Nuclear Materials Management Program

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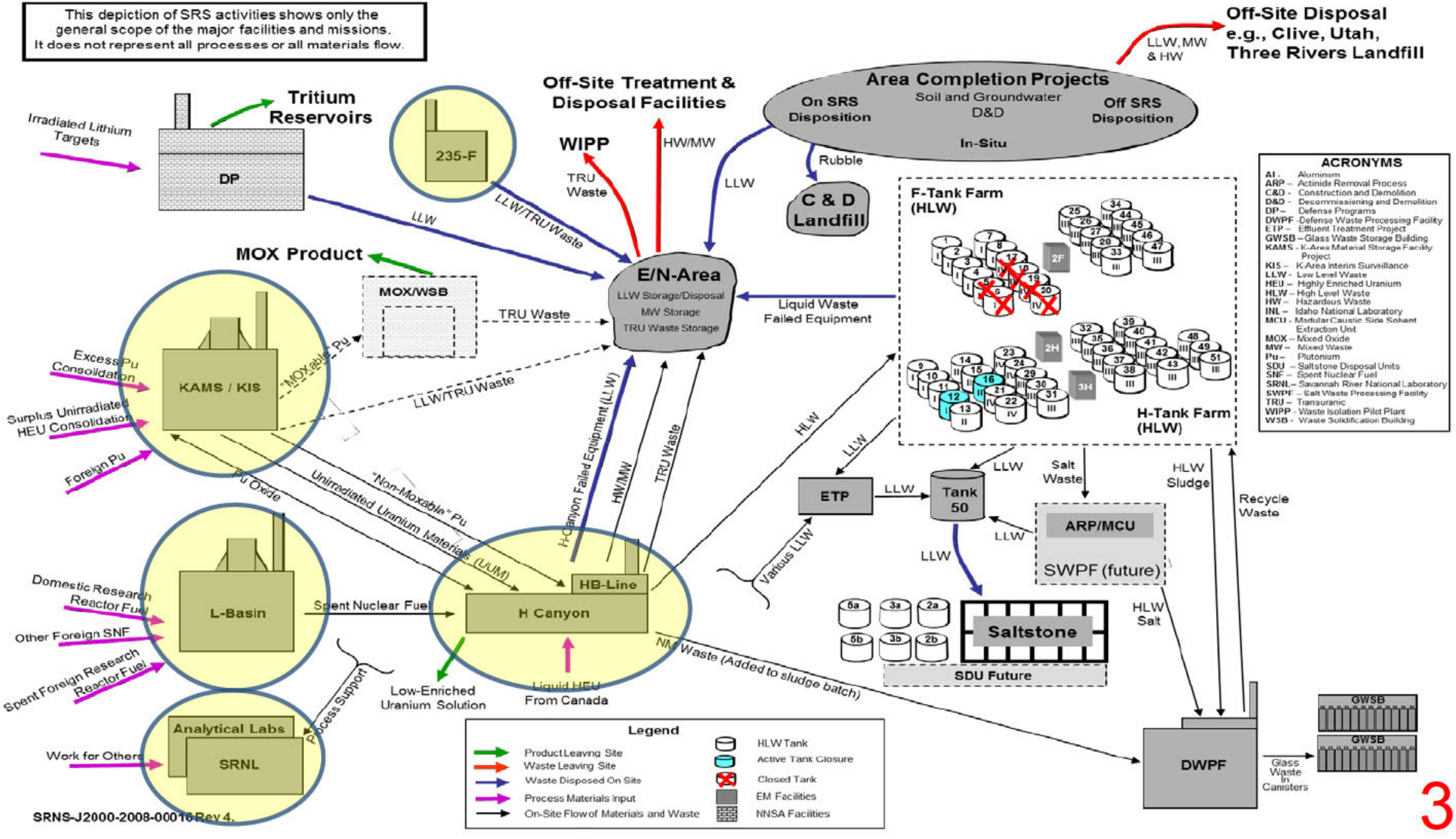
Purpose

- Satisfy Nuclear Materials Committee work plan item regarding Nuclear Materials Management Program
- Provide Citizens Advisory Board an overview of the Nuclear Materials Management Program

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.



