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October 23, 2017

Sent VIA E-MAIL AND OVERNIGHT DELIVERY

Mr. Scott Anderson
Director
Division of Waste Management and Radiation Control
Utah Department of Environmental Quality
195 North 1950 West
P.O. Box 144880
Salt Lake City, UT 84114-4820

Re: Response to Public Comments on the White Mesa Mill Groundwater Discharge Permit and Radioactive Materials License

Dear Mr. Anderson:

Pursuant to the Division of Waste Management and Radiation Control's ("DWMRC's") letter dated October 3, 2017, Energy Fuels Resources (USA) Inc. ("EFRI") is providing responses to the select list of public comments listed below relating to the renewal of the White Mesa Mill's (the "Mill's") State of Utah Radioactive Materials License No. UT1900479 (the "License") and State of Utah Groundwater Discharge Permit No. UGW370004 (the "GWDP").

For ease of review, this letter provides the public comments verbatim, in italics, below, followed by EFRI's response.

Ute Mountain Ute Tribe White Mesa Mill Groundwater Discharge Permit UGW370004 Comments and Statement of Basis Part III July 31, 2017

Section 6: Summary of Requested Actions

Based on the foregoing comments and the Geo-Logics Report, the Tribe requests DWMRC take actions to address in a substantive manner (for example by imposing additional permit/license requirements and conditions with strict timelines) prior to approving the proposed license and discharge permit. The Tribe requests these actions include:

1. *The SAR's conducted to date for wells MW-24, MW-28, MW-5, MW-31 (in addition to all wells exhibiting a significant decline in pH which will be discussed in greater detail below) are required to be performed again at a more rigorous scientific level considering all of the 38 constituents required for monitoring as indicator parameters of facility impact at a more sophisticated and detailed level, site specific geochemistry and incorporating analysis from an updated isotopic data.*

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EFRI Response:

The indicator parameters chosen for this Site are based on the following factors.

Many of the permit-required constituents are naturally occurring and have been shown to occur in the region in varying concentrations, as discussed in the Addendum to the Background Groundwater Quality Report: Existing Wells for Denison Mines (USA) Corp.'s White Mesa Uranium Mill Site, Evaluation of Available Pre-Operational and Regional Background Data (INTERA, 2007a). As presented in the Background Groundwater Quality Report (INTERA, 2007b), ideal indicator parameters of potential tailings seepage would meet these criteria:

1. Move with the same velocity of the transporting water,
2. Be present in source solutions at easily measurable concentrations, and
3. Not be common in ambient groundwater.

Of the constituents listed in the GWDP, chloride has chemical properties that lend it most readily to transport by water. Chloride is often chosen as a tracer of groundwater flow because common chloride minerals are highly soluble in water and have little tendency to crystallize from solution. Since chloride participates in relatively few chemical reactions, concentrations move along a groundwater flow path with little attenuation in concentrations. Chloride meets at least two specifications of an ideal indicator of potential tailings solution impact to groundwater: it moves with the same velocity of transporting water, and it is present in source solutions at easily measurable concentrations. Although chloride is common in ambient groundwater at the Mill, the average chloride concentration in tailings impoundment solutions is sufficient to ensure that any potential seepage from tailings impoundments would be measurable in groundwater before any substantial volume had entered the system. Thus, chloride is a primary indicator of potential tailings impact.

Sulfate is present in tailings solutions at high concentrations but is also present in ambient groundwater at proportionally higher concentrations than chloride. Further, the solubility of common calcium sulfate minerals is lower than the most common chloride minerals, which can limit the amount of sulfate that can remain dissolved and will generally retard sulfate concentrations along a flow path compared to chloride. Nevertheless, given the high concentrations of sulfate in the Mill's tailings cells of approximately 65,000 mg/L and its generally low attenuation, it is still considered to be a good indicator parameter.

Other than chloride, the constituent with most promise for indicating potential impacts from tailings solutions is fluoride. Referring to the Periodic Table, fluoride is in the same elemental period occupied by chloride and, for this reason exhibits similar chemical properties. Fluoride is present in tailings impoundment solutions at an average concentration of nearly 1,500 mg/L. Fluoride is present in natural groundwater at concentrations ranging from less than detection to more than 100 mg/L, but concentrations are typically near one mg/L. Unlike chloride, however, the common trace mineral apatite is known to act as a solubility control that can reduce fluoride concentrations along a flow path. Thus, while fluoride is a very good indicator parameter and generally expected to move faster in groundwater than sulfate, fluoride should

be considered to be secondary to chloride as an indicator of impact. Although fluoride is generally expected to move as quickly in groundwater as chloride, it can move somewhat slower than chloride, depending on concentrations of apatite along the flowpath.

In contrast, a number of chemical constituents present at high concentrations in tailings solutions have transport properties that would generally not allow early detection of potential milling related impacts to groundwater. It is true, as Table 11 of the Geo-Logics Report demonstrates, that most of the heavy metals listed in the GWDP are detected more than nearly 100% of the time in the Mill's tailings impoundment system, and that with the exception of a few common heavy metals (iron, manganese, selenium, and uranium) detection rates for heavy metals in groundwater monitoring wells are less than 30% (Geo-Logics, 2017).

However, among the metals, uranium is probably the most mobile and is therefore the best indicator parameter for metals. Any potential seepage from tailings impoundments would be expected to exhibit rising concentrations of chloride and possibly fluoride, sulfate, and uranium. While uranium may be the most mobile of the metals, it is typically retarded behind chloride and would likely not be expressed in groundwater until sometime later than chloride concentrations had begun to rise. This is because uranium is subject to sorption, which depends upon speciation and pH. Many metals are soluble and transportable at low pH, but exhibit progressively higher retardation as pH values rise above the 3 to 4.5 range. Observations at a large number of uranium mill tailings facilities in the western United States indicate that low pH in tailings solutions rarely persists more than a few hundred feet in any transport direction from a source due to the high neutralization potential generally observed in alkaline soils from arid regions of the western United States. As a result, most metals would be expected to exhibit high retardation as low pH solutions from a potential tailings leak would be expected to quickly rise after being exposed to soils, and would therefore be poor indicators of any potential tailings cell leaks. Chloride, fluoride and sulfate would experience much less, if any, retardation in those same circumstances and would hence be expected to be the best first indicators of any such potential tailings cell leakage.

In sum, the constituents appearing in red in Table 11 of the Geo-Logics Report have a ubiquitous presence across the Mill site, and include all the major anionic species, and uranium, which are commonly found in groundwater and discussed above as potential tracers of mill process impact to groundwater. These commonly detected constituents indicate that, of the trace constituents on the GWDP list, chloride, fluoride, sulfate, and uranium are likely the most mobile in the groundwater environment beneath the Mill site and possibly the most mobile of the constituents of greatest concern. They are therefore the best first indicators of any potential tailings cell leakage.

The purpose of indicator parameters is not to reduce the importance of other GWDP constituents, but to identify the more mobile constituents as first indicators of potential milling related impacts. Each of the 38 GWDP constituents has a Groundwater Compliance Limit ("GWCL"). In accordance with the GWDP, if a sample exceeds a GWCL, accelerated monitoring is initiated and the Director of DWMRC (the "Director") is notified. If an exceedance of the GWCL occurs two consecutive times, EFRI must submit within 30 days to

the Director a plan and time schedule for assessment of the sources, extent and potential dispersion of the contaminant (DWMRC, 2012). So, each constituent is evaluated, but most of these constituents are not considered to be nearly as good first indicators of potential impacts as chloride, fluoride, sulfate, and uranium.

Further, as discussed in detail in the response to Comment #4 and Comment #6, site specific geochemistry was used to develop the Pyrite Report (HGC, 2012) and pH Report (INTERA, 2012) and is used in all SARs to date to evaluate potential impacts of pH changes on all constituents. It is therefore not necessary to perform any additional analyses considering all of the 38 constituents required.

The foregoing analyses of all of the constituents, the impacts of pH trends on the constituents and the identification and analysis of the key indicator parameters allows for a comprehensive analysis of all of the constituents of concern at the site and for early identification of any potential Mill-related impacts on groundwater at the site, in accordance with applicable US Environmental Protection Agency ("EPA") guidance. Additional isotopic analyses are not required under such guidance, and, as discussed below, would not be appropriate to add to the GWDP. In any event, two recent isotopic analyses have been performed at and around the Mill (Hurst and Solomon, 2008, Naftz et. al., 2011), which confirm the geochemical analyses performed at the site, as described above. There is no need for any further isotopic analyses at the site.

For these reasons, it is not necessary to perform the SAR analyses for wells MW-24, MW-28, MW-5, MW-31 "at a more rigorous scientific level" considering all of the 38 constituents required for monitoring as indicator parameters of facility impact "at a more sophisticated and detailed level" using site-specific geochemistry and incorporating analysis from an updated isotopic investigation.

2. *Stop using rationale sourced from EFR regarding using only four of the 38 DWMRC specifically selected indicator parameters as part of the DWMRC rationale for approving modified GWCLs and move to a more sophisticated approach as intended when the 2004 GWDP SOB was developed. Page 7 of the 2004 SOB details the development of GWCLs for each of the 38 chosen parameters, "to be used as early warning indicators of impending groundwater pollution."*

EFRI Response:

As described in Comment #1, the point of indicator parameters is not to reduce the importance of other GWDP constituents, but to identify the more mobile constituents as first indicators of any potential Mill-related impact. The compliance monitoring program under the GWDP includes a compliance limit for each of the 38 constituents listed in the GWDP. Compliance is therefore based on all 38 GWCP parameters, not just for the four selected indicator parameters.

Exceedances of any of the GWDP constituents are addressed in accordance with the GWDP. If a sample exceeds a GWCL, accelerated monitoring is initiated and the Director is notified. If an

exceedance of the GWCL occurs two consecutive times, EFRI must, within 30 days, submit to the Director a plan and time schedule for assessment of the sources, extent and potential dispersion of the contaminant (DWMRC, 2012). For any exceedance, the Mill must evaluate all potential reasons for the exceedance, *taking all factors into account*, including the mobility of the constituent, the sensitivity of the constituent to changes in pH, any changes in pH in the well, the behavior of the indicator parameters in the well, and any other relevant factors. Based on all of this information, a determination is made as to whether the exceedance is likely due to Mill-related factors or natural background factors, and revised GWCLs are set or further analyses and/or corrective actions are taken, as appropriate.

3. *Require development and assessment methodology of site specific Kd (soil partitioning values) for each parameter with site-specific geochemical analytic data and associated modeling and interpretation.*

EFRI Response:

Based on EPA 402-R-99-004B (EPA 1999):

"The partition coefficient, Kd, is defined as the ratio of the quantity of the adsorbate adsorbed per mass of solid to the amount of the adsorbate remaining in solution at equilibrium.

Retardation is defined as the ratio of the velocity of the water through a control volume to the velocity of contaminant through a control volume.

Chemical retardation is defined as:

$1 + (pb/ne)Kd$

Where: pb = porous media bulk density (mass/length^3)
ne = effective porosity of the media at saturation. "

The Kd value for a particular solute within a particular porous medium thus provides a measure of the degree of retardation of the rate of solute transport with respect to the rate of interstitial groundwater flow. The higher the Kd, the slower the solute will migrate, and the larger the discrepancy between the solute migration rate and the groundwater flow velocity.

Further, as discussed in detail in the response to Comment #4 and Comment #6, site specific geochemistry was used to develop the Pyrite Report (HGC, 2012) and pH Report (INTERA, 2012). In addition, site-specific Kd analysis for certain constituents in select drill holes at or near some of the tailings cells was completed as part of the design of the evapotranspiration cover system for the tailings impoundments. However, a full site-specific Kd analysis for each constituent has not been performed and would be very difficult and very expensive, given the variability of conditions at the site. The Kds for each constituent may change from location to location at the site and may vary by depth as different soil conditions are encountered. It would be very difficult to determine a representative Kd for each constituent for the entire site. Instead,

it is standard practice and more useful to use conservative textbook Kds for each constituent as representative of what a conservative Kd for the constituent would likely be across the entire site. Under any type of Kd analysis, whether site-specific or textbook, the four indicator parameters identified for the site, chloride, fluoride, sulfate and uranium, would still be considered to be the best first indicators of any potential tailings cell leakage.

4. *Require as a condition to the proposed GWDP an Isotopic Groundwater and Surface Water Investigation and Report.*

EFRI Response:

An Isotopic Groundwater and Surface Water Investigation and Report is not necessary for the Mill site because it is not required under any applicable EPA guidance. Furthermore, there are no standardized analytical techniques approved by EPA or other comparable certification bodies, and therefore it is impossible to set compliance standards. Without standardized methodologies and no acceptable method to set compliance standards, it is not appropriate to include isotopic studies in the Mill's GWDP for compliance purposes. In any event, detailed isotopic investigations of both groundwater and surface water at the site have already been carried out and published, which confirm the conclusions and validity of the existing groundwater monitoring program. Further isotopic studies are not warranted. A brief summary of the isotope systems used, findings, and interpretations are given below.

Hurst and Solomon (2008) surveyed surface water (tailings cells and wildlife ponds) and groundwater (monitoring wells) in the area around the Mill. They used noble gas and tritium/helium-3 measurements to determine the age of water and found a trend of more recent ages for groundwater monitoring wells near the wildlife ponds, and increasing ages (to greater than 50 years) downgradient from these wells. The source of water in these downgradient wells is thus older than the onset of milling in 1980. Deuterium and oxygen-18 measurements revealed that surface water samples were isotopically enriched, indicative of evaporation. Groundwater samples revealed values that plotted linearly on a mixing line of deuterium and oxygen-18, with a similar slope, but slightly enriched, relative to that of the Utah Meteoric Water Line. Isotopic measurements of sulfate showed that tailings cell water and wildlife ponds were isotopically enriched in oxygen-18 relative to groundwater monitoring wells, and depleted in sulfur-34 relative to groundwater monitoring wells. MW-27 was the only well that exhibited oxygen-18 and sulfur-34 values for sulfate that were close to those measured in tailings water and the wildlife ponds. Sulfate concentrations in MW-27 were relatively low, however, so leakage and transport of tailings water to MW-27 is unlikely. Groundwater monitoring sites with high dissolved metals concentrations were isotopically distinct from tailings cell water in terms of oxygen-18 and sulfur-34 in sulfate. The authors concluded that "the data collected in this study do not provide evidence that tailings cell leakage is leading to contamination of groundwater in the area around the White Mesa Mill" (pg. 58-59).

Naftz et al. (2011) collected surface water samples of local springs, stock ponds, and Recapture Reservoir, and groundwater samples of local monitoring wells and domestic and public supply wells. They measured noble gases and tritium/helium-3 and found that wells completed in the

Dakota Sandstone and Burro Canyon formations exhibited apparent ages greater than 50 years. Local springs (Cow Camp, Oasis, and Entrance Springs) exhibited apparent ages ranging from 19 years to present. Deuterium and oxygen-18 measurements revealed values that fell along a mixing line between isotopically enriched Recapture Reservoir water and relatively depleted samples that fell directly on the Global Meteoric Water Line. The latter samples corresponded with groundwater of greater age. Values in Entrance Spring were similar to those for Recapture Reservoir, the water from which is used for milling operations on site. Measurement of sulfur-34 and oxygen-18 in sulfate revealed that results for monitoring wells and springs were isotopically distinct from tailings cell water. In addition to stable isotope measurements, the authors measured uranium-234, -235, and -238. The activity ratio ("AR") of uranium-234 to uranium-238 was calculated to assess the possibility of tailings leakage, given that samples of milling-impacted waters tend to have a uranium AR near 1 (Zielinski et al., 1997). Most samples exhibited dissolved uranium concentrations below the EPA maximum contaminant level ("MCL") of 30 µg/L, and uranium AR values ranged between 1.4 to 3.4, which is a range expected for non-impacted waters (Zielinski et al., 1997). The uranium AR values for Entrance Spring exhibited a general decline towards those expected for mill-impacted water. This spring is located up- to cross-gradient of expected groundwater flow, however, so if uranium AR values are indeed indicative of a milling input, this milling input is most likely to be from eolian transport of tailings. For a more detailed discussion of uranium AR values, see response to Comment 13.

These investigations have utilized isotope measurements to determine water ages, important processes such as evaporation and mixing, and possible water sources. Both studies conclude that groundwater is not likely to be impacted by any potential tailings cell leakage based on the age of the water and the isotopic signatures of sulfur and uranium.

These isotopic studies should be taken as confirmation of the conclusions and validity of the existing groundwater monitoring program at the Mill, and hence the sufficiency of the existing program. There is therefore no need to perform any further isotopic analysis at the Mill. As stated above there are no standardized analytical techniques for isotopic studies and it would therefore not be appropriate to add them to the existing program.

5. *Require measurement of Dissolved Oxygen as part of the field parameter set.*

EFRI Response:

Accurate measurement of dissolved oxygen ("DO") in groundwater collected from perched monitoring wells is problematic at the Mill due to the low permeability of the formation hosting the perched groundwater and the consequent low productivity of wells installed to monitor the perched groundwater.

First, the low rates of perched groundwater flow exacerbate the impact of wells on perched groundwater oxygen concentrations near the wells. Water flowing through the wells is in contact with oxygen introduced into the well casings for substantial periods, allowing for substantial

diffusion of oxygen into the groundwater within and near the wells. Transport is additionally enhanced by barometrically-induced water level fluctuations within the wells.

Second, most of the wells have screens extending into the vadose zone, which allows diffusion of oxygen into the vadose zone directly above the water table in these wells. This diffusion occurs in all directions, including upgradient with respect to groundwater flow. This gas-phase diffusion, which occurs approximately four orders of magnitude more rapidly than aqueous-phase diffusion, creates a large reservoir of gas-phase oxygen in contact with groundwater near the wells. Because oxygen from this reservoir is in contact with a relatively large area of groundwater, diffusive transport to the groundwater is enhanced. In addition, air contains approximately 30 times more oxygen on a mass per volume basis than groundwater saturated with oxygen, which increases the mass of oxygen available to be transported to groundwater near each well. Barometrically-induced water table fluctuations near the wells also enhances transport of oxygen from this vadose reservoir to the wells.

Third, because of the extremely low productivity of many of the sampled wells, the purging alone may have a substantial impact on DO. The substantial degree of water level fluctuation resulting from purging enhances oxygen transport to the groundwater in the immediate vicinities of the sampled wells.

All these factors are important because they impact oxygen concentrations in groundwater near the wells, which is the water that is collected during sampling. Water at distance from the wells likely contains much lower oxygen concentrations. For the above stated reasons, the collection of DO in the field parameter set is not warranted or advisable.

6. *Rescind DWMRC approval of the modified GWCLs based on the December 7, 2012 pH/pyrite investigation report and related documents, EFR October 2012, Source Assessment Report White Mesa Uranium Mill, prepared by Intera Geosciences and Engineering and the EFR November 9, 2012 pH Report White Mesa Uranium Mill, prepared by Intera as the source of pH decline/metals increase documented in the April 25, 2013 DWMRC letter to Jo Ann Tischler, Director Compliance Energy Fuels Resources with the Subject: Energy Fuels Resources (USA) Inc. October 10, 2012 Source Assessment Report White Mesa Uranium Mill and associated pH documents (dated November 9, 2012 pH report and December 7, 2012 Pyrite Investigation Report): DRC Findings, and impose a permit condition requiring a new pH investigation report for OOC wells including extensive and comprehensive isotopic/geochemical investigation including humidity cell testing.*

EFRI Response:

A new pH investigation report for out of compliance ("OOC") wells including extensive and comprehensive isotopic/geochemical investigation with humidity cell testing is not necessary, and in the case of humidity cell testing, would not be useful.

The pH Report (INTERA, 2012) and the Pyrite Investigation Report (HGC, 2012) include detailed geochemical analyses supported by site specific data. Additionally, these

investigations were performed within a year of Naftz et al. (2011), which included isotopic and geochemical analysis of local springs, stock ponds, Recapture Reservoir, and groundwater samples of local monitoring wells and domestic and public supply wells. Furthermore, as discussed above, there are no standardized analytical technologies for isotopic studies approved by EPA or other certification bodies.

Humidity cell tests are a type of kinetic test used to predict the potential for acid mine drainage ("AMD"). Typically, about 1 kg of ore or waste rock is placed into a column and subjected to periodic leaching and air drying. The effluent is tested for pH and dissolved constituents over time. These tests are useful for determining whether acidic drainage will be produced at a given site. However, one of the major challenges of these tests is that results can vary by an order of magnitude for different tests using the same material (Sapsford et al., 2009). This variability reveals the limitations imposed by testing small amounts of material that is most often heterogeneous.

Humidity cell testing at the Mill site does not make sense since the wells and tailings cells are providing water samples, and humidity cell testing is carried out on solid samples. The information gained from sampling and analyzing monitoring wells and tailings water is far superior to humidity cell testing, because the results are the net result of the site-specific heterogeneity encountered over the flow path, under environmentally-relevant conditions.

7. *Require direct testing of liner integrity and leak location surveys for the three legacy cells and direct testing of subsurface leakage to the vadose zone under the three legacy cells. Identify appropriate methodology by evaluating existing technologies, including but not limited to: electrical integrity surveys of the liners and advanced geophysical characterization of the vadose zone using high performance subsurface imagery techniques (Please see Attachment C for additional information regarding this technology and note that Dawn Wellman manager of the Environmental Health and Remediation market sector at Pacific Northwest National Laboratory. , Pacific Northwest National Laboratory PO Box 999 Richland, WA 99352 (509) 375-2017 has been contacted by the Tribe and is available to share information via phone calls, video conferencing, etc. with DWMRC regarding advanced vadose zone characterization).*

EFRI Response:

Monitoring the leak detection systems in each of the cells, and monitoring of indicator parameters in groundwater adjacent to and downgradient of the tailings management system as described in the responses to comments 1 and 2 provides early warning of any potential subsurface leakage from the tailings cells.

Direct testing of liner integrity as identified in Comment 7, is not feasible in Cells 1, 2 or 3. Direct liner integrity testing requires the cell in question to be empty and the liner floor and walls to be exposed and visible. Cells 2 and 3 have been filled and have a portion of the reclamation cover in place. The cell liner in each of these cells can no longer be accessed without complete excavation of the entire tailings contents of each. Similarly, the liner in Cell 1, which is in

continuous service for solution management, cannot be accessed without emptying the cell contents. Additionally, the Discharge Minimization Technology ("DMT") requirements for monitoring the leak detection system on Cell 1 have successfully indicated liner integrity changes, resulting in the repairs of the Cell 1 liner.

With respect to the methodologies identified in the comment and in Attachment C of the Geo-Logic Associates July 2017 Updated Data Review and Evaluation of Groundwater Monitoring Report, each of the technologies offered by Pacific Northwest National Laboratories is technologically inappropriate for the following reasons. Attachment C of the Geo-Logic Report described three technologies, as follows.

3D Imaging of Vadose Zone Contaminant Distribution. This technology was proposed for monitoring contamination at shallow depths in the subsurface and/or vadose zone at the Hanford Reserve B-Complex, via variations in electrical conductivity. The technology is not applicable at the depths required to monitor below the bottom of the tailings cell liners, at depths of 20 - 40 feet below ground surface or greater.

3D Imaging to Monitor Treatability Testing. - The above technology was also proposed for monitoring the progress of dewatering and desiccation in the active remediation of vadose zone contamination at the Hanford Reserve. No plume of contamination has been identified in the tailings subsurface at the Mill; no vadose zone or other subsurface remediation is required; therefore no dewatering, desiccation or other hydraulic management is required. Proposed technologies for monitoring of dewatering and desiccation in an ongoing remediation are irrelevant and inapplicable.

Real Time Imaging of Natural and Engineered Subsurface Remediation Processes. This technology was offered for monitoring the addition of liquid and gaseous amendments and treatment additives and the rate of amendment addition in an active remediation of vadose zone contamination at the Hanford Reserve via Electrical Resistivity Tomography ("ERT") imaging. No plume of contamination has been identified in the tailings subsurface at the Mill; no vadose zone or other subsurface remediation is required; therefore no treatment additives or soil amendments are required. The proposed technology for monitoring of reagent or amendment addition in an ongoing remediation is irrelevant and inapplicable.

Advanced External Tank Leak Detection Imaging Using Direct Push Buried Electrodes. Both the standard and the proposed direct push electrode system for leak detection imaging described in Appendix C of the Geo-Logic Report are specifically limited to monitoring of leakage from "metal pipes and tanks" and require that the system to be monitored be constructed of metal suitable for establishing voltage differentials. The technology is inapplicable to the Mill's tailings system constructed of polymer liners and plastic piping.

8. *Require Source Assessment Report and Contamination Investigation for the Chloride plume prior to approving modified GWCLs for wells associated with the chloride plume.*

EFRI Response:

A SAR and Contaminant Investigation for the chloride plume is unnecessary because the chloride plume is relatively collocated with the nitrate plume (Figures I-1 and I-2 of the Nitrate Monitoring Report [EFRI, 2017a])). Elevated nitrate and chloride concentrations in groundwater at the Mill were addressed in the Contamination Investigation Report ("CIR"). Results of the CIR led to a Stipulated Consent Agreement and Corrective Action Plan (HGC, 2012). Corrective actions associated with the nitrate and chloride plumes include the pumping of four wells from within the plumes to remove nitrate and chloride mass, reduce concentrations, and minimize or prevent plume migration, and continued monitoring and reporting of wells in the plumes. Monitoring and reporting of the behavior of nitrate and chloride associated with the plumes occurs quarterly (EFRI, 2017a)

9. *Require a detailed southeast hydrologic investigation and report to define, demonstrate and characterize the hydraulic connection and local groundwater flow directions between the tailings cells and MW-22. This investigation and report should be similar in scope and requirements to the Detailed Southwest Investigation report which DWMRC previously required of EFR, and include multiple piezometers, borings and/or monitoring wells to complete a detailed subsurface characterization of groundwater flow at a sufficient resolution to identify any existing preferential channels of migration.*

EFRI Response:

Performance of such a study is unnecessary for the following reasons.

