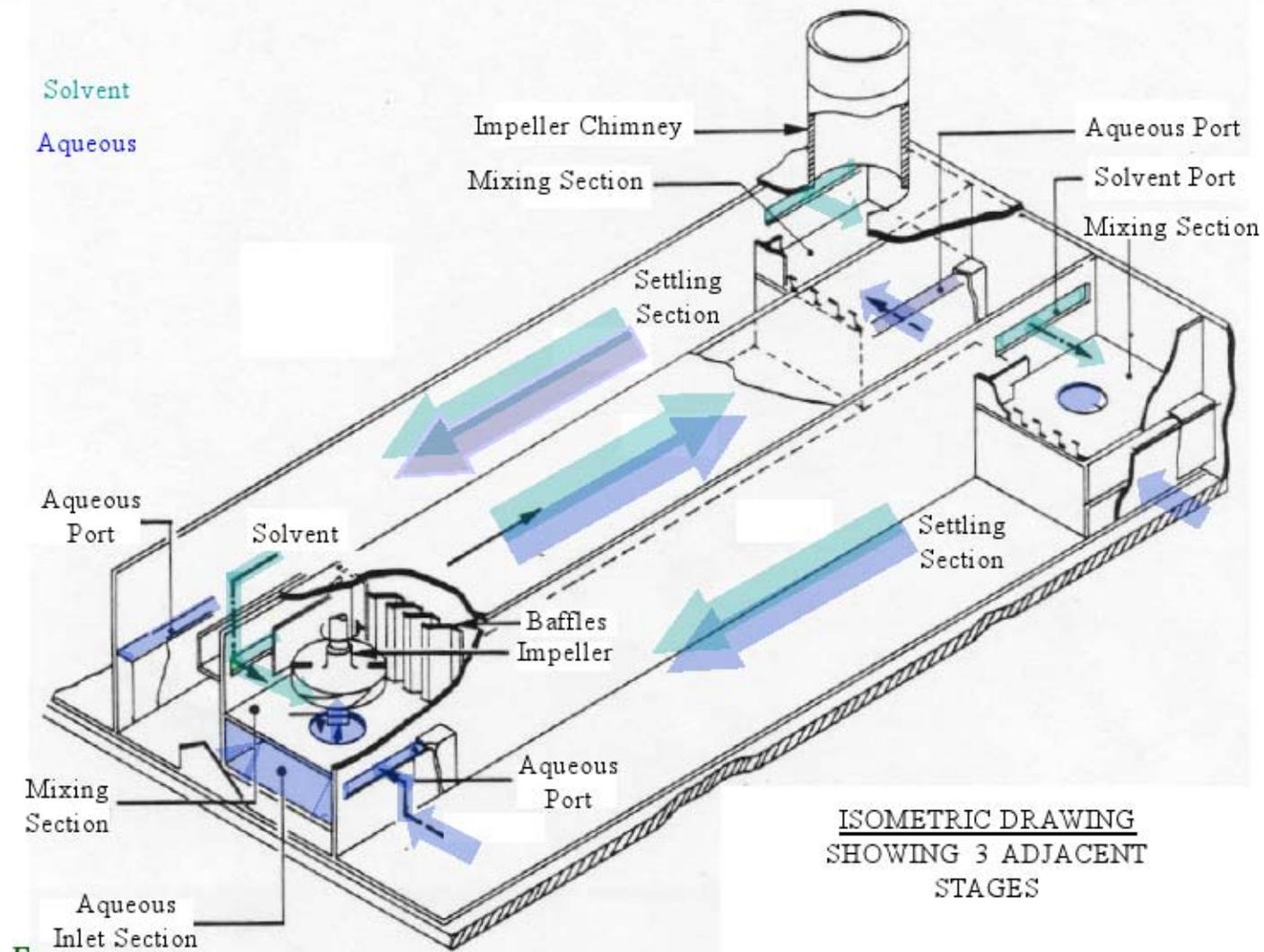
H-Canyon Warm Canyon



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Mixer-Settler



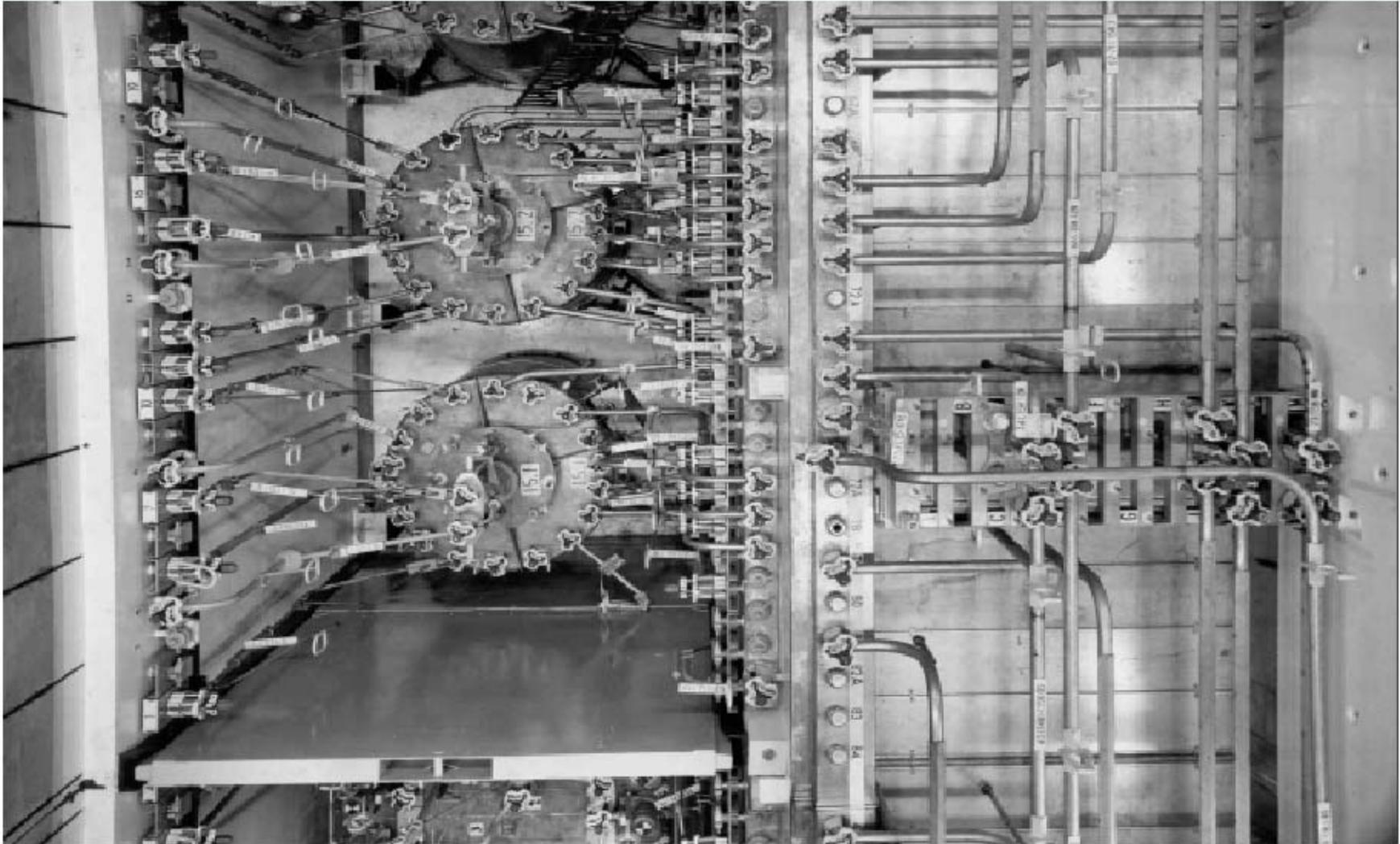
ISOMETRIC DRAWING
SHOWING 3 ADJACENT
STAGES



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H-Canyon – Overhead Photo of Typical Cell



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H-Canyon – Hot Canyon Crane



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Key NEPA Decisions

- 1996 – FRR EIS and ROD issued
 - Begin FRR receipts (US origin material)
- 2000 - SRS Spent Nuclear Fuel EIS and ROD was issued with Melt and Dilute of Al-clad UNF
 - Melt and Dilute
 - Al-clad fuel cropped
 - Melted with depleted uranium to form low enriched uranium metal
 - Cast in disk and placed in cans for disposal with high level waste canisters
 - Other alternatives evaluated:
 - Processing through H Canyon; Wet Storage; Other Technologies
- 2006 - Department approved the Uranium Disposition Project which included processing unirradiated highly enriched uranium materials and the Al-clad UNF. Recover the enriched uranium, down blend to low enriched uranium, and ship to TVA.
 - Required issuance of Amended Record of Decision for UNF processing
- 2013 – EM-1 signed an Supplement Analysis and Amended Record of Decision
 - Process 1,000 bundles of Material Test Reactor fuel
 - 200 cores of High Flux Test Reactor Cores
 - Recover the Enriched Uranium and Down Blend to 4.95% enrichment and use as feed for Tennessee Valley Authority reactor fuel



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H Canyon –SNF Disposition Status

- **“Vulnerable”**
 - Completed the dissolution of Sodium Reactor Experiment (SRE) SNF on August 14, 2014
 - SRE and other Hi Al/Low Uranium SNF campaigned as a blend to mitigate viscosity issues of thorium-based fuel (SRE) in caustic solution
 - Disposition of resulting solution directly to sludge batch tank
 - Initiated transfers to the sludge batch tank
- **“Highly Enriched Uranium Al-clad SNF”**
 - Initiated the dissolution of Material Test Reactor Fuel on September 14, 2014