Acronyms

DE – Destructive Examination
DRR – Domestic Research Reactor
DSA – Documented Safety Analysis
DWPF – Defense Waste Processing Facility
FRR – Foreign Research Reactor
HEU – Highly Enriched Uranium
LEU – Low Enriched Uranium
MOX – Mixed Oxide
NM – Nuclear Materials
NNSA – National Nuclear Security Administration
Np – Neptunium
NRC – Nuclear Regulatory Commission
Pu – Plutonium
RA – Readiness Assessment
R&D – Research and Development
S&S – Safeguards and Security
SNF – Spent Nuclear Fuel (also known as Used Nuclear Fuel)
SRE – Sodium Reactor Experiment
TVA – Tennessee Valley Authority
U – Uranium
WIPP – Waste Isolation Pilot Plant

Introduction

- The presentation today provides:
  - Assumptions
  - Approved Missions

Nuclear Material Facilities

Nuclear Material Operational Facilities

- H-Canyon
- HB-Line
- K-Area
- L-Area

Supporting Facilities/Interfaces

- F-Area/H-Area Analytical Laboratories (F/H Lab)
- SRNL
- Liquid Waste
- Transuranic Waste (E-Area)

Deactivated/Inactive Facilities

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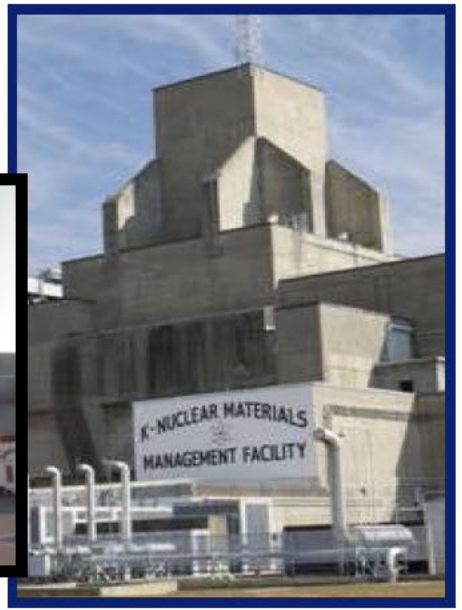
Deactivated/Inactive Facilities not addressed in the System Plan

- F-Canyon/FB-Line
- Receiving Basin for Offsite Fuels (RBOF)
- C-Area (Surveillance of Heavy Water only)

NM Storage and Disposition Facility Missions

K-Area safely receives and stores enriched uranium and plutonium materials awaiting disposition



L-Area safely receives and stores Spent Nuclear Fuel awaiting disposition

H-Area safely dispositions uranium (including fuel) and plutonium materials

General Assumptions

- The general assumptions are:
  - Support safe and secure operation of Nuclear Material facilities to disposition uranium and plutonium
  - Meet Department of Energy – Environmental Management and National Nuclear Security Administration non-proliferation missions
  - Support efficient operations and minimize waste generation

H-Canyon Assumptions

- H-Canyon has dissolved Sodium Reactor Experiment fuel for vitrification via the Defense Waste Processing Facility (Dissolution completed August 2014 – solution transfer to the Defense Waste Processing Facility is on-going)
- H-Canyon is dissolving Spent Nuclear Fuel to recover uranium (U) and blend to Low Enriched Uranium for the Tennessee Valley Authority (Dissolution of Spent Fuel for recovery of U began September 2014)
- H-Canyon will process sufficient Spent Nuclear Fuel to allow for L-Area receipts through 2035
- H-Canyon is supporting HB-Line with the dissolution of plutonium for a National Nuclear Security Administration mission (see HB-Line Assumptions slide)
- Dissolver being used for plutonium dissolution will begin dissolving Spent Nuclear Fuel in 2018
- Missions are integrated with the High Level Waste System*

*High Level Waste Limits (gallons/yr):