First, the southeastern portion of the site is cross-gradient with respect to perched groundwater flow beneath the Mill site and tailings management system. The proper area to do such an investigation would be the southwest portion of the site which is directly downgradient of both the Mill and tailings cell management system. As pointed out by the commenter, such a study has already been completed.

Second, there is no evidence to suggest that a continuous higher permeability zone exists in the southeastern portion of the site or that such a zone might hydraulically connect the tailings cells to MW-22. MW-22 has one of the lowest hydraulic conductivities measured at the site. A relatively continuous higher permeability zone is associated with the eastern portion of the chloroform plume in an area where groundwater flow is to the south-southeast. This zone, located northeast and east (up- to cross-gradient) of the tailings management system, is known to 'pinch out' immediately to the south of well TW4-4 based on numerous hydraulic conductivity measurements downgradient of TW4-4 (including TW4-6, TW4-14, TW4-26, TW4-27, TW4-29, and TW4-33). TW4-4 is located east of Cell 3 and more than 1¼ miles north of MW-22. Even enhanced by this known higher permeability zone (which is approximately three orders of magnitude more permeable than the formation at MW-22), chloroform released to two sanitary

leach fields prior to Mill operation has migrated only about 2,150 feet to the south-southeast in more than 37 years. More than 35 years were required for detectable chloroform to reach well TW4-14, located approximately 1,800 feet south-southeast of the suspected source area in a low permeability zone adjacent to the higher permeability zone penetrated by TW4-4. MW-22 is over 6,000 feet further south of TW4-4.

Third, relatively stable (and relatively low) chloride concentrations at MW-22 are inconsistent with the existence of any nearby higher permeability zone that could potentially have conveyed a water quality impact from the vicinity of the tailings management system to MW-22. If any potential tailings seepage could possibly have travelled cross gradient the full distance to MW-22, chloride would be the first constituent to demonstrate a rising trend. In addition, any such impact, should it exist, would be detected first at existing MW-17, located southeast of the tailings management system and between the tailings management system and MW-22.

There should be no concern that any potential impacts from the Mill are affecting MW-22 at this time.

10. Inclusion of three new point of compliance monitoring wells between tailings cell 4A and MW-22.

EFRI Response:

In response to the Ute Mountain Ute Tribe's (the "Tribe's") concerns discussed in both September 2015 working session and a February 2016 meeting, EFRI has proposed several alternatives for the installation and monitoring of three wells between Cell 4A and MW-22 to address the Tribe's concern regarding groundwater flow and hydraulic conductivity in the area between the tailings management system and the White Mesa community. EFRI has also offered to sample the two wells installed by the Tribe on the boundary shared with the Mill. These offers were made in correspondence to the Tribe in August 2016. EFRI repeatedly requested a response from the Tribe (throughout the remainder of 2016 and in early 2017) regarding the offers to add three wells and sample the Tribe's wells. Since no response was received by EFRI, DWMRC modified the GWDP to add full suite analytical parameters to TW4-24 in lieu of additional wells between Cell 4A and MW-22 due to the Tribe's apparent disinterest in such additional wells. Given the additional monitoring at TW4-24, EFR is not prepared to incur the further costs of additional wells, for no good reason.

In light of the overwhelming existing evidence, discussed above in response to comment 9, that there could be no impact to MW-22 from the Mill's tailings impoundments, EFRI sees no benefit to adding the three requested additional wells. The addition of the three wells will add little to the existing information yet will result in significant unnecessary cost to EFRI.

11. Designate MW-22 a POC well and require a SAR for OOC parameters.

EFRI Response:

MW-22 is not necessary as a POC well because it is located far (more than 1 mile) cross-gradient of the tailings management system, and because an unimpacted cross-gradient well (MW-17) is located between the tailings management system and MW-22. MW-17 is located approximately five (5) times closer to the tailings management system and is more appropriately positioned for the timely detection of any potential cross-gradient water quality impacts.

Concerns have been raised regarding the water quality at MW-22 due to elevated concentrations of sulfate and some other constituents (primarily metals), relatively low pH, and past water level increases. However, relatively stable and relatively low chloride at MW-22 is inconsistent with a water quality impact resulting from any potential tailings cell seepage.

In addition, the association of relatively low pH and relatively high sulfate and metals concentrations is consistent with oxidation of naturally occurring pyrite in the formation as discussed in HGC (2012) [Investigation of Pyrite in the Perched Zone, White Mesa Uranium Mill Site, Blanding, Utah, December 7 2012]. The oxidation of pyrite is accelerated by enhanced transport of oxygen to the formation via the monitoring well casings as discussed in the response to Comment 5. Pyrite oxidation releases sulfate and acid. The release of acid lowers pH and mobilizes naturally occurring metals in the formation. As an example, the increase in cobalt concentrations at MW-22 is likely due to decreasing pH resulting from pyrite oxidation. Naturally-occurring cobalt is commonly co-precipitated with manganese oxides. Therefore, any change in groundwater chemistry that tends to destabilize manganese oxides, such as a drop in pH, will also tend to mobilize cobalt.

The lack of evidence to support the existence of a high conductivity 'channel' to or near MW-22 that could potentially have conveyed a water quality impact from the tailings management system to MW-22 is discussed in the response to Comment 9. Increases in water levels at MW-22 that have also been used to support the potential existence of such a feature are relatively small (about 12% of saturated thickness) and more likely result from local sources of enhanced recharge. Most of the water level increase at MW-22 occurred prior to 2007 with a significant decline in the rate of water level increase since 2007. This timing is inconsistent with wildlife pond recharge and does not match water level patterns at wells likely to be unaffected by chloroform and nitrate pumping that are much closer to the wildlife ponds such as MW-5, MW-11, MW-12, MW-14, and MW-17.

The low conductivity at MW-22 makes it possible for relatively large water level increases to occur in response to relatively small-magnitude local recharge sources. One potential source of enhanced recharge is the stock pond located approximately 1,300 feet northeast of MW-22 (and about four times closer than the southernmost wildlife pond). Aerial photography shows water in this pond at various times in the past including a photo dated April 5, 2015. Other potential sources of enhanced recharge are the drainages located immediately east and immediately west of MW-22. Recharge from these drainages is likely to have been enhanced in the vicinity of MW-22 by the construction of the rerouted access road linking highway 191 to Cottonwood Creek Canyon, which is located along the western margin of White Mesa. Prior to Mill

construction the road extended directly across the Mill property but was re-routed to the south when the Mill was constructed. This dirt road, located immediately north of MW-22, runs east-west at that location, and cuts approximately perpendicularly to the direction of drainage. The roadway itself is cut down into the mesa; the central roadbed is slightly elevated, and is bordered by shallow ditches. The road crosses both drainages bordering MW-22, creating a potential source of enhanced ponding and recharge. The elevated central roadbed itself is expected to act as a dam to surface runoff and to enhance recharge; the ditches on either side of the central roadbed are also expected to collect water, primarily as runoff from the central roadbed, and enhance recharge. Fisher (2000) [Simulation of Partially Saturated - Saturated Flow in the Caspar Creek E-Road Groundwater System. Master of Science Thesis, Humboldt State University May, 2000] discusses a logging road cutting perpendicularly to surface drainage that acts as a dam to subsurface waters. Shallow subsurface waters are likely to exist in the vicinity of the drainages bordering MW-22 as a result of enhanced infiltration along the drainages. By analogy with Fisher (2000), the road cutting across the bordering drainages is likely to compact underlying soils and act as a dam to shallow subsurface waters originating from the bordering drainages, additionally increasing recharge.

12. *Add a stipulation to include a sampling schedule required for the deep water supply wells completed in the N aquifer at the Mill site under the Safe Drinking Water Act (SDWA) and for results to be provided in annual 4th quarter groundwater reports.*

EFRI Response:

This comment appears to be motivated by a concern that Mill activities could impact water quality in the deep Navajo aquifer. However, such sampling is considered unnecessary because of the negligible likelihood that Mill activities could impact the deep aquifer. Reasons include:

- The Navajo aquifer is located approximately 1,200 feet beneath the Mill and more than 1,000 feet beneath the base of the monitored perched water zone;
- The Navajo aquifer is separated from the base of the perched zone by more than 1,000 feet of materials having low average vertical permeability, including hundreds of feet of bentonitic shale which functions as an aquiclude;
- The Navajo aquifer is protected by bore seals in the deep wells;
- The Navajo aquifer is additionally protected by artesian pressure, which causes water in the deep wells to rise nearly 800 feet above the top of the aquifer; and
- With respect to perched groundwater flow, all three wells (WW-2, WW-4 and WW-5) are located either upgradient to far upgradient (north-northeast) or far cross-gradient (southeast) of the tailings management system and Mill processing areas. Their locations make it even more unlikely that they could ever be affected by perched water potentially impacted by Mill activities.

13. *The Tribe requests that uranium isotopes be required during scheduled monitoring events for MW-26 and that the activity ratio (AR ratio) be calculated and reported with regular monitoring reports. The GWCL for uranium in MW-26 is proposed to increase dramatically. We understand that this is a pumping/remediation well and that DWMRC has inserted a*

caveat that any interpretation of data from this well needs to be understood in that light, i.e. that DWMRC expects concentrations to vary and that increasing contaminants will likely not be viewed as facility impacts. The AR ratio has been well- established as a reliable method for determining if uranium present in groundwater has an anthropogenic or natural signature, and DWMRC has agreed with past recommendations (USGS report review findings) that including it as a monitoring constituent for monitoring wells at the facility would be a good idea.

EFRI Response:

A uranium isotopic analysis is not necessary or appropriate for the Mill site because such an analysis is not required under any applicable EPA guidance, and, as discussed above, there are no standardized analytical techniques approved by EPA or other comparable certification bodies, and therefore it is impossible to set compliance limits. Further, due to the large variation and uncertainty in interpreting uranium AR values, they are not appropriate for the Mill site, as discussed below.

Dissolved uranium concentrations alone are not enough to determine whether the source of uranium is from natural weathering or from the uranium milling process, particularly near ore deposits, where background levels of uranium are expected to be relatively high. As a result, researchers have only been able to include the AR of uranium-234 to uranium-238 as an additional line of evidence for possible milling impacts, but not as being determinative.

Uranium deposits that are greater than one million years old and closed to weathering are expected to have reached secular equilibrium with respect to uranium-234 and uranium-238, a state represented by uranium AR values of one. When these ores are mined and milled, uranium mineral dissolution is expected to be rapid and complete, and dissolved uranium in milling and tailings water is expected to inherit the original uranium AR of the ore. When uranium mineral dissolution is relatively slow and incomplete, uranium isotopes will have an opportunity to fractionate, and uranium-234 is expected to be more mobile than uranium-238. In this case, the uranium AR of groundwater may be 1.5 to 10 times higher than that of the source rock.

Zielinski et al. (1997) conducted one of the most highly cited studies utilizing uranium AR measurements. They found that in water samples with a known milling impact and dissolved uranium concentrations > 100 µg/L, uranium AR values ranged from 0.98 to 1.05. In samples that represented background, on the other hand, uranium concentrations were at or below 30 µg/L, and uranium AR values ranged from 1.32 to 1.41. The authors concluded that groundwater with uranium AR values below 1.3 are indicative of uranium milling impact, whereas uranium AR values above 1.3 represent natural sources of uranium. Similar results have been found at other uranium mining and/or milling and uranium-rich background sites (e.g., Van Metre et al. (1997); Naftz et al. (2011); Morrison et al. (2012); Kamp and Morrison (2014)).

It is noteworthy that these studies used multiple lines of evidence, not just uranium AR values, to support their determination of impacted and unimpacted water. Some of these studies combined uranium AR measurements with the sulfur and oxygen isotopic compositions of sulfate, trace metal concentrations, water age dating, or other chemical indicators to determine mining and/or milling impacts. These studies generally present results that follow the consistent observation that uranium AR values are near 1 for mill-impacted water and above 1.3 for unimpacted water, but there are exceptions. For example, Van Metre et al. (1997) measured uranium AR values for 55 impacted samples, 19 of which had uranium AR values greater than 1.3 (range of 1.31 to 2.25). In addition, at least one previous study is inconsistent with expected uranium AR trends. Basu et al. (2015) carried out uranium AR measurements on groundwater at an in-situ recovery ("ISR") mine in Rosita, TX. Like the milling process, uranium mineral dissolution during ISR is expected to be rapid and complete. The authors found that the average and standard deviation for uranium AR values were 0.76 ± 0.03 (excluding one value that was 2.23) for ore zone groundwater, and 1.0 ± 0.33 for sites upgradient of the ore zone. Assuming these upgradient sites represent background values, the results lie exactly in the range expected for impacted water. The relatively low uranium AR values at this site in general make more sense considering that the ore itself had an average uranium AR value of 0.76 ± 0.06.

These studies highlight that the AR value of dissolved uranium will reflect both the AR value of the original ore, as well as the rates and processes that occurred during uranium mineral dissolution. While it is reasonable to assume that uranium mineral dissolution is rapid and complete during the milling process and during ISR mining, the reverse of slow and incomplete dissolution will not always be true during natural weathering of uranium minerals. During natural weathering, rapid and complete dissolution of uranium minerals could occur under a variety of conditions, such as in highly oxidizing environments or in cases where mineral surface areas are high. In either situation, the natural background uranium AR values could resemble those expected for mined and milled uranium. As a result, the most compelling studies that include uranium AR measurements are those that measure this parameter for both dissolved uranium and the original uranium ore, and combine these measurements with the presence or absence of additional indicators of mining and/or milling impact. Any routine measurements of uranium AR values in monitoring wells at the Mill site would therefore need to include tailings samples. The resulting uranium AR values, however, would likely show substantial variation because the tailings are made up of different uranium ore sources. Such variation would make it challenging to interpret the source of uranium in local groundwater.

Due to the large variation and uncertainty in interpreting uranium AR values, and the absence of EPA or other State of Federal guidance on their interpretation and use in a groundwater compliance context, they are not appropriate for the Mill site. Further, background AR values have not been calculated and could not be calculated at this time for MW-26, which would make interpretation of the results even more uncertain.

14. *As suggested in DWMRC review memo (DWMRC, June 27, 2000) and recommended in the Geo-Logic Report as a standard industry practice, EFR should be required to calculate an annual water balance for water received, consumed and lost at the Mill, and report the*

balance with annual DMT reports to assist with evaluation and performance of the discharge minimization technology required under the GWDP. Currently, there is no accounting of water use and loss at the Mill.

EFRI Response:

Presumably, the water balance would be performed to determine whether a potential release occurred, including a potential release (leak) from the tailings management system. A water balance would necessarily include estimates of evaporative losses from and contributions via precipitation to the tailings management system, other lined surface water features, and open tanks that are part of the processing facilities. The unavoidable error associated with such calculations would necessarily render them useless in determining whether small releases occurred, or if any leaks in the tailings management system occurred. Any small release would not be able to be picked up by the water balance. In any event, any releases, whether small or large, would be obvious, and would not require the use of a water balance to identify them. Any release to the land surface would be exposed to view and obvious. Any release from the tailings management system would be detected by the cell's leak detection system and would be reflected by increases in water levels accompanied by increases in chloride concentrations in perched groundwater monitoring wells surrounding the cells. The entire purpose of installing relatively closely spaced wells between and surrounding the individual tailings cells was to provide an early warning system for potential leakage.

15. *The thorium isotopes, Th-230 and Th-232 should be assayed individually in the conventional compound effluent in the Annual Tailings Cells Wastewater Sampling Report. Using gross alpha as a surrogate does not allow quantification of these isotopes individually (or any other additional alpha emitter present in the tailing cell effluent "soup")*

EFRI Response:

The primary purpose for tailings cell wastewater sampling is to monitor the source for constituents that could potentially leak out of the tailings management system impoundments and contaminate groundwater. The constituents sampled in the tailings cell wastewater sampling therefore mirror the constituents required to be sampled at the Mill's groundwater monitoring wells under the GWDP.

Under the GWDP, the DWMRC evaluates the monitoring results for each groundwater monitoring well that is sampled for compliance with standards for 38 different constituents and for trends in the data that may show a need for further action. In addition to other lines of evidence, DWMRC staff looks for increasing trends for four indicator parameters (chloride, uranium, fluoride, and sulfate). As noted above, these indicators will appear in sample results at elevated and increasing levels if any potential cell leakage has occurred. As discussed above, these constituents serve well as indicators because:

• The process water (tailings solution) contains significant concentrations of them;

• They are more mobile (non-reactive) indicators in groundwater and will show up at monitoring wells sooner than other available indicators; and

• They should demonstrate increasing concentrations and an upward trend in groundwater concentration.

Thorium-230 and thorium-232 are not groundwater monitoring constituents under the GWDP. thorium-230 and thorium-232 are minimally soluble at a pH greater than 4 and would not serve well as indicator parameters of potential tailings cell leakage in groundwater. Since the thorium isotopes are minimally soluble, there is no comparison point for the data from the waste water to groundwater data, and the addition of the thorium isotopes to the tailings waste water analytical suite would not provide useful or usable data for the determination of tailings management system performance. Since thorium-230 and thorium-232 are currently not groundwater monitoring constituents in the GWDP and there is no good reason to add them as monitoring constituents to the GWDP, there is no need to add them as sampling constituents to the Mill's tailings management system sampling program.

It should be noted that EFRI voluntarily sampled and analyzed the tailings waste water for several additional constituents (including the thorium isotopes) from 2015 through 2017 to address the following submissions made by the Tribe to the EPA in connection with the proposed revisions to 40 CFR Part 61-Subpart W, National Emission Standards for Radon Emissions From Operating Uranium Mill Tailings:

> • Calculation Brief, Radon Emissions from Evaporative Ponds White Mesa Uranium Mill dated July 07, 2014, prepared by Mike King, and submitted to EPA on July 9, 2014; and
>
> • Supplement to Calculation Brief (July 7, 2014), dated February 10, 2015, prepared by the Tribe.

The data resulting from the voluntary analyses are discussed in the EFRI letter to Mr. Jon Edwards of the EPA, dated August 18, 2016. The purpose of the voluntary sampling and analysis was to address the incorrect assumption that gross alpha data could be used as a proxy for radium-226 data as asserted by the two Tribe submissions noted above. The thorium isotopes were included to demonstrate that the gross alpha results in the waste water samples did not represent radium-226, but other alpha emitting isotopes. The data from the voluntary analyses did in fact demonstrate that the primary alpha emitting isotopes were the thorium isotopes. Further analysis of the thorium isotopes would not provide useful information regarding tailings management system performance nor would thorium isotope data provide information relevant to mill impacts and therefore should not be included. It is important to note that both thorium-230 and thorium-232 do not pose a significant health hazard in the tailings waste water because they are bound in solution and cannot be released, and they don't generate radon.

Grand Canyon Trust Comments on the Proposed Renewal and Amendment of Energy Fuels Resources (USA), Inc.'s Radioactive Materials License and Groundwater Discharge Permit for the White Mesa Mill

B. The definitions and standards used to establish reclamation milestones should be revised to be consistent with federal and state law.

Reclamation Plan Revision 5.1 uses several definitions and standards that are at odds with the impoundment-closure standards in federal and state law. The problem lies with how the plan redefines two regulatory terms of art—"operation" and "final closure"—that control when Appendix A's impoundment cleanup requirements and deadlines are triggered. These inconsistencies should be eliminated to ensure that the company closes impoundments promptly and in compliance with the law.

1. Background

When a tailings impoundment "ceases operation," Appendix A requires uranium mill operators to expeditiously build a "final radon barrier" over the impoundment "in accordance with a written, Commission-approved reclamation plan."[73] Reclamation plans must have clear, enforceable deadlines, or as Appendix A puts it, "a schedule for reclamation milestones that are key to the completion of the final radon barrier...."[74] Milestones aren't flexible target timeframes or performance goals; they're "an action or event that is required to occur by an enforceable date."[75]

The event that triggers the expeditious-closure requirement for any given impoundment is taking that impoundment out of "operation."[76] Appendix A defines "operation" to mean that an impoundment is "being used for the continued placement of byproduct material or is in standby status for such placement."[77] Impoundments are in "operation," the definition goes on, "from the day that byproduct material is first placed in the pile or impoundment until the day final closure begins."[78] So, there are two conditions that are essential for an impoundment to cease "operation." "Byproduct material" must have been placed into the impoundment to initiate an impoundment's "operation," and "final closure" must have begun to end the impoundment's "operation."

2. Problems with the Reclamation Plan's Definitions

There are two main flaws with the definitions Energy Fuels has put in Reclamation Plan Revision 5.1. First, the Plan defines the term "operation" so that its impoundment-closure requirements apply only to those impoundments used for disposing of "tailings sands," even though Appendix A's impoundment-closure requirements apply to impoundments used to dispose of any wastes produced by processing uranium. Second, the Plan defines the term "final closure" in a way that purports to allow final closure to begin under circumstances when it would not begin under federal and state law.

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses these concerns, as discussed below.

a. "Operation"

"Operation," according to Plan Revision 5.1, means a tailings impoundment that "is being used for the continued placement of tailings sands or is on standby status for such placement."[79] *Under Appendix A, in contrast, impoundments are in "operation" when they're first used to dispose of "byproduct material," not just "tailings sands."*[80] *The term "byproduct material" means the "tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore primarily processed for its source material content, including discrete surface wastes resulting from uranium solution extraction processes."*[81]

By its plain terms, Appendix A's definition of "byproduct material" includes everything that Energy Fuels puts in the cells at the mill: the mostly liquid raffinate wastes, semi-solid counter-current decantation slurry, "tailings sands," and all the other uranium-milling wastes the company discards in the cells. Indeed, the radioactive materials license and groundwater discharge permit prohibit the company from disposing of anything other than "byproduct material" in the cells.[82] *In a pending Clean Air Act lawsuit, Energy Fuels has concurred that "byproduct material" under the Atomic Energy Act and UMTRCA includes all these wastes. "[B]yproduct material," the company argued, "is the broader category of waste produced at a mill and regulated under UMTRCA, while tailings"—by which Energy Fuels meant the same thing as "tailings sands"—"represent a form or subset of byproduct material."*[83] *Consequently, all the cells at the mill have been used for the placement of "byproduct material," and thus, all the cells have been put into "operation" under Appendix A. Any cell taken out of "operation" is therefore subject to the expeditious-closure and deadline requirements in Appendix A.*

By defining "operation" to refer only to impoundments that have received "tailings sands," Plan Revision 5.1 unlawfully purports to limit Appendix A's impoundment-closure requirements only to impoundments that have received "tailings sands." The Plan doesn't say what "tailings sands" are or which cells have received them, but Energy Fuels has argued in pending litigation that the slurry pumped over the years to Cells 2, 3, and 4A is the only source of "tailings sands" at the mill.[84] *Thus, under the company's view of the facts, "tailings sands" have not been discarded in Cells 1 and 4B (even though part of the slurry from the counter-current-decantation circuit has been siphoned into Cell 4B). And that being so, under the company's tailings-sands-based definition of "operation," Cells 1 and 4B would not be subject to Appendix A's expeditious-closure requirements when they are no longer in use.*

That outcome would be contrary to Appendix A, whose expeditious-closure requirements apply to all cells at the mill. The Division accordingly should require Energy Fuels to revise Plan Revision 5.1 to use a definition of "operation" that is identical to the definition in Appendix A and to clarify how it applies to the mill's cells. In particular, the Division should require Energy Fuels to revise Section 6 of Plan Revision 5.1 as follows:

- *The definition of "operation" that appears in Section 6.2.1 should be changed to match the definition in Appendix A: "Operation means that a uranium or thorium mill tailings pile or impoundment is being used for the continued placement of byproduct material or is in standby status for such placement. A pile or impoundment is in operation from the*

day that byproduct material is first placed in the pile or impoundment until the day final closure begins."[85]

EFRI Response:

The definition of "operation" in revised Section 6.2.1 has been changed to match the definition in 40 CFR Part 61 Subpart W, which is essentially the same as the definition of "operation" in Appendix A.

It should be noted that slurry has not been transferred to Cell 4B, only solution.

- *The definition of "byproduct material" used in the Nuclear Regulatory Commission's regulations (that has been incorporated by reference under State law) should be added to the Plan. The pertinent part of that definition is: "Byproduct Material means the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes."*[86]

EFRI Response:

There is no need to add a definition of byproduct material to the Reclamation Plan. The definition of byproduct material is fundamental to the Atomic Energy Act (AEA") and its regulations, and there is no uncertainty as to what that term means.

- *The Plan should clarify that Appendix A's impoundment-closure requirements apply to all cells at the mill, including Cells 1 and 4B, and will apply to any cells built in the future into which "byproduct material" is placed. Thus, for example, the plan's description of the existing "tailings management system at the Mill" should be revised to confirm that there are currently five waste impoundments at the mill: Cell 1, Cell 2, Cell 3, Cell 4A, and Cell 4B.*[87]

EFRI Response:

Criterion 6A applies only to tailings impoundments, which are permanent disposal facilities for byproduct material, and for which a final radon barrier will be constructed. Evaporation ponds are not permanent disposal facilities and will be removed and the liners etc. disposed of in a tailings impoundment for permanent disposal as 11e.(2) byproduct material. Evaporation ponds at the Mill do not have radon barriers. If an evaporation pond contains tailings that will require permanent disposal and a radon barrier, then they are not evaporation ponds; they are tailings impoundments and would be subject to the requirements set out in Criterion 6A. As stated below, in the Nuclear Regulatory Commission's ("NRC's") preamble (see Appendix 1) to its rulemaking under which Criterion 6A was added to 10 CFR Part 40 Appendix A, Federal Register Volume 59, Number 104, Wednesday June 1, 1994, (the "NRC Preamble"), page 28224, NRC states:

> Note, as discussed in EPA's statements of consideration for its amendment of 40 CFR part 192 (at FR 32183, June 8, 1993 and reiterated at 58 FR 60354; November 15, 1993), the reclamation of evaporation ponds may be dealt with separately from meeting the expeditious radon cover requirements if deemed appropriate by the Commission or the regulating Agreement State. This may be the case whether or not the evaporation pond area is being used for continued disposal of byproduct material.

None of the Mill's evaporation ponds will have a final radon barrier, so milestones are not required to be set under Criterion 6A for the decommissioning of the evaporation ponds at the site.

It should be noted, however, that 40 CFR 61.251(o) of EPA's revised Subpart W regulations defines "Reclamation Plan" to mean a plan detailing activities and milestones to accomplish reclamation of tailings impoundments as well as the "removal and disposal of non-conventional impoundments," which includes evaporation ponds. It should also be noted that Subpart W provides that an approved "reclamation plan prepared and approved in accordance with 10 CFR part 40, Appendix A is considered a reclamation plan" for purposes of Subpart W.

EFRI is of the view that since an approved reclamation plan that meets the requirements of Appendix A satisfies the definition of "Reclamation Plan" in Subpart W, and Appendix A does not require any milestones under Criterion 6A that do not relate to the placement of a final radon barrier on a tailings impoundment, any closure requirements in the Reclamation Plan relating to removal and disposal of non-conventional impoundments need not be milestones.

Nevertheless, although not required, we have added milestones for the removal and disposal of non-conventional impoundments to revised Section 6 of the Reclamation Plan. Although these milestones are not milestones required under Criterion 6A(1), EFRI has committed in revised Section 6 that for purposes of the Reclamation Plan they will be treated as milestones as required by Criterion 6A(1), and as a result EFRI has committed that they will be subject to the provisions of Criterion 6A(2) (see Appendix 2)

These milestones require the removal and disposal of non-conventional impoundments within a total of seven years after the impoundment begins final closure. This is within the timeframe contemplated by Subpart W. In the preamble to the Subpart W rulemaking (FR Vol. 82, No. 10 January 17, 2017) (the "Subpart W Preamble") (see Appendix 3), EPA states on pages 5170 and 5171 that: "The EPA and the NRC agreed that such activities can, for the most part, be conducted and a final cover [on a conventional impoundment] installed within seven years of the end of operations. Similar timeframes should be possible for non-conventional impoundments, which are likely to be removed altogether." Because it is impossible to determine the amount of liquids to be removed from the impoundments at this time and, depending on the availability of other impoundments at the time, it may be necessary to rely solely on evaporation to remove the liquids from non-conventional impoundments. At a net evaporation rate of 30 inches per year (which would actually be less than 30 inches per year due to the added infiltration into the pond from drainage from other parts of the Mill site into the impoundments during storm events etc.)

this could take more than five years in some circumstances, although this should be able to be managed by appropriate scheduling of evaporation in impoundments and commencement of final closure of impoundments. For these reasons, EFRI believes this timeframe should be manageable. In any event, so long as there are liquids in the evaporation ponds, the protections in Subpart W will continue to be met.

- *The Plan should include milestones for closing all the mill's impoundments, including Cells 1 and 4B, as well as any other so-called "evaporation ponds" built in the future. Thus, for example, the Plan should have deadlines for closing Cell 1 when it is taken out of operation and deadlines for closing Cell 4B if it is taken out of operation before Energy Fuels starts pumping "tailings sands" from the counter-current-decantation circuit into that cell. At a minimum, for closing "evaporation ponds," the Plan should have deadlines for removing freestanding liquids; excavating solids, contaminated soil, and the liner and burying those materials in an operating tailings cell; and building a final radon barrier over any section of those impoundments that will be covered in place.*[88]

EFRI Response:

See above and revised Section 6 of the Reclamation Plan. Revised Section 6 of the Reclamation Plan sets out milestones to accomplish removal and disposal of evaporation ponds and any other non-conventional impoundments at the Mill site.

b. "Final Closure"

The second flaw in Plan Revision 5.1's impoundment-closure definitions is that the company has given the term "final closure" a meaning that is inconsistent with federal and state law. Neither Appendix A nor any other regulations adopted by the Nuclear Regulatory Commission define the phrase "final closure." EPA has, however, defined that phrase in a separate set of Clean Air Act rules, commonly called Subpart W,[89] *that apply to tailings impoundments. And the State has incorporated Subpart W into state law by reference.*[90]

For the reasons set out below, EPA's definition should control when "final closure" begins under Appendix A. Energy Fuels, however, has given the term "final closure" a different definition in Plan Revision 5.1. Final closure begins, according to the Plan, when an impoundment:

(A) is no longer being used for the continued placement of tailings sands and [Energy Fuels] has advised the Director in writing that the impoundment is no longer being used for the continued placement of tailings sands and is not on standby status for such placement; or

(B) is no longer being used for the continued placement of tailings sands, interim cover has been placed over the entire surface area of the impoundment, and dewatering activities have begun; or

(C) the Mill facility as a whole has commenced final closure and a written notice to that effect has been provided to the Director in accordance with this Plan.[91]

There are three main problems with this definition: (1) it doesn't match the definition in Subpart W, which could muddle when "final closure" begins for differing regulatory purposes; (2) like the Plan's definition of "operation," it also improperly purports to apply the concept of "final closure" only to those impoundments that contain "tailings sands" and not all impoundments containing uranium byproduct material; and (3) it creates an internal inconsistency in the Plan by allowing, under Option B, for "final closure" to begin when interim cover has been placed over an entire cell and dewatering has begun even though the Plan has milestones for placing interim cover and dewatering after final closure begins.

For the reasons set out below, the Division should require Energy Fuels to update Plan Revision 5.1 so that the definition of "final closure" matches the definition in Subpart W.[92]

EFRI Response:

See revised Section 6 of the Reclamation Plan, which includes the pertinent parts of the definition of "final closure" from the new 40 CFR Part 61 Subpart W regulations. The definition of "final closure" in revised Section 6 excludes the paragraph relating to heap leach piles because that paragraph is inapplicable to the Mill (the Mill is not licensed to have any heap leach piles).

i. EPA's Regulation of Tailings Impoundments

When Congress passed UMTRCA in 1978, it directed EPA to establish general standards to protect public health and the environment from hazards posed by processing and disposing of Uranium- milling tailings.[93] *It also required the Nuclear Regulatory Commission's rules to conform to EPA's general standards.*[94] *For operating uranium mills, those standards are set out in 40 C.F.R. Part 192, Subpart D. EPA's initial version of those standards were issued in 1983 and included design, operating, and closure standards for the pits at uranium mills in which tailings are buried.*[95] *For example, these standards required impoundments to be closed so that radon releases would not exceed 20 pCi/(m2-sec) for 1,000 years.*[96] *The Commission revised its own regulations (in Appendix A) in 1985 to conform to EPA's rules.*[97]

By the late 1980s, EPA realized its rules had a flaw: They failed to set deadlines for closing tailings impoundments.[98] *Though the rules had performance standards that closed impoundments must meet; there was no mandate for when mill operators, like Energy Fuels, had to meet those standards. EPA set out to fix this problem in a rulemaking under the Clean Air Act.*

That story starts in late 1979, when EPA designated radionuclides as a "hazardous air pollutant" under the Clean Air Act after finding that exposure to radionuclides increases the risk of getting cancer and suffering genetic damage.[99] *At the time, the Clean Air Act required EPA to set emission standards for hazardous air pollutants that would protect the public health from those pollutants with an "ample margin of safety."*[100] *In 1986, EPA concluded that radon emitted from tailings impoundments poses a significant enough health risk (particularly of lung*

cancer) to warrant establishing emission standards for those releases under the Clean Air Act.[101] *Those standards— modified at 40 C.F.R. Part 61, Subpart W—required mill operators to phase out big, radon-emitting tailings impoundments and transition to using just two smaller impoundments that were to be cleaned up one-by-one as they filled up, ceased "operation," and "final closure" began.*[102] *This was the first use of the term "final closure" in regulating uranium-mill impoundments.*

In 1989, EPA added a new rule to those standards—40 C.F.R. Subpart T—to set impoundment-closure deadlines and thereby fix the closure-limbo problem created by the agency's 1983 UMTRCA rulemaking.[103] *EPA recognized that "[t]he existing UMTRCA regulations set no time limits for the disposal of [tailings] piles" and "[s]ome piles have remained uncovered for decades emitting radon."*[104] *Setting closure deadlines in Subpart T, EPA asserted, would assure that impoundments "will be disposed of in a timely manner after they are removed from service," thereby reducing radon emissions and protecting public health.*[105] *To meet that goal, Subpart T gave mill operators two years to close impoundments after they ceased to be "operational."*[106]

Protracted litigation over Subpart T ensued. Ultimately, a complex negotiation among EPA, the Nuclear Regulatory Commission, and affected states yielded an agreement to rescind Subpart T, but only after EPA amended its general standards under UMTRCA to require impoundments to be closed expeditiously according to deadlines, and only on the condition that the Commission amend Appendix A to conform to that change.[107] *To define when those requirements would be triggered, EPA's revised general standards, adopted in 1993, borrowed a functionally equivalent version of the agency's own prior definition of "operation" from Subpart W, under which operation continues until "final closure" begins.*[108] *The Nuclear Regulatory Commission, as it is required to do, then conformed Appendix A to EPA's general standards, adopting EPA's definition of "operation" and its use of the term "final closure."*[109] *The upshot under these rules was that impoundments are subject to Subpart W's two-impoundment limit while they are in "operation," and they become subject to Appendix A when "final closure" begins and "operation" ends.*

This history reveals three critical points about the term "final closure." First, EPA first coined that term for use in Subpart W in 1986. Second, Appendix A's mandate to close impoundments expeditiously and according to a deadline-driven reclamation plan after "operation" ceases and "final closure" begins was added at EPA's direction. Third, EPA used functionally identical definitions of "operation" in Subpart W and its general standards in Part 192 to establish a clear point at which impoundments were no longer subject to Subpart W's two-impoundment limit and had to be closed according to Appendix A.

In short, EPA is the architect of the impoundment-closure requirements and the author of the key regulatory language—including the terms "operation" and "final closure"—that trigger those requirements. EPA's definition of "final closure" should therefore control the meaning of that term under Appendix A.

EFRI Response:

Criterion 6A addresses the placement of a final radon barrier on each permanent tailings disposal impoundment that has ceased operation. It does not require milestones for any other purpose.

It is important to note that 40 CFR Part 61 Subpart W provides protection against radon flux while an impoundment is in operation. When the impoundment ceases operation and final closure begins, Subpart W no longer applies, but Appendix A takes over. Because Criterion 6(1) of Appendix A requires that the final radon barrier for a tailings impoundment must satisfy EPA's 20 $pCi/m^2/s$ standard, adequate protections against radon flux are ensured once the final radon barrier is constructed. As identified in the comment above, the problem that 40 CFR Part 61 Subpart T (now rescinded) was intended to address was the gap between when an impoundment ceases operations, at which time Subpart W ceases to apply, and the time that the final radon barrier is completed under Appendix A. The requirement in Criterion 6A(1) for milestones therefore applies only to ensure the timely placement of the final radon barrier and for no other purpose, so as to make sure that this gap is as short as practicable considering technological feasibility. ***Neither Subpart W, nor Appendix A, sets any timeframe or limit as to when an impoundment (whether conventional or non-conventional) must cease operation and begin final closure.*** This is because the protections in Subpart W continue so long as an impoundment is in operation, so there is no need to limit the period of operations. ***The milestones and targets only apply after an impoundment ceases operations and Subpart W no longer applies***.

ii. Reclamation Plan Revision 5.1 should be revised to conform to EPA's definition of "final closure" set out in Subpart W.

Earlier this year, EPA amended Subpart W. Among other revisions, the agency added a definition of "final closure" to that rule.[110] *That definition says that "final closure" means "the period during which an impoundment ... is being managed in accordance with the milestones and requirements in an approved reclamation plan."* [111] *It begins when:*

> *the owner or operator provides written notice to the [EPA] and to the Nuclear Regulatory Commission or applicable NRC Agreement State that:*
> *(1) A conventional impoundment is no longer receiving uranium byproduct material or tailings, is no longer on standby for such receipt and is being managed under an approved reclamation plan for that impoundment or facility closure plan; or*
> *(2) A non-conventional impoundment is no longer required for evaporation or holding purposes, is no longer on standby for such purposes and is being managed under an approved reclamation plan for that impoundment or facility closure plan; ....*[112]

The Division should require Energy Fuels to revise Plan Revision 5.1 so that the Plan's definition of "final closure" matches the definition in Subpart W. This is important for four reasons. First, EPA's definition makes clear that "final closure" begins only when the deadlines (a.k.a. "milestones") in the reclamation plan have been triggered.[113] *That means, if deadlines*

don't start running, final closure can't begin, a critical condition to avoid delay. Second, EPA's definition leaves no doubt about when "nonconventional impoundments"—also called evaporation ponds—enter final closure and must be managed "in accordance with the milestones and requirements in an approved reclamation plan."[114] That fixes the problem that Energy Fuels' definition creates by referring only to impoundments used to discard "tailings sands," which are "conventional impoundments" according to Subpart W's definition of "final closure." Third, using the same definitions in Subpart W and the reclamation plan will ensure that the exact same event—proper notice to the Division and EPA—triggers "final closure," eliminating any possibility that Energy Fuels could claim that an impoundment is not in "operation" under Subpart W but also not in "final closure" under Appendix A. Fourth, adopting EPA's definition of final closure eliminates the internal inconsistency created by Energy Fuels' definition of that term when compared with the plan's milestones.

EFRI Response:

See above and revised Section 6 of the Reclamation Plan, which includes pertinent parts of the definition of "final closure" from the new 40 CFR Part 61 Subpart W regulations. Milestones are included for conventional impoundments that are not in operation and have commenced final closure, as required under Criterion 6A, and milestones have also been added for non-conventional impoundments that are not in operation and have commenced final closure.

C. The reclamation deadlines in Revision 5.1 are inadequate.

1. Deadlines must be imposed for all key tasks for completing the final radon barrier.

Energy Fuels' reclamation plan lacks several deadlines the plan is required to have. Appendix A Mandates that reclamation plans have "milestones that are key to the completion of the final radon barrier...."[115] At a minimum; milestones must be established for retrieving windblown tailings, stabilizing the impoundment (including removing freestanding liquids, recontouring, and dewatering), and finishing the final radon barrier.[116] Again, milestones aren't flexible goals. They're "an action or event that is required to occur by an enforceable date."[117]

EFRI Response:

Please see revised Section 6 of the Reclamation Plan, attached hereto as Schedule A, which sets out milestones for retrieving windblown tailings, stabilizing the impoundment (including removing freestanding liquids, recontouring, and dewatering) and finishing the final radon barrier for impoundments that are not in operation and for which final closure has commenced. Each of those milestones is an action or event that is required to occur by an enforceable date. Revised Section 6 also sets out additional schedule commitments that are not milestones, because they do not relate to the completion of the final radon barrier on any impoundments. As those schedule commitments are not milestones they do not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing those activities is retained. The licensee must complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

In developing these milestones and schedule commitments, the following factors were taken into consideration:

a) Three Milestones Required.

10 CFR Part 40 Appendix A, Criterion 6A(1) requires that deadlines must be established for only the following three items:

- Completion of the final radon barrier;
- Windblown tailings retrieval and placement on the pile; and
- Interim stabilization (including dewatering or the removal of freestanding liquids and re-contouring).

In the NRC Preamble, page 28226, NRC states that: "The final rule has been changed to specifically require the establishment of deadlines for only three milestones: windblown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and re-contouring) and final radon barrier construction. The Commission, however, retains the authority to require the establishment of additional milestones determined to be "key" to the completion of the final radon barrier in an individual case (note the words "but not limited to" in the definition of reclamation plan)."

b) Additional Schedule Commitments may be Set, but they are not Subject to Paragraph 2 of Criterion 6A

In describing Criterion 6A in the NRC Preamble, page 28225, NRC states that: "no deadlines are required to be established in the licenses beyond completing the final radon barrier as a result of this rulemaking and that any other schedules established in a license do not come under the specific provisions of paragraph (2) of Criterion 6A".

In revised Section 6 of the Reclamation Plan we have set out a comprehensive schedule for reclamation of impoundments, which goes beyond completing the final radon barrier for conventional impoundments. In revised Section 6 of the Plan and in these comments, we refer to deadlines that are not milestones (because they go beyond or are not related to completing the final radon barrier) as "schedule commitments." As those schedule commitments are not milestones they do not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing those activities is retained. The licensee must complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

c) Radon Barrier is Not the Entire Tailings Cover.

The radon barrier is not the entire tailings impoundment cover, but only the radon barrier layer of the cover. The erosion protection barriers or other features necessary for long-term control of the tailings are placed on top of the final radon barrier and are not part of the final

radon barrier. In the Subpart W Preamble, on page 36285, EPA notes that: "Milestones which are not reasonably determined to advance timely compliance with the radon air emissions standard, e.g., installation of erosion protection and groundwater corrective actions, are not relevant to the tailings closure plans (radon)." In the NRC Preamble, page 28222, NRC states that: "A definition of final radon barrier was also included in the Commission's proposed rule. . . . This definition excludes the erosion protection features which were not a subject to EPA's amendment to 40 CFR part 192."

d) The Required Milestones do not include the Erosion Protection Barrier or other Features Necessary for Long-Term Control of the Tailings.

The milestones required under Criterion 6A(1) do not include erosion protection barriers or other features necessary for long-term control of the tailings. In the NRC Preamble, page 28226, NRC states that: "The final rule has been modified so that the terminology 'as expeditiously as practicable considering technological feasibility' is used only for emplacement of the final radon barrier. A general timeliness standard for completing erosion protection features is retained. Thus, it is clear that the licensee must complete these actions in a timely way and that the NRC has the authority to take action if necessary in this regard. However, the restrictive cost considerations specified for the completion of the final radon barrier do not apply to decisions concerning the timeliness of completion of erosion protection features. Instead, the more flexible, general cost considerations of the AEA (Section 84a(1)) apply."(NRC 2015b)

In the case of Reclamation Plan 5.1, the final radon barrier is Layer 2 (3.0 – 4.0 ft. (91 to 122 cm) thick Primary Radon Attenuation Layer (highly compacted loam to sandy clay)), and the erosion protection barriers or other features necessary for long-term control of the tailings are Layer 3 (3.5 ft. (107 cm) thick Water Storage/Biointrusion/Frost Protection/Secondary Radon Attenuation Layer (loam to sandy clay)) and Layer 4 (0.5 ft. (15 cm) thick Erosion Protection Layer (topsoil-gravel admixture or topsoil)). For Reclamation Plan 3.2, the final radon barrier is Layer 2 (1 ft. (30.5cm) Radon Barrier (compacted clay)), and the erosion protection barriers or other features necessary for long-term control of the tailings are Layer 3 (2 ft. (61 cm) Frost Barrier Layer (random fill)) and Layer 4 (3 in. (7.6 cm) Rock Armor).

Accordingly, the milestones required under Criterion 6A(1) are for the completion of Layers 1 and 2 under each Reclamation Plan option (the Proposed Cover Design and the Existing Cover Design, respectively, using the terminology in revised Section 6 of the Reclamation Plan). Schedule commitments, not milestones, are set for the remaining Layers under each cover design option. As those schedule commitments are not milestones they do not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing those activities is retained. The licensee must complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

e) Milestones not Required for Evaporation Ponds

The milestones required under Criterion 6A(1) do not generally extend to evaporation ponds, because they generally do not have a final radon barrier. In the NRC Preamble, page 28224, NRC states:

> Note, as discussed in EPA's statements of consideration for its amendment of 40 CFR part 192 (at FR 32183, June 8, 1993 and reiterated at 58 FR 60354; November 15, 1993), the reclamation of evaporation ponds may be dealt with separately from meeting the expeditious radon cover requirements if deemed appropriate by the Commission or the regulating Agreement State. This may be the case whether or not the evaporation pond area is being used for continued disposal of byproduct material.

In our view, milestones need not be set for reclamation of evaporation ponds unless such reclamation is a required step that needs to be done *after* a conventional impoundment (which would require a radon barrier) begins final closure and prior to placement of the final radon barrier. In most cases, reclamation of evaporation ponds could be accomplished independently of conventional impoundments, so milestones for evaporation ponds would not be required.

Further, in EPA's preamble to its amendment of 40 CFR Part 192 (FR, Vol 58, No. 108, June 8, 1993) (the "Subpart D Preamble") (see Appendix 4), EPA states on pages 32183-32184 that:

> EPA does not intend that the expeditious radon cover requirement extend to areas where evaporation ponds are located, even if on the pile itself, to the extent that such evaporation pond is deemed by the implementing agency (NRC or an affected Agreement State) to be an appropriate aspect to the overall remedial program for the particular site. Rather, the evaporation pond area may be covered to control radon after it is no longer in use and ready for covering. EPA believes the overall public health interest in comprehensively resolving the problems associated with each site is best served by requiring that the radon cover be expeditiously installed in a manner that does not require interruption of this aspect of remediation. Moreover, the ponds themselves serve as an effective radon barrier. Thus, this decision is bolstered by the absence of any evidence that there is a significant public health risk presented by the radon emissions from these evaporation ponds during the period they are employed as part of the overall remediation of the site. EPA believes that provided all other parts of the pile are covered with the radon barrier, compliance with the 20 pCi/m^2-s standard will result, and this will be maintained by covering the evaporation pond area when it is no longer in use.

It should be noted, however, that 40 CFR 61.251(o) of EPA's revised Subpart W regulations defines "Reclamation Plan" to mean a plan detailing activities and milestones to accomplish reclamation of tailings impoundments as well as the "removal and disposal of non-conventional impoundments," which includes evaporation ponds. It should also be noted that Subpart W provides that an approved reclamation plan prepared and approved in accordance with 10 CFR Part 40, Appendix A is considered a reclamation plan for purposes of Subpart W. EFRI is of the view that since an approved reclamation plan that meets the requirements of Appendix A, satisfies the definition of "Reclamation Plan" in Subpart W, and Appendix A does not require any milestones under Criterion 6A that do not relate to the placement of a final radon barrier on a tailings impoundment, any closure requirements in the Reclamation Plan relating to removal and disposal of non-conventional impoundments need not be milestones.

Nevertheless, although not required, we have added milestones for the removal and disposal of non-conventional impoundments to revised Section 6 of the Reclamation Plan. Although these milestones are not milestones required under Criterion 6A(1), EFRI has committed in revised Section 6 that for purposes of the Reclamation Plan they will be treated as milestones as required by Criterion 6A(1), and as a result EFRI has committed that they will be subject to the provisions of Criterion 6A(2).

f) The Guiding Objective is to Complete the Final Radon Barrier Within Seven Years of a Tailings Impoundment Ceasing Operations

The *Memorandum of Understanding* (the "MOU") (see Appendix 5) *Between EPA, NRC and The State of Colorado, Texas, and Washington Concerning Clean Air Act Standards for Radon Releases from Uranium Mill Tailings, Subparts T and W, 40 CFR Part 61*, dated October 1991, which was entered into in connection with the rescission of 40 CFR Part 61 Subpart T, states that:

> EPA, NRC and affected Agreement States are entering into this MOU to ensure that owners and operators of existing uranium mill tailings disposal sites licensed by the NRC, or the affected Agreement States, who have ceased operation, effect emplacement of a final earthen cover to limit radon emissions to a flux of no more than 20 $pCi/m^2/s$, as expeditiously as practicable considering technological feasibility. *A guiding objective is that this occur to all current disposal sites (see attachment A) by the end of 1997, and within seven years of when the existing operating and standby sites cease operation.* The final closure requirement shall be enforceable by NRC or the affected Agreement States." (Emphasis added).
>
> The MOU also states that: NRC or the affected Agreement States will ensure that the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility and that cover emplacement of the tailings impoundments occurs as expeditiously as practicable

> considering both short-term reductions in radon releases and long-term stability of the uranium tailings.

On November 15, 1993, EPA amended 40 CFR part 192 subpart D to provide for site closure to occur as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee). In the Subpart D Preamble, EPA noted on page 36285 that:

> The goal of the amendments to subpart D is for existing sites, or those that become non-operational in the future, to achieve compliance as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees) within the time periods set forth in the MOU, including Attachment A thereto, and for new sites to achieve compliance no later than seven years after becoming non-operational.

In the Subpart D Preamble, page 36288, EPA notes that:

> EPA has modified its UMTRCA regulations (40 CFR part 192 subpart D) to require compliance with the 20 pCi/m^2-s flux standard as expeditiously as practicable considering technological feasibility (and factors beyond the control of the licensee), and to require appropriate monitoring to verify the efficacy of the design of the permanent radon barrier. By definition, no more rapid compliance can occur, as a practical matter, because this schedule represents the earliest that the sites could be closed when all factors are considered. EPA expects that these compliance schedules were developed and will be modified consistent with the targets set forth in the MOU as reasonably applied to the specific circumstances of each site. When EPA promulgated subpart T it recognized that many sources might not be able to comply with the two year compliance date then required pursuant to section 112. Based on this, subpart T includes a provision that in such a case EPA would 'establish a compliance agreement which will assure that disposal will be completed as quickly as possible.' 40 CFR 61.222(b). The time period required for closure under subpart D embodies the same approach. In practice, therefore, both subpart T and subpart D establish the same basic timeframes for achievement of the flux standard. Assuming NRC and the Agreement States faithfully implement subpart D and the license amendments required under subpart D, EPA would not expect there to be any significant difference between these two programs in the amount of time required for sites to comply with the radon flux standard.

Further, on page 36286, EPA states that: "although NRC's conforming regulations are not identical to subpart D, the differences are minor in nature, and properly reflect application of the subpart D requirements to NRC's separate regulatory program."

The milestones set out in revised Section 6 of the Reclamation Plan are consistent with the targets set forth in the MOU as reasonably applied to the specific circumstances of the Mill

site. The milestones require that the final radon barrier be placed as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees), as reasonably applied to the specific circumstances of the Mill site, and require that the final radon cover be completed within the seven-year guiding objective set forth in the MOU.

g) Schedules and Conditions for Effecting Final Closure must be Flexible.

The MOU states that:

> NRC or the affected Agreement States will ensure that the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility and that cover emplacement of the tailings impoundments occurs as expeditiously as practicable considering both short-term reductions in radon releases and long-term stability of the uranium tailings.

In revised Section 6 of the Reclamation Plan, we have set the milestones and schedule commitments for impoundments to be as firm as possible, while maintaining enough flexibility to contemplate technological feasibility, with an outside date of seven years from commencement of final closure for placement of the final radon barrier, in the case of conventional impoundments, as well as for removal and disposal, in the case of non-conventional impoundments. In the case of conventional impoundments, we have retained some flexibility to place Layer 2 (the final radon barrier) before or after completion of dewatering because the weight of Layer 2 may help to speed up the dewatering in some circumstances, which would help to expedite closure. In any event, Layer 2 (the final radon barrier) would be required to be placed within seven years from commencement of final closure of the impoundment. We have also added flexibility to add Layer 3 before or after completion of dewatering for the same reasons. We have added flexibility to complete dewatering up to two years after the final radon barrier is placed on the impoundment to allow some time for any resulting settlement, and we have added flexibility to place Layer 4 on the impoundment up to two years after placement of Layer 3, also to allow some time for any resulting settlement. None of this flexibility changes the seven-year milestone for completion of placement of the final radon barrier. We believe this flexibility is necessary to allow for proper dewatering and settlement.

We have added some flexibility to the milestones for removal and disposal of each non-conventional impoundment. We have set five years as the milestone to remove all freestanding liquids from the impoundment. Net evaporation at the site is about 30 inches per year, not counting additional inflows from area drainage into the cells that would occur during storm events. The depth of solutions in evaporation ponds could exceed fifteen feet, which would require more than five years to evaporate the solutions if no other evaporative capacity is available at the site. We believe we should be able to manage this five-year milestone by using any additional evaporative capacity that may be available at the site, or by timing commencement of final closure of the impoundment such that evaporation within a

five-year period after final closure begins is reasonable to expect. It should be noted that the primary protection of Subpart W (requiring that all sediments in the pond be covered by solution) will apply prior to the impoundment commencing final closure, and for a good portion of the time it takes to evaporate the fluids (because solutions will continue to cover sediments during the evaporation process). We expect that the liners, sediments and any contaminated soils can be removed within three years thereafter, but in any event within a total elapsed time of seven years from the date final closure begins, and the milestone has been set accordingly.

These schedules are tight and fall within the seven-year goal. We do not believe it is reasonable to attempt to apply any further restrictions on the timing of any of the various steps. Although in some cases it may be possible to complete a step in less than the allocated time period, if commenced during the beginning of a construction season, it may take the full time period if commenced at a different time of the year. We have taken these seasonal matters into account in setting all of the milestones and schedule commitments.

h) Neither Subpart W, nor Appendix A, sets any timeframe or limit as to when an impoundment (whether conventional or non-conventional) must cease operation and begin final closure.

As discussed above, 40 CFR Part 61 Subpart W provides protection against radon flux while an impoundment is in operation. When the impoundment ceases operation and final closure begins, Subpart W no longer applies, but Appendix A takes over. Because Criterion 6(1) of Appendix A requires that the final radon barrier for a tailings impoundment must satisfy EPA's 20 $pCi/m^2/s$ standard, adequate protections against radon flux are ensured once the final radon barrier is constructed. The problem that 40 CFR Part 61 Subpart T was intended to address was the gap between the time an impoundment ceases operations, and Subpart W ceases to apply, and the time that the final radon barrier is completed under Appendix A. The requirement in Criterion 6A(1) for milestones therefore applies only to ensure the timely placement of the final radon barrier and for no other purpose, so as to make sure this gap is as short as practicable considering technological feasibility. ***Neither Subpart W, nor Appendix A, sets any timeframe or limit as to when an impoundment (whether conventional or non-conventional) must cease operation and begin final closure.*** This is because the protections in Subpart W continue so long as an impoundment is in operation, so there is no need to limit the period of operations. ***The milestones and targets only apply after an impoundment ceases operations and Subpart W no longer applies.***

Subpart T applied to mill tailings "piles" that were no longer operational. The definition of "operational" in Subpart T stated that "A pile cannot be considered operational if it is filled to capacity or the mill it accepts tailings from has been dismantled or otherwise decommissioned". Subpart T was challenged by a number of parties, including the American Mining Congress and NRC on the basis that Subpart T was unnecessarily burdensome and duplicative with NRC regulations, and because it was physically impossible to come into compliance with Subpart T in the time required. Subpart T was rescinded by EPA in 1994 and the definition of "operational" was replaced with a definition of "operation," and the

concept that an impoundment cannot be considered operational or in operation if it is filled to capacity or the mill it accepts tailings from has been dismantled or otherwise decommissioned was eliminated. As a result, after the rescission of Subpart T, there was no requirement for an impoundment to be deemed to be in final closure just because the mill site may be in closure or decommissioned.

This has been confirmed by the NRC in the NRC Preamble, page 28228, where NRC stated that:

> If Subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

Reclamation Plan Revision 5.1 has a handful of deadlines that run from the date "final closure" begins or from a prior reclamation step. For example, the plan commits Energy Fuels to recontour impoundments within 180 days after freestanding liquids are removed.[118] The interim cover must be finished anywhere from 19–33 months after recontouring is complete.[119] Other steps follow similar patterns.[120]

EFRI Response:

We believe the milestones currently in Section 6 of the Reclamation Plan set out enforceable deadlines. However, in order to address this concern, we have revised the milestones in Section 6 to be tied to years from the date of commencement of final closure, as suggested by the commenter.

The plan sets no deadlines, however, for some key reclamation steps. Cell dewatering, for example, is subject to no time limit. Instead, the plan has a performance standard to determine when enough dewatering has occurred to allow for placement of the final-cover layers.[121] There is also no deadline for removing freestanding liquids.[122] Instead, the plan explains that, when final closure begins, Energy Fuels will "minimize" the addition of liquids to the impoundment, except for precipitation, and let liquids evaporate (unless they can be pumped elsewhere without interfering with mill operations).[123]

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern. Specifically, revised Section 6 states that the Mill will cease to add liquids to an impoundment once final closure begins.

This doesn't comply with Appendix A. The "milestones" in reclamation plans must be actions or events that are "required to occur by an enforceable date."[124] The dewatering performance standard that Energy Fuels proposes thus doesn't qualify as a "milestone," nor does a

commitment to "minimize" the addition of liquids to impoundments. Enforceable deadlines must be established for both tasks.

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern.

Energy Fuels asserts that the time needed to dewater and stabilize impoundments "depends on physical and technological factors beyond [its] control," and that it is thus "not possible to establish absolute deadlines or milestones" when the reclamation plan is approved.[125] This argument lacks merit for three reasons.

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern. Although the milestones as currently drafted are enforceable, the milestones have been adjusted in revised Section 6 to be tied to specific periods of time from the date final closure begins.

First, there are no exemptions from Appendix A's deadline-setting requirements, for factors that are beyond Energy Fuels' control or otherwise. Factors beyond the licensee's control are a failsafe for Appendix A's expeditious-closure standard, but they are not an excuse for leaving deadlines out of reclamation plans. Again, Appendix A requires impoundments to be closed "as expeditiously as practicable considering technological feasibility."[126] That is basically a performance standard—one that specifies how fast impoundments must be closed ("as quickly as possible") and what considerations may temper that pace (physical characteristics of the site, technological limitations, compliance with other regulatory programs, and factors beyond the licensee's control).[127] So, when Energy Fuels points to "physical and technological factors beyond [its] control" as a reason not to set deadlines, it's borrowing language from Appendix A's definition of the phrase "as expeditiously as practicable considering technological feasibility."

But that language has nothing to do with Appendix A's deadline-setting requirements. Milestones must be established wholly apart from the expeditious- closure standard.[128] And there are no exemptions whatsoever from Appendix A's milestone requirements. Put differently, factors beyond a licensee's control may be an acceptable justification for missing a deadline, but they are not a justification for not setting one.

Second, there is a failsafe in Appendix A if deadlines cannot be met. Deadlines may be extended, but only after allowing public participation, only after finding that radon-222 releases from the impoundment are less than 20 pCi/(m2-sec) on average, only if radon-222 emissions are monitored annually during the period of delay, and if an extension for placing the final radon barrier is sought based on cost, only after even more criteria are met.[129] By failing to include absolute deadlines in its plan, Energy Fuels is impermissibly attempting to bypass these requirements.

Third, it is possible to estimate how long it will take to stabilize an impoundment and set deadlines based on that estimate. For cell dewatering, in fact, Energy Fuels has already made those estimates for all the mill's impoundments. To develop Reclamation Plan Revision 5.1, Energy Fuels modelled the cell dewatering times for Cells 2 and 3 to be 10 years.[130] And the company has modelled the dewatering time for the cell design used for Cells 4A and 4B to be 5.5 years.[131] The company's reclamation plan also has comparable estimates of the time needed to dewater those cells, plus an estimate of two years to dewater Cell 1.[132] Comparable modelling can no doubt be completed for the time needed for evaporating the estimated volume of freestanding liquids at the time final closure begins.

The Division accordingly should insist that enforceable deadlines be established in Plan Revision 5.1 for all reclamation steps that are key to completing the final radon barrier, including removal of freestanding liquids and dewatering. It is essential that the schedule of milestones be structured so that the first deadline starts running the moment that "final closure" begins, and the time limit for each subsequent reclamation step is automatically triggered when the prior step is completed or the deadline for the prior step passes, whichever occurs first. And the Division should require Energy Fuels to eliminate all qualifications and caveats from the schedule, such as allowing for "such longer time as may be required [to recontour an impoundment] if instability of the tailings sands restricts or hampers such activities."[133] That is the only way to make sure that deadlines have teeth and can only be extended for a good reason after going through the process Appendix A demands.

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses these concerns.

A proper schedule would conceptually work as set out in the following table (though we don't pass judgement on whether the time limit listed below for each step is appropriate):

Reclamation Task	***Milestone***
Removing Freestanding Liquids	*Freestanding liquids will be removed from the impoundment 180 days after final closure begins.*
Recontouring	*Recontouring of the impoundment will be complete 90 days after freestanding liquids are removed or 270 days after final closure begins, whichever occurs first.*
Interim Cover Layers	*Interim cover will be extended over the entire impoundment within 270 days after recontouring is complete or 540 days after final closure begins, whichever occurs first.*
Dewatering	*Dewatering of the impoundment will be complete within 5 years and 180 days after interim cover is placed or 7 years after final closure begins, whichever occurs first.*
Final Cover Layers	*Final cover layers will be placed within 365 days after dewatering is complete or 8 years after final closure begins, whichever occurs first.*

Reseeding Vegetative Cover	*Seeding for revegetation will be complete within 270 days after the final cover layers are placed or 8 years and 270 days after final closure begins, whichever occurs first.*

Composing the schedule this way is clear and establishes true "milestones" that are required to occur by an enforceable date. If Energy Fuels ends up needing more time for any task, it may request an extension as provided by Criterion 6A in Appendix A: after public participation, only if radon-222 emissions are monitored annually during the period of delay and stay below 20 pCi/(m2-sec) on average, and if an extension for placing the final radon barrier is sought based on cost, only if the Division finds that Energy Fuels is "making good faith efforts to emplace the final radon barrier, the delay is consistent with the definition of available technology, and the radon releases caused by the delay will not result in a significant incremental risk to the public health."[134]

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses these concerns.

In addition to requiring Energy Fuels to modify the schedule of milestones in Revision 5.1 according to the structure illustrated above, the Division should require Energy Fuels to:

- *Establish an absolute deadline for removing freestanding liquids, such as 180 days after final closure begins. Also, to meet Appendix A's requirement that impoundments be closed as quickly as possible considering technological feasibility, require Energy Fuels to stop adding liquids to the impoundment once final closure begins (rather than to "minimize" addition of liquids) and to pump freestanding liquids into other operating cells, regardless of whether doing so will force the company to curtail mill operations.*

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses these concerns.

- *Eliminate the proviso in the recontouring milestone that allows for more than 180 days to finish recontouring "as may be required if instability of the tailings sands restricts or hampers such activities."*[135] *If Energy Fuels needs that deadline to be extended, it may apply for an extension as provided by Appendix A.*

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern. The proviso referred to has been eliminated.

- *Establish an absolute deadline for completing dewatering that is based on current modelling of how long it will take to meet the settlement performance standard in the plan (e.g., for Cells 4A and 4B, 5.5 years after dewatering is commenced). If the*

> *settlement performance standard is met before the deadline, then the deadline for the next reclamation task (placement of final cover layers) should be triggered. If the deadline cannot be met despite proceeding "as expeditiously as practicable considering technological feasibility," as that phrase is defined by Appendix A, then Energy Fuels may apply for an extension according to the process laid out in Criterion 6A. The same modification should be made to the Stipulation and Consent Agreement for completing the final cover on Cell 2.*

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern. The total time allocated to complete the final radon barrier is estimated to be seven years, which meets the goals set by EPA as stated in the MOU. Note, however, that it is not possible or necessary to add the level of structure suggested above. The key requirement is that the milestones set out an enforceable schedule that meets the stated goals. As stated in the MOU, it is important to ensure that "the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility." For the reasons stated above, the milestones in revised Section 6 of the Reclamation Plan are as tight as we believe would be reasonably achievable. We can't control physical features and seasonal constraints with any more precision than as drafted in revised Section 6.

- *Delete the second paragraph in Section 6.1 of the plan, which inaccurately asserts that "it is not possible to establish absolute deadlines or milestones for reclamation at the time of approval of this Plan."*[136] *Delete comparable statements elsewhere in the Plan that deadlines cannot be established.*[137]

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern. Those deletions have been made.

- *Set a deadline for establishing vegetative cover and diversity that meets the design criteria for the ET cover. This modification should also be made to the Stipulation and Consent Agreement for completing the final cover on Cell 2.*

EFRI Response:

As stated above, the milestones required under Criterion 6A do not include erosion protection barriers or other features necessary for long-term control of the tailings. In the NRC Preamble, page 28227, NRC states that:

> The final rule has been modified so that the terminology "as expeditiously as practicable considering technological feasibility" is used only for emplacement of the final radon barrier. A general timeliness standard for completing erosion protection features is retained. Thus, it is clear that the licensee must complete

> these actions in a timely way and that the NRC has the authority to take action if necessary in this regard. However, the restrictive cost considerations specified for the completion of the final radon barrier do not apply to decisions concerning the timeliness of completion of erosion protection features. Instead, the more flexible, general cost considerations of the AEA (Section 84a(1)) apply. (NRC 2015b)

Accordingly, revised Section 6 of the Reclamation Plan does not set milestones relating to vegetative cover. Instead it sets schedule commitments for completion of those activities. As those schedule commitments are not milestones required by Criterion 6A(1), the provisions of Criterion 6A(2) do not apply to those schedule commitments. Rather, EFRI is required to complete those activities in a timely way, and the Director has the authority to take action if necessary in this regard.

2. The schedule that applies if the mill is closed violates Appendix A.

If Energy Fuels decides to shut down the mill, Plan Revision 5.1 modifies the impoundment cleanup deadlines that would apply to impoundments that are closed while the mill is running.[138] *Rather than establish deadlines that run from the day final closure of each remaining impoundment begins (as required by Appendix A), Revision 5.1 says that Energy Fuels will submit a separate decommissioning schedule to the Division when the mill closes.*[139] *Only after the Division approves that schedule would any closure deadlines be triggered.*[140]

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern. Deadlines are established that run from the day final closure of each impoundment begins. The requirement for the Division to approve a schedule has been removed.

Under this plan, Energy Fuels would start demolishing the mill and retrieving windblown tailings 180 days after the schedule is approved and "sufficient" solutions evaporate from the cell that the dismantled mill will go in.[141] *Unreclaimed impoundments would be closed one-by-one, starting "as soon as reasonably practicable" after the Division approves the schedule.*[142] *So, if Energy Fuels closed the mill with five operating impoundments, until closure of the first impoundment was complete, the company wouldn't be required to start the first steps in its reclamation plan for the second impoundment—such as finishing placement of interim cover, recontouring, and dewatering (which could take years). And only after closing the second impoundment, would closure of the third impoundment have to begin, and so on. This could take decades.*

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern.

As stated above, nothing in Appendix A or Subpart W sets a time limit for when an impoundment (whether conventional or non-conventional) must cease operation and go into final closure, because Subpart W continues to apply so long as the impoundment is in operation. The milestones required under Criterion 6A only apply after the impoundment begins final closure, which is when Subpart W no longer applies to the impoundment. They do not dictate when final closure begins.

Revised Section 6 of the Reclamation Plan sets out milestones relating to closure of each conventional impoundment and each non-conventional impoundment. Those milestones commence when the impoundment begins final closure, regardless of whether that is prior to, during or after final closure of the mill facility itself. It is expected that one or more impoundments will continue in operation during the final mill closure process in order to receive decommissioning byproduct material.

Impermissible delay taints this plan. The day "final closure" of an impoundment at the mill begins, the clock must start ticking on closure milestones—meaning enforceable deadlines—for that impoundment.[143] *When the mill closure begins, it's necessarily true that "final closure" of all operating impoundments will begin. Initiating closure of the mill, that is, necessarily means that the whole facility is being managed in accordance with the mill's reclamation plan, including all impoundments that were still in operation. And that means all operating impoundments will enter "final closure": namely, "the period during which [the] impoundment ... is being managed in accordance with the milestones and requirements in an approved reclamation plan."*[144] *Thus, initiating mill closure must simultaneously trigger "final closure" of all operating impoundments. And under Criterion 6A of Appendix A, that must trigger closure milestones.*

EFRI Response:

See revised Section 6 of the Reclamation Plan, which addresses this concern.

It is incorrect to state that "when Mill closure begins, it's necessarily true that 'final closure' of all operating impoundments will begin." As stated above, Criterion 6A(1) applies to each non-operating impoundment. Neither Criterion 6A nor Subpart W dictates when an impoundment must begin final closure. Again, that is because the protections of Subpart W continue while an impoundment is in operation, so the rules are not concerned about when operations cease. They are only concerned about setting milestones that commence when each impoundment begins final closure, because the protections of Subpart W no longer apply to each such impoundment.

In revised Section 6, appropriate milestones are set for completing the final radon barriers for all tailings impoundments, which are tied to when each such impoundment ceases operation. It should be noted that, as the Grand Canyon Trust has pointed out above, a tailings impoundment is in operation so long as it is receiving byproduct material for disposal. As all of the site decommissioning materials, windblown materials, evaporation pond liners etc., must be disposed of into the Mill's remaining tailings impoundments, and such materials are 11e.(2) byproduct material, one or both of the remaining tailings impoundments continue in operation until all such

materials are disposed of in the tailings impoundments. The milestone for placing the final radon barrier on each remaining tailings impoundment must therefore be tied to the day that each such impoundment ceases operations. In accordance with Subpart W, a maximum of only two conventional impoundments will remain in operation at any one time. The milestones and targets in revised Section 6 of the Reclamation Plan set milestones and targets that address these matters.

It is not uncommon for a licensed uranium mill to maintain an impoundment in operation indefinitely after the rest of the Mill is decommissioned, to perform licensed operations, such as to receive 11e.(2) byproduct material from In Situ Recovery operations for direct disposal. In those cases, Subpart W continues to apply (which limits the number of impoundments that are in operation at any one time to two or fewer), so long as the impoundment continues in operation. There is no reason to assume that all impoundments cease operation upon commencement of Mill closure, and as discussed above, they are considered to remain in operation as long as they receive Mill decommissioning byproduct material.

Further, as discussed above, in the NRC Preamble, page 28228, NRC states that:

> If subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

The upshot is twofold: (1) deadlines must be established for closing the last impoundment that account for decommissioning the mill and other structures and burying them in that impoundment before the final radon barrier is placed; (2) closure of all unreclaimed impoundments must proceed simultaneously, not one-by-one.

EFRI Response:

See previous comment. Revised Section 6 sets out all milestones required under Criterion 6A(1) and satisfies all requirements contemplated by Subpart W with respect to conventional and non-conventional impoundments that have ceased operation. As Subpart W applies while an impoundment is in operation, there is no requirement to dictate when an impoundment must cease operation and commence final closure.

The reasoning behind the first point is simple. Energy Fuels plans to bury the mill and other leftover waste in the last open impoundment. Until that happens, it's impossible to place the final radon barrier on the last unreclaimed cell. And Appendix A requires a deadline to be set for completing the final radon barrier for that cell, like all others at the mill. Thus, to comply with Appendix A, a deadline must be established now for building the final radon barrier on the last unreclaimed cell that is based on a predicted decommissioning schedule for the rest of the mill.

The second point likewise follows from the standards in Appendix A. Closing impoundments one by one is impermissible under Appendix A because Criterion 6A insists that impoundments be closed "as expeditiously as practicable considering technological feasibility" after they stop operating.[145] *That phrase means "as quickly as possible" considering physical site characteristics, technology, regulatory requirements, and uncontrollable factors.*[146] *Waiting to start reclaiming an impoundment until closure of another impoundment is complete, by definition, cannot amount to closing the idle impoundment "as quickly as possible." Energy Fuels hasn't identified any physical characteristics of the mill site, technological limitations, or regulatory requirements that would justify closing impoundments sequentially. And the Division should prohibit the company from doing so.*

EFRI Response:

See the previous response. Nothing in Criterion 6A(1) or Subpart W dictates when an impoundment must cease operations and go into final closure. Subpart W applies to each impoundment when it is in operation, and the milestones required under Criterion 6A(1) commence when final closure of the impoundment begins and Subpart W no longer applies. *The purpose of this regulatory program is to ensure that there is no unregulated gap in radon protection, not to shut down uranium mills or their impoundments.*

The Division accordingly should require Energy Fuels to revise the reclamation plan so that:

- *Initiating mill closure also initiates final closure of all operating impoundments (including conventional and non-conventional impoundments alike, and triggers milestones for closing those impoundments;*

EFRI Response:

See the responses above. Milestones must be set for all non-operating tailings impoundments. A tailings impoundment is in operation so long as it is receiving byproduct material, which for some or all of the impoundments will continue throughout the Mill decommissioning process. Appropriate milestones have been set in revised Section 6 of the Reclamation Plan, which commence when each impoundment ceases operation, as required by Criterion 6A(1).

In the preamble to the Subpart W rulemaking (FR Vol. 82, No. 10 January 17, 2017) (the "Subpart W Preamble"), EPA states at page 5168 that:

> In 10 CFR Part 40, Appendix A, NRC identifies *a reclamation plan as applicable to individual impoundments, while the closure plan is a more comprehensive document that addresses all aspects of facility closure and decommissioning,* including any necessary site remediation. A reclamation plan prepared and approved in accordance with NRC requirements in 10 CFR Part 40, Appendix A, is considered a reclamation plan for purposes of Subpart W. The reclamation plan may be incorporated into the larger facility closure plan

(Emphasis added).

On page 5171 of the Subpart W Preamble EPA states that:

> Both 40 CFR 192.32(a)(3) and 10 CFR Part 40 Appendix A, Criterion 6(a) provide for the use of impoundments while they are undergoing closure. However, impoundments that are used to manage uranium byproduct material or tailings generated during closure or remediation activities, while remaining open to manage operational wastes, would continue to fall under Subpart W until they formally enter the closure process and implement *the approved reclamation plan for that impoundment.*

(Emphasis added).

Further, at page 5168 of the Subpart W Preamble, EPA stated: "[a]n impoundment remains "operating" until it enters closure, even if it is not receiving newly-generated uranium byproduct material or tailings from facility processing (79 FR 25404)."

Finally, at page 5166 of the Subpart W Preamble, EPA states that ". . . [n]on-conventional impoundments remain subject to the requirements of Subpart W until they enter final closure pursuant to an approved reclamation plan *for that impoundment*, even if at some point in their operational life *they are used for the purpose of managing liquids from closure or remediation activities.*" (Emphasis added).

It is clear from the foregoing that initiating Mill final closure does not initiate final closure of individual impoundments. There is nothing in the regulatory regime that requires this, nor should there be, since Subpart W continues until final closure of the impoundment begins, so there is no gap.

- *The plan includes a schedule for decommissioning activities that Energy Fuels must accomplish before completing the final radon barrier, such as dismantling the mill, digging up any non-conventional impoundments that won't be closed in place, and burying those materials in the last impoundment.*

EFRI Response:

These matters are addressed in revised Section 6 to the Reclamation Plan.

Milestones are only applicable to placement of the final radon barrier on tailings impoundments after they have ceased to be in operation. As stated above, in describing Criterion 6A in the NRC Preamble, page 28225, NRC states that: "no deadlines are required to be established in the licenses beyond completing the final radon barrier as a result of this rulemaking and that any other schedules established in a license do not come under the specific provisions of paragraph (2) of Criterion 6A". In the NRC Preamble, page 28228, NRC further states that:

> If subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

Further, as Grand Canyon Trust has pointed out, a tailings impoundment is in operation so long as it is receiving byproduct material, which will of necessity require that all or some of the impoundments must continue in operation during the entire Mill decommissioning process. As Criterion 6A only requires milestones to be applied after an impoundment ceases operation, the milestones required under Criterion 6A only apply once the impoundment ceases operations; they are not intended to set dates by which an impoundment must cease operations.

3. Deadlines must be established as a condition of the radioactive materials license.

Criterion 6A in Appendix A is clear that "[d]eadlines for completion of the final radon barrier" and, if applicable, other interim milestones "must be established as a condition of the individual license."[147] The Division's draft radioactive materials license doesn't do that. It's completely silent on the subject.

The consequences of this lapse are more than ministerial. Under the Utah Radiation Control Act, civil penalties may be assessed for violating a radioactive materials license.[148] Thus, putting reclamation deadlines in the license, as the Division is required to do, will give Energy Fuels more incentive to meet them and the Division more clout if Energy Fuels doesn't.

The Division should correct this omission by stating as a condition of the license all milestones that are expressed in Plan Revision 5.1 (as revised according to our comments above).

EFRI Response:

The Mill's Reclamation Plan is incorporated by reference into the Mill's license, and is enforceable as if it were stated in the License. There is no need to include the milestones in the License per se.

G. The liner design for the Cell 1 disposal area is inadequate.

Under Reclamation Plan Revision 5.1, Energy Fuels is planning to dig up Cell 1, its liner, and contaminated soil beneath the cell and place all that material in another cell.[237] After that, the plan gives Energy Fuels the option to use part of the pit left behind as a cap-in-place disposal area for other "contaminated materials and debris from the Mill site decommissioning and windblown cleanup."[238] If this happens, Energy Fuels plans to line this "Cell 1 Disposal Area" with a 1' clay liner, fill it with contaminated waste, and cap it with the ET cover.[239]

That plan flouts the law's design requirements for burying uranium-milling waste. The UMTRCA standards set by EPA require all surface impoundments to be built according to EPA's design

standards for hazardous-waste impoundments,[240] *which appear at 40 C.F.R. § 264.221. Under those rules, all impoundments built after 1992 must have "two or more liners and a leachate collection and removal system between [those] liners."*[241] *Utah's groundwater-protection rules similarly require waste-storage pits to be designed according to the "best available technology."*[242] *Under these standards, a clay liner doesn't cut it.*

It's not clear why Energy Fuels' plan for the Cell 1 Disposal Area disregards these design requirements. The mill-decommissioning waste slated to go into the Cell 1 Disposal Area is undoubtedly "uranium byproduct material," as EPA (and the Nuclear Regulatory Commission and State of Utah) define that term: "the tailings or wastes produced by the extraction or concentration of uranium from any ore processed primarily for its source material content."[243] *After all, if that waste weren't uranium byproduct material, Energy Fuels wouldn't be licensed to possess or discard it.*[244]

Perhaps Energy Fuels believes that EPA's general UMTRCA standards don't apply to the company's operations at White Mesa when the Nuclear Regulatory Commission's rules don't conform precisely to EPA's standards, which is the case for the impoundment-liner standard. The Nuclear Regulatory Commission's liner requirements in Appendix A duplicate EPA's design standards for hazardous-waste impoundments built before 1992 but don't regurgitate EPA's standards for impoundments built after 1992.[245] *Criterion 5A in Appendix A says that impoundments "must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, groundwater, or surface water at any time during the active life (including the closure period) of the impoundment."*[246] *Even under that standard, a geomembrane rather than a clay liner is almost always required.*[247]

But even if Appendix A can be read to have a more lenient liner standard than EPA's standard for hazardous-waste impoundments, EPA's standard still applies. The language in EPA's general UMTRCA standards applies directly to uranium-milling operations. As those standards say at the outset:

This subpart applies to the management of uranium byproduct materials under section 84 of the Atomic Energy Act of 1954 (henceforth designated "the Act"), as amended, during and following processing of uranium ores, and to restoration of disposal sites following any use of such sites under section 83(b)(1)(B) of the Act.[248]

There is no doubt that Energy Fuels is managing uranium byproduct materials at the mill. And the design standard in EPA's rule is phrased to apply directly to uranium-mill operators. It says that "surface impoundments subject to this subpart must be designed, constructed, and installed in such a manner as to conform to the requirements of § 264.221 of this chapter...."[249] *That expresses a command that Energy Fuels must comply with, regardless of whether Appendix A has the same command.*

Even assuming (for the sake of argument only) that EPA's general UMTRCA standards don't apply to Energy Fuels' when the Nuclear Regulatory Commission's rules don't conform to EPA's standards the company is still required to comply with EPA's standards for two reasons.

First, Utah state law requires all waste pits that may discharge pollutants to be built using the best available technology and that technology are to use double-liners with an interstitial leak-detection system.[250] That is at least one reason why Cells 4A and 4B at the mill were built to that standard.[251] And there's no reason the "best available technology" for discarding uranium byproduct material in the Cell 1 Disposal Area should be any different.

Second, EPA's radon-emission standards in Subpart W require surface impoundments used for discarding uranium byproduct material to comply with the agency's design standards for hazardous-waste impoundments.[252] That rule prohibits owners and operators of uranium mills from building a new "conventional impoundment" unless that impoundment is designed and built to "comply with the requirements of 40 CFR 192.32(a) (1)."[253] And, again, 40 C.F.R. § 192.32(a) (1) explicitly requires impoundments used for discarding uranium byproduct material to be built according to EPA's standards for hazardous-waste impoundments, which demand double liners and a leak-detection system for impoundments built after 1992.[254] The Cell 1 disposal area meets the definition of a "conventional impoundment" under 40 C.F.R. § 61.251 because it will be a "permanent structure located at any uranium recovery facility which contains mostly solid uranium byproduct material or tailings from the extraction of uranium from uranium ore.[255]" It therefore must be designed to comply with EPA's surface impoundment design standards under UMTRCA that are codified at 40 C.F.R. § 192.32(a)(1).[256]

True enough, Subpart W states at the outset that it "does not apply to the disposal of tailings,"[257] and perhaps Energy Fuels is silently relying on that statement to sidestep the liner requirements for the Cell 1 Disposal Area. But the Cell 1 Disposal Area will be placed in "operation" within the meaning of Subpart W, and that makes the area subject to Subpart W's impoundment-design requirements, even if the rest of Subpart W's requirements cease to apply immediately. The term "operation" means "that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins."[258] So, as soon as uranium byproduct material is placed in the Cell 1 Disposal Area, it will go into "operation," even if "final closure" begins the same day. That is enough to make Subpart W's design standard for conventional impoundments applicable.

EFRI Response:

The so-called "Cell 1 Disposal Area" is not something new that EFRI added to the Reclamation Plan arbitrarily or to "flout" applicable regulations. The Cell 1 Disposal Area is part of the Mill's existing license. It was reviewed and approved by the NRC and was the subject of a specific license amendment (Amendment 15) in July 2000, which was supported by a Technical Evaluation Report the "Technical Evaluation Report") dated July 13, 2000. (.

NRC's interpretation and implementation of its regulations in Appendix A are determinative. The Mill is not directly regulated by EPA's standards at 10 CFR Part 192. Those regulations merely set the standards to be adopted by NRC in its regulatory program, and do not form a parallel regulatory regime applicable to uranium mill licensees. The AEA grants the EPA authority only to *promulgate* "standards of *general* application... from radiological and nonradiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, as defined in section 11e.(2) of this Act (NRC 2015a), at sites at which ores are processed primarily for their source material content or which are used for the disposal of such byproduct material" (AEA §275(b)(1)) (NRC 2015c) (Emphasis added). In contrast, Section 84(a) (NRC 2015b), grants exclusive *management* authority to the Atomic Energy Commission, now the NRC over 11e.(2) byproduct material "in such manner as the Commission deems appropriate" (§84(a)(1)) (NRC 2015b) while conforming "with applicable general standards promulgated by the Administrator of the Environmental Protection Agency under section 275" (§84(a)(2)) by establishing its own requirements "which are, to the maximum extent practicable, *at least comparable* to requirements... regulated by the Administrator under the Solid Waste Disposal Act..." (§84(a)(3)) (NRC 2015b).

EPA's standards were thus not intended to apply *directly* to uranium-milling operators. The purpose of this is clear from the legislative history – to avoid dual regulation by federal agencies (or their Agreement States) by allocating specific and distinct, exclusive roles to each, and providing license applicants with clear guidelines on which to rely. EPA confirmed this interpretation in the Subpart D Preamble (page 32184) by stating that:

> EPA is constrained by Congress in the scope of the UMTRCA amendments which the Agency may promulgate. EPA does not have the authority to provide for a legally enforceable means of compelling compliance with the UMTRCA requirements that are implemented by NRC. . . . EPA's role in amending UMTRCA encompasses promulgating generally applicable standards without specifying any particular method of control. . . . UMTRCA gives NRC and the Agreement States the responsibility to implement and enforce UMTRCA.

Nevertheless, even though the Cell 1 Disposal Area and its current design are an approved part of the Mill's existing license, EFRI is prepared to agree to revising the wording in the Reclamation Plan to state that the liner system for the Cell 1 Disposal Area will have the same basic design as the liner system for Cell 4B, including the same basic leak detection system design, with the specific details of the design to be submitted to the Director for approval prior to construction of the Cell 1 Disposal Area.

Comments are submitted by URANIUM WATCH, Living Rivers, and the Utah Chapter of the Sierra Club. These comments incorporate by reference comments submitted by the Ute Mountain Ute Tribe and the December 21, 2011, comments submitted by Uranium Watch et al.

4.10. License Condition 13.1.AA and Reclamation Plan Revision 5.1. License Condition 13.1 lists various Licensee submittals that the Licensee must comply with: "Except as specifically provided otherwise by this license, the licensee shall conduct operations in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below." License Condition 13.1.AA lists: "White Mesa Uranium Mill Reclamation and Decommissioning Plan Rev 5.1, from Energy Fuels dated August 10, 2016 and February 23, 2017 to UDWMRC."

COMMENT

4.10.1. The Renewed License should have a specific Section and License Condition for the Reclamation Plans, not just a reference at the end of a list of other Licensee submittals. If the Division approves Reclamation Plan Rev. 5.1., there should be a separate License Condition that reflects that submittal and any other submittals (such as the 2017 "Stipulated Consent Agreement") that should be referenced in a License Condition set aside for Reclamation Plans incorporated into the License.

EFRI Response:

As stated above, the Mill's Reclamation Plan is incorporated by reference into the Mill's license, and is enforceable as if it were stated in the License.

4.10.2. The draft License does not include any reclamation milestones associated with the reclamation Plan, specifically milestones for the closure of Cell 2. Enforceable reclamation milestones are required under EPA[9] and NRC[10] regulations applicable to operational uranium mills. Milestones include dates for the placement of the interim cover, dewatering, cleanup of windblown tailings and other on-site and off-site contamination, and placement of the final radon barrier. The Licensee is in the process of dewatering Cell 2, placing an interim radon barrier, and other closure activities. Yet, the draft License and TEEA makes no mention of the need for the establishment of reclamation milestones.

EFRI Response:

See the discussion above and revised Section 6 of the Reclamation Plan, which sets out all required milestones. The definition of "Reclamation Plan" in 10 CFR Part 40 Appendix A contemplates that the schedule of milestones would be placed in the reclamation plan.

4.10.3. Reclamation Plan Rev. 5.1, regarding the establishment of reclamation milestones for the reclamation of Cell 2—the only Mill tailings impoundment undergoing closure—at Section 6.22 Deadlines and Interim Milestones for Closure of Cell 2 (page 6-3), states:

The deadlines and interim milestones for closure of Cell 2 will be set out in the SCA. The requirements set out in the SCA, when finalized, will be incorporated by reference into this Plan as if set out in this Plan.

The signed "Stipulated Consent Agreement" (SCA) was submitted to the DWMRC by Energy Fuels on February 20, 2017. The SCA includes proposed reclamation milestones for Cell 2 under Phase 1 Cover Construction in the "Agreement," page 3:

Cell 2 Phase 1 cover placement commenced in April 2016, and will be completed on or before August 31, 2017, or such later date as may be approved by the Director.

Other pertinent reclamation milestone are indicated, but without any certain dates. The milestone for the completion of the Cell 2 Phase 1 cover should be incorporated into the License as a license condition. If the August 31, 2017, date is not feasible, then it is the responsibility of the Licensee to notify the DWMRC and request an extension of the milestone. It is however, unclear if the SCA is a License Amendment request, or the Licensee must submit a separate request for the establishment of the milestones for Cell 2 outlined in the SCA.

EFRI Response:

The deadlines, interim milestones and scheduled dates for closure of Cell 2 are set out in the Stipulation and Consent Agreement (the "SCA"). The requirements set out in the ('SCA"), are incorporated by reference into the Reclamation Plan as if set out in the Reclamation Plan. The final radon barrier for Cell 2 (Layers 1 and 2 under the Proposed Cover Design) *has already been put in place.* Radon flux measurements taken since the final radon barrier have been placed onto Cell 2 have been well below the 20 $pCi/m^2/s$ standard set out in Criterion 6A. The milestones required by Criterion 6A, which milestones only relate to completion of the final radon barrier, have therefore been fully satisfied at this time. Nevertheless, detailed additional schedules and deadlines are set out in the SCA.

4.10.4. The License must submit license amendment requests for the establishment of any reclamation milestone and any extensions on established reclamation milestones. The Division cannot establish or amend a reclamation milestone, only approve a proposed milestone. Further, the Division is required by the EPA to publish a notice and request public comment on any licensee request for, or amendment to, a reclamation milestone and publish a notice and request public comment on the Divisions proposed approval of a reclamation milestone or amendment to established milestone.11 In this instance, the Division did not notice the Licensee's proposed milestone for completion of Cell 2 Phase 1 cover. The Licensee should have submitted a separate amendment request for approval of the milestone for completion of Cell 2 Phase I Cover. Division should have issued a separate notice and opportunity to comment on the establishment of the milestone, rather than hiding the proposed milestone within Reclamation Plan Rev. 5.1 and the SCA.

EFRI Response:

As stated above, the final radon barrier on Cell 2 has already been put in place, and radon measurements since placement have been well below the applicable standards.

4.10.5. The Division should incorporate time frames for other submittals indicated in the SCA within another Reclamation Plan license conditions, but not as reclamation milestones until a date certain has been proposed by the Licensee and approved by the Division.

EFRI Response:

As stated above, the final radon barrier on Cell 2 has already been put in place, and radon measurements since placement have been well below the applicable standards.

UTE MOUNTAIN UTE TRIBE – COMMENTS ON RADIOACTIVE MATERIALS LICENSE RENEWAL – PART 1- JULY 31, 2017

I-III-D Regarding Sec. 9.7 Cultural Resources Protections, the Tribe requests that procedures be implemented by the State of Utah at the White Mesa Mill for repatriation of human remains and related artifacts in the same manner as the Native American Graves Repatriation Act (NAGPRA).

Due to the sensitive and sacred nature of the lands the WMM sits upon, they are already subject to the Archaeological Protection Act of 1979 (ARPA) and the National Historic Preservation Act (NHPA). The Tribe believes that the Native American Grave and Repatriation Act (NAGPRA) should also be complied with in order to return to their ancestors any human remains, funerary objects and sacred objects found when the ground is disturbed.

EFRI Response:

The Native American Graves Protection and Repatriation Act ("NAGPRA") applies only to Native American human remains and cultural items which are excavated or discovered on Federal or tribal lands. *See* 25 U.S.C. § 3002 (granting "ownership or control over Native American cultural items which are excavated or discovered on Federal or tribal lands" to lineal descendants and culturally affiliated tribes) (Emphasis added). The Mill is not located on Federal or tribal lands; therefore, NAGPRA does not apply here.

However, there is a process in place for respectfully handling and arranging for the final disposition of human remains and cultural items discovered on the Mill property. Whenever any human remains or cultural items are discovered, EFRI notifies the State Historical Preservation Officer (SHPO) and EFRI's archaeological contractor who has been approved by the SHPO. In most cases, the contractor prepares and submits a research design plan, which must be approved by the SHPO before any work can begin. The contractor then removes the remains and cultural items in accordance with the approved plan. The items are sent to the Edge of the Cedars Museum in Blanding, Utah. Ownership and display details for all recovered items are delineated in the approved plans submitted to the SHPO.

I-III-E The Tribe would like the Tribal Historical Preservation Officer to be added to the Memorandum of Agreement and have the Tribe provide comments and amendments to the current MOA.

Long historical documented connection between the Ute Mountain Tribe and the sites at the mill. The ancestors of some Tribal Members may be located at the site, and the desecration of these causes cultural and spiritual damage to Tribal Members.

EFRI Response:

Section 9.7 of the License implements the terms of the Memorandum of Agreement ("MOA"), as amended, but the MOA was executed independently of the License. The Section 9.7 terms are being carried out satisfactorily and the commenter does not seek any specific changes to this section. The commenter's request to be added to the MOA is outside the scope of this proceeding.

I-III-Q The Ute Mountain Ute Tribe requests that the Emergency Preparedness Plan be amended to include notification procedures to the White Mesa Community and Ute Mountain Ute Tribal officials. In addition, there are no specific procedures in the Emergency Response or the Environmental Monitoring Handbook for trucks delivering specifically delivering ISL Material; these need to be developed.

The White Mesa Ute community, a sovereign government, who shares a boundary with the mill, is not on any list or communication tree for ANY emergency involving potential off-site or public releases of hazardous or radiological substances. They are not listed as contacts within any of these documents:

- *EMERGENCY RESPONSE MANUAL FOR URANIUM CONCENTRATE SPILL or*
- *SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN FOR CHEMICALS AND PETROLEUM PRODUCTS, or*
- *TRANSPORTATION ACCIDENT RESPONSE PLAN.*

In terms of the policy of As Low as Reasonably Achievable (ALARA) and as a good neighbor policy for the nearest community residing near the mill, the Tribe requests immediate inclusion in the notification process in these plans for incidents such as:

- *Leaking shipment of radioactive ISL waste from Cameco Smith-Ranch ISL Facility in Glenrock, Wyoming on or about August 21, 2015;*
- *Leaking intermodal container of radioactive ISL waste from Cameco Smith-Ranch ISL Facility in Glenrock, Wyoming on or about March 29, 2016, resulting in spillage of radioactive material along US Highway 191 and at the entrance to the White Mesa Mill; or*
- *Leaking barrels of radioactive material transported by truck from Honeywell (Converdyne) and received at the White Mesa Mill on or about January 12, 2017.*

The Risk Management Plan's worst case scenario's for the Mill considers the total release of 140,000 pounds of anhydrous ammonia from the one of the two tanks over a 10 minute time period. This could result in a cloud of hazardous material that causes lung damage and lethality if enough is inhaled which could extend 12 miles. One report listing accidents in the USA from the years 1996 – 2011, found there were 939 accidents due to anhydrous ammonia, and resulting in 19 deaths and 1651 injuries. (Center for Effective Government, 2013). So this is a very real scenario. An effective plan for the neighboring communities, including the Tribe's White Mesa community must be made aware of the possibilities of such scenarios and have emergency preparedness operations or evacuation plans in place, for considerations especially of the elderly, children, and handicapped.

In line with the question above, in the DWMRC White Mesa Uranium Mill Frequently Asked Questions, it is listed: What is the Mill required to do if an Environmental Release Occurs? The response suggests that the mill's emergency response plan will address any issue "and has provided notifications for incidents in the past. DWMRC also provides required notifications to the appropriate parties," or only those parties require by state or federal regulation, and not those most likely to be affected by even the smallest radioactive or chemical spill, the closest community of White Mesa. The DWMRC answer to this question concludes with, "(DWMRC) encourages suggestions from the public on ways to improve the current notification process." So let this be the time that the Tribe, as a sovereign nation, and as a member of the public implores the DWMRC, the DEQ, and the State of Utah, for inclusion in this process.

EFRI Response:

Emergency Response Plan ("ERP")
NRC regulations in Reg. Guide 3.67, (NRC 2010) require the preparation of an ERP. The Reg. Guide defines three classes of accidents which are subject to the Mill's ERP (EFRI 2015): Alerts, Site Area Emergencies, and On-Site Emergencies. Offsite transportation accidents involving ISL shipments or feed material shipments, such as the three shipment-related incidents identified in the comment, are defined as Non-Subject Incidents and are not subject to the Mill's ERP. These types of incidents are addressed in plans and standard operating procedures ("SOPs") other than the ERP.

The Tribe states that the DWMRC's responses to Frequently Asked Questions "suggest" that the "mill's emergency response plan will address any issue." As stated above, the ERP addresses only those types of issues required to be addressed by Reg. Guide 3.67. Other types of incidents and plans are discussed below.

Spill Prevention Control and Countermeasures Plan ("SPCC")
The SPCC Plan (EFRI 2017b) addresses prevention and response to spills of materials on site. The transportation spills of ISL materials identified in the Ute comment are not subject to the SPCC plan.

Transportation Accident Plan ("TAP")

Section 1.2 of the TAP states that transportation accidents involving radioactive materials "such as yellowcake" are addressed, and identifies the phases of response for such accidents. The TAP addresses yellowcake shipments in transit from the Mill as well as shipments of yellowcake feed material to the Mill for reprocessing. Accidents involving yellowcake are specifically addressed, because yellowcake contains higher uranium content, higher activity, and higher potential for dispersion following a spill than potential spills of ISR byproduct material or alternate feed material. Although Section 1.3 of the TAP identified only the total activity of a load of calcined U_3O_8 (yellowcake), this value represents the highest potential activity of any possible spill, and is significantly higher than a potential ISR or alternate feed spill.

Alternate Feedstock Material Procedures

Management of leaking transport containers of ISR material arriving at the Mill are specifically addressed in the Mill's Containerized Alternate Feedstock Material Storage Procedure (EFRI 2017b). Section 3.1 of this SOP describes the steps and notifications required if containers entering the Mill site are found to be leaking. Emergency response procedures for containers that are leaking from the point of shipment to the Mill property are covered by the generator and carrier procedures in accordance with Department of Transportation ("DOT") or other applicable requirements.

With respect to the incidents mentioned in the Tribe comment, it should be noted that:

The August 21, 2015 shipment of ISR material from Cameco Smith Ranch traveled overland from Wyoming to the Mill and reached the Blanding area on Utah 191, from the north. Additionally, the vehicle at no time traveled south of the Mill and at no time was it in the vicinity of the Ute Tribal lands where the land borders the Mill at the southeast of the Mill property.

The March 29, 2016 shipment of ISR material from Cameco Smith Ranch traveled overland from Wyoming to the Mill, and reached the Blanding area on Utah 191, from the north. Although the incident report identified that a small quantity of material, less than 5 gallons in total, was released from the container, the majority remained affixed to the truck and did not reach the road or the environment. Additionally,

a. The quantity of spilled material was too small to reach surface water, sediments or other environmental media, nor did it involve material that could be volatilized to or suspended in air.
b. The vehicle at no time traveled south of the Mill and at no time was it in the vicinity of the Ute Tribal lands where the land borders the Mill at the southeast of the Mill property.

Therefore the spill posed no risk, required no action by, and required no notification to the Tribe.

The January 12, 2017 shipment from Honeywell involved three drums that were found leaking inside the transport container. There was no release to the roadway or the environment. Therefore the spill posed no risk, required no action by, and required no notification to the Tribe.

With respect to the storage of anhydrous ammonia, discussed in the Center for Effective Government ("CEG") report referenced in the Tribe's comment, it should be noted that for the entire period referenced in the data table, in Utah:

- There were no fatalities
- There were no accidents requiring evacuation.
- None of the accidents occurred at the Mill.
- None of the less than 0.5 injuries per year were related to the Mill.

The theoretical ammonia release modeled in the Mill's Risk Management Plan ("RMP") is discussed below.

The ERP, the SPCC and the TAP specify the local, county, State, and Federal agencies or organizations having responsibilities for radiological or other hazardous material emergencies at the Mill. For spills or accidents which may involve releases beyond the Mill boundary, these plans identify which agencies are to be contacted. Depending on the nature of the emergency, these include:

- Blanding Police Department;
- Blanding City Fire Department;
- San Juan County Sheriff;
- San Juan County Emergency Medical Service;
- All local medical clinics and or hospitals; and
- Utah Highway Patrol

The ERP requires that the Mill perform quarterly communication checks with all of these potential offsite emergency responders to confirm that contact information is current and communication systems are functional. This communication plan and contact list complies with the NRC and DWMRC requirements for emergency planning. The focus of the initial notification is to reach those agencies which are expected to provide technical or medical personnel and/or equipment support to supplement the Mill's resources as needed during an emergency, if the spill or emergency released material off site or required additional resources beyond those at the Mill.

Mill personnel also meet annually with San Juan County Office of Emergency Management and Fire Control and City of Blanding Fire Department to review relevant changes in the ERP or other plans and availability of equipment and technically trained personnel. During those meetings Mill personnel discuss the notification procedures and overall response coordination, as necessary with the technically trained and responsible off site personnel.

Consistent with the NRC Reg. Guide 3.67 and Utah Administrative Code ("UAC") requirements for spill notification, following the emergency, the Mill also contacts agencies with responsibility for regulation of radiological or hazardous materials, which include DWMRC, and depending on the nature of the emergency may also include the:

- Mine Safety and Health Administration ("MSHA") Field, District and National Office
- Utah State Emergency Response Commission
- State of Utah, Natural Resources, Dam Safety Office
- National Response Center
- Utah Poison Control Center

It is the responsibility of the San Juan County Office of Emergency Management and Fire Control and City of Blanding Fire Department to determine whether communities or organizations need to be notified regarding a potential hazard and/or the need for evacuation. It is the responsibility of DWMRC, to contact other agencies or organizations they deem necessary, beyond those required and listed in the Mill's approved plans, if any.

As discussed above, if an emergency spill or release may affect the public outside of the Mill, or requires the use of outside personnel or equipment, the Mill's response notification protocols require Mill personnel to contact the Local Emergency Preparedness Committee (city and county emergency response personnel) listed above. Those agencies have the responsibility to contact members of the public who may be affected to a level requiring evacuation or other action.

The Mill is not required to contact DWMRC as part of initial notifications during the immediate response to and management of an emergency, as required by:

- Utah Administrative Code 19-5-114,
- Part I.C.2 of the Mill's GWDP,
- the Mill's SPCC Plan,
- the Mill's Contingency Plan (EFRI 2011),
- the Mill's TAP, and
- the Mill's ERP.

The Mill or a member of EFRI management is required to contact DWMRC within 24 hours of a spill or release as defined in those plans and regulations.

In summary, the Mill is required to make notifications and to follow emergency response procedures in accordance with applicable federal and state requirements. All of the Mill's procedures and the ERP are set up to follow those requirements in a manner that ensures the safety of workers, the public and the environment in a coordinated fashion. Not all parties are first responders, by definition. The requirements and procedures are set up to ensure that first responders are notified first and others notified thereafter, in a manner that allows for coordinated responses. EFRI is prepared to consider adding the Tribe to its various lists of notifications, provided that:

1. The Tribe demonstrates that it is able to provide contact information that is current and communication systems that are functional that will allow for reliable personal contact with identified individuals on a 24-hour, seven day per week basis;

2. The Tribe determines which notifications it believes are appropriate and discusses with each of the official responders described above the purpose of the notification and the role (including the scope and limits) it would like to take;
3. The Tribe provides the concurrence of each such official responder to such role to be taken by the Tribe;
4. The Tribe demonstrates that it is complying with the foregoing requirements on an on-going basis, in order for its continued role to be honored; and
5. DWMRC agrees to the Tribe's role and concurs that it is consistent with all applicable Mill requirements.

The Mill is prepared to consider notifications to the Tribe on the foregoing basis, but it must by understood that such notifications cannot interfere with the Mill's ability to comply with all emergency response requirements applicable to it.

At the hearing in Salt Lake City, a Ute Mountain Ute Tribal Member who has resided in White Mesa throughout his life asked a question that could not be answered due to a lack of concise context regarding emergency response and safety for proximate residents. To clarify and assist the UDWMRC in responding to his comment, we have bolstered his concern with actual scenarios for the DWMRC to be able to adequately address his concerns. Mr. Dutchie asked at the hearing what the safe distant was if something went wrong at the White Mesa Mill. To add context, we have used specific examples for the response to public comment by DWMRC:

1. *In the event of a release of 140,000 pounds of anhydrous ammonia (considered to be one of the worst-case scenarios of potentially acute toxins from the facility), what is the zone of exposure, in lateral distance from the mill's storage chemical storage facility, and what would be the emergency response procedure implemented to protect those residents and passers-by within the zone?*

EFRI Response:

Section 112(r) of the Clean Air Act Amendments requires EPA to publish regulations and guidance for chemical accident prevention at facilities that use certain hazardous substances. These regulations and guidance are contained in the Risk Management Plan ("RMP") rule. The RMP rule requires facilities that use certain hazardous substances to develop an RMP which:

- identifies the potential effects of a chemical accident,
- identifies steps the facility is taking to prevent an accident, and
- spells out emergency response procedures should an accident occur.

These plans provide valuable information to local fire, police, and emergency response personnel to prepare for and respond to chemical emergencies in their community.

The RMP rule was built upon existing industry codes and standards. It requires facilities that use listed regulated Toxic or Flammable Substances for Accidental Release Prevention to develop an RMP and submit that plan to EPA.

The Mill has an RMP that it has submitted to EPA, which addresses the potential effects of a chemical accident involving the release of anhydrous ammonia. The responses in the RMP follow industry codes and standards applicable to all types of facilities that use significant quantities of anhydrous ammonia in their process activities, and provide similar protections as for all other facilities in the State of Utah and federally. Under the RMP, a potential worst-case scenario involving a release of anhydrous ammonia is modeled to determine the worst potential impact to the public and sets out emergency responses based on industry codes and standards to ensure that the public is protected from any potential impacts from the release.

The theoretical worst-case release modeled in the RMP yielded an estimated Distance to Endpoint of 6.9 miles. The Tribe's comment incorrectly states an estimated distance of 12 miles. Even for a theoretical release of two complete tanks, or greater than 140,000 lbs, the distance to endpoint would not extend to 12 miles. An anhydrous ammonia release which reached, or had the potential to reach, off-site communities is defined as a Site Area Emergency, in the Section on Classification and Notification of Accidents in the ERP. The response procedures to be implemented are those described in the ERP section on Site Area Emergencies and are based on national standards for dealing with a potential anhydrous ammonia release.

It should be noted that the anhydrous ammonia accident situation submitted and modeled in the RMP represents a nearly impossible worst case scenario. While the EPA regulations may require the modeling of a theoretical complete release of a tank's contents in a finite time period, this situation is unrealistic as discussed below.

The modeled case of a release of 14,000 lbs. per minute of liquid, at a density of approximately 5.7 lb/gallon, represents a release rate of approximately 2,500 gpm.

Ammonia in the Mill's two anhydrous ammonia tanks are filled, and liquid ammonia is withdrawn, through a system of bottom pipes which operate under the pressure head of the tank (approximately 100 psi.). The bottom piping is protected by a rupture valve system which will shut off bottom flow if it senses a high discharge flow rate. The tanks themselves are protected by a pressure relief system designed to vent a gaseous over-pressure (such as from an overfilling error) to prevent rupture of the tank structure.

All realistic operating scenarios which could result in a spill or release would be limited to the maximum release rate at which:

- liquid ammonia could discharge by the pressure head of the tank, from a damaged or severed 3 inch or smaller section of the bottom piping, or
- gaseous ammonia was released from the pressure safety vent system.

It is not possible for either the bottom drain piping or the safety vent system to release 2,500 gpm for a continuous 10 minutes. In fact they could not release more than a small percentage of that rate. The estimated 14,000 lbs. per hour or 2500 gpm release could only be achieved by a complete failure (rupture or collapse) of one of the tanks itself. As mentioned above, the pressure safety vent system is designed to prevent overpressure from operational causes. While the possibility exists that one or both

of the tanks could be damaged by sabotage, an aircraft crash, or other catastrophic scenario, there is no reasonable scenario that could produce such a complete and instantaneous tank failure. In this case, following the Mill's notification of the Blanding and San Juan authorities listed above, those authorities would make contact with the Tribe or others who may need to evacuate.

Additionally, regardless of the rate of release, the EPA RMP*Comp™ model is conservative in that it does not account for many chemical and environmental factors which could reduce the concentration of airborne ammonia following a release. The model estimates distance based on the variables of windspeed and topography, but cannot be adjusted to account for:

- Rate of vaporization of ammonia
- Ammonia absorption and reactivity with atmospheric moisture
- The density of ammonia atmospheric reaction products
- What fraction of ammonia products will precipitate before they leave the Mill site.

The worst case scenario is therefore very conservative, as it should be, so that maximum precautions can be taken in the event of a potential release.

2. *From August 1 to September 6, 2016, during an ore processing campaign, the yellowcake drying ovens were operating at a level higher than their permitted drying capacity (letter to Utah DAQ September 22, 2016 by EFRI). This caused an excess of 346 lbs. of emissions over that period. What is the zone of exposure, in lateral distance from the mill's drying stacks, and what was the emergency response procedure implemented to protect those residents and passers-by within the zone? Please estimate the exposure to uranium oxide and other pollutants to the nearest resident (<2 miles), White Mesa residents (average of 4 miles), and those passers-by, such as school children on the bus between Bluff and White Mesa and Blanding on the highway next to the mill, twice per day as they started their school year.*

EFRI Response:

This event involved the excess emission of PM_{10} during the period, of which a portion was uranium oxide (uranium and oxygen) and a portion was compounds of nitrogen which may have potentially contained ammonia compounds and sulfate compounds.

The high volume air monitors at the site perimeter, as well as within the perimeter, did not detect any measurable increase in uranium emissions during the period that included the emissions event. Therefore, this event did not result in any measurable increases in uranium or other radionuclide emissions at the site boundary, *even for a person who resided at the boundary full time during the period.* All radionuclide emissions during the period were well within regulatory standards. Any impacts to a person who drove by the site twice a day would be even less (less than measurable) and also well within the regulatory standards.

If the uranium oxide had no measurable impact at the site boundary, it is reasonable to expect that any other particulate components did not have any significant impact at the site boundary, even for a person residing their full time. It should be noted that:

a. The primary wind direction is not from west to east, and the measured wind direction has a component to the east less than 50% of the time.
b. The emissions mass includes some fraction that would be deposited on the Mill property and not on the road (or school bus).
c. As mentioned above, the high volume air monitors at the site perimeter did not detect any increase in radioactive particulate emissions during the months which included the emissions event.

It should also be noted that overall during 2016, even under the most conservative assumptions, the Mill generated far less than the pollutants permitted by the Mill's Air Approval Order for the yellowcake dryer systems.

3. *In March of 2012, a Ute Mountain Ute Tribal Member from White Mesa photographed a release from the facility and the Tribal government inquired about it with the Utah Division of Air Quality (photograph included in Sec. I-III-G). There is no record of the incident being reported by EFRI. The Tribe was informed by the Division of Air Quality 21 that it was a malfunction in an alternative feeds circuit processing material at the time. Please estimate the exposure to uranium oxide, and other pollutants to the nearest resident (<2 miles), White Mesa residents (average of 4 miles), and those passers-by, such as school children on the bus between Bluff and White Mesa and Blanding on the highway next to the mill. (See Part I, Exhibit C – Energy Fuels letter).*

EFRI Response:

The March 2012 incident identified in the comment involved the emission of steam containing carbon monoxide ("CO") and NOx. Discrete samples were collected to monitor for other inorganic and acid gas parameters, including chlorine, hydrogen fluoride and acid gases. None of those constituents were detected. Monthly high volume sampler data, which was operated continuously during the period that included the incident, did not indicate any increase in emissions during the period. That is, there was no measurable increase in uranium, radium-226, thorium-230 or lead-210, as measured by monitoring of airborne radiological particulates, during the period which included the event.

All available data indicate that there was no exposure of nearby residents to uranium oxides.

Mark Kerr Comments on the Proposed Renewal and Amendment of Energy Fuels Resources (USA), Inc.'s Radioactive Materials License and Groundwater Discharge Permit for the White Mesa Mill.

EFRI General Response:

In order to properly respond to Mr. Kerr's comments it is important to understand Mr. Kerr's past association with the Mill. Mr. Kerr, and his company, KGL Associates, (hereafter referred to as "Kerr") were contracted to construct Cell 4B of the Mill's Tailings Management System. Part way through the project Kerr abandoned the job leaving a partially constructed Cell 4B for EFRI (formerly Denison Mines) to complete. Kerr sued EFRI for damages, and EFRI counterclaimed in Federal court. The case eventually went to arbitration. The arbitrator ruled in favor of EFRI on all claims, and as of today Kerr owes EFRI/Denison in excess of $4,000,000 in damages. Kerr has appealed the arbitrator's ruling at least three times and has been denied on all counts. Since the arbitrator and appeal court decisions, Kerr has continued to make unfounded complaints to the EPA and the NRC.

The controlling documents for the Tailings Cell 4B project were the *Technical Specifications* and the *Construction Quality Assurance Plan*. Denison Mines submitted a *Cell 4B Construction Quality Assurance Report* (CQA Report) to demonstrate it performed the work required by those documents. On January 27, 2011 the DWMRC (formerly DRC) determined that requirements of the documents noted above were met prior to authorizing Cell 4B to operate. Because the DRC engineer that performed the review of the CQA Report was the same engineer who observed the construction in the field, the DRC review was made with the knowledge of the changes in the technical specifications. Therefore, the DRC concluded that even with the technical specification changes as constructed, the construction was acceptable. In October 2011 Mr. Kerr contacted the DRC with the same concern sent to the EPA on April 13, 2017. In December 2011 the DRC let Mr. Kerr know that the CQA Report review was made with the knowledge of the changes in the technical specifications. Unsatisfied, in a letter dated December 20, 2011 Mr. Kerr sent the same concern to the NRC. On February 3, 2012 the NRC told Mr. Kerr it was satisfied with the DRC response that even with the technical specification changes as constructed, the construction was acceptable.

The operating license and the groundwater discharge permit at the White Mesa Uranium Mill should not be issued, and operations should be suspended until numerous issues are addressed.

These 'poor housekeeping' practices are as much the responsibility of the UT DEQ as they are the mill owner/operator, as neither party can be expected to follow rules, regulations, license requirements, or construction permit technical specifications, as proven by past practice. It is no surprise that plumes of contamination exist, radon emissions exceed limits, and monitor wells contaminates exceed limits set by the regulators.

EFRI Response:

Kerr provides insufficient basis for the above general comments on "contamination", "emissions", or "exceed limits". There is not enough detail to allow for a meaningful response. His comments in general appear to want to raise tangential and stale issues related to prior construction events that were fully resolved during the construction.

Construction bid documents for Cell 4B in Jan 2008 require major changes be reported to the regulators prior to implementation. Reporting of those changes did not occur prior to implementation.

EFRI Response:

See general response above.

The mill owner/operator indicated, 8-7-09, that blasted rock during cell construction would be removed. The blasted rock was not removed. In lieu of rock removal a directive for a revised compaction methodology, 5-19- 10, was issued. But large areas of the cell floor were left untouched by the new methodology, as directed by the mill owner's engineer.

EFRI Response:

Kerr violated the construction specifications and design by over blasting the Cell 4B bottom beyond the design lines and grade. Kerr was instructed to cease that activity and remove loose rock and backfill with compacted fill material. Kerr refused, claiming in his opinion that the loose rock was acceptable for the Cell 4B foundation. Kerr was instructed to remove and replace the loose material, or as an alternative, a revised procedure was developed by Geosyntec Consultants to compact the loose material to design specifications. Kerr then elected to utilize the alternative compaction method until he ultimately abandoned the job. The remainder of the Cell 4B construction was completed according to design plans specifications by EFRI.

On 6-8-2010 the mill owner's engineer states that over blasting of rock can result in an unstable soil/rock mixture that may settle differentially or significantly.....yet the rock was not removed, and as noted above the compaction methodology was not applied consistently over the cell floor.

EFRI Response:

See general response above.

On 6-14-2010 the mill owner/engineer was asked if the regulators were aware of the changes, and on 6-17-2010, the mill owner/engineer advise that the question is inappropriate, and they state, 'please revise or rescind' the question. Back on 3-12-2010 the mill owner/engineer advised of the format to use for questions, so they could respond 'accordingly.'

EFRI Response:

It is hard to follow this comment but EFRI references the general response above.

UT DEQ's consultant, URS, 9-4-09, states that the blasting plan should be included as a critical component of the technical specifications for construction. On 3-4-10 the mill owner/owner's engineer direct changes to the blasting plan without notice to the regulators. Back on 11-6-09

the mill owners engineer states that they are not, and the contractor is, responsible for deviations to the contract documents.

EFRI Response:

See general response above.

12-14-2011, UT DEQ advises that they allow for discretion on the part of the permittee (the mill owner & mill owner's engineer) types of changes that require notification. UT DEQ states that it appeared that DUSA/Geosyntec determined that changes to compaction methodology did not qualify as being sufficiently significant to notify UT DEQ of such a change.

EFRI Response:

See general response above.

UT DEQ states than notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.

It is well documented that the UT DEQ, the mill owner, and the mill owner's engineer, all considered rock excavation, blasting, and compaction to be sufficiently significant to report changes. All were changed, no notice was given, and questions about reporting were ignored or rejected altogether.

EFRI Response:

See general response above.

1-13-2012, the UT DEQ states that following their review, the review made now knowing of the changes, that cell construction was acceptable. BUT, how could that be. This means that conflicting Technical Specifications implemented during construction are now OK. The Blasting plan was critical according to UT DEQ, URS, DUSA, and Geosyntec....but the plan was changed in direct conflict with documents from all 4 parties.

EFRI Response:

See general response above.

The blasted rock would increase fractures & jointing, or rock would become discontinuous,(or as the Exec VP of US Operations for the DUSA puts it.....the blasting would cause caverns to form, which would collapse over time, tearing the cell liners and the cell would leak, releasing contaminates into the ground water), but as stated by the VP, 8-7-09, not to worry, the blasted rock would be removed. The rock was not removed.

EFRI Response:

The loose rock was in fact removed and replaced with fill material meeting the design plans and specifications. See general response above.

Addressing the 'poor housekeeping': The regulators take the position of allowing the owners/engineers to determine what is reportable and what isn't based on the discretion of the owners/engineers. Why would anything be reported if it might cost the owner time and money. Everyone's off the hook concerning the environment. The owners/engineers are essentially given permission of what to report, and the regulators can't act on what they don't know.

EFRI Response:

This general comment lacks sufficient detail to allow for a meaningful response.

Sure, sometimes there are fines, and some requirements imposed of the owner for some remediation. But, these permits should not be granted, and mill operations should be suspended until regulatory oversight is responsible enough to require emissions compliance, groundwater contaminate plume elimination, clean monitor well samples, a regulatory presence on the mill grounds full time, and Cell 4B is reconstructed in compliance with specifications.

Having some experience in this industry, it is impossible for a facility such as this to go NOV free for nearly 4 years!

EFRI Response:

The frequency and results of inspections of the Mill's operation is a matter of public record and can be found on the DWMRC web site. The general comment otherwise lacks sufficient detail for a meaningful response.

Please contact me if you have any questions or require any further information.

Yours very truly,

ENERGY FUELS RESOURCES (USA) INC.
David C. Frydenlund
Senior Vice President, General Counsel and Corporate Secretary

cc: Mark Chalmers
Harold Roberts
Kathy Weinel
David Turk
Scott Bakken
Logan Shumway
Julia Yeckes

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Appendix 1
NRC Preamble

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§ 94.13 [Amended]

6. In § 94.13, in the introductory text, the first sentence is amended by adding "Austria," immediately before "The Bahamas,"; by adding a comma immediately after "Yugoslavia"; by removing the words "§ 94.12(a); are countries which" and adding the words "§ 94.12(a), are countries that" in their place; and by removing the words "or which have a common border with such countries; or which" and adding the words "have a common border with such countries; or" in their place.

Done in Washington, DC, this 25th day of May 1994.

Lonnie J. King,

Acting Administrator, Animal and Plant Health Inspection Service.

[FR Doc. 94-13291 Filed 5-31-94; 8:45 am]

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NUCLEAR REGULATORY COMMISSION

10 CFR Part 40

RIN 3150-AE77

Uranium Mill Tailings Regulations; Conforming NRC Requirements to EPA Standards

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its regulations governing the disposal of uranium mill tailings. These changes conform existing NRC regulations to regulations published by the Environmental Protection Agency (EPA). The conforming amendments are intended to clarify the existing rules by ensuring timely emplacement of the final radon barrier and by requiring appropriate verification of the radon flux through that barrier. This action is related to another action by EPA to rescind its National Emissions Standard for Hazardous Air Pollutants (NESHAPs) for radon emissions from the licensed disposal of uranium mill tailings at non-operational sites.

EFFECTIVE DATE: This regulation becomes effective on July 1, 1994.

FOR FURTHER INFORMATION CONTACT: Catherine R. Mattsen, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 415-6264.

SUPPLEMENTARY INFORMATION:

Background

On April 29, 1983 (48 FR 19584), EPA proposed general environmental standards for uranium and thorium mill tailings sites licensed by NRC or one of its Agreement States. Final standards were published on September 30, 1983 (48 FR 45926), and codified in 40 CFR part 192, subparts D and E. On October 16, 1985 (50 FR 41852), NRC published amendments to 10 CFR part 40 to conform its rules to EPA's general standards in 40 CFR part 192, as it affected matters other than ground water protection. Both NRC and EPA regulations included a design standard requiring that the tailings or wastes from mill operations be covered to provide reasonable assurance that radon released to the atmosphere from the tailings or wastes will not exceed an average of 20 picocuries per square meter per second (pCi/m²s) for 1000 years, to the extent reasonably achievable, and in any case, for 200 years.

Neither the EPA standards of 1983 nor NRC's conforming standards of 1985 established compliance schedules to ensure that the tailings piles would be expeditiously closed and the 20 pCi/m²s standard would be met within a reasonable period of time. Criterion 6 of appendix A to part 40 was initially only a design standard and did not require verification that the radon releases meet this "flux standard."

In response to the separate requirements of the Clean Air Act (CAA), EPA promulgated additional standards in 40 CFR part 61 (subpart T for non-operational sites) to ensure that the piles would be closed in a timely manner (December 15, 1989; 54 FR 51654). This regulation applies only to uranium mill tailings and requires, in addition to the flux standard of 20 pCi/m²s, that once a uranium mill tailings pile or impoundment ceases to be operational, it must be closed and brought into compliance with the standard within two years of the effective date of the standard (by December 15, 1991) or within two years of the day it ceases to be operational, whichever is later. If it were not physically possible for the mill owner or operator to complete disposal within that time, EPA contemplated a negotiated compliance agreement with the mill owner or operator pursuant to EPA's enforcement authority in order to assure that disposal would be completed as quickly as possible. Subpart T of 40 CFR part 61 also requires testing for all piles within the facility to demonstrate compliance with the emission limit and specifies reporting and recordkeeping associated with this demonstration.

Subpart T was challenged by a number of parties including the American Mining Congress (AMC), the Environmental Defense Fund (EDF), and the Natural Resources Defense Council (NRDC). In addition, AMC, the NRC, and others filed an administrative petition for reconsideration of subpart T. Among the concerns of these parties was the argument that the overlap between EPA's subpart D of 40 CFR part 192 (based on the Uranium Mill Tailings Radiation Control Act (UMTRCA)) and subpart T of 40 CFR part 61 (based on the CAA) resulted in regulations that are unnecessarily burdensome and duplicative. Among other things, the industry also alleged that subpart T was unlawful because it was physically impossible to come into compliance with subpart T in the time required. In November 1990, Congress amended the CAA by including a new provision, section 112(d)(9). This provision authorized EPA to decline to regulate radionuclide emissions from NRC licensees under the CAA if EPA found, by rule, after consultation with NRC, that the regulatory program implemented by NRC protects the public health with an ample margin of safety.

In July 1991, EPA, NRC, and the affected Agreement States began discussions concerning the dual regulatory programs established under UMTRCA and the CAA. In October 1991, those discussions resulted in a Memorandum of Understanding (MOU) between EPA, NRC, and the affected Agreement States. The MOU outlines the steps each party would take to both eliminate regulatory redundancy and to ensure uranium mill tailings piles are closed as expeditiously as practicable. (The MOU was published by EPA on October 25, 1991 (56 FR 55434) as part of a proposal to stay subpart T.) The primary purpose of the MOU is to ensure that the owners and operators of all disposal sites that have ceased operation and those owners and operators of sites that will cease operation in the future effect emplacement of a final earthen cover to limit radon emissions to a flux of no more than 20 pCi/m²s as expeditiously as practicable considering technological feasibility. The MOU presents a goal that all current disposal sites be closed and in compliance with the radon emission standard by the end of 1997 or within seven years of the date on which existing operations cease and standby sites enter disposal status. The attachment to the MOU lists specific target dates for completing emplacement of final earthen covers to limit radon emissions from non-operational tailings impoundments. These target dates were

based on consultations with the licensed mill operators.

On December 31, 1991, the EPA published three Federal Register notices: a final rule to stay the effectiveness of 40 CFR part 61, subpart T, as it applies to owners and operators of uranium mill tailings disposal sites licensed by the NRC or an Agreement State (56 FR 67537); a proposed rule to rescind 40 CFR part 61, subpart T, as it applies to uranium mill tailings disposal sites licensed by the NRC or an Agreement State (56 FR 67561); and an advance notice of proposed rulemaking to amend 40 CFR part 192, subpart D, to require that site closure occur as expeditiously as practicable considering technological feasibility and to add a demonstration of compliance with the design standard for radon releases (56 FR 67569). The stay of effectiveness of subpart T is to remain in effect until EPA takes final action to rescind subpart T and amend 40 CFR part 192, subpart D, to ensure that the remaining rules are as protective of the public health with an ample margin of safety as implementation of subpart T, or until June 30, 1994. If EPA fails to complete these rulemakings by that date, the stay will expire and the requirements of subpart T will become effective.

The stay of effectiveness of subpart T was also challenged. Discussions continued between EPA, the litigants, and the NRC. In February 1993, final agreement was reached to settle the pending litigation and the administrative proceeding, avoid potential future litigation, and otherwise agree to a consensus approach to regulation of licensed non-operational uranium mill tailings disposal sites. EPA announced the settlement agreement in a notice of April 1, 1993 (58 FR 17230). The NRC was not a signatory to this agreement but agreed in principle with the settlement agreement. The settlement agreement further defined steps for implementing the MOU. It called for the NRC to amend its regulations in appendix A of part 40 to be substantially consistent with a specific regulatory approach described in the settlement agreement. It also described actions to be taken by the parties to the agreement which were intended to implement the MOU and eliminate further litigation with respect to subpart T.

On June 8, 1993 (58 FR 32174), the EPA proposed minor amendments to 40 CFR part 192, subpart D, to ensure timely emplacement of the final radon barrier and to require monitoring to verify radon flux levels (a one-time verification). In that notice, the EPA stated its tentative conclusion that if those amendments to 40 CFR part 192, subpart D, were properly implemented by NRC and the Agreement States to ensure specific, enforceable closure schedules and radon level monitoring, the NRC's regulatory program for non-operational uranium mill tailings piles would protect the public health with an ample margin of safety. The EPA also noted its intent to publish a proposed finding for public comment on whether the NRC program protects public health with an ample margin of safety before taking final action on rescission of 40 CFR part 61, subpart T.

On November 3, 1993 (58 FR 58657), the NRC published a proposed revision to appendix A of part 40 intended to conform to EPA's proposed revisions to 40 CFR part 192, subpart D. On November 15, 1993 (58 FR 60340), the EPA published a final effective rule amending 40 CFR part 192, subpart D. This final amendment to appendix A of 10 CFR part 40 must conform to 40 CFR part 192, subpart D, as amended on November 15, 1993. Changes in this final rule that relate to changes made in EPA's final rule are noted in the detailed discussion.

On February 7, 1994 (59 FR 5674), the EPA published a supplement to its proposed rescission of subpart T as it applies to owners and operators of uranium mill tailings disposal sites licensed by the NRC or an Agreement State. That action was also taken in accordance with the settlement agreement. That notice did not present a change from EPA's plans, strategies, or findings as discussed in the actions pertaining to the revision of 40 CFR part 192, subpart D. EPA invited comments on the proposed rescission of subpart T and on its determination that the NRC regulatory program protects public health and safety with an ample margin. It does not specifically address NRC actions except that EPA has again stated that this conforming rule is necessary to support the rescission of 40 CFR part 61, subpart T.

EPA's revision to 40 CFR part 192 is not intended to change EPA's original rationale or scheme set forth in its 1983 rule. The EPA rule "seeks to clarify and supplement that scheme in a manner that will better support its original intent." EPA's final rule and this NRC conforming rule require that when a uranium mill becomes non-operational, the final barrier to control radon will be emplaced as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee). Setting interim dates for achieving milestones towards emplacement will support and better assure this progress. Also, post-emplacement determination of radon flux will serve as confirmation that the design of the cover is working as intended. EPA's June 8, 1993 (58 FR 32174), notice of proposed rulemaking and its November 15, 1993 (58 FR 60340), notice of final rulemaking provide detailed discussion of the rationale for the action and the legislative and regulatory history leading to its proposal.

Coordination With Affected NRC Agreement States

The affected Agreement States of Colorado, Texas, and Washington, as well as the State of Illinois, were provided a draft of the proposed rule before its promulgation. These States' comments and the Commission's responses were discussed in the notice of proposed rulemaking of November 3, 1993 (58 FR 58657). Copies of that notice were sent to the affected States. One State submitted comments, which are addressed below along with the other comments received.

Issue of Compatibility With Agreement States

The Commission has determined that these changes are a Division 2 matter of compatibility. Under Division 2, States must adopt the provisions of an NRC rule but can adopt more stringent provisions. A State may not adopt less stringent ones. This designation (Division 2) is compatible with section 274o of the Atomic Energy Act of 1954, as amended (AEA).

Description of the Rule

Section 84a(2) of the AEA requires the Commission to conform its regulations governing uranium mill tailings to applicable EPA requirements and standards. Based on this requirement and the plans and schedules related to the rescission discussed in this document, the NRC proposed to amend appendix A of 10 CFR part 40 to conform to EPA proposed amendments to 40 CFR part 192, subpart D, concerning non-operational, NRC or Agreement State licensed mill tailings sites. Criterion 6 of appendix A to part 40 requires that an earthen cover (or approved alternative cover) be placed over uranium mill tailings to control the release of radon-222 at the end of milling operations. This cover is to be designed to provide reasonable assurance that releases of radon will not exceed an average of 20 pCi/m²s and that the barrier will be effective in controlling radon releases to this level for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years. The design for satisfying the

longevity requirement includes features for erosion control such as the placement of riprap over the earthen cover itself. (Criterion 6 is also applicable to thorium mill tailings. These amendments to Criterion 6 apply to uranium mill tailings only.)

This rule, both as proposed and as now being adopted, amends Criterion 6, adds a new Criterion 6A, and adds to the definitions contained in the Introduction to appendix A to part 40.

Paragraphs (1), (5), (6), and (7) of revised Criterion 6 contain the previously existing requirements of Criterion 6. These provisions were not the subject of or affected by this rulemaking. These preexisting portions of Criterion 6 appear in this notice only for the purpose of numbering the paragraphs for ease of reference to specific requirements contained within the criterion. However, minor conforming revisions, as proposed, have been made to paragraph (1) of Criterion 6 and its footnotes for clarity and consistency with the new requirements.

This rule adds a requirement to Criterion 6 for a one-time verification that the barrier, as constructed, is effective in controlling releases of radon from uranium byproduct material to levels no greater than 20 pCi/m²s when averaged over the pile or impoundment. This provision, which appears at paragraph (2), also specifies EPA method 115, as described in 40 CFR part 61, appendix B, as a standard for adequate demonstration of compliance. As is required by the recent amendments to 40 CFR part 192, subpart D, the licensee must use this method or another approved by the NRC as being at least as effective in demonstrating the effectiveness of the final radon barrier. A copy of 40 CFR part 61, appendix B, has been made available for inspection at the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC.

Because of practical reasons, the verification of radon flux levels must take place after emplacement of the final radon barrier but before completion of erosion protection features. In order for the results of the verification to remain valid, erosion protection features must be completed before significant degradation of the earthen barrier occurs. The NRC will consider this in a final determination of compliance with Criterion 6. The NRC could require, among other things, repetition of part or all of the verification procedures on a case-by-case basis if significant delay occurs before completion of erosion protection features.

Paragraph (3) of revised Criterion 6 adds a requirement that, if the reclamation plan calls for phased emplacement of the final radon barrier, the verification of radon flux be performed on each portion of the pile or impoundment as the final radon barrier is completed.

Paragraph (4) specifies the reporting and recordkeeping to be made in connection with this demonstration of effectiveness of the final radon barrier. A one-time report that details the method of verification is to be made within 90 days of completion of the final determination of radon flux levels. Records will be required to be kept until license termination documenting the source of input parameters and the results of all measurements on which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine compliance. These reporting and recordkeeping requirements are comparable to the EPA requirements in 40 CFR part 61, subpart T.

The Commission notes that the proper implementation of the design standard of paragraph (1) of Criterion 6 is of primary importance in the control of radon releases. The addition of the requirement for verification of radon flux levels does not replace or detract from the importance of the radon attenuation tailings cover design standard.

The new Criterion 6A addresses the timeliness of achieving radon emission control in the case of uranium mill tailings. Criterion 6A requires that the emplacement of the earthen cover (or approved alternative cover) be carried out in accordance with a written, Commission-approved, reclamation plan that includes enforceable dates for the completion of key reclamation milestones. This plan will be incorporated as a condition of the individual license. This plan must provide for the completion of the final radon barrier as expeditiously as practicable considering technological feasibility after the pile or impoundment ceases operation. This timeliness requirement has the same goals for completing the final radon barrier as were in the MOU discussed above. In addition, erosion protection features must also be completed in a timely manner in accordance with the Commission-approved reclamation plan.

For the purposes of Criterion 6A, definitions are being added to the Introduction of appendix A to part 40 (in alphabetical order with the preexisting definitions) for: *as expeditiously as practicable considering technological feasibility, available technology, factors beyond the control of the licensee, final radon barrier, milestone, operation,* and *reclamation plan.* These definitions are substantively the same as contained in the EPA's recent amendment to 40 CFR part 192, subpart D. However, *reclamation plan* covers a broader range of activities than required in EPA's *tailings closure plan (radon).* Reclamation of the tailings in accordance with appendix A to part 40 includes activities also occurring after the end of operation that are beyond those involved in the control of radon releases, such as groundwater remediation. Thus, it is appropriate and efficient for planning if these activities are addressed in a single document. (This rule would also allow the reclamation plan to be incorporated into the pre-existing closure plan, also required by appendix A, which includes other activities associated with decommissioning of the mill.)

A definition of *final radon barrier* was also included in the Commission's proposed rule to facilitate the drafting of clear regulatory text and to eliminate any ambiguity with respect to compliance with the 20 pCi/m²s "flux standard" after completion of the final earthen barrier and not as a result of any temporary conditions or interim measures. This definition excludes the erosion protection features which were not a subject of EPA's amendment to 40 CFR part 192. The EPA's proposed rule had not provided a definition of this term or comparable term. However, in its final rule, the EPA added a definition of the term *permanent radon barrier,* also to reduce ambiguity. The EPA's definition is substantively the same as the NRC definition of *final radon barrier.* The EPA used the word "permanent" in keeping with the terminology of the settlement agreement but defined "permanent radon barrier" as "the final radon barrier constructed to achieve compliance with, including attainment of, the limit on releases of radon-222 in § 192.32(b)(1)(ii)." Both definitions refer to comparable standards requiring control of radon releases to levels not exceeding 20 pCi/m²s after closure. This final NRC rule continues to use the word "final" as proposed, because it is more appropriate. The word "final" more accurately describes the last earthen cover over the tailings pile without the erosion protection features. The barrier would not provide permanent protection without the erosion protection features. Even after these features are completed, the applicable long-term design standard in paragraph

(1) of Criterion 6 is "effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years." Although not intended by EPA, the term "permanent" could be interpreted to imply "forever."

Factors beyond the control of the licensee are defined as factors proximately causing delay in meeting the schedule in the applicable reclamation plan for the timely emplacement of the final radon barrier notwithstanding the good faith efforts of the licensee to complete the barrier. Consistent with the final version of EPA's rule, the following description of possible factors beyond the control of the licensee has been added to the definition in this final rule; these factors may include, but are not limited to:

Physical conditions at the site;

Inclement weather or climatic conditions;

An act of God;

An act of war;

A judicial or administrative order or decision, or change to the statutory, regulatory, or other legal requirements applicable to the licensee's facility that would preclude or delay the performance of activities required for compliance;

Labor disturbances;

Any modifications, cessation, or delay ordered by State, Federal, or local agencies;

Delays beyond the time reasonably required in obtaining necessary government permits, licenses, approvals, or consent for activities described in the reclamation plan proposed by the licensee that result from agency failure to take final action after the licensee has made a good faith, timely effort to submit legally sufficient applications, responses to requests (including relevant data requested by the agencies), or other information, including approval of the reclamation plan; and

An act or omission of any third party over whom the licensee has no control.

In the definition of *available technology*, the phrase "and provided there is reasonable progress toward emplacement of a permanent radon barrier" was not included in the Commission's proposed rule as it seemed inappropriate within the definition and the concept is incorporated into the standard itself, i.e., Criterion 6A. This phrase has been included in the final definition with the word "final" in place of "permanent" in keeping with the terminology used in this rule. A parenthetical with illustrative examples of grossly excessive costs has also been added consistent with EPA's final amendments.

The definitions for *as expeditiously as practicable considering technological feasibility* and *reclamation plan* have been specifically identified as applying to only Criterion 6A to prevent any potential misapplication. This has not been done in the case of the other definitions because either the terms are not used elsewhere in appendix A or are used consistently with the definitions being added.

This rule goes beyond EPA's rule by requiring that the erosion protection barriers (or other features for longevity) be completed in a timely manner. However, the rule does not require that enforceable dates be established for completion of erosion protection as a condition of license. (The key reclamation activities or "milestones" for which enforceable dates are to be established are the same as in EPA's rule.) The reason for this difference is so that the NRC can assure that erosion protection is completed before the barrier could degrade significantly while allowing more flexibility in this regard than for the "key reclamation milestones." Allowing significant degradation of the cover before completion of other aspects of the design could violate the design basis.

As a result of the MOU, most affected licensees (those facilities that were non-operational at the time of the MOU) have voluntarily submitted reclamation plans which include proposed dates for attainment of key reclamation milestones. (Planning for reclamation activities with Commission approval was required by previously existing regulations.) The process of approving those reclamation plans, at least those portions dealing with control of radon emissions, and amending the licenses to make the dates for completion of key reclamation milestones a condition of license is complete with the exception of the Atlas site in Moab, Utah. (In this case, license amendment has been delayed pending resolution of issues raised when the action was noticed in the Federal Register.) These impoundments are in the process of being reclaimed with varying degrees of completion. Other affected NRC licensees include one whose impoundment has ceased operation since the MOU and who is in the process of preparing a reclamation plan, and four with operational impoundments who will be affected at the time the impoundments cease to be operational.

The considerations made in these recent licensing actions have been consistent with those reflected in this rule, i.e., paragraph (1) of Criterion 6A has essentially been implemented prior to promulgation as a result of the MOU and the settlement agreement and in anticipation of the amendments to 40 CFR part 192 and this rulemaking. Thus, the deadlines for completion of milestones established in licenses will not need to be reconsidered as a result of this rule. Also, the actions taken since the MOU in the case of the Atlas site in Moab, Utah are consistent with this rulemaking. The licensee has submitted proposed revisions to its reclamation plans. The licensee has also supplied further information and proposed modifications to address concerns that have been raised. Notices of proposed amendments to the license to provide for public participation have been published. The most recent of these was published on April 7, 1994 (58 FR 16665). Delays in the schedule for radon barrier emplacement are as a result of difficulties in resolving technical issues related to the adequacy of plans for erosion protection and groundwater protection and the consideration of alternatives under the National Environmental Policy Act. Thus, delays result from a combination of "the need for consistency with mandatory requirements of other regulatory programs" and "factors beyond the control of the licensee." This case is primarily an example of factor number (8) in the definition of *factors beyond the control of the licensee* concerning delays in obtaining necessary approvals. The issues of concern in the approval of this revised reclamation plan are yet to be resolved and further delays are possible. However, no new issues with regard to the scheduling of final radon barrier emplacement are added as a result of this rule. The license amendment process and the approval of the reclamation plans will not be adversely affected. The NRC staff is continuing to provide timely attention to the resolution of this case.

Paragraph (2) of Criterion 6A adds specific criteria for certain circumstances under which the NRC may extend the time allowed for completion of key milestones once enforceable dates have been established. An opportunity for public participation will be provided in a decision to extend the time allowed in these cases. The Commission may approve an extension of the schedule for meeting milestones if it is demonstrated that radon emissions do not exceed 20 pCi/m^{2}s averaged over the entire impoundment. The intent of this provision is that, if the radon release rates are as low as will be required after closure, there is no need

for complex justifications for delaying completion of reclamation. However, the Commission may not necessarily extend deadlines for completion of milestones indefinitely on this basis alone. In addition, the Commission may approve an extension of the final compliance date for completion of the final radon barrier based upon cost if the Commission finds that the licensee is making good faith efforts to emplace the final radon barrier, that the delay is consistent with the definition of *available technology*, and that the radon releases caused by the delay will not result in a significant incremental risk to the public health. If the basis for approving a delay is that the radon levels do not exceed 20 pCi/m^2s, verification of radon levels will be required annually. Any other reconsideration of deadlines once established as a result of changing circumstances would be evaluated under paragraph (1) of Criterion 6A giving consideration to all factors relevant to the "as expeditiously as practicable considering technological feasibility" standard.

Paragraph (3) of Criterion 6A, as proposed, was to allow for the continued acceptance of uranium byproduct material or such materials that are similar in physical, chemical, and radiological characteristics to the uranium mill tailings and associated wastes in the pile or impoundment, from other sources, for disposal into a portion of the impoundment after the end of operation but during closure activities. This authorization was to be made only after providing an opportunity for public participation. This paragraph was intended to conform with proposed 40 CFR 192.32(a)(3)(iii). In the context of appendix A, "during closure activities" could include the period after emplacement of the final radon barrier. In this circumstance, the Commission may except completion of reclamation activities for a small portion of the impoundment from the deadlines established in the license. The proposed rule specified that the verification requirements for radon releases may still be satisfied in this case if the Commission finds that the impoundment will continue to achieve a level of radon releases not exceeding 20 pCi/m^2s averaged over the entire impoundment. However, reclamation of the remaining disposal area, as appropriate, would be required in a timely manner once the waste disposal operations cease.

This paragraph has been somewhat revised in the final rule consistent with revisions made in EPA's final rule; these provisions now appear at 40 CFR 192.32(a)(3) (iv) and (v). Both final rules are more consistent with the settlement agreement in this regard. The revisions are (1) that only byproduct material, not "similar" material, will be approved for disposal after the final radon barrier is complete except for the continuing disposal area and the verification of radon flux levels has been made, and (2) that public participation is specifically to be provided for only in the case of continued disposal after radon flux verification.

The final rule has also been modified by changing the words "as expeditiously as practicable" in the last sentence of this paragraph to "in a timely manner" to avoid the unintended application of the definition of the term "as expeditiously as practicable considering technological feasibility" to activities beyond the emplacement of the final radon barrier. Additional clarifying language has also been added to this paragraph.

Note, as discussed in EPA's statements of consideration for its amendment of 40 CFR part 192 (at 58 FR 32183; June 8, 1993 and reiterated at 58 FR 60354; November 15, 1993), the reclamation of evaporation ponds may be dealt with separately from meeting the expeditious radon cover requirements if deemed appropriate by the Commission or the regulating Agreement State. This may be the case whether or not the evaporation pond area is being used for continued disposal of byproduct material.

The opportunities for public participation specified in Criterion 6A are in keeping with the MOU and the settlement agreement, and will be made through a notice in the Federal Register providing an opportunity for public comment on the proposed license amendment. This notice will also provide the opportunity to request an informal hearing in accordance with the Commission's regulations in 10 CFR part 2, subpart L.

Analysis of Comments

In response to the proposed rule, the Commission received comments from seven organizations including one State regulatory agency, the Environmental Protection Agency, and five industry organizations. Copies of the comments may be examined and copied for a fee at the Commission's Public Document Room at 2120 L Street, NW. (Lower Level), Washington, DC. The following discussion summarizes and responds to the comments.

General: Need and Basis for Rule

Comment. The commenters were generally in favor of the proposed rule. However, most had some suggestions for modifications. Many of these proposed modifications reflected a desire for stricter adherence to the words of the settlement agreement or to EPA's final rule. One commenter said that it understood the proposal to be consistent with the terms that industry litigants accepted in the related EPA proceedings. The American Mining Congress (AMC) and the Atlantic Richfield Company (ARCO), which incorporated all of the AMC comments by reference in its comments, specifically supported the rule for the purpose of implementing the settlement agreement and in order that the "duplicative" Clean Air Act requirements in 40 CFR part 61, subpart T, would be rescinded. AMC and ARCO contended that the rule was not needed to protect public health with the ample margin of safety required as a basis for rescinding subpart T, but that it would strengthen existing protection. Specifically, it was suggested that § 40.63 gives NRC the ability to provide post-closure testing; that § 40.42(c)(2)(i), (iii), and (iv) can provide for timely reclamation of the tailings; that proper milestones have been added to licenses under the existing regulatory program; and that EPA has never issued a finding of unacceptable risk. In addition, AMC provided extensive background and support for rescission of subpart T and elimination of dual regulation.

Response. The Commission has stated and continues to believe that its program provides an adequate degree of protection of the public health and safety but that this rule provides greater assurance that the final radon barrier will be completed in a timely manner and in accordance with the design standard. The Commission disagrees with certain statements made by commenters to support their contention that this rule was not necessary to support the rescission of subpart T. With regard to § 40.63 and post-closure testing, because footnote 1 to Criterion 6 specifically indicated that no radon monitoring was required, the Commission would not have considered it appropriate to use § 40.63 to require post-closure testing to verify that radon flux levels do not exceed 20 pCi/m^2s. It was also suggested that § 40.42 adequately addresses the timeliness of tailings reclamation. Although decommissioning normally includes cleanup of a site, appendix A provides the detailed closure requirements for mills in which the reclamation of tailings is covered as a separate activity and, thus, is an exception to the general requirements for decommissioning. This

is a result of the unique treatment of tailings under UMTRCA, which provides for the ultimate custodial care of tailings by the Federal government rather than a return to unrestricted use. The timeliness statement in § 40.42(c)(2)(iv) is interpreted as applying to the decommissioning of the mill not to reclamation of the tailings. The background materials submitted by AMC have been reviewed to assure that there are no gaps in the information previously available to the Commission in its deliberations.

As a general response concerning the use of the exact words of the settlement agreement and the EPA regulations, the Commission notes that it is required to "conform" to 40 CFR part 192 by section 84a(2) of the AEA and has agreed in principle to, but was not a party to, the settlement agreement. In past conforming changes, conformance has not been viewed as requiring identical wording and flexibility has been used for clarity and to account for different formats and contents of rules. Thus, the Commission is not bound to the exact words in either case. Some differences are necessary to avoid ambiguity or confusion. For example, with regard to this rulemaking, the scope of both the settlement agreement and the EPA amendments were limited to the completion of the final radon barrier and did not extend to the longevity aspect of radon control nor to other aspects of reclamation. The terms "reclamation" and "closure" have a broader meaning in appendix A than as used in the settlement agreement or in EPA's amendments to 40 CFR part 192. It would not be practical to limit the use of these terms for the purpose of these specific amendments to appendix A. There are other terms that must also be used carefully because of their use in NRC regulations or by the regulated industry. Beyond what was considered necessary to avoid ambiguity and to provide appropriate expansion beyond the scope of EPA's amendments, the Commission has attempted to be consistent with the words of the settlement agreement and 40 CFR part 192.

Definitions

Comment. The four industry commenters who suggested that changes were needed all believed it was important that the definitions of *factors beyond the control of the licensee* and *available technology* be completely consistent with the settlement agreement and the final amendments to 40 CFR part 192, subpart D, and specifically, to include all the illustrative examples within the definition, not just in the statement of considerations. Some also suggested that the words "complete the barrier" in the definition of *factors beyond the control of the licensee* be changed to "achieve compliance." They were concerned that the intent of the parties to the settlement agreement would not be carried out in the interpretation of these terms in the future. Some specifically noted the loss of personnel familiar with the issues that will accompany the close of the NRC uranium recovery field office (URFO). The EPA did not suggest that including all of the illustrative text was necessary for conformance but suggested it would be best to include the phrase "provided there is reasonable progress toward emplacement of the final radon barrier" (from 40 CFR 192.31(m)) in NRC's definition of *available technology*. The EPA also suggested adding "in compliance with Criterion 6A-(1)" after "complete the barrier" in the definition of *factors beyond the control of the licensee* for clarity and to assure proper implementation of subpart D of 40 CFR part 192.

Response. Explanations concerning the Commission's intent regarding its interpretation of its regulations that appear in statements of consideration stand as a record of the Commission's intent. However, inclusion within the regulatory text makes the illustrative examples more readily available so that questions of interpretation are less likely to arise. Consistent with EPA's final amendments to 40 CFR part 192, all of the illustrative examples have been added in the final definitions. The additional text suggested by EPA has also been included in these definitions.

Comment. Most of the industry commenters also wanted the definition of *milestone* to be worded exactly as in 40 CFR part 192. The concern was primarily that milestones not be required to be established for actions beyond meeting the radon "flux standard." Some of the commenters also suggested that the use in the preamble of varying modifiers, "key," "interim," and "reclamation," to "milestones" and "milestone activities," which are used interchangeably, was confusing.

Response. The definition of *milestone* has not been changed because the Commission believes it is less confusing in that it is in better agreement with normal usage. There is no substantive difference in the standard as a result of this difference and it gives the Commission the flexibility to use the term generically. The concerns expressed are addressed alternatively through minor revisions to the definition of *reclamation plan* and paragraph (2) of Criterion 6A to further clarity that no deadlines are required to be established in the licenses beyond completing the final radon barrier as a result of this rulemaking and that any other schedules established in a license do not come under the specific provisions of paragraph (2) of Criterion 6A. The term "milestone activities" has been avoided in this final rule as it is redundant given this definition. The terms "key," "interim," and "reclamation" are used in accordance with their dictionary definitions and require no further definition. As is clear from the definition of *reclamation plan*, the term "reclamation" is not limited to radon control measures.

No comments were received concerning the definitions of *as expeditiously as practicable considering technological feasibility, final radon barrier,* and *operation.*

Criterion 6—Verification of Radon Release Levels

Comment. Some commenters suggested that paragraph (4) of Criterion 6 could be interpreted to require submission of the results of radon measurements after measurements are made on a portion of an impoundment in the case of phased emplacement of the radon barrier. Two commenters suggested that interim reports might be required in a particular case subject to the agreement of the licensee, but objected to the possible interpretation that separate reports be required routinely on each portion. One suggested that it should be clarified that the testing need not be done on each portion as the cover is completed.

Response. Paragraph (3) specifically requires testing to be done on each portion of the impoundment as the cover is completed in the case of phased emplacement. This was made a requirement rather than simply being allowed as in 40 CFR 192.32(b)(4)(ii) because of the requirement in paragraph (2) of this Criterion to conduct testing and analysis prior to placement of erosion protection features and the importance of timeliness in completing erosion protection features. There is, however, no specific time limit established in the regulation for these measurements on the individual portions of the impoundment.

Paragraph (4) requires submittal of a report 90 days after completion of the testing and analysis. Because this verification is of radon flux levels averaged over the impoundment, it is not complete until all testing and analysis is complete for the whole impoundment. Thus, only one report is required, although further testing and

analysis with associated reporting could be required in a particular case if the initial report is not acceptable. Minor editorial changes have been made to further clarify this point. Note, although it is impractical to do so routinely, riprap or other erosion protection barriers can be disturbed in order to take a radon emission measurement if necessary.

Comment. One commenter suggested that paragraph (2) of Criterion 6 should contain details such as are contained in 40 CFR part 61 on the one-time measurement which are intended to assure that conditions under which the flux is measured lead to a reasonable average flux. It was suggested that this would eliminate confusion with footnote 2 that applies to the design criterion. Related to this, some commenters argued for deletion of part of existing footnote 2 regarding average radon emissions being "over a period of at least one year, but a period short compared to 100 years." These commenters were concerned that long-term monitoring could be implied. Also, two commenters said the footnote was contrary to the settlement agreement and the EPA rule. One said specifically that it was inconsistent with language of 40 CFR 192.12(b)(2).

Response. Footnote 2 applies only to the design criterion. Although the new testing and analysis is intended to verify the effectiveness of the radon barrier, it does not need to take place over the period of time specified in footnote 2. However, it should be reasonably representative of long-term radon releases. The details concerning conditions for flux measurements in 40 CFR part 61 are contained in the description of Method 115 in appendix B and address such matters as the weather conditions at the time measurements are performed. Method 115 is specifically identified in this standard as acceptable and, if used, the conditions embodied in the description in appendix B of 40 CFR part 61 would apply. Because Method 115 is also a standard for the adequacy of other verification methods in Criterion 6, alternative methods must be approved by the Commission as being at least as effective as Method 115. Similar considerations to those embodied in Method 115 concerning the representiveness of the measurement results of the long term radon releases will be made in judging alternative methods. Details of conditions for measurement need not be specified in this rule.

Modifying footnote 2 substantively, as was suggested by the commenters, would be outside the scope of this rulemaking. Footnote 2 is consistent with 40 CFR part 192, subpart D, which contains the same footnote (in the comparable design standard, 40 CFR 192.32(b)(1)(ii)). The footnote was not intended to and does not require long-term monitoring. The Commission agrees that long-term monitoring would be contrary to the settlement agreement.

Comment. One commenter argued that the existing requirement to reduce gamma exposure to background levels should be eliminated or applied only at the site boundary. This commenter stated that this requirement appears to be a misinterpretation of the intent of 40 CFR part 192, subpart A. This commenter also said that the radon cover will attenuate gamma radiation to near background levels in most cases; and that in an unusual case, adding to the cover to control gamma exposure levels could be unnecessarily expensive, as access is restricted. The commenter believed that, as a minimum, the Commission should specify a limit based on acceptable risk to the maximum-exposed individual that can be supported by a cost-benefit analysis.

Response. The criterion on gamma exposure levels is not based on 40 CFR part 192 nor any other EPA regulation. It has been in appendix A to part 40 since it was originally added to part 40 on October 3, 1980 (45 FR 65521). This aspect of Criterion 6 is outside the scope of this rulemaking. However, if the cost of meeting any criterion in appendix A is excessive in a specific case due to unique conditions, the licensee may request an alternative approach in accordance with the introduction to appendix A.

Criterion 6A, Paragraph (1)—Requirement for Timeliness

Comment. Two commenters were concerned that the parenthetical "(including factors beyond the control of the licensee)" was not included in the standard following, "as expeditiously as practicable considering technological feasibility" as in 40 CFR 192.32(a)(3)(i) even though it is contained in the definition of *as expeditiously as practicable considering technological feasibility*. They claimed that this could lead to misinterpretation that the standard deletes this essential concept.

Response. A parenthetical statement noting that the term *as expeditiously as practicable considering technological feasibility* is specifically defined in the Introduction and includes "factors beyond the control of the licensee" has been added.

Comment. Some of the commenters opposed the establishment of separate milestone deadlines for dewatering and recontouring, saying that the settlement agreement and 40 CFR part 192 specify only three required milestones including just one for interim stabilization. Dewatering and recontouring are part of interim stabilization. These commenters said that this was also inconsistent with the practice with existing licenses. The EPA noted that it agreed with NRC's statement in the preamble of its proposed rule that the concept of milestones could not be omitted.

Response. The final rule has been changed to specifically require the establishment of deadlines for only three milestones: Wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and final radon barrier construction. The Commission, however, retains the authority to require the establishment of additional milestones determined to be "key" to the completion of the final radon barrier in an individual case (note the words "but not limited to" in the definition of *reclamation plan*). This is consistent with 40 CFR part 192, subpart D, and with the settlement agreement. The Commission has no intent at this time to change the milestones for which deadlines have already been approved in individual licensing actions.

Comment. The EPA noted that it understands that emplacement of the final radon barrier is a requisite milestone but was concerned that it could be interpreted otherwise, and suggested clarification. The EPA also noted that it understands "deadlines" to mean dates by which actions must be completed and "established as a condition of an individual license" to mean incorporation of a condition into a license by the Commission. However, the EPA was concerned that paragraph (1) of Criterion 6A may be ambiguous and provided specific suggested edits.

Response. Paragraph (1) of Criterion 6A has been modified slightly to address EPA's concerns, although not exactly as suggested. The Commission believes it is clear that completion of the final radon barrier is a requisite milestone, that "deadlines" means dates by which actions must be completed, and that deadlines are to be established on the basis that the barrier is to be completed as expeditiously as practicable considering technological feasibility. The Commission also believes that its regulations are less subject to misinterpretation if there is consistency of style and terminology.

Comment. Two commenters were concerned about the NRC extending the

scope of the timeliness requirement from that of 40 CFR part 192, subpart D, stating that the "as expeditiously as practicable considering technological feasibility" requirement should not be extended to erosion protection. They contended that this is a term of art limited to radon emissions, that EPA used this term to eliminate the cost-balancing standards of the AEA from radon control measures, and that applying it to erosion protection would constrain the use of AEA cost considerations. They also noted that NRC has adequate authority under other aspects of its UMTRCA program to deal with concern for degradation of the barrier and stated that NRC should handle this on a site-specific basis through license amendment.

Response. The final rule has been modified so that the terminology "as expeditiously as practicable considering technological feasibility" is used only for emplacement of the final radon barrier. A general timeliness standard for completing erosion protection features is retained. Thus, it is clear that the licensee must complete these actions in a timely way and that the NRC has the authority to take action if necessary in this regard. However, the restrictive cost considerations specified for the completion of the final radon barrier do not apply to decisions concerning the timeliness of completion of erosion protection features. Instead, the more flexible, general cost considerations of the AEA (Section 84a(1)) apply.

Comment. The same commenters sought clarification of NRC's intent in extending reclamation plans to cover groundwater protection. They asked whether the NRC could prevent licensees from continuing surface reclamation until groundwater issues are resolved, stating that this was not past practice. However, they also wanted the Commission to confirm that groundwater concerns could constitute a legitimate cause for delay.

Response. It is important for all aspects of reclamation to be addressed in one plan so that potential interactions of various activities can be accounted for and that reclamation can be planned for overall efficiency. Nonetheless, all aspects of a reclamation plan would not necessarily be approved at the same time. Past licensing practice has not necessarily required all details of reclamation planning to be in one document; however, approvals of activities have included consideration of impacts to other aspects of reclamation. The NRC would not necessarily prevent licensees from continuing surface reclamation until groundwater issues are resolved. However, the words "the need for consistency with mandatory requirements of other regulatory programs" in the definition of "as expeditiously as practicable considering technological feasibility" make it clear that groundwater concerns could constitute a legitimate cause for delay. Whether or not a groundwater issue would be considered a legitimate cause for delay of radon control measures under paragraph (1) of Criterion 6A would depend on the nature of the interaction of the various reclamation activities in a particular case.

Criterion 6A, Paragraph (2)—Special Criteria for Approval of Delays

Comment. Two commenters stated that paragraph (2) of Criterion 6A does not fully implement the settlement agreement. They stated that the settlement agreement and 40 CFR 192.32(a)(3)(iii) include delay of interim milestones for reason of cost not just the dates for completion of the final radon barrier. These same commenters were concerned that it was not clear from paragraph (2) of Criterion 6A that deadlines for milestones could also be extended because of factors beyond the control of the licensee and also expressed strong agreement with the statement that there is "no need for complex justifications for delaying completion of reclamation" if the licensee demonstrates that the site meets 20 pCi/m²s prior to final closure. These two commenters also stated that the intent of the settlement agreement is that interim milestones may be changed without meeting 20 pCi/m²s, if there is no delay in final closure date. On this subject, the EPA specifically supported paragraph (2) of Criterion 6A as drafted. The EPA also specifically confirmed our interpretation of its amendments to 40 CFR part 192 in this regard and clarified that there may be other instances under which NRC may reconsider a date established for completion of a milestone. The EPA also stated in its comments that the alternative interpretation of its proposed amendments suggested in the Commission's preamble to its proposed rule (that meeting the 20 pCi/m²s "flux standard" might be required in all cases) was incorrect.

Response. The Commission does not agree that the words "or relevant milestone" in section III.2.j of the settlement agreement and 40 CFR 192.32(a)(3)(iii) should be interpreted to mean that these paragraphs address delay of interim milestones for reason of cost. Also, approvals of extensions of interim milestones without meeting 20 pCi/m²s are not necessarily limited to cases where there is no delay in final closure date.

Paragraph (2) of Criterion 6A and 40 CFR 192.32(a)(3)(ii) and (iii) set forth specific criteria for extensions of deadlines under certain circumstances. These provisions do not cover all circumstances under which extensions may be approved. This interpretation was confirmed by EPA in the preamble of its final rule and in its comments submitted on NRC's proposed rule. All other approvals of extensions must be made under paragraph (1) of Criterion 6A through applying all of the concepts involved in the requirement for completion of the final radon barrier "as expeditiously as practicable considering technological feasibility" (including within its definition "factors beyond the control of the licensee"). This was stressed in EPA's final rule notice of November 15, 1993, at 58 FR 60351. In response to a commenter that noted that NRC or an Agreement State may extend the date for emplacement of the radon barrier based on "factors beyond the control of the licensee" as that term is implicit in the definition of "as expeditiously as possible," EPA stated in part that "there is no bar to NRC or an Agreement State reconsidering a prior decision establishing a date for emplacement of the radon barrier that meets the standard of 'as expeditiously as possible.' Such reconsideration could, for example, be based on the existence of factors beyond the control of the licensee, or on a change in any of the various factors that must be considered in establishing a date that meets the 'as expeditiously as practicable' standard of § 192.32(a)(3)(i). However, EPA stresses that such a change in circumstances would not automatically lead to an extension. It would be incumbent on NRC or an Agreement State to evaluate all of the factors relevant under § 192.32(a)(3)(i) before it could change a previously established milestone or date for the emplacement of the final barrier, and any new date would have to meet the standard set out in § 192.32(a)(3)(i)." The comparable standard in this NRC rule is set out in paragraph (1) of Criterion 6A.

Criterion 6A, Paragraph (3)—Continuing Disposal During Closure

Comment. Some commenters noted that Criterion 6A, paragraph 3, as proposed, was inconsistent with the final EPA rule. Some also suggested that it was inconsistent with the settlement agreement, could lead to premature closure, and would require radon monitoring during closure. One

commenter said that "during closure activities" does not include the period after emplacement of the final radon barrier according to the EPA rule and the settlement agreement, and that the intent should be that "once the final radon barrier has been placed over the impoundment, excluding the area receiving byproduct material, the 'closure process' ceases." Two of the commenters specifically agreed with the interpretation that "during closure activities" could include the period after emplacement of the final radon barrier and wanted the NRC to confirm this so that similar materials would still be allowed at that time. These two commenters did not want paragraph (3) of Criterion 6A to require an opportunity for public participation in approving acceptance of byproduct material "during closure." The EPA submitted suggested revisions to make final paragraph (3) of Criterion 6A consistent with the final amendments in 40 CFR 192.32(a)(3)(iv) and (v).

Response. EPA, in its proposed revision of 40 CFR part 192, subpart D, combined the provisions of sections III.2.c (i) and (ii) of the settlement agreement in one paragraph. In so doing, EPA, apparently inadvertently, differed somewhat from the settlement agreement but modified the final rule so that it is now consistent with the settlement agreement. The Commission must conform appendix A to 40 CFR part 192, as adopted, and has thus revised its final rule accordingly. The differences from the proposed rule are that (1) materials similar to byproduct material will not be approved for continued disposal after the verification of radon flux levels and (2) an opportunity for public participation will not specifically be provided in the case of continued disposal during closure prior to this point in time. Note, however, opportunity for public participation exists in any case under 10 CFR part 2, subpart L. The exact words suggested in EPA's comments have not been used but the revisions are substantively the same. The reasons for differing are the same as when the proposed rule was drafted: (1) the term "closure" in appendix A has a broader meaning than the scope of EPA's rule, and (2) the final radon barrier is not absolutely complete while disposal is continuing even though it may be adequate to demonstrate that average radon release levels meet the 20 pCi/m^2s "flux standard."

Miscellaneous comments

Comment. One State commenter strongly recommended that NRC offer guidance (not necessarily in the rule) on paragraph (3) of Criterion 6A on what materials are appropriately similar. The commenter suggested specification of limits to the range of variation of a critical property or concentration or activity.

Response. Guidance on considerations for the approval of disposal of non-11e(2) materials in tailings impoundments was published May 13, 1992 (57 FR 20525). This notice also presented a staff analysis on which the guidance is based and requested public comment to be considered in a decision on whether the guidance should be revised.

Comment. Two commenters stated, for the record, that they agreed with NRC that the implementation details of EPA's 40 CFR part 192, subpart D, are a special case and go beyond "generally applicable standards," and that these provisions should not set a precedent with regard to what constitutes a generally applicable standard. They contended that certain aspects of subpart D exceed EPA's statutory authority.

Response. The Commission noted in the preamble of the proposed rule that the nature of the revisions to 40 CFR part 192, subpart D, were influenced by the settlement agreement, that the settlement agreement included considerable detail concerning the specifics of the regulations that were to be developed, and that apparently as a result of this, 40 CFR part 192, subpart D, includes numerous details of implementation. The Commission also stated its view, which it still holds, that the inclusion of these implementation details is a special case because of the settlement agreement and does not establish any precedent with regard to what constitutes a generally applicable standard. With regard to the question of the limits of EPA's statutory authority, any challenge to EPA's authority to issue the November 15, 1993, final amendments to 40 CFR part 192 is outside the scope of this conforming action.

Comment. The AMC stated that even if the Commission makes this rule a Division 2 matter of compatibility, AMC will return to litigation if an Agreement State adopts more stringent provisions.

Response. UMTRCA provides the States an option for alternative, more stringent standards. The settlement agreement cannot eliminate this option. However, notice for comment and approval by NRC is required and AMC can raise appropriate issues at that time should a State propose more stringent standards. The Division 2 matter of compatibility is maintained.

Comment. The AMC contended that some statements in the preamble to the proposed rule were in error or in need of clarification. Among these contentions were that the summary of bases for AMC's challenge to subpart T implied that the limited bases mentioned were all inclusive.

Response. The primary bases for the various litigants' challenges were mentioned in a brief historical summary that was not presented as a complete background. The EPA's various notices are referenced in the background section of this notice for more details concerning subpart T and the related litigation.

Comment. AMC also stated that NRC had implied that EPA could not rescind subpart T if the planned rulemakings were not completed, arguing that EPA has adequate bases to rescind absent these rulemakings.

Response. NRC did not mean to imply that EPA could not rescind subpart T absent the planned rulemakings. However, EPA had made statements that it would not rescind subpart T unless comparable provisions were added to 40 CFR part 192 and 10 CFR part 40.

Comment. The AMC also stated that the timeliness of decommissioning rule should not have been suggested as in any way relevant and requested that NRC note that Chairman Selin is on record suggesting that a blanket exemption of uranium recovery facilities may make sense.

Response. Final action on the proposed NRC rule to require timeliness in decommissioning (January 13, 1993; 58 FR 4099) would be expected to impact the timing of decommissioning of the mill, not necessarily the timing of the impoundment going from operational status to closure. ("Closure" in appendix A does include both decommissioning of the mill and reclamation of the tailings and/or waste disposal areas.) If subpart T is rescinded, there will be no regulatory requirement for the tailings impoundment to change from operational to non-operational status within any specified time after the mill ceases operation. The definition of "operational" in subpart T would have restricted the continued use of the impoundment for extended periods after the associated mill was decommissioned.

No comments were received on the regulatory analysis or the environmental assessment and finding of no significant impact.

Conclusion

As indicated in the responses to the comments, the Commission has decided

to adopt the rule as proposed with minor modifications, which consist of revisions to conform to the final effective amendments to 40 CFR part 192 and clarifications.

Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in subpart A of 10 CFR part 51, that this rule is not a major Federal action significantly affecting the quality of the human environment and therefore an environmental impact statement is not required. This final rule requires that enforceable dates be established for certain interim milestones and completion of the final radon barrier on non-operational mill tailings piles through an approved reclamation plan and that a determination of the radon flux levels be made to verify compliance with the existing design standard for the final radon barrier. It is intended to better assure that the final radon barrier is completed in a timely manner and is adequately constructed to comply with the applicable design standard. Thus, it provides an additional assurance that public health and the environment are adequately protected. Because the final rule is not expected to change the basic procedures or construction of the radon barrier, there should be no adverse environmental impacts. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the environmental assessment and finding of no significant impact are available from Catherine R. Mattsen, U. S. Nuclear Regulatory Commission, Washington, DC 20555, Phone: (301) 415–6264.

Paperwork Reduction Act Statement

This final rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). These requirements were approved by the Office of Management and Budget approval number 3150–0020.

Public reporting burden for this collection of information is estimated to average 156 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch (T–6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB–3019 (3150–0020), Office of Management and Budget, Washington, DC 20503.

Regulatory Analysis

The Commission has prepared a regulatory analysis on this final regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The analysis is available for inspection in the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the analysis may be obtained from Catherine R. Mattsen, U.S. Nuclear Regulatory Commission, Washington, DC 20555, (301) 415–6264.

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980, (5 U.S.C. 605(b)), the Commission certifies that this rule will not have a significant economic impact on a substantial number of small entities. There are only 19 NRC uranium mill licensees. Almost all of these mills are owned by large corporations. Although a few of the mills are partly-owned by companies that might qualify as small businesses under the Small Business Administration size standards, the Regulatory Flexibility Act incorporates the definition of small business presented in the Small Business Act. Under this definition, a small business is one that is independently owned and operated and is not dominant in its field. Because these mills are not independently owned, they do not qualify as small entities.

List of Subjects in 10 CFR part 40

Criminal penalties, Government contracts, Hazardous materials transportation, Nuclear materials, Reporting and recordkeeping requirements, Source material, Uranium.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 552 and 553; the NRC is adopting the following amendments to 10 CFR part 40.

PART 40—LICENSING OF SOURCE MATERIAL

1. The authority citation for part 40 continues to read as follows:

Authority: Secs. 62, 63, 64, 65, 81, 161, 182, 183, 186, 68 Stat. 932, 933, 935, 948, 953, 954, 955, as amended, secs. 11e(2), 83, 84, Pub. L. 95–604, 92 Stat. 3033, as amended, 3039, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2014(e)(2), 2092, 2093, 2094, 2095, 2111, 2113, 2114, 2201, 2232, 2233, 2236, 2282); sec. 274, Pub. L. 86–373, 73 Stat. 688 (42 U.S.C. 2021); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 275, 92 Stat. 3021, as amended by Pub. L. 97–415, 96 Stat. 2067 (42 U.S.C. 2022).

Section 40.7 also issued under Pub. L. 95–601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 40.31(g) also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 40.71 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

2. In appendix A, add the definitions of *as expeditiously as practicable considering technological feasibility, available technology, factors beyond the control of the licensee, final radon barrier, milestone, operation,* and *reclamation plan* to the Introduction in alphabetical order; revise Criterion 6; and add Criterion 6A to read as follows:

Appendix A to Part 40—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

Introduction

* * * * *

As expeditiously as practicable considering technological feasibility, for the purposes of Criterion 6A, means as quickly as possible considering: the physical characteristics of the tailings and the site; the limits of *available technology*; the need for consistency with mandatory requirements of other regulatory programs; and *factors beyond the control of the licensee.* The phrase permits consideration of the cost of compliance only to the extent specifically provided for by use of the term *available technology.*

Available technology means technologies and methods for emplacing a final radon barrier on uranium mill tailings piles or impoundments. This term shall not be construed to include extraordinary measures or techniques that would impose costs that are grossly excessive as measured by practice within the industry for one that is reasonably analogous), (such as, by way of illustration only, unreasonable overtime, staffing, or transportation requirements, etc., considering normal practice in the industry; laser fusion of soils, etc.), provided there is reasonable

progress toward emplacement of the final radon barrier. To determine grossly excessive costs, the relevant baseline against which cost shall be compared is the cost estimate for tailings impoundment closure contained in the licensee's approved reclamation plan, but costs beyond these estimates shall not automatically be considered grossly excessive.

* * * * *

Factors beyond the control of the licensee means factors proximately causing delay in meeting the schedule in the applicable reclamation plan for the timely emplacement of the final radon barrier notwithstanding the good faith efforts of the licensee to complete the barrier in compliance with paragraph (1) of Criterion 6A. These factors may include, but are not limited to—

(1) Physical conditions at the site;

(2) Inclement weather or climatic conditions;

(3) An act of God;

(4) An act of war;

(5) A judicial or administrative order or decision, or change to the statutory, regulatory, or other legal requirements applicable to the licensee's facility that would preclude or delay the performance of activities required for compliance;

(6) Labor disturbances;

(7) Any modifications, cessation or delay ordered by State, Federal, or local agencies;

(8) Delays beyond the time reasonably required in obtaining necessary government permits, licenses, approvals, or consent for activities described in the reclamation plan proposed by the licensee that result from agency failure to take final action after the licensee has made a good faith, timely effort to submit legally sufficient applications, responses to requests (including relevant data requested by the agencies), or other information, including approval of the reclamation plan; and

(9) An act or omission of any third party over whom the licensee has no control.

Final radon barrier means the earthen cover (or approved alternative cover) over tailings or waste constructed to comply with Criterion 6 of this appendix (excluding erosion protection features).

* * * * *

Milestone means an action or event that is required to occur by an enforceable date.

* * * * *

Operation means that a uranium or thorium mill tailings pile or impoundment is being used for the continued placement of byproduct material or is in standby status for such placement. A pile or impoundment is in operation from the day that byproduct material is first placed in the pile or impoundment until the day final closure begins.

* * * * *

Reclamation plan, for the purposes of Criterion 6A, means the plan detailing activities to accomplish reclamation of the tailings or waste disposal area in accordance with the technical criteria of this appendix. The reclamation plan must include a schedule for reclamation milestones that are key to the completion of the final radon barrier including as appropriate, but not limited to, wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and final radon barrier construction. (Reclamation of tailings must also be addressed in the closure plan; the detailed reclamation plan may be incorporated into the closure plan.)

* * * * *

Criterion 6 (1) In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations and shall close the waste disposal area in accordance with a design [1] which provides reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as not to exceed an average [2] release rate of 20 picocuries per square meter per second (pCi/m^2s) to the extent practicable throughout the effective design life determined pursuant to (1)(i) of this Criterion. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances may not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer may not be taken into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that these materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term intervals.

(2) As soon as reasonably achievable after emplacement of the final cover to limit releases of radon-222 from uranium byproduct material and prior to placement of erosion protection barriers or other features necessary for long-term control of the tailings, the licensee shall verify through appropriate testing and analysis that the design and construction of the final radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m^2s averaged over the entire pile or impoundment using the procedures described in 40 CFR part 61, appendix B, Method 115, or another method of verification approved by the Commission as being at least as effective in demonstrating the effectiveness of the final radon barrier.

(3) When phased emplacement of the final radon barrier is included in the applicable reclamation plan, the verification of radon-222 release rates required in paragraph (2) of this criterion must be conducted for each portion of the pile or impoundment as the final radon barrier for that portion is emplaced.

(4) Within ninety days of the completion of all testing and analysis relevant to the required verification in paragraphs (2) and (3) of this criterion, the uranium mill licensee shall report to the Commission the results detailing the actions taken to verify that levels of release of radon-222 do not exceed 20 pCi/m^2s when averaged over the entire pile or impoundment. The licensee shall maintain records until termination of the license documenting the source of input parameters including the results of all measurements on which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine compliance. These records shall be kept in a form suitable for transfer to the custodial agency at the time of transfer of the site to DOE or a State for long-term care if requested.

(5) Near surface cover materials (i.e., within the top three meters) may not include waste or rock that contains elevated levels of radium; soils used for near surface cover must be essentially the same, as far as radioactivity is concerned, as that of surrounding surface soils. This is to ensure that surface radon exhalation is not significantly above background because of the cover material itself.

(6) The design requirements in this criterion for longevity and control of radon releases apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged over areas of 100 square meters, which, as a result of byproduct material, does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface.

(7) The licensee shall also address the nonradiological hazards associated with the wastes in planning and implementing closure. The licensee shall ensure that disposal areas are closed in a manner that minimizes the need for further maintenance. To the extent necessary to prevent threats to human health and the environment, the licensee shall control, minimize, or eliminate post-closure escape of nonradiological hazardous constituents, leachate, contaminated rainwater, or waste decomposition products to the ground or surface waters or to the atmosphere.

Criterion 6A (1) For impoundments containing uranium byproduct materials, the final radon barrier must be completed *as expeditiously as practicable considering technological feasibility* after the pile or impoundment ceases operation in accordance with a written, Commission-approved reclamation plan. (The term *as expeditiously as practicable considering technological feasibility* as specifically

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[1] In the case of thorium byproduct materials, the standard applies only to design. Monitoring for radon emissions from thorium byproduct materials after installation of an appropriately designed cover is not required.

[2] This average applies to the entire surface of each disposal area over a period of a least one year, but a period short compared to 100 years. Radon will come from both byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from byproduct materials to the atmosphere.

defined in the introduction of this appendix includes factors beyond the control of the (licensee.) Deadlines for completion of the final radon barrier and, if applicable, the following interim milestones must be established as a condition of the individual license: windblown tailings retrieval and placement on the pile and interim stabilization (including dewatering or the removal of freestanding liquids and recontouring). The placement of erosion protection barriers or other features necessary for long-term control of the tailings must also be completed in a timely manner in accordance with a written, Commission-approved reclamation plan.

(2) The Commission may approve a licensee's request to extend the time for performance of milestones related to emplacement of the final radon barrier if, after providing an opportunity for public participation, the Commission finds that the licensee has adequately demonstrated in the manner required in paragraph (2) of Criterion 6 that releases of radon-222 do not exceed an average of 20 pCi/m²s. If the delay is approved on the basis that the radon releases do not exceed 20 pCi/m²s, a verification of radon levels, as required by paragraph (2) of Criterion 6, must be made annually during the period of delay. In addition, once the Commission has established the date in the reclamation plan for the milestone for completion of the final radon barrier, the Commission may extend that date based on cost if, after providing an opportunity for public participation, the Commission finds that the licensee is making good faith efforts to emplace the final radon barrier, the delay is consistent with the definition of *available technology*, and the radon releases caused by the delay will not result in a significant incremental risk to the public health.

(3) The Commission may authorize by license amendment, upon licensee request, a portion of the impoundment to accept uranium byproduct material or such materials that are similar in physical, chemical, and radiological characteristics to the uranium mill tailings and associated wastes already in the pile or impoundment, from other sources, during the closure process. No such authorization will be made if it results in a delay or impediment to emplacement of the final radon barrier over the remainder of the impoundment in a manner that will achieve levels of radon-222 releases not exceeding 20 pCi/m²s averaged over the entire impoundment. The verification required in paragraph (2) of Criterion 6 may be completed with a portion of the impoundment being used for further disposal if the Commission makes a final finding that the impoundment will continue to achieve a level of radon-222 releases not exceeding 20 pCi/m²s averaged over the entire impoundment. In this case, after the final radon barrier is complete except for the continuing disposal area, (a) only byproduct material will be authorized for disposal, (b) the disposal will be limited to the specified existing disposal area, and (c) this authorization will only be made after providing opportunity for public participation. Reclamation of the disposal area, as appropriate, must be completed in a timely manner after disposal operations cease in accordance with paragraph (1) of Criterion 6; however, these actions are not required to be complete as part of meeting the deadline for final radon barrier construction.

Dated at Rockville, Maryland, this 24th day of May, 1994.

For the Nuclear Regulatory Commission.

John C. Hoyle,

Acