INL ENVIRONMENTAL LIABILITIES REGISTER

Delete line numbers as rough-drafts of Registry (HRM) entries, and use to view for funding purposes

INL Environmental Liabilities Register

1. **Spent Nuclear Fuels (SNF) - Disposition**
   - **Description**: EBR-II driver fuel and EBR-II blanket elements in storage at MFC pending disposition.
   - **Decision for Disposition**: INL Contract Driver Project Readiness Management.
   - **Approved by**: EBR-II, FFTF.
   - **Decision for Disposition**: INL Contract Driver Project Readiness Management.
   - **Estimated Cost**: $205M for EBR-II Blanket Fuel and $159M for EBR-II Driver Fuel, January 2007, Scenario 2B-84 (Table 9). Includes Idaho National Engineering Laboratory Preferred Disposition Path for Sodium and Oxide blanket.
   - **Current Status**: 87% completion as of 11/1/2015.
   - **Notes**: State Contract and other DEO Engineered Solution Pathway.

2. **Spent Nuclear Fuels (SNF) - Disposition**
   - **Description**: INL Contract Driver Project Readiness Management.
   - **Approved by**: Idaho National Engineering Laboratory Preferred Disposition Path.
   - **Decision for Disposition**: INL Contract Driver Readiness Management.
   - **Estimated Cost**: INL cost estimate # 1C31 prepared in June 2010. This estimate re-estimated $205M for EBR-II Blanket Fuel and $159M for EBR-II Driver Fuel, January 2007, Scenario 2B-84 & 2A-40. Additionally, 2007 scenario estimate is being developed by ATR canal operations.
   - **Current Status**: 87% completion as of 11/1/2015.
   - **Notes**: State Contract and other DEO Engineered Solution Pathway.

3. **Spent Nuclear Fuels (SNF) - Disposition**
   - **Description**: EBR-II driver fuel and EBR-II blanket elements in storage at MFC pending disposition.
   - **Decision for Disposition**: INL Contract Driver Project Readiness Management.
   - **Estimated Cost**: $205M for EBR-II Blanket Fuel and $159M for EBR-II Driver Fuel, January 2007, Scenario 2B-84 (Table 9). Includes Idaho National Engineering Laboratory Preferred Disposition Path for Sodium and Oxide blanket.
   - **Current Status**: 87% completion as of 11/1/2015.
   - **Notes**: State Contract and other DEO Engineered Solution Pathway.

4. **Spent Nuclear Fuels (SNF) - Disposition**
   - **Description**: EBR-II driver fuel and EBR-II blanket elements in storage at MFC pending disposition.
   - **Decision for Disposition**: INL Contract Driver Project Readiness Management.
   - **Estimated Cost**: $205M for EBR-II Blanket Fuel and $159M for EBR-II Driver Fuel, January 2007, Scenario 2B-84 (Table 9). Includes Idaho National Engineering Laboratory Preferred Disposition Path for Sodium and Oxide blanket.
   - **Current Status**: 87% completion as of 11/1/2015.
   - **Notes**: State Contract and other DEO Engineered Solution Pathway.

5. **Spent Nuclear Fuels (SNF) - Disposition**
   - **Description**: EBR-II driver fuel and EBR-II blanket elements in storage at MFC pending disposition.
   - **Decision for Disposition**: INL Contract Driver Project Readiness Management.
   - **Estimated Cost**: $205M for EBR-II Blanket Fuel and $159M for EBR-II Driver Fuel, January 2007, Scenario 2B-84 (Table 9). Includes Idaho National Engineering Laboratory Preferred Disposition Path for Sodium and Oxide blanket.
   - **Current Status**: 87% completion as of 11/1/2015.
   - **Notes**: State Contract and other DEO Engineered Solution Pathway.