Waste Generation

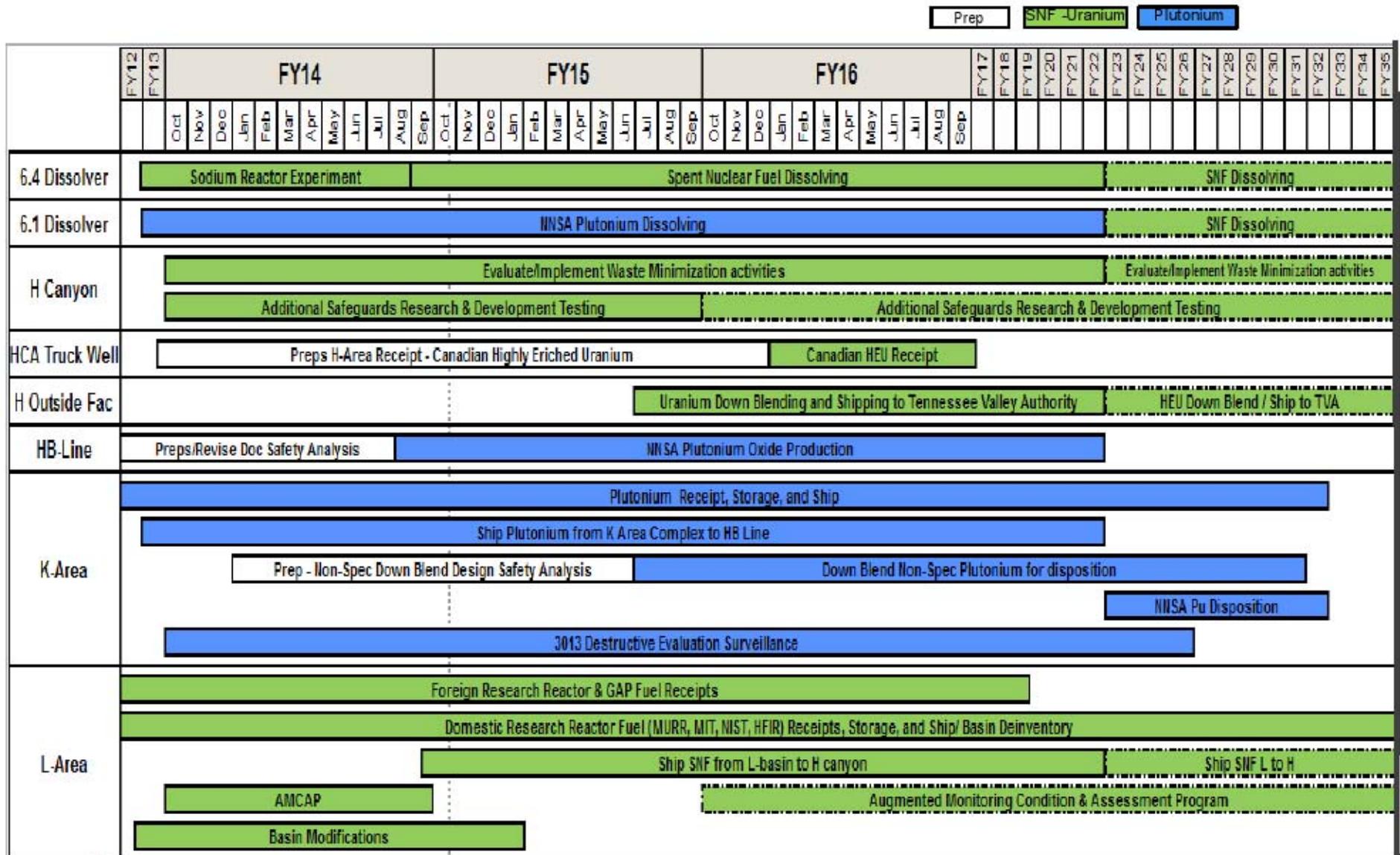
- Processing of Al-clad SNF and plutonium materials are expected to generate between 150,000 and 250,000 gallons annually of high level liquid waste
- H Canyon has a concerted effort to identify facility and process changes that reduce the amount of high level liquid waste H Canyon will generate and send to the waste system
- Based on projected budgets, Savannah River Operations Office issued the following guidance to Savannah River Nuclear Solutions identifying waste receipt volumes in the tank farms to be used in program planning, these fully support program:
 - FY15 – 150,000 gallons
 - FY16 -17 – 200,000 gallons yearly
 - FY18 -25 – 300,000 gallons yearly



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Nuclear Materials Assigned Missions Roadmap



Required Upgrades

- Savannah River Site has maintained and will continue to maintain the safety systems in H Canyon which ensure the protection of the public, environment, and workers
- DOE must provide adequate funds to support required infrastructure upgrades and spare equipment inventory to support continued H Canyon operations
 - Some examples of the production support systems that need to be upgraded which have been identified on a consolidated site priority lists:
 - Substation
 - Transformers
 - Roofs
 - Exhaust Fan



Modifications Required to Process non-Aluminum SNF

- H Canyon utilizes a nitric acid based modified PUREX process to dissolve and recover enriched uranium from Al-clad SNF which is not compatible with stainless steel or zirconium clad SNF
- In order to dissolve non-Al SNF, a modified head-end process (shear) would have to be installed on H Canyon
- The shear would expose the uranium in the fuel assembly allowing the uranium material to be leached out utilizing the existing H Canyon process chemistry
- Included in the modifications would be a capability to remove and dispose of the residual hulls



Questions?



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