



NNSA's Plutonium Disposition Program Update

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Acronyms



- CD – Critical Decision
- CPI – Cost Performance Index
- FY – Fiscal Year
- LANL - Los Alamos National Laboratory
- MFFF - MOX Fuel Fabrication Facility
- MOX – Mixed Oxide Fuel
- MT – Metric Ton
- NNSA – National Nuclear Security Administration
- PDCF – Pit Disassembly and Conversion Facility
- Pu – Plutonium
- SPI – Schedule Performance Index
- WSB – Waste Solidification Building



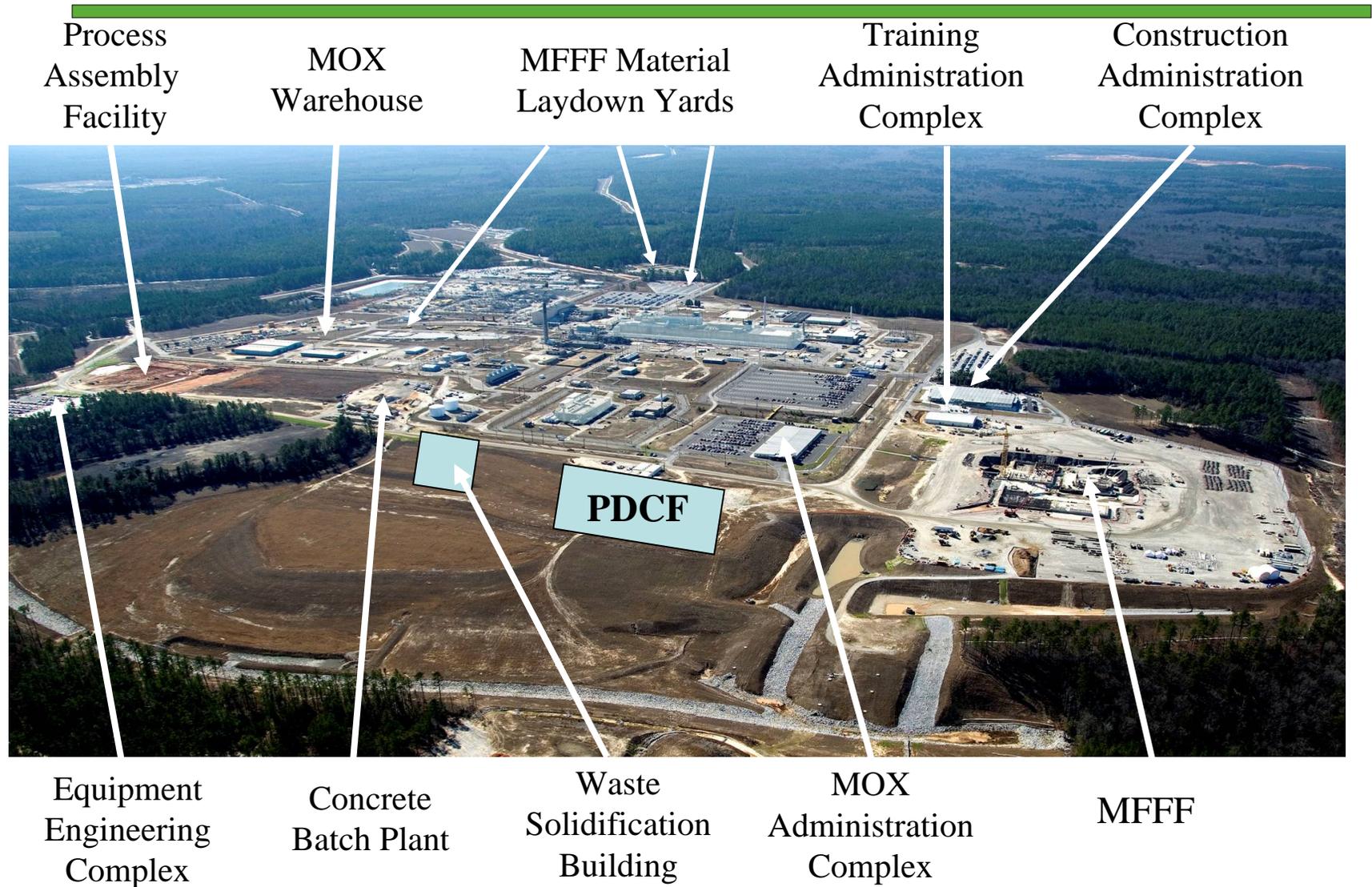
Pu Disposition Program



- At the end of the Cold War, the U.S. and Russia began to cooperate to prevent the proliferation of weapons of mass destruction.
- In 2000, both countries agreed to dispose of 34 metric tons of surplus weapon-grade plutonium each – enough for thousands of nuclear weapons.
- Both the U.S. and Russia will dispose of plutonium by irradiating it as mixed oxide (MOX) fuel in existing reactors.
- Three facilities will be built at Savannah River Site for the U.S. plutonium disposition program:
 - *Pit Disassembly and Conversion Facility (PDCF)* – where nuclear weapons pits are disassembled & the resulting metal is converted into an unclassified plutonium oxide form.
 - *MOX Fuel Fabrication Facility (MFFF)* – where plutonium oxide is mixed with uranium oxide to form MOX fuel assemblies.
 - *Waste Solidification Building (WSB)* – where waste from PDCF and MFFF is conditioned for final disposal.



