TECHNICAL EVALUATION REPORT
LONG-TERM CARE FEE DETERMINATION
WESTERN NUCLEAR INCORPORATED SPLIT ROCK

DOCKET NO.:	**40-1162**
DATE:	**July 15, 2022**
FACILITY:	**WESTERN NUCLEAR INCORPORATED (WNI) SPLIT ROCK, UMTRCA TITLE II SITE NEAR, JEFFREY CITY, WYOMING**
TECHNICAL REVIEWERS:	**Nick Orlando (retired), Tom Lancaster, Steve McCarthy, Richard Turtil**
PROJECT MANAGER:	**Tom Lancaster**

SUMMARY AND CONCLUSION:

On June 1, 2021, and August 19, 2021, the U.S. Department of Energy (DOE) provided a cost estimate for the DOE to perform long-term surveillance and maintenance (LTS&M) at the Western Nuclear Incorporated (WNI), Split Rock site, a Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Title II site near Jeffrey City, WY (DOE, 2021h, i). This cost estimate, the DOE Long-Term Care Fee (LTCF) estimate, is approximately $9 Million (M). This value is in excess of the minimum value in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 40, Appendix A, "Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content," Criterion 10 of $250 Thousand (K) in 1978 dollars, which equates to approximately $1.2 M as of April 2022 (U.S. Department of Labor, Bureau of Labor Statistics (BLS), 2022).

On August 30, 2021, September 29, 2021, April 21, 2022, and May 6, 2022, DOE responded to the U.S. Nuclear Regulatory Commission (NRC) staff requests for clarification of DOE's LTCF estimate (DOE, 2021g, e, 2022c, b, a). The NRC held public meetings on October 18, 2021, and December 14, 2021 (NRC, 2021, 2022b), to hear the views of WNI and the Wyoming Department of Environmental Quality (WDEQ) on DOE's estimate. Subsequently, in letters dated January 25, 2022, April 1, 2022, and April 20, 2022 (WNI, 2022b, c, d), WNI provided its views on the LTCF estimate, stating that the LTCF amount should be roughly equivalent to the minimum charge of approximately $1.2 Million (M) (2022 dollars). WNI also provided its views of activities in DOE's preliminary final Long-Term Surveillance Plan (LTSP) (DOE, 2021e) and LTCF estimate summary (DOE, 2021f, c) that should not be charged to WNI and provided WNI's proposed method of LTCF calculation that accounts for long-term care activities that do not occur annually (WNI, 2022b). The NRC staff considered the DOE fee estimate and the views of WNI in its evaluation of the LTCF for the Split Rock site.

Based on the NRC staff's review of the DOE's LTCF cost estimate and the NRC staff's consideration of WNI's input, the NRC staff determined that a LTCF of $4.2 M is appropriate. While Criterion 10 of 10 CFR Part 40, Appendix A has a minimum charge of approximately $1.2 M (2022 dollars), the increased LTCF will cover direct costs for site management, site inspections, groundwater and surface water (GW & SW) monitoring, maintenance activities, and

NRC oversight of the WNI Split Rock site. The NRC staff found the site-specific surveillance and control requirements for the long-term care of the Split Rock site are significantly greater than those specified in 10 CFR Part 40, Appendix A, Criterion 12, which supports the increase in the LTCF from $1.2 M. However, the NRC staff reduced the LTCF from the DOE estimate of $9 M for the following reasons: 1) the DOE's indirect costs in the LTCF do not have a nexus to radiological health and safety and are, in part, duplicative of other DOE LTS&M activities in DOE's estimate of direct costs, 2) rangeland maintenance of invasive and noxious vegetation does not have a nexus to radiological health and safety, 3) the NRC used a time-phased expenditure of costs approach for activities that do not occur annually, and 4) the NRC inspection interval will be less frequent than anticipated by the DOE, which reduces the "NRC Annual Oversight" costs in the LTCF.