6. **Spent Nuclear Fuels (SNF) - Disposition**
   - **Description**: EBR-II driver fuel and EBR-II blanket elements in storage at MFC pending disposition.
   - **Decision for Disposition**: INL Contract Driver Project Readiness Management.
   - **Estimated Cost**: $205M for EBR-II Blanket Fuel and $159M for EBR-II Driver Fuel, January 2007, Scenario 2B-84 (Table 9). Includes Idaho National Engineering Laboratory Preferred Disposition Path for Sodium and Oxide blanket.
   - **Current Status**: 87% completion as of 11/1/2015.
   - **Notes**: State Contract and other DEO Engineered Solution Pathway.
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<th>Scope of Work Descriptions</th>
<th>Quantity</th>
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<td>Design and construction of a RH-LLW disposal facility</td>
<td>A new disposal facility for RH LLW must be operational by October 2017 to support uninterrupted INL operations.</td>
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<td>Cost estimate number 9A-28N Estimate booked is upper range estimate based on this cost estimate.</td>
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<td>MFC - Remote Handled Low Level Waste Stored at MFC</td>
<td>This activity involves approximately 328 waste cans/liners containing legacy RH LLW that are currently stored at RWSF at MFC. The waste consists primarily of irradiated metals and must be disposed of at a disposal facility with performance assessments limits that will allow disposal i.e., NNSS or facility identified in 5.1. For planning purposes, approximately 10% of the legacy large liners will require repackaging.</td>
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<td>Inventory maintained in the Integrated Waste Tracking System (IWTS).</td>
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<td>ATR - Remote Handled Low Level Waste Stored at ATR Complex</td>
<td>RH-LLW currently being stored in ATR Canal. This includes approximately 25 cubic meters of activated metal reactor parts. The waste consists primarily of irradiated metals and must be disposed of at a disposal facility with performance assessments limits that will allow disposal i.e., NNSS or facility identified in 5.1. Driver - INL Contract DE-AC07-051D14517, Section J, Attachment P. The project could be initiated at any time if funding is available.</td>
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<td>RAM - Remote Handled Low Level Waste Stored at RAM Complex</td>
<td>RH-LLW currently being stored in RAM Canal. This includes approximately 10 cubic meters of activated metal reactor parts. The waste consists primarily of irradiated metals and must be disposed of at a disposal facility with performance assessments limits that will allow disposal i.e., NNSS or facility identified in 5.1. Driver - INL Contract DE-AC07-051D14517, Section J, Attachment P. The project could be initiated at any time if funding is available.</td>
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### INL ENVIRONMENTAL LIABILITIES REGISTER

#### INL CH-TRU Program Costs

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2/17/2016 4:58 PM

Total Environmental Liability

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<th>Scope of Work Description</th>
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</table>

Total | $3,061,773,354 | $494,694,447 | (16,215,602) | $3,540,252,199 |

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Recycling for reuse is the most environmentally responsible path forward from a stewardship basis and will also support the INL R&D mission. The alternative is disposal if and when a geologic repository is available. This alternative is not anticipated to be more cost effective and is not likely to satisfy Idaho Settlement Agreement any better than the current path. At the current pyro-processing rate of 0.5 MTHM per year, it will take at least 44 years to treat this fuel using the existing facility. The production capability of the existing facility will not support the Idaho Settlement Agreement milestone to remove all SNF from the State of Idaho by 2035. Increased staffing and shifts could reduce the processing time considerably.

FY-12 funding reduction necessitated return to 9 x 80 working schedule. Continued funding and increased personnel, as mentioned on FY-13 forecast, had increased the 2016 total estimated personnel to over 300. Current current quarter planning does not include activities beyond the current quarter. The current expectation is to meet all of the fiscal year 2013 milestone commitments.

FY-13 3rd Quarter booked estimate is arrived at by starting with the scenario 2A-40 estimate of $594M and subtracting actual costs for EBR-II Blanket & Driver and FFTF driver from 2008 - May 2013 = $61.4M.

At the current pyro-processing rate of 0.17 MTHM per year, it will take at least 10 years to treat the driver fuel and another 18 years to treat the blanket fuel referenced above using the existing facility. The production capability of the existing facility will not support the Idaho Settlement Agreement milestone to remove all SNF from the State of Idaho by 2035. Increased staffing and shifts could reduce the processing time considerably.

Excess Pu-bearing material currently has no defined disposition path due to lack of defined end-state. Applying escalation is appropriate for this estimate.

ERP funding needs have been identified in the current 2013 Finance Plan. ERP funding needs have been identified in the current 2013 Finance Plan.

This estimate will need to be revised to reflect the revised commitment dates.

In order to prepare a reasonable cost estimate the destination facility and disposition requirements (WAC) must be known. The siting recommendations are being driven by the Blue Ribbon Commission (BRC). To date, no location has been selected or evaluated.

Estimate requires review.
Comments

FY14-2nd Qtr - Project is now fully funded and moving forward. Estimate still accurate.

FY13-3rd Qtr - Project is now on hold pending appropriation of capital funds. Project files are being stored under the Project Management Office server location.

FY12-3rd Qtr - Estimate should not contain escalation or contingency. Estimate booked is upper range of planning baseline estimate.

In 2010 EnergySolutions determined a rough estimate of the costs for disposal at NNSS of the current ATR Canal inventory of activated metals. This would exclude the beryllium and hafnium items that would be TRU wastes. A formal detailed estimate was not prepared as it was determined that the waste would be prepared for disposal at the planned INL RH LLW disposal facility. This rough estimate included procurement of a new Type B cask, design and procurement of ATR canal-specific liners, and all costs associated with shipping to NNSS. The new cask would accommodate the current configuration of ATR resin liners. Disposal of the current inventory of activated metals could be accomplished in 4-5 years. Disposal of activated metal waste from future CICs would cost approximately $1.8M to $2M each.

8,172,000 Based on new estimate received on 5/17. See binder for details.

Line item costs are Rough Order of Magnitude (ROM) estimates and are not to be used for funding purposes.
Line item costs are Rough Order of Magnitude (ROM) estimates and are not to be used for funding purposes.

Comments

Cost basis is from a preliminary planning calculator, based on estimating costs for all activities associated with characterization, packaging and shipment of RH-TRU containers from MFC to INTEC, Analytical Lab will store in CIC.

Recommend deletion of this line item as CH-TRU is being managed as an active program primarily for newly generated and no longer for legacy. One drum left.

Blanket material included. Estimate is based on 93 HUP cans, in 31 IWC/OWC 5 cask waste containers, containing 103 DU ingots (some HUPS contain 2 ingots). $600K per container times number of existing containers assumes removal of the HUP cans from existing containers and repacking in a 30 gallon drum. Cannot be loaded 1 to 1 due to FGE limits, thus approximately 2 additional final waste packages will be assumed necessary.

The environmental liability estimate for CP/CF dross is based on trying to quantify the amount of dross material associated with the crucibles and then multiplying that quantity by the assumed number of batches required to treat the entire inventory of Sodium Bonded Fuel. Once the quantity is determined, it is multiplied by an assumed cost/unit to come up with an estimated disposition cost.

There is currently no NE generated HLW in storage. It will eventually be produced at the INL from the electrorefiner processing of SNF.

Estimate was prepared several years ago and is based on 8 blocks, 16 shims/CIC. There are currently 20 blocks and 55 shims from 4 CICs in storage. CIC from 1976 was disposed at RWMC, half of the 1984 CIC went to RWMC, and 1984 and 1991 remain in the canal.

The irradiated Be has an average TRU concentration of 500 nCi/gram; contains approximately 1.5 M Ci of 3H; and, high levels of 60Co, 94Nb, and 14C. The TRU is formed when elemental impurities of 238U in the metal are exposed to ATR's high neutron flux. This waste has been included in the waste inventory for the GTCC EIS; however, viable disposal options for this waste must be identified. WIPP may be an option, but will be 80% of WIPP capacity along with other certain obstacles. Another significant consideration is that the waste has a 30 year decay factor.

Excess Legacy Materials Inventory Report for the Idaho National Laboratory, INL/EXT-10-17710, April 2010 includes Table-1 and Table 2. A strategy and preliminary cost estimates for managing these inventories is presented in a draft document, "Excess Legacy Materials Disposition Strategy", 8/30/11. The strategy includes materials that will be managed under other programs identified on this table. When materials are managed under other programs, the associated costs are assigned to that program and subtracted from this category. (for example, DU ingots identified in Table 1 are managed as TRU waste in Line 6.3.

Inert diluents, (poly, steel, aluminum, etc.). H20 reactives (sodium, lithium compounds).

Source (depleted uranium, thorium, natural uranium). See Table 2-3 Excess Legacy Materials Disposition Strategy.

Need formal verification of the transfer of this liability from NE to EM before removing from list.
Line item costs are Rough Order of Magnitude (ROM) estimates and are not to be used for funding purposes.

Comments

Five year campaign.

The RH MLLW inventory is being tracked on the NE side of the liabilities until EM adds it to their liability.

Estimate being developed to determine if this qualifies as an EL.

SPF handed off to EM for sodium treatment process for remote TRU.

SCMS may still be of interest to EM, but not currently.

Details are contained in document DOE/ID-11429 (PART 1), “Five-Year Review of CERCLA response actions at the Idaho National Laboratory Site - Fiscal Years 2005-2009 (PART 1)”