Pu Facilities Locations



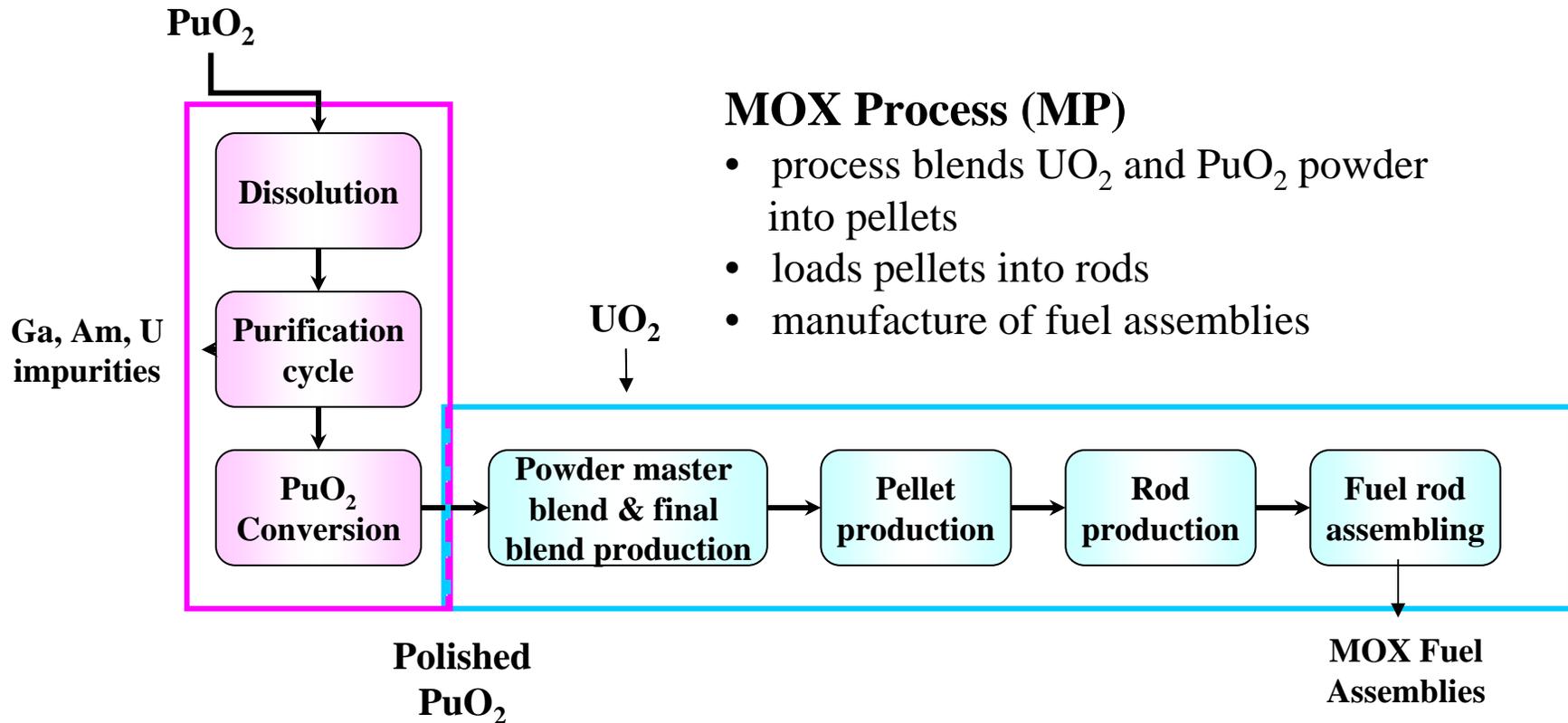


MFFF Process Overview



Aqueous Polishing (AP)

- primarily used to remove Ga & Am contaminants
- also removes other impurities



MOX Process (MP)

- process blends UO₂ and PuO₂ powder into pellets
- loads pellets into rods
- manufacture of fuel assemblies



MOX Current Status



- Construction started August 1, 2007.
 - Construction of the MFFF Process Building structure continues on schedule
 - Foundation construction is nearly 50% complete.
 - Construction started on intermediate walls and floors.
 - Glovebox Assembly Complex construction started
 - Electrical Substation site preparation started
 - Delivery of long-lead equipment continued on schedule to support construction
- All project performance indicators are green – CPI and SPI are 1.0.
- Installed ~ 15,011 cubic yards of concrete.
- Installed ~ 2,722 tons of rebar.
- Installed ~ 3,178 feet of embedded piping.
- Staffing numbers – 753 engineering and management; 240 construction and craft.
- Capability – Will process at least 34 MT of plutonium into MOX fuel including up to 7.8 MT of surplus non-pit Pu-239 from Environmental Management.
- Schedule – Begin operations in September, 2016.



Pit Disassembly & Conversion Facility (PDCF)



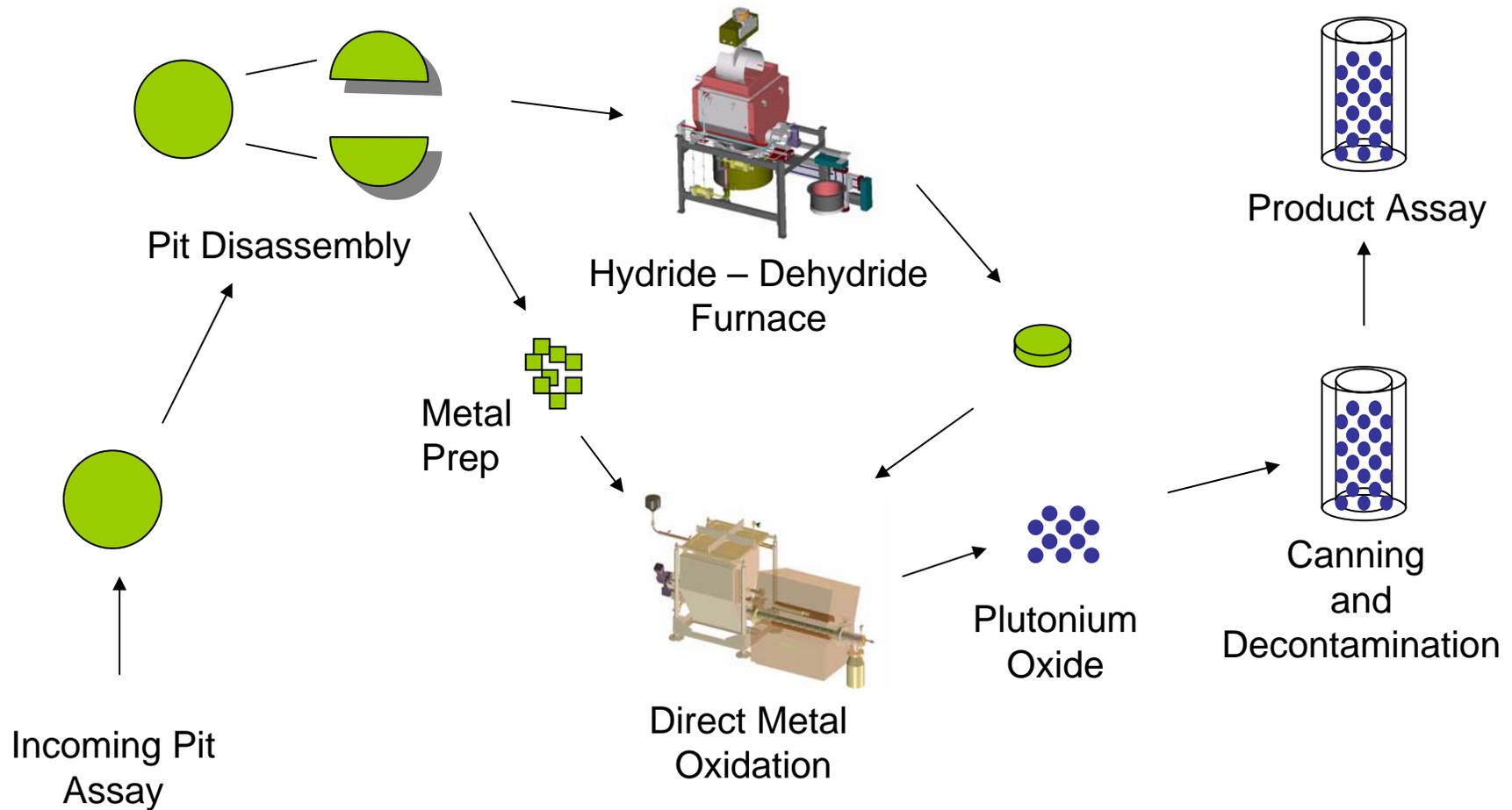
Purpose: Disassemble and convert weapon grade plutonium pits to an oxide form suitable for feedstock in the MFFF.

Major Components:

- Process Building
 - Underground (bermed) (Category 1 SNM) building
 - ~100,000 ft² with over 20 glovebox lines
 - Will handle Pu, HEU, classified parts
- Gloveboxes
 - Connected by overhead trolley systems – all transfers within containment.
 - Includes industrial lathes, direct metal oxidation furnaces, hydride reactors, robotic manipulators, oxide blending equipment, welding equipment.



PDCF Process Overview





PDCF Current Status



- Design is approximately 65% complete and is continuing.
 - Design being conducted by WGI in Denver, CO.
- Developing the required documentation (integrated project schedule, cost estimate, risk analysis and supporting documents) to support an external independent project review that will allow NNSA to set the cost and schedule baseline for this project.
- Working with the U.S. Army Corps of Engineers to review and validate the construction estimate and schedule, and initiate pre-construction planning.
- Expect to begin construction in the 2011 timeframe.



Waste Solidification Building (WSB)



- **Purpose:** WSB takes the high activity and low activity liquid waste streams from the MFFF and PDCF, neutralizes and evaporates the waste, and solidifies the waste in drums for permanent disposal offsite.
- **Major Components:**
 - Process Building (~28,000 sq. ft.)
 - Two evaporator systems – high activity and low activity
 - Feed tanks, laboratory
 - Waste mixing / cementation system



WSB Current Status



- Design is approximately ~85% complete and should be completed in June, 2008.
- Project documentation will be submitted for review and approval of the project baseline (cost and schedule) and for start of construction this summer.
- Expect to initiate site preparation activities in late summer/early fall with start of construction in late 2008.
- Project will complete construction and begin operation in 2013.
 - Must be online to support MFFF cold startup testing.

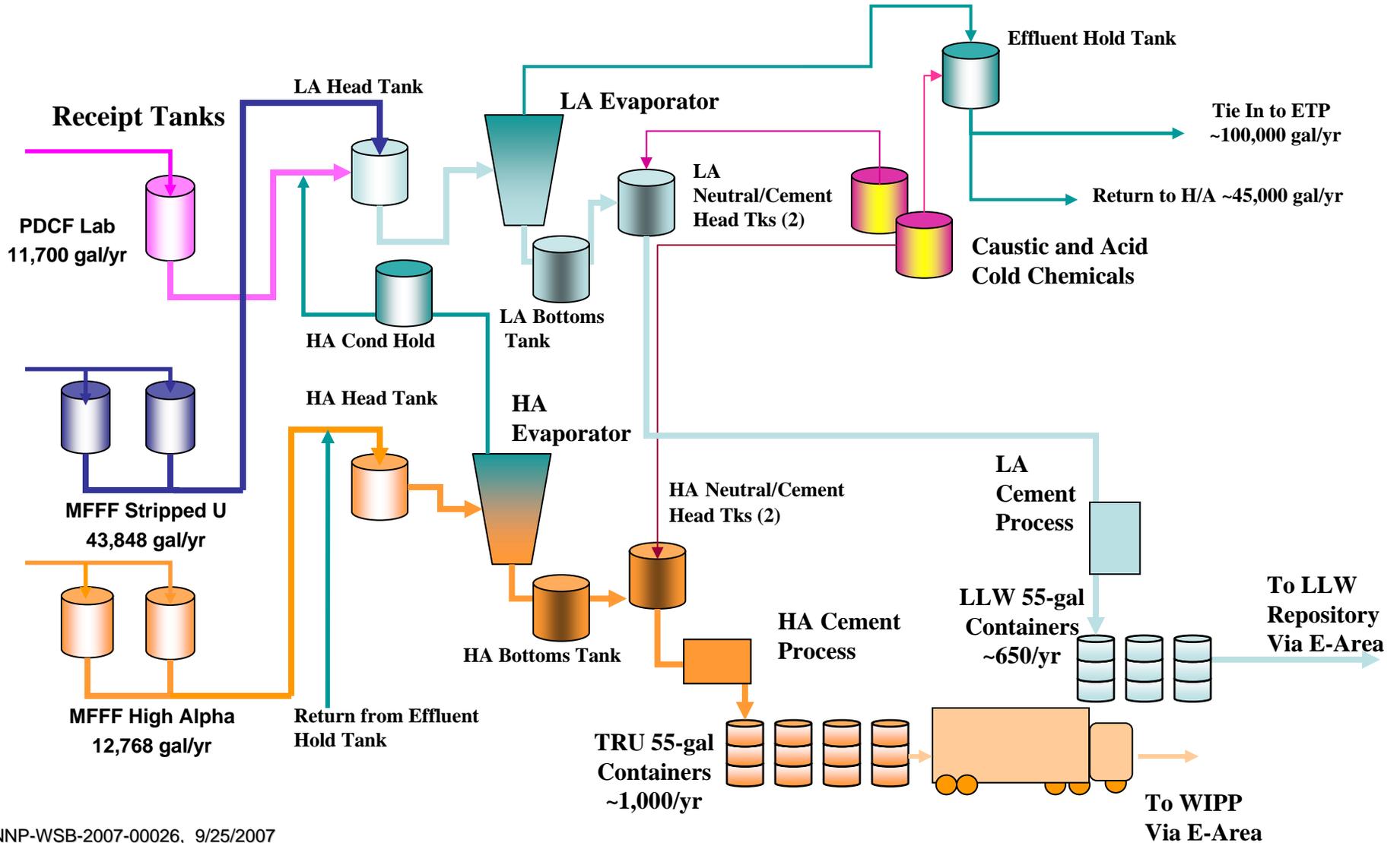
Annual Volumes (includes flush):

PDCF Lab: 11,700 gal

MFFF SU: 43,848

MFFF HA: 12,768

Waste Solidification Building Process Flow (w/ HA Evaporation)





Summary



- Three major projects all moving forward in an integrated approach.
 - MFFF construction under way
 - PDCF design progressing
 - WSB design nearing completion
- End result – plutonium being turned into electricity while making it no longer usable for nuclear weapons with no impact to the SRS cleanup missions.