- 2014: 100,000
- 2015: 200,000
- 2016: 200,000
- 2017+: <300,000

H-Canyon / HB-Line

HB-Line Assumptions

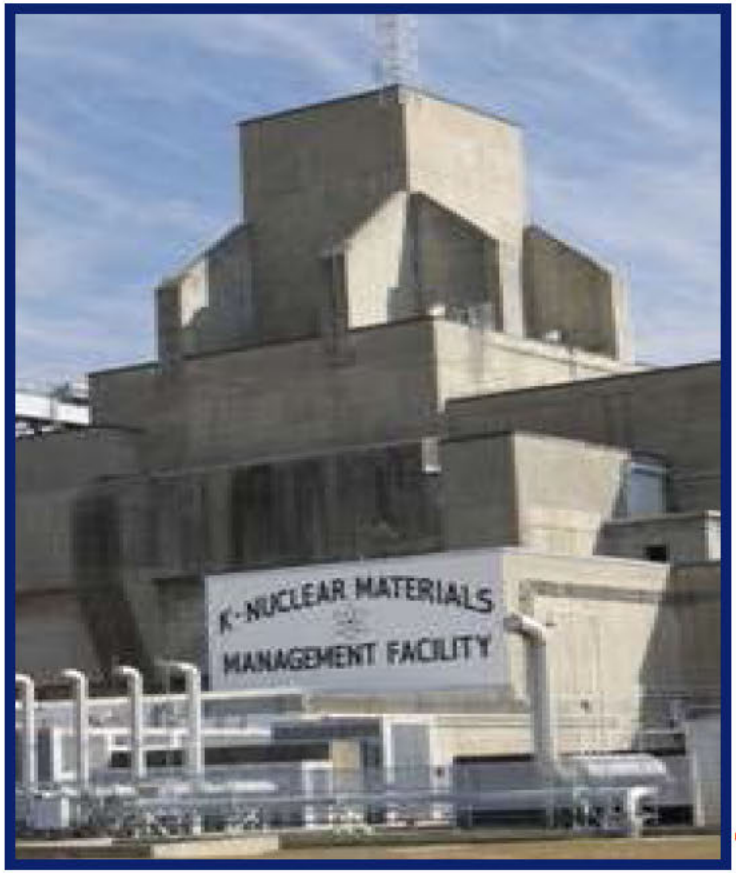
- HB-Line began plutonium oxide production in July of 2014 and will produce oxide through 2019 to support potential Mixed Oxide Fuel Feed for National Nuclear Security Administration (Oxide production began August 2014)

Glove-boxes in HB-Line

View of H-Canyon/HB-Line (looking North)

K-Area Assumptions

- K-Area will store the plutonium oxide produced by HB-Line
- Continue with safe storage, receipts and shipments until approximately 2039 (Basis: one glove-box line for disposition of non-MOXable plutonium)
- Continue Destructive Examinations of plutonium oxide containers (Department of Energy Standard 3013 containers) through 2026 to support continued safe storage



L-Area Assumptions

- Spent Nuclear Fuel processing in H-Canyon will eliminate the need for installation of new storage capacity (racks) in L-Area
- No new Foreign Research Reactor fuel receipts past May 12, 2019 (Per a Record of Decision)
- L-Area will support Domestic Research Reactor fuel receipts through 2035
- Heavy water will continue to be safely stored in L-Area, K-Area, and C-Area until a disposition path is determined/established

Support Facilities/Interfaces

Savannah River National Laboratory & F-Area/H-Area Laboratory

- Savannah River National Laboratory & F-Area/H-Area Laboratory will continue to support Nuclear Materials facilities with flowsheet development and analytical results, respectively, at the level necessary to support missions

Site Infrastructure

- Department of Energy – Savannah River will continue to support the infrastructure (for example: waste management, site services, medical facilities, etc.) and safeguards and security capabilities (for example: physical security, security workforce, material accountability, etc.)

Deactivated Facilities

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- Reduce and/or immobilize residual radiological material in Building
- Deactivation Project Plan was approved 3rd quarter of 2013

The following deactivated facilities are included here for information

- F-Canyon and FB-Line – partial deactivation, awaiting further deactivation
- Receiving Basin for Offsite Fuels – initial deactivation, awaiting turnover to the Deactivation and Decontamination organization (D&D)
- C-Area – some deactivation, awaiting further deactivation

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Summary

- SAFETY comes first!
- Some of our Facilities are One-Of-A-Kind National Assets (for example H-Canyon)
- We Stabilize/Disposition Nuclear Materials to:
  - Allow for de-inventory of DOE Environmental Management facilities
  - Meet non-proliferation goals
- We Operate in an Environmentally Sound Manner