BACKGROUND

Criterion 10 of Appendix A to 10 CFR Part 40, among other things, establishes the requirements for licensees to provide resources to allow the State or the DOE to carry out the LTS&M requirements of Sections 202 and 203 of the UMTRCA. Criterion 10 of 10 CFR Part 40, provides:

> Criterion 10—A minimum charge of $250,000 (1978 dollars) to cover the costs of long-term surveillance must be paid by each mill operator to the general treasury of the United States or to an appropriate State agency prior to the termination of a uranium or thorium mill license.
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> If site surveillance or control requirements at a particular site are determined on the basis of a site-specific evaluation, to be significantly greater than those specified in Criterion 12 (e.g., if fencing is determined to be necessary), variance in funding requirements may be specified by the Commission. In any case, the total charge to cover the costs of long-term surveillance must be such that, with an assumed one percent annual real interest rate, the collected funds will yield interest in an amount sufficient to cover the annual costs of site surveillance. The total charge will be adjusted annually prior to actual payment to recognize inflation. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

As part of the license termination process for uranium recovery sites governed by Title II of UMTRCA, disposal sites containing uranium mill tailings are typically transferred to the DOE for LTS&M when the licensee has completed decommissioning the site. If the site is transferred to DOE, or another Federal agency, specific licensees are required to pay a one-time fee to the U.S. Government (i.e., the LTCF) to provide resources to carry out the LTS&M program at the site. The fee is paid to the Department of the Treasury if DOE or another Federal agency is the custodian of the site. To aid the NRC in setting the LTCF, DOE and the licensee can develop estimates for the LTCF and submit those estimates to the NRC for consideration (NRC, 2011).

Criterion 10 of 10 CFR Part 40, Appendix A, establishes the minimum amount of $250 K (1978 dollars) that a uranium mill licensee must provide for LTS&M. This minimum amount is approximately $1.2 M as of April 2022 when using the "CPI [Consumer Price Index] Inflation Calculator" website of the U.S. Department of Labor, Bureau of Labor Statistics." In developing Criterion 10, the NRC also developed NUREG-0706, "Generic Environmental Impact Statement

on Uranium Milling" (NRC, 1980), to support the licensing requirements for uranium mill sites in 10 CFR Part 40. Section 8.2, Section 14, and Appendix R of NUREG-0706 discuss the LTS&M costs and LTCF. The NRC set the minimum value assuming a 1 percent annual return on the LTCF and an annual cost to the U.S. Government of $2,500 in 1978 for LTS&M. NUREG-0706, Appendix R describes several LTS&M scenarios. The NRC developed Scenario 1 of the NUREG-0706, Appendix R evaluation, which is the basis for the Criterion 10 minimum amount, with the assumption that the mill disposal site would require minimal care and the principal cost would be for a government inspector to perform an annual inspection of the site.

The annual inspections for Scenario 1 in NUREG-0706, Appendix R (NRC, 1980) assume that the work is performed by a Federal employee. The NRC staff independently calculated the cost for the Federal inspector in Scenario 1 based on the 1978 salary, personnel benefits, administrative support, travel, management supervision, and general overhead of an NRC inspector in the Office of Inspection and Enforcement. In 1978 dollars, the approximate cost for an NRC inspector was $65 K per year or about $250 per day. Similarly, the estimated 1978 inspection costs based on lower and upper bound timeframes of 3 and 8 days were $750 and $2,000, respectively. Scenario 1 also contemplated an NRC oversight role and assumed that the NRC cost would be about $500 per year (mainly performing audits of the DOE inspection reports). Thus, Scenario 1 resulted in a total of $2,500 as the estimated annual total cost (i.e., both the custodial agency and the NRC) to manage the site for the U.S. Government. This sum equals 1 percent of the $250 K minimum estimate (NUREG-0706, vol. 1, pp 14-12 and Appendix R, Scenario 1).

Since the NRC calculated the yearly costs for Scenario 1 of Appendix R almost four decades ago, some of the underlying assumptions are no longer current. For example, while the Scenario 1 assumes that a Federal employee would conduct the annual inspection, the DOE currently uses contractors to perform inspections, which has different direct and indirect costs. Additionally, the NRC staff's evaluation for Scenario 1 did not include an annual licensing fee for the general licensee, only an estimate of the cost for the NRC staff to perform the audits. The Statements of Consideration for the 1980 and 1990 revisions to the 10 CFR Part 40 regulations did not discuss an NRC annual fee as a separate cost item (Fed Reg, 1980, 1990).

