Overview of Options for Operating HCAN

Nuclear Material System Plan

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CAB Meeting

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Acronyms

- ATR – Advanced Technical Reactor (Idaho)
- AROD – Amended Record of Decision (SNF)
- DRR – Domestic Research Reactor
- FCA – Fast Critical Assembly (Japan)
- FRR – Foreign Research Reactor
- HALEU – High Assay Low Enriched Uranium (Research)
- HCAN – H Canyon
- HFIR – High Flux Isotope Reactor (Oak Ridge)
- ALT HLW – Alternative to High Level Waste (ex: Melter in HCAN)
- LEU – Low Enriched Uranium (TVA)
- MOU – Memorandum of Understanding
- MTR – Material Test Reactor (DRR & FRR)
- NEPA – National Environmental Policy Act
- SNF – Spent Nuclear Fuel
- TRM – Target Residue Material (Canada)

HCAN – Key Mission Decisions

DECISION	OPTIONS
How fast do you run HCanyon?	Current (5 Dissolutions/yr) vs Accelerated (15 Dissolutions/yr)
How long do you run HCanyon?	AROD (2024), Dry Storage Validation (2027), HLW System (2030), All Al Clad Fuel (2040)
What feed does HCanyon process?	MTR (Commerce), HFIR (Science), TRM (Canadian HEU), ATR (INL), FCA (NNSA)
What product does HCanyon produce?	LEU (4.95%) vs HALEU (19.75%)

* Until Law changed – Ensure High State of Readiness in Perpetuity

Savannah River Site | H Canyon Mission Decisions

ENVIRONMENTAL STEWARDSHIP • NATIONAL SECURITY • SCIENCE AND ENERGY

Key Points

- U.S. Law states that H Canyon must remain in a high state of readiness and operational, but the Integrated Life Cycle Estimate has H Canyon shutting down by 2024
- H Canyon is the nation's only operating production-scale nuclear chemical separation facility, making it a national asset. ALL DOE offices should be considered during decision making
- H Canyon is currently the only technically proven disposition path for Spent Nuclear Fuel
- Existing MOUs define EM's responsibility (and financial liability) for SNF disposition

Rate of Production

(H Canyon Cost Only)

Slow

$200 million = $12 billion

*Per Year — Life Cycle

Option 4

($4 billion savings)

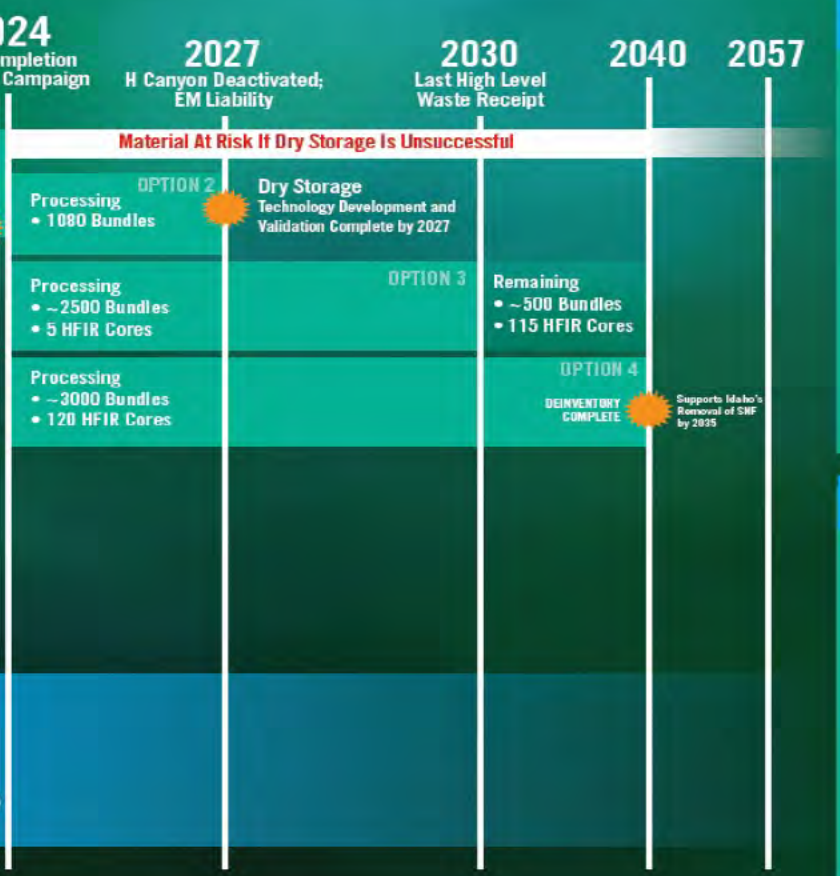
~$350 million = $8 billion

Per Year (including infrastructure and ALT HLW disposition) — Life Cycle

Current Mission (EM ~$200M/yr)

Potential Future Missions

- NNSA (FRR,FCA)
- Commerce (DRR)
- NE (DRR)
- Science (HFIR)
- EM (German HEU, Canadian LEU)



Key Decisions

How fast/long does it run?

- Slow/Flat Funding
- Accelerated (Full) Operations

Option 1
Through AROD (2024)

Option 2
Through Dry Storage (2027)

Option 3
Up Until HLW Decoupling (2030)

Option 4
Through ALL SNF Processing (2040)

Other Decisions

What feed to process?

- MTR
- HFIR
- TRM
- ATR
- FCA

What product?

- LEU
- HALEU

October 2018

* $200M/yr provides insufficient funding to meet the 2024 completion date for processing of the 1000 bundles and 200 HFIR cores reflected in the current EM liability.

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COMPARISON OF OPTIONS*

Selection Criteria	AROD (2024)	Dry Storage (2027)	HLW (2030)	All SNF (2040)
SNF Processing	Stop Dissolution 2024. 2,000 MTR Bundles / 200 HFIR Cores Remain in L-Basin	Stop Dissolution 2027. 1,000 MTR Bundles / 120 HFIR Cores Remain in L-Basin	Stop Dissolution 2030. 500 Bundles / 115 Cores Remain in L-Basin	ALL SNF Processed. No Remaining Bundles or Cores
Annual Funding **A. 5 Dissolutions/Yr.** **B. 15 Dissolutions/Yr.**	A. $234M/Yr. B. $270M/Yr.	A. $234M/Yr. B. $270M/Yr.	A. $234M/Yr. B. $270M/Yr.	A. ---------- B. $270M/Yr. [1]
Waste Management	No Alternative HLW Required	No Alternative HLW Required	No Alternative HLW Required	Alternative HLW post 2030, $820M
Long Term Storage	Dry Storage required after 2024, $1.3B	Dry Storage required after 2027, $845M	Dry Storage required after 2030, $260M	No Dry Storage required
Duration of Operation	2059 [2]	2059 [2]	2059 [2]	2040

[1] $350M/Yr. includes Alternative HLW and Processing.
[2] EM ILCE assumption date for removal of Dry SNF and shipment to the repository.

*DOE has formed an Integrated Project Team to evaluate these and other options