



**Portland General Electric Company**

Trojan ISFSI  
71760 Columbia River Hwy  
Rainier, Oregon 97048

February 21, 2019

VPN-004-2019

Trojan ISFSI  
Docket No. 72-17  
CAC No. 001028  
EPID No. L-2017-RNW-0011

ATTN: Document Control Desk  
Director, Division of Spent Fuel Management  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**Submittal of Response to NRC's Request for Additional Information  
Related to the Trojan ISFSI License Change Application (LCA 72-07) for  
License Renewal (CAC No. 001028)**

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By letter dated March 23, 2017, Portland General Electric Company (PGE) submitted to the Nuclear Regulatory Commission (NRC) an application for renewal of License No. SNM-2509 for the Trojan Independent Spent Fuel Storage Installation (ISFSI). PGE was informed that the application was accepted for technical review on May 31, 2017. In a letter dated February 4, 2019 from Christopher T. Markley to Bradley Y. Jenkins, the NRC requested additional information from PGE to support technical review of the license renewal application. This letter is provided in reply to the request for additional information (RAI).

The enclosures to this letter provide the current estimated operating and maintenance costs for the Trojan ISFSI, as well as sources of funds, over the planned life of the ISFSI, and provides the rationale for these cost projections.

This information is provided to show compliance with 10 CFR 72.22(e).

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This application is executed in original form and signed under oath or affirmation as required by 10 CFR 72.16(b) and (c). Please contact Mr. Mark Tursa of my staff at 503-556-7030 if you have questions regarding this correspondence.

Sincerely,



FOR BILL NICHOLSON PER TELECON

Bill Nicholson  
Vice President,  
Utility Technical Services

Enclosures

c: C. T. Markley, NRC, NMSS, SFPO  
Director, DNMS, NRC Region IV  
T. R. Cornett, ODOE  
Chairman, Columbia County Commissioners

State of Oregon,       )  
                                      )  
                                      )  
County of Multnomah    )

I, Bill Nicholson, being duly sworn, subscribe to and say that I am the Vice President, Utility Technical Services for Portland General Electric Company, the applicant herein; that I have full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

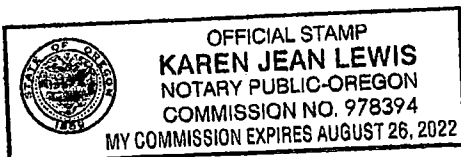
Date February 21, 2019

Bill Nicholson

Bill Nicholson  
Vice President, Utility Technical Services

On this day appeared before me Bill Nicholson, to me known to be the individual who executed the foregoing instrument and acknowledged that he signed the same as his free act.

GIVEN under my hand and seal this 21 day of February 2019.



Notary Public in and for the  
State of Oregon

Karen Jean Lewis

Residing at Portland Oregon  
My commission expires August 26, 2022

**RESPONSE TO NUCLEAR REGULATORY COMMISSION (NRC)  
REQUEST FOR ADDITIONAL INFORMATION FOR THE  
TECHNICAL REVIEW OF THE APPLICATION FOR RENEWAL OF THE  
TROJAN INDEPENDENT SPENT FUEL STORAGE INSTALLATION  
LICENSE NO. SNM-2509**

By letter dated February 4, 2019, the NRC issued to Portland General Electric Company (PGE) a "Request for Additional Information for the Technical Review of the Application for Renewal of the Trojan Independent Spent Fuel Storage Installation License No. SNM-2509 (CAC No. 001028)." This NRC's Request for Additional Information (RAI) and PGE's response to the RAI is provided below.

**CHAPTER 1 – GENERAL INFORMATION**

**RAI 1-1.** In its submittal, Portland General Electric Company (PGE) stated, in part, that itself and co-owners of the Trojan Independent Spent Fuel Storage Installation (ISFSI) will remain financially qualified to carry out the operation and decommissioning of the ISFSI during the period of the renewed material license as required by 10 CFR 72.22(e). Additionally, PGE provided web links to the annual financial reports for PGE, PacifiCorp, and the Eugene Water and Electric Board (EWEB) current at that time. Two of the web links are currently inactive.

The regulation at 10 CFR 72.22(e) "Contents of application: General and Financial Information," states:

Except for DOE, information sufficient to demonstrate to the Commission the financial qualifications of the applicant to carry out, in accordance with the regulations in this chapter, the activities for which the license is sought. The information must state the place at which the activity is to be performed, the general plan for carrying out the activity, and the period of time for which the license is requested. The information must show that the applicant either possesses the necessary funds, or that the applicant has reasonable assurance of obtaining the necessary funds or that by a combination of the two, the applicant will have the necessary funds available to cover the following:

- (1) Estimated construction costs;
- (2) Estimated operating costs over the planned life of the ISFSI; and
- (3) Estimated decommissioning costs, and the necessary financial arrangements to provide reasonable assurance before licensing, that decommissioning will be carried out after the removal of spent fuel, high level radioactive waste, and/or reactor related GTCC waste from storage.

After reviewing PGE's submittal, it appears that the estimated operating and maintenance costs, as well as sources of funds to operate the Trojan ISFSI were not specifically provided in the application for license renewal, nor could this information be easily obtained from staff's review of the PGE annual report.

### **Request for Additional Information 1**

Provide the current estimated operating and maintenance costs for the Trojan ISFSI, as well as sources of funds, over the planned life of the ISFSI. Additionally, provide the rationale for these cost projections.

This information is required to determine compliance with 10 CFR 72.22(e).

### **PGE Response**

PGE is providing the following updated and additional information that supports the statements made in its License Renewal Application, LCA 72-07, Section 1.3.6 to show compliance with 10 CFR 72.22(e).

The Trojan ISFSI is co-owned by Portland General Electric (PGE), Eugene Water and Electric Board (EWEB), and PacifiCorp with ownership percentages of 67.5 percent, 30 percent, and 2.5 percent respectively.

All three co-owners prepare annual financial reports as required by regulation. The December 31, 2017 annual financial report for PGE may be found at:

<https://www.sec.gov/Archives/edgar/data/784977/000078497718000005/a201710-k.htm>

The December 31, 2017 annual financial report for PacifiCorp may be found at:

<https://www.sec.gov/Archives/edgar/data/71180/000108131618000014/bhe123117form10-k.htm>

The December 31, 2017 annual financial report for EWEB was transmitted to the NRC by PGE letter VPN-003-2018 (Reference ML18116A468) dated March 28, 2018 pursuant to 10 CFR 72.80(b).

### **Current Estimated Operating and Maintenance Costs for the Trojan ISFSI**

PGE prepares a Trojan ISFSI Operations and Maintenance (O&M) budget each year that includes ISFSI staff labor, contract support labor, and materials. Estimated costs are then added for non-routine activities such as performing the 5-year Concrete Cask interior inspection required by ISFSI Safety Analysis Report (SAR) Section 9.7.7, and ISFSI license renewal. Each month, ISFSI actual costs are totaled and billed to each co-owner based on their percentage of ownership.

Table 5-2, "Decommissioning Cost Estimate for Trojan Nuclear Plant and Trojan ISFSI Itemized Decommissioning Expenditure Schedule," from PGE-1061, "Trojan Decommissioning Plan," is enclosed. The table shows actual operations and maintenance expenditures (in 2015 dollars x 1000) for years 1993–2017 and projected costs for years 2018–2034 under the column "Spent Fuel Management Costs."

This table specifies expenditures for the following categories:

- Trojan Nuclear Plant (TNP) Radiological Decommissioning
- TNP Non-Radiological Decommissioning
- Spent Fuel Management Costs (as explained in a footnote)
- ISFSI Radiological Decommissioning
- Financial Activity Costs (for NRC required Financial Assurance)
- Combined Decommissioning Costs

The planned life of the Trojan ISFSI is currently projected to end in year 2034. This is described in Section 3.1 (PGE's Assumptions and Basis for the Trojan ISFSI Projected Radiological Decommissioning Schedule) of PGE-1082, "Trojan ISFSI Preliminary Radiological Decommissioning Plan," which is included in Appendix H of the Trojan LRA. This section refers to Figure 3-1 (Trojan ISFSI Project Timeline) in PGE-1082, which is attached and shows the current overall project timeline of major activities including ISFSI radiological decommissioning and projected dates. PGE plans to add at least ten years to the projected dates for major activities in the Trojan ISFSI Project Timeline in Figure 3-1 in the next revision to PGE-1082, due to be submitted to NRC in 2020.

### **Sources of Funds**

PGE and PacifiCorp are public utilities and recover a portion of Trojan ISFSI costs through rates approved by the Oregon Public Utility Commission. PGE's rate recovery was \$3.5 million in year 2018. In Oregon PUC Order Number 07-015, the OPUC approved the continuation of collections until completion of decommissioning of the Trojan Facility.

In addition, pursuant to the USDOE's approved settlement, the USDOJ reviews the Trojan ISFSI's annual expenditures and makes an annual settlement payment to the Trojan co-owners as described in the following excerpt from PGE's 2017 10-K filing:

*In 2004, the co-owners of Trojan filed a complaint against the USDOE for failure to accept spent nuclear fuel by January 31, 1998. PGE had contracted with the USDOE for the permanent disposal of spent nuclear fuel in order to allow the final decommissioning of Trojan. The Plaintiffs paid for permanent disposal services during the period of plant operation and have met all other conditions precedent. The Plaintiffs sought reimbursement for damages incurred through 2009.*

*A trial before the U.S. Court of Federal Claims concluded in 2012, with the Court issuing a judgment awarding certain damages to the Plaintiffs. The settlement agreement also provides for a process to submit claims for allowable costs for the periods subsequent to 2009, including an extension to cover costs through 2019. Pursuant to this process, the USDOE has reimbursed the Plaintiffs \$85 million for costs incurred through 2016 resulting from USDOE delays in accepting spent nuclear fuel.*

Table 5-4, "Portland General Electric Decommissioning Funding Cash Flow," and Table 5-6, "PacifiCorp Decommissioning Funding Cash Flow" from PGE-1061, "Trojan Decommissioning Plan," are enclosed. The tables show actual EOY 2017 Trust Fund balances and forecasted fund contributions from rate recovery. The tables include a 2% annual growth rate as allowed by the NRC.

EWEB has Net Billing Agreements with Bonneville Power Administration (BPA) and BPA is obligated through these Net Billing Agreements to pay costs associated with EWEB's share of Trojan, including ISFSI O&M costs, non-radiological decommissioning costs, and radiological decommissioning costs. For radiological decommissioning, EWEB, as a government agency, uses a Statement of Intent for their financial instrument as described in PGE Topical Report PGE-1082. EWEB's Statement of Intent and Certification of Financial Assurance both document BPA's obligation to pay the decommissioning funding obligations of EWEB.

Table 5-5, "EWEB/BPA Decommissioning Funding Annual Cash Obligations," from PGE-1061, "Trojan Decommissioning Plan," is enclosed. The table shows forecasted obligations for both non-radiological decommissioning and radiological decommissioning.

Tables 5.3-1 and 5.3-2 from LRA Section 1.3.7.2 are enclosed and have been updated to provide Decommissioning Trust Funds balances for PGE and PacifiCorp through December 31, 2018. A correction to the 12-31-2016 Total Market Value entry in Table 5.3-2 is also included to reflect the final actual value.

# Enclosure 2 to VPN-004-2019

(7 pages)

## License Renewal Application

Cover Page – Revision Status      Page 1 of 18      Revision 1a

Tables 5.3-1 and 5.3-2      Page 1-8      Revision 1a

## Trojan Decommissioning Plan (PGE-1061)

Table 5-2      Revision 37

Table 5-4      Revision 37

Table 5-5      Revision 37

Table 5-6      Revision 37

## Trojan ISFSI Preliminary Radiological Decommissioning Plan (PGE-1082)

Figure 3-1 (Page 3-2)      Revision 1



<b>LICENSE APPLICATION SECTION REVISION STATUS, LIST OF AFFECTED SECTIONS, REVISION SUMMARY, AND LIST OF LRA CHANGES</b>		
<b>TITLE</b>	Trojan ISFSI License Renewal Application (LRA)	
<p>This LRA is submitted to the NRC in support of the application to renew the Trojan ISFSI Part 72 Site-Specific License No. SNM-2509.</p> <p>If any change in the content is made to LRA Chapter 1, 2, or 3 or Appendix A, B, C, or D, then the change is indicated by a “bar” in the right page margin and the revision number of the entire Chapter or Appendix is changed.</p> <p>If any change in the content is made to the Appendix E, F, G, or H attached documents, then the change is indicated by a “bar” in the right page margin and the page footer revision number is updated along with the attached document’s “List of Effective Pages”.</p> <p>To support NRC’s review, the attached “List of LRA Changes” contains a comprehensive listing of changes in sequential order throughout the LRA including the Appendices. Minor editorial changes to this LRA may not be included in the List of LRA Changes. The List of LRA Changes contains the following:</p> <ul style="list-style-type: none"> <li>• Sequential Item number,</li> <li>• Section number,</li> <li>• Page number,</li> <li>• Reason Type (E = editorial, C = clarification or correction, and RAI = RAI response),</li> <li>• Description of change</li> </ul>		
<p align="center"><b>License Application Section Revision Status, List of Affected Sections, Revision Summary, and List of LRA Changes</b></p>		
<b>Affected Section or Table No.</b>	<b>Current Revision No.</b>	<b>Summary Description of Change</b>
Page 1	1a	February 2019 (RAI)
Pages 2 through 18	1	New List of LRA Changes is attached
<p align="center"><b>LRA Table of Contents/Glossary/Acronym List</b></p>		
<b>Affected Section or Table No.</b>	<b>Current Revision No.</b>	<b>Summary Description of Change</b>
Pages i through vii	1	January 2019
<p align="center"><b>Chapter 1 – General Information</b></p>		
<b>Affected Section or Table No.</b>	<b>Current Revision No.</b>	<b>Summary Description of Change</b>
Pages 1-1 through 1-7	1	January 2019
Page 1-8	1a	February 2019 (RAI)
Pages 1-9 through 1-13	1	January 2019

**Table 5.3-1**  
**PGE's Decommissioning Trust Funds' Balances**

Portland General Electric (PGE)	ISFSI Radiological Decommissioning Fund Market Value	Total Market Value of All Funds in PGE's Trojan Decommissioning Trust Accounts
<b>PGE-1082 Proposed Rev. 1 as of 10-31-2015</b>	<b>\$5,130,604</b>	<b>\$40,130,043</b>
<b>As of 12-31-2016</b>	<b>\$5,150,625</b>	<b>\$40,996,096</b>
<b>As of 12-31-2017</b>	<b>\$5,200,556</b>	<b>\$41,910,157</b>
<b>As of 12-31-2018</b>	<b>\$5,299,507</b>	<b>\$42,455,822</b>

Rev. 1a

**Table 5.3-2**  
**PacifiCorp's Decommissioning Trust Funds' Balances**

PacifiCorp	ISFSI Radiological Decommissioning Fund Market Value	Total Market Value of All Funds in PacifiCorp's Trojan Decommissioning Trust Accounts
<b>PGE-1082 Proposed Rev. 1 as of 11-24-2015</b>	<b>\$148,013</b>	<b>\$1,547,446</b>
<b>As of 12-31-2016</b>	<b>\$148,395</b>	<b>\$1,838,748</b>
<b>As of 12-31-2017</b>	<b>149,571</b>	<b>\$1,876,736</b>
<b>As of 12-31-2018</b>	<b>\$152,201</b>	<b>\$1,927,960</b>

Rev. 1a

- 1.3.7.3 In 2018, Trojan discovered that PGE-1082 Section 2.6 and Tables 2-1 and 2-3 for Concrete Cask "activation" were not revised from 40 years to cover the new 60 years proposed in the 2017 License Renewal Application. PGE-1082 Section 2.6 and Tables 2-1 and 2-3 have been revised to incorporate the results of the 2018 Concrete Cask 60-year activation analysis contained in Holtec Report No. HI-2012749, "Shielding Evaluation for the Trojan ISFSI Completion Project", Table O.1, Revisions 5 and 6 (Ref. 1.3.1), to replace the 40-year analysis numbers with the 60-year analysis numbers. In addition, Table 2-3 was revised to use the 60-year nuclide values to calculate the Percentage of Residual Activity vs Concentration for 25 mrem/year to verify that the results are less than 100%.
- 1.3.7.4 Pursuant to NRC's RAI letter, dated April 3, 2018, and PGE's response letter (VPN-004-2018, dated May 15, 2018), PGE revised PGE-1082, Section 4.1 to add Trojan's conclusions of "No Changes" to decommissioning costs for each of the following events listed in 10 CFR 72.30(c)(1)-(4): (1) spills of radioactive material producing additional residual radioactivity in onsite subsurface material, (2) facility modifications, (3) changes in authorized possession limits, and (4) actual remediation costs that exceed the previous cost estimate.

Table 5-2

**Decommissioning Cost Estimate for Trojan Nuclear Plant and Trojan ISFSI  
Itemized Decommissioning Expenditure Schedule  
(2015 dollars x 1000)**

Total Decommissioning Expenditures						
Year	TNP Radiological Decommissioning Costs	TNP Non-Radiological Decommissioning Costs	Spent Fuel Management Costs *	ISFSI Radiological Decommissioning	Financing Activity Costs	Combined Decommissioning Costs
1993	3,947	0	0	0	0	3,947
1994	7,854	100	0	0	0	7,954
1995	23,470	66	1,624	0	0	25,160
1996	13,410	358	4,641	0	0	18,409
1997	28,380	517	11,764	0	0	40,661
1998	50,659	91	14,323	0	0	65,073
1999	56,052	1,938	26,541	0	0	84,531
2000	48,984	1,148	4,953	0	0	55,085
2001	12,377	294	9,937	0	0	22,608
2002	12,297	(69)	23,045	0	0	35,273
2003	20,484	361	19,038	0	0	39,883
2004	25,132	738	3,973	0	23	29,866
2005	2,572	671	3,348	0	0	6,591
2006	0	4,977	2,992	0	0	7,969
2007	0	3,268	3,175	0	0	6,443
2008	0	5,457	3,372	0	0	8,829
2009	0	(42)	3,691	0	0	3,649
2010	0	0	4,828	0	0	4,828
2011	0	0	6,020	0	0	6,020
2012	0	0	4,059	0	0	4,059
2013	0	153	3,962	0	0	4,115
2014	0	669	3,888	0	0	4,557
2015	0	2	4,213	0	0	4,215
2016	0	0	4,689	0	0	4,689
2017	0	0	4,559	0	0	4,559
2018	0	0	5,988	0	0	5,988
2019	0	0	5,988	0	0	5,988
2020	0	0	5,800	0	0	5,800
2021	0	0	5,800	0	0	5,800
2022	0	0	5,800	0	0	5,800
2023	0	0	6,367	0	0	6,367
2024	0	0	8,228	0	0	8,228
2025	0	0	8,228	0	0	8,228
2026	0	0	8,228	0	0	8,228
2027	0	0	8,434	0	0	8,434
2028	0	0	8,935	0	0	8,935
2029	0	0	8,935	0	0	8,935
2030	0	0	8,935	98	0	9,033
2031	0	0	8,935	199	0	9,134
2032	0	0	8,960	172	0	9,132
2033	0	0	7,805	939	0	8,744
2034	0	3,404	3,774	2,578	0	9,756
Total	305,618	24,101	297,775	3,986	23	631,503

Values updated to reflect 2017 actual costs and the new Decommissioning \$631.50 million forecast number.

- \* Spent Fuel Management Cost estimates include the following: Years 1995 through 2003 include wet fuel storage costs, ISFSI construction costs, and ISFSI fuel loading costs; Years 2015 through 2019 include costs for License Renewal; Years 2023 through 2033 include packaging spent fuel for shipment costs. Year 2034 includes ISFSI non-radiological decommissioning costs; and Years 2024 through 2034 include a spreading of the \$20 million amount of the project management reserve.

Table 5-4

**Portland General Electric  
Decommissioning Funding Cash Flow  
(Nominal dollars x 1000)**

Year	PGE Trust Fund Expenditures A	PGE Trust Fund Contributions B	PGE DOE Settlement F	PGE Trust Fund Net Earnings C	PGE Taxes, Fees, and Expenses D	PGE Trust Fund EOY Balance E
2017						41,910
2018	(4,298)	3,500	4,297	838	(26)	46,222
2019	(4,401)	2,500	4,401	924	(26)	49,620
2020	(4,368)	2,500	4,368	992	(27)	53,086
2021	(4,475)	2,500	4,475	1,061	(27)	56,620
2022	(4,585)	2,500	4,586	1,133	(28)	60,226
2023	(5,162)	2,500	4,702	1,205	(28)	63,442
2024	(6,836)	2,500	0	1,269	(29)	60,347
2025	(7,006)	2,500	0	1,206	(29)	57,017
2026	(7,178)	2,500	0	1,140	(30)	53,450
2027	(7,539)	2,500	0	1,069	(31)	49,449
2028	(8,176)	2,500	0	989	(31)	44,731
2029	(8,369)	2,500	0	894	(32)	39,724
2030	(8,663)	2,500	0	795	(32)	34,324
2031	(8,972)	2,500	0	687	(33)	28,506
2032	(9,187)	2,500	0	570	(34)	22,355
2033	(9,010)	2,500	0	448	(34)	16,259
2034	(10,295)	2,500	0	325	(35)	8,754
Total	(118,520)	43,500	26,829	15,545	(510)	

2017 EOY Value updated to reflect December 31, 2017. Other values updated to reflect new Decommissioning \$631.50 million forecast number.

NOTE 1: Positive numbers indicate cash flow into trust fund; negative numbers (#) indicate cash flow out of trust fund.

NOTE 2: Current EOY balance = previous year EOY balance + current year A + B + F + C + D.

NOTE 3: The NRC allows a 2% growth rate in conjunction with annual collections through ratemaking for purposes of providing financial assurance of Decommissioning Trust Funds. Therefore, PGE is using 2% of the prior years balance as the "Net Earnings."

NOTE 4: USDOE nonperformance settlement reimbursement – includes ISFSI long-term operations only. It concludes in 2024 when fuel off-load begins.

Table 5-5

**EWEB / BPA**  
**Decommissioning Funding Annual Cash Obligations**  
**(Nominal dollars x 1000)**

Year	Eugene Water and Electric Board / Bonneville Power Administration Decommissioning Obligations
2018	1,910
2019	1,956
2020	1,941
2021	1,989
2022	2,038
2023	2,294
2024	3,039
2025	3,114
2026	3,190
2027	3,351
2028	3,634
2029	3,720
2030	3,850
2031	3,987
2032	4,083
2033	4,004
2034	4,576
Total	52,676

Values updated to reflect the new Decommissioning \$631.50 million forecast number.

NOTE 1: BPA provides decommissioning funding from its operating budget as such funds are needed. Financial assurance is provided by an EWEB Statement of Intent that includes BPA's contractual commitment to pay EWEB's share of Trojan costs; therefore, no external trust fund is required.

Table 5-6

**PacifiCorp  
Decommissioning Funding Cash Flow  
(Nominal dollars x 1000)**

Year	PacifiCorp Trust Fund Expenditures A	PacifiCorp Trust Fund Contributions B	PacifiCorp Trust Fund Net Earnings C	PacifiCorp Taxes, Fees, and Expenses D	PacifiCorp Trust Fund EOY Balance E
2017					1,877
2018	(159)	140	38	0	1,896
2019	(163)	140	38	0	1,911
2020	(162)	140	38	0	1,927
2021	(166)	140	38	0	1,939
2022	(170)	140	39	0	1,948
2023	(191)	140	39	0	1,936
2024	(253)	140	38	0	1,861
2025	(260)	140	37	0	1,778
2026	(266)	140	35	0	1,687
2027	(279)	140	34	0	1,582
2028	(303)	140	32	0	1,451
2029	(310)	140	29	0	1,310
2030	(321)	140	26	0	1,155
2031	(332)	140	23	0	986
2032	(340)	80	20	0	746
2033	(334)	0	15	0	427
2034	(381)	0	9	0	55
Total	(4,390)	2,040	528	0	

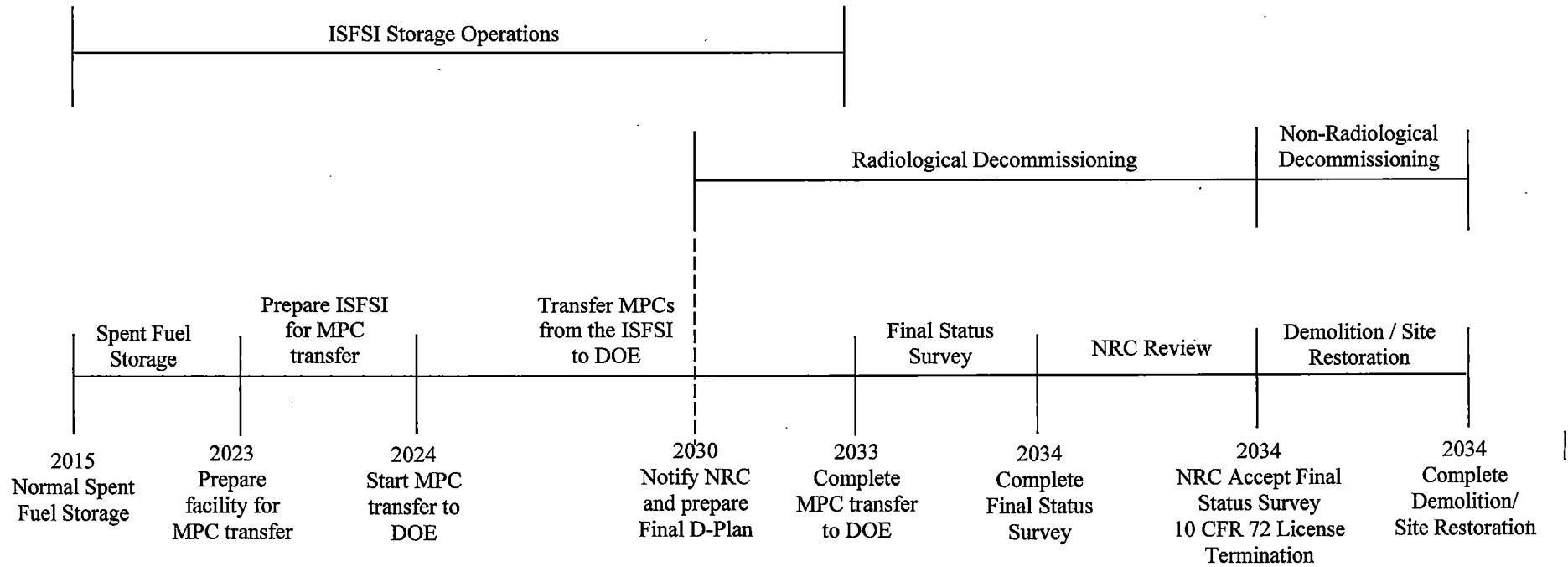
2017 EOY Value updated to reflect December 31, 2017. Other values updated to reflect the new Decommissioning \$631.50 million forecast number.

NOTE 1: Positive numbers indicate cash flow into trust fund; negative numbers (#) indicate cash flow out of trust fund.

NOTE 2: Current EOY balance = previous year EOY balance + current year A + B + C + D.



**FIGURE 3-1**  
**TROJAN ISFSI PROJECT TIMELINE**



Year Line is Not to Scale