Appendix R of NUREG-0706 (NRC, 1980) includes four additional scenarios that provide estimates of LTS&M costs for sites where additional activities, other than the annual inspection activities discussed in Scenario 1 (Passive Monitoring), may be necessary.[1] They are:

- Inspection Plus GW Monitoring (assumes five monitoring wells)—$7 K/year (approximately $32,400 in April 2022 dollars),
- Passive Monitoring Plus Fencing—$8 K/year, (approximately $37,000 in April 2022 dollars),
- Limited Maintenance—$10,500/year (approximately $48,600 in April 2022 dollars), and
- Extensive Maintenance and Irrigation—$34 K/year (approximately $157,300 in April 2022 dollars).

[1] Each of the scenarios is inclusive of the activities and costs proceeding it. For example, Limited Maintenance scenario, in addition to its own separate activities, includes the activities in the Inspection Plus Groundwater Monitoring scenario and Passive Monitoring Plus Fencing scenario.

As discussed below, the activities that are necessary for DOE to perform LTS&M at the WNI Split Rock site are more akin to the Passive Monitoring Plus Fencing or Limited Maintenance scenarios in NUREG-0706 than the minimum cost scenario.

Under UMTRCA, the NRC has sole responsibility for setting the LTCF. However, DOE and the licensee can provide their LTCF estimates to help inform the NRC's decision. The NRC can increase the final LTCF from the minimum amount based on its evaluation of the site and necessary post termination surveillance and maintenance activities.

The NRC regulations and guidance are clear that the LTCF can be increased for activities that are not included in the minimum amount as warranted by site-specific circumstances. Regulatory Issue Summary (RIS)-2011-11, "Regarding Long-term Surveillance Charge for Conventional or Heap Leach Uranium Recovery Facilities Licensed under 10 CFR Part 40" (NRC, 2011),[2] states:

> If site surveillance or control requirements are expected to be greater than those specified in Criterion 12 to Appendix A of 10 CFR Part 40 and provided that there is a nexus to radiological health and safety, the NRC may consider increasing the LTSC [Long-term Surveillance Charge] above the minimum amount, adjusted to current year dollars. The increase in the LTSC would cover those additional expected long-term surveillance and control activities relied on for the performance of the tailings impoundment. The NRC may consider increasing the LTSC for long-term maintenance and control activities undertaken to ensure maintenance of radiological health and safety such as, but not limited to: (1) groundwater monitoring; (2) riprap, erosion, or other cover repair; (3) fencing; and (4) vegetation control.

The RIS further clarifies that these additional activities must have a nexus to radiological safety and health and, if not, the custodial agency must fund the cost:

> If the custodial agency desires to have commitments in the LTSP [Long-Term Surveillance Plan] that exceed the requirements set forth in Appendix A of 10 CFR Part 40 and do not have a nexus to radiological health and safety (e.g., fencing that is not necessary to ensure maintenance of radiological health and safety), the custodial agency would solely be responsible for funding such commitments.

To date, six UMTRCA Title II sites have been transferred to DOE (Bluewater and L-Bar, New Mexico; Edgemont, South Dakota; Maybell West, Colorado; Sherwood, Washington; and Shirley Basin South, Wyoming). The LTCFs were increased above the minimum LTCF for the Bluewater site with the inclusion of GW monitoring and the L-BAR site with the inclusion of sediment control. However, at the remaining sites, the LTCF was based only on the $250 K (1978 dollars) minimum in Criterion 10 of 10 CFR Part 40, Appendix A.

[2] The LTCF is also referred to as the LTSC.

EVALUATION and DISCUSSION

On June 1, 2021, DOE submitted a detailed non-public LTCF estimate for the WNI Split Rock site in Wyoming (DOE, 2021i, g). On August 30, 2021, DOE provided its LTCF estimate in an Excel Spreadsheet format, which showed formulas and equations that DOE used to arrive at its LTCF estimate (DOE, 2021g). DOE also submitted a publicly available summary of LTCF estimate on September 16, 2021, and a more specific LTCF estimate on November 15, 2021 (DOE, 2021f, c), which includes a breakout of the indirect cost totals. The DOE's LTCF estimate is approximately $90 K per year for all proposed site maintenance activities at WNI, including the cost of NRC oversight. Pursuant to Criterion 10 of Appendix A of 10 CFR Part 40, the LTCF must, with an assumed 1 percent annual real interest rate, be sufficient to cover the annual costs of site surveillance. Because DOE's LTCF estimate is approximately $90 K per year, and based on Criterion 10, this results in a LTCF estimate of approximately $9 M, which would cover DOE's annual estimate of LTSM activities.

The DOE LTCF estimate for the WNI Split Rock site includes nine "major line items." The major line items are:

1. Site Management,
2. Site Inspection,
3. GW & SW Monitoring,
4. Periodic GW & SW Monitoring Program Evaluation,
5. Minor Maintenance,
6. Monitor Well Maintenance,
7. Rangeland Maintenance,
8. A 15 percent contingency factor, and
9. NRC oversight costs.

Each "major line item" includes several sub-items, such as labor and other direct costs (e.g., monitoring well pump replacement) as well as indirect costs.

DOE also included pretransition costs (i.e., the costs DOE incurs preparing for the transfer of the site to DOE) for fiscal years 2019 - 2021. These pretransition costs are approximately $385 K (DOE, 2021c, i) and were provided separately from the DOE's cost estimate of approximately $9 M and are not included in the NRC's LTCF calculation.

The NRC held public meetings on October 18, 2021, and December 14, 2021, to hear the views of WNI and the WDEQ on the DOE's fee estimate. The NRC staff prepared a summary of each of these meetings (NRC, 2021, 2022b). In letters dated January 25, 2022, April 1, 2022, and April 20, 2022 (WNI, 2022b, c, d), WNI provided its views on the LTCF estimate, stating that the LTCF amount should be roughly equivalent to the minimum charge of $250 K (1978 dollars). In

support, WNI explained that it had reviewed the DOE's monitoring programs for six UMTRCA Title II sites and determined that three of them have monitoring and inspection programs of comparable scope and frequency as that identified in the Draft Final LTSP for the WNI Split Rock site. WNI also provided its views of activities in DOE's preliminary final LTSP (DOE, 2021a) and LTCF estimate summary (DOE, 2021f, c) that should not be charged to WNI.

WNI identified four primary issues: (1) specific costs that should not be the responsibility of WNI, (2) DOE should reduce travel costs by performing inspections of multiple Title II sites at one-time, (3) method of LTCF calculation should account for long-term care activities that do not occur annually, and (4) cost estimates should be sufficiently detailed to permit WNI to have sufficient understanding of the cost basis and for the NRC to reasonably calculate the LTCF. The NRC considered WNI's views in the review of DOE's estimate.

The NRC staff reviewed DOE's LTCF estimate and WNI's views based on the guidance and statements in:

- NUREG-0706, "Generic Environmental Impact Statement for Uranium Milling," (NRC, 1980),

- NUREG-1620, "Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978" (NUREG-1620, Revision 1, Appendix D and E) (NRC, 2003),

- NUREG/CR-7288, "Evaluation of In-Service Radon Barriers Over Uranium Mill Tailings Disposal Facilities" (NRC, 2022a),

- NRC RIS 2011-11, "Regarding Long-term Surveillance Charge for Conventional or Heap Leach Uranium Recovery Facilities Licensed under 10 CFR Part 40" (NRC, 2011), and

- NRC letter to DOE dated June 17, 2010, discussing long-term care activities that would merit an increase in the LTCF (NRC, 2010).

Using these documents, the NRC staff determined that the following criteria were appropriate for evaluating each major- or sub-line item from the LTCF:

1. The item has a nexus to radiological health and safety per RIS 2011-11 (NRC, 2011) and the June 17, 2010, letter to DOE (NRC, 2010),

2. The item is included in the NUREG-0706 assumptions (NRC, 1980) or, if not, the activity is now necessary to ensure the tailings remain safely isolated,

3. The NRC has previously indicated the costs could be included in the LTCF, and

4. The costs are not duplicated in the LTCF estimate.

INDIRECT COSTS

Before evaluating dollar values in the major- and sub-line items, the NRC staff first determined whether the indirect costs should be included in the LTCF categorically. Based on DOE's November 15, 2021, publicly available LTCF cost estimate summary (DOE, 2021c), the indirect costs for the WNI Split Rock site equal approximately $41 K/year or $4.1 M of DOE's total LTCF estimate. DOE's indirect costs (assigned to each major line-item) include an Award fee, General and Administrative (G&A), a Project Management (PM) Allocation, and a Program-wide Support (PWS) Allocation (DOE, 2021b). These items are described by DOE as:

> Award Fee—Applied to all Direct Costs. In accordance with Section B.3 Estimated Cost Plus Performance Based Award Fee of the DOE Legacy Management (DOE LM) prime contract recent history, the award fee pool is established. The Award Fee is allocated to each site/activity based on a weighted percentage.
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> G&A—Applied to Other Direct Costs. In accordance with Section I.22 Contract Clause 52.216-7 Allowable Cost and Payment of the DOE LM prime contract recent history, the contractor is authorized to apply a corporate G&A rate based on annual final indirect costs for the period of performance.
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> PM Allocation—A PM Allocation is applied that covers activities that are not directly charged to individual sites. It includes activities at the total task assignment level and activities at the subtask/regulatory level.
>
> PWS Allocation—A PWS Allocation is applied that covers LM program activities that are general in nature, cannot be directly charged to specific task assignments, and are a benefit to the entire LM prime contract operation. These indirect activities are grouped together into the PWS task. Many of them are the management level of the activity (e.g., while project controls are within the respective task assignment PM Allocation, the overall contract-wide management of that area is included here).

The NRC staff finds that these indirect costs should be excluded from the LTCF because, although DOE has stated that these indirect costs are a necessary element of its contracting structure, the basis for the inclusion of these indirect cost in the LTCF was not established. Specifically for the Split Rock site, the award fee appears be an award for winning the Legacy Management Support Services (LMSS) contract (i.e., a "signing bonus"); the award fee does not have a nexus to radiological health and safety. The G&A fee applies to the LMSS contractor's corporate expenses and does not have a nexus to radiological health and safety. The PWS allocation activities are general in nature, support the entire DOE LM program, and do not apply directly to the WNI Split Rock site. Therefore, they do not have a nexus to radiological health and safety. Finally, several of the activities in the indirect costs for PM Allocation appear to be duplicative of activities included in the direct costs for site management (e.g., property management). For this reason, and because the other PM Allocation costs do not have a nexus to radiological health and safety, the indirect costs of PM Allocation were not included in the LTCF.

The NRC staff acknowledges that DOE's indirect costs, even taken programmatically (versus those indirect costs specific to any particular site) ultimately support DOE's LTS&M activities at the Split Rock site. But for the reasons described above and based upon the approach in RIS 2011-11, the NRC staff finds that these activities do not have a nexus to radiological health

and safety, and, as a result, they should not be included in the calculation of the LTCF. This conclusion, however, in no way diminishes the importance of those proposed LTS&M activities not included within the LTCF. Instead, the only issue for the NRC staff to decide here is whether those activities have a nexus to radiological health and safety for inclusion in the calculation of the LTCF.

DIRECT COSTS

The NRC staff's evaluation of the direct costs is below:

- Site Management—DOE describes site management (DOE, 2021i, g) as: Routine costs required to perform project management activities as a DOE operated and managed site. Activities include routine budgeting, scheduling, reporting, property management, records management and stakeholder communications and other activities necessary as a DOE owned property asset.

  Unlike the indirect costs of activities related to PM/PWS, discussed above, site management is specific to the WNI Split Rock site, and therefore inclusion of direct costs for site management reflects the appropriate range of activities to support the long-term management of the site. As a result, site management has a nexus to radiological health and safety, and therefore, it is reasonable to include these direct costs.

- Site inspection—Site inspections are required by the UMTRCA and have a nexus to radiological health and safety. These direct costs are included in NUREG-0706 (NRC, 1980).

- GW & SW Monitoring—DOE's preliminary final LTSP includes 11 GW monitoring wells and 4 SW monitoring locations, which are three times as many monitoring locations than contemplated in Scenario 2 of Appendix R of NUREG-0706. The NRC staff has concluded that a GW & SW monitoring program is necessary for future tracking of the degree and extent of impacted GW & SW at the site. This program has a nexus to radiological health and safety and is included in NUREG-0706 (NRC, 1980).

- Periodic GW & SW Monitoring Program Evaluation—This is directly related to the GW & SW Monitoring line-item (above) and involves periodic data reduction and evaluation of the cumulative GW & SW monitoring data. This data will be reviewed to assess the progress of and need for continued GW & SW monitoring. This evaluation has a nexus to radiological health and safety.

- GW Monitoring Well Replacement—This has a nexus to radiological health and safety and is necessary for the GW monitoring program.

- Minor Maintenance—The sub-items discussed here (e.g., maintaining a fence at the perimeter of the tailings impoundment, sign replacement, bladder pump replacements for 11 GW monitoring wells, and monitoring well maintenance) have a nexus to radiological health and safety and are included in NUREG-0706 (NRC, 1980).

  DOE's LTCF distinguishes between fencing around the tailings impoundment and the site boundary fence (DOE, 2022b):

> Under long-term care, fencing in the immediate vicinity of the disposal cell will be maintained to be protective of radiological health and safety. At this site, fencing and granite outcrops enclose the tailings impoundment. Maintenance of the site boundary fence, which is inclusive of buffer lands, is excluded from the long-term care cost estimate for fence maintenance.

The NRC staff agrees that fencing around the tailings impoundment (disposal cell) has a nexus to radiological health and safety. As an example, without a fence, all-terrain vehicles, utility-terrain, and other vehicles used for recreation and hunting could create tracks on the impoundment that could result in pathways for erosion of the impoundment cover.

- Rangeland Maintenance–Rangeland maintenance includes DOE's control of vegetation inside the long-term boundary. For the Split Rock site, DOE will control invasive and noxious vegetation pursuant to rangeland maintenance measures as a landowner,[3] which does not have a nexus to radiological health and safety. As a result, the costs associated with DOE's land management of noxious and invasive plants, over the entire site, were not included in the LTCF (DOE, 2022d, c, b). However, as discussed below, the NRC is including the costs associated with deep-rooted vegetation on the tailings impoundment, which were provided in DOE 2022a, because the deep-rooted vegetation control at the tailings impoundment has a nexus to radiological health and safety.

  While control of invasive and noxious vegetation was not included in the LTCF, the NRC staff found that vegetation monitoring and control of deep-rooted vegetation at the tailings impoundment has a nexus to radiological health and safety and was included in the LTCF. As detailed in the NRC and DOE's joint guidance in NUREG/CR-7288, "Evaluation of In-Service Radon Barriers Over Uranium Mill Tailings Disposal Facilities," (NRC, 2022a) deep-rooted vegetation may adversely affect the performance of the tailings impoundment cover by penetrating the radon barrier. The NUREG/CR-7288 study evaluated radon barriers at four UMTRCA covers that have been in-service for approximately 20 years. Roots were found near the bottom of the radon barrier at each site, and radon fluxes were higher where deep-rooted vegetation was located. The study also observed that vegetation that penetrates the radon barrier may significantly increase hydraulic conductivity, how easily water passed through the soil or rock, of the impoundment cover (NRC, 2022a).

  Although the cover at the Split Rock disposal site was not designed as a vegetated cover, deep-rooted vegetation, including Rubber Rabbitbrush, is now observed on the disposal cell cover (DOE, 2022d). Rubber Rabbitbrush is a deep-rooted perennial shrub; its maximum observed rooting depth is approximately 13 feet (Stromberg, 2013). As shown in Figure 10 of the draft final LTSP, the depth to the top of the radon barrier ranges between 1 to 1.8 feet, while the depth to the actual tailings ranges between 2.8 to 7.8 feet (DOE, 2021a). As such, the NRC staff determined that the monitoring and

[3] The DOE has stated that, "rangeland maintenance measures to be more related to DOE being a land manager than for the safety of the mill tailings," and "understands that some of the estimated annual costs for Split Rock, such as rangeland maintenance measures, may not be identified by NRC as having a nexus to radiological safety." (DOE, 2022d)

management of deep-rooted vegetation is necessary at the Split Rock disposal site because deep-rooted vegetation, such as Rubber Rabbitbrush, may adversely impact the tailings impoundment area, specifically the radon cover.

Based on NUREG/CR-7288 and the vegetation on the site (NRC, 2022a, DOE, 2022d), DOE committed to revising the final LTSP to include vegetation monitoring and control of deep-rooted vegetation at the tailings impoundment. DOE estimated an annual cost of approximately $6,900, with about $4,800 or 69 percent related to direct cost, for monitoring and controlling deep-rooted vegetation at the tailings impoundment (DOE, 2022a). As a result, vegetation monitoring and control of deep-rooted vegetation has a nexus to radiological health and safety and the direct costs of approximately $4,800 should be included in the LTCF.

- The NRC staff evaluated the individual direct cost items in the DOE estimate (DOE, 2021i, g). The NRC staff's review included the evaluation of units (labor, materials, etc.) and unit rates used in each of DOE's line-item costs. The NRC staff evaluated and verified each line-item direct cost in DOE's estimate to establish that the line-item direct cost was reasonable.

  The NRC staff reviewed spreadsheet formulas and associated descriptions of the formula calculations provided by DOE (DOE, 2021i, g). With one exception, the NRC staff determined that all line items units were reasonable and appropriate. The exception is the 5-year inspection interval used in the DOE's calculation of the NRC annual oversight. Since the NRC will inspect the site on a 10-year basis (NRC, 2019), the NRC annual oversight in the LTCF was reduced by half.

  The NRC staff reviewed the General Services Administration website (GSA, 2021) to determine the average labor rate for the DOE's labor classification as well as GSA travel-related costs. Based on the NRC staff's review, the NRC staff determined that the labor rate is reasonable and acceptable. WNI stated that "DOE costs associated with travel to and from the Split Rock site for inspections and sampling should be reduced to reflect the DOE historic practice of coordinating site activities at multiple sites in a particular region." (WNI, 2022c) DOE's cost estimate for travel associated with site inspection and GW & SW monitoring is split between two Title II sites (DOE, 2021i, g). Therefore, the cost estimate accounts for some level of coordination between sites.

  The NRC staff evaluated unit rates for all the other line-item unit rates in the DOE LTCF estimate. The NRC staff determined that these rates are reasonable and acceptable, as they are based on an average of DOE's recent contractor historical rates. (DOE, 2021i, g).

OTHER COST CONSIDERATIONS

In correspondence dated April 20, 2022, and April 28, 2022 (WNI, 2022b), WNI stated that DOE's estimate contains costs for activities that would not occur annually, resulting in an annual cost estimate that is inappropriately inflated. Accordingly, WNI suggested that the time-phased expenditure of costs approach would be a more accurate cost accounting approach. The time-phased expenditure approach would calculate the LTCF using specific, year-by-year

expenses, as opposed to a straight line, average cost per year approach. WNI provided a hypothetical example of the time-phased expenditure calculation as an attachment to their April 28, 2022, submittal (WNI, 2022b).

The NRC staff agrees with WNI that a time-phased expenditure approach, which produces a "net present value" for long-term care for the Split Rock site by DOE and is a generally accepted accounting practice, is an appropriate method to account for activities that do not occur annually. (WNI, 2022a, Financial Accounting Standards Board (FASB)), 2022, Harvard Business Review (HBR), 2022). Applying the time-phased expenditure approach, the resulting LTCF of $4.2 M meets the requirements of 10 CFR Part 40, Criterion 10 because, with an assumed 1 percent annual real interest rate, the LTCF would be sufficient to cover the annual costs of site surveillance.

Other costs included that the NRC staff found to be appropriate for the Split Rock LTCF are as follows.

- 15 percent contingency—Ensuring that adequate funds are available to address unforeseen circumstances that have a nexus to radiological health and safety. A contingency factor is not included in the NUREG-0706 evaluation, but it has become a standard component of the NRC's financial assurance programs (NRC, 2003). The contingency factor is included to provide assurance that funds will be available to correct issues that would be addressed by the direct costs.

- NRC annual oversight—NRC oversight of the DOE has a nexus to radiological health and safety and is included in NUREG-0706 (NRC, 1980).

PRETRANSITION COSTS

In DOE's WNI Split Rock site LTCF estimate (DOE, 2021i), pretransition costs were not included as a part of the DOE's LTCF estimate but were provided as a separate attachment.

In 2014, DOE's Office of the Inspector General (DOE IG) conducted an audit of DOE's management of LTS&M of UMTRCA sites. As part of that audit, the DOE IG evaluated the manner in which DOE requested that pretransition costs be incorporated into the LTCF. The DOE IG report (DOE, 2014) stated:

> Legacy Management has not asked the [Nuclear Regulatory] Commission to include its pretransfer costs in the calculation of the surveillance charge because it believes the charge is only for post license termination surveillance and maintenance activities. However, the Commission has agreed that Legacy Management needs to conduct pretransfer activities to facilitate transition and Legacy Management guidance states that these activities should begin approximately two years prior to transfer. Despite this agreement, there is currently no provision in the rules for these costs to be part of the surveillance charge calculation and modification of governing legislation will likely be required before such costs can be included. According to the Commission, Legacy Management can include pretransfer costs in their surveillance charge estimates, so long as it shows that these costs have a nexus to radiological health and safety and are within the scope of the Atomic Energy Act of 1954 and UMTRCA.

Consistent with the above, the NRC staff concludes that, while some of DOE's pretransition costs do have a nexus to radiological health and safety, these costs are not recoverable as part of the LTCF (DOE, 2014).

CONCLUSION

Based on the review of DOE's estimated cost for the Split Rock site and consideration of WNI's input, the NRC staff determined that $4.2 M is appropriate for the WNI Split Rock site LTCF. The NRC staff considered DOE's cost estimate of approximately $9 M but excluded or reduced several costs, including:

- DOE's indirect costs in the LTCF, because they do not have a clear nexus to radiological health and safety and appear to be, in part, duplicative with other included DOE LTS&M activities,

- rangeland maintenance cost, which includes control of invasive and noxious vegetation throughout the site because it does not have a nexus to radiological health and safety. (However, the control of deep-rooted vegetation at the tailings impoundment does have a nexus to radiological health and safety and is included in the LTCF), and

- an adjustment of the NRC inspection interval from 5 years to 10 years, which alters DOE's calculated amount for "NRC Annual Oversight" in the LTCF.

In addition, the NRC staff used the time-phased expenditure of costs approach suggested by WNI (WNI, 2022b), which is a generally accepted accounting practice for activities that do not occur annually. The use of this approach resulted in a reduction of the LTCF.

While Criterion 10 of 10 CFR Part 40, Appendix A has a minimum charge of $1.2 M (2022 dollars), the NRC staff found that increasing the LTCF above the minimum charge will cover direct costs for conducting site-specific surveillance or control requirements that have a nexus to radiological health and safety and which are significantly greater than those specified in 10 CFR Part 40, Appendix A, Criterion 12, and minimum level of activities provided in NUREG-0706. The NRC staff found activities associated with the following direct costs have a nexus to radiological health and safety as specified by the approach in RIS 2011-11:

- Site Management,

- Site Inspection,

- GW & SW Monitoring,

- Minor Maintenance (e.g., bladder pump replacement, maintaining a fence at the perimeter of the tailings impoundment, sign replacement, and well maintenance),

- Monitoring Well Replacement, and

- Vegetation Monitoring and Deep-Rooted Vegetation Control at the Tailings Impoundment.

Based on the NRC staff's review of DOE's LTCF cost estimate and NRC staff's consideration of WNI's input, the NRC staff determined that a LTCF of $4.2 M is appropriate and shall be paid by WNI to the U.S. Treasury to support DOE's LTSM activities at the Split Rock site as required by Criterion 10 of 10 CFR Part 40, Appendix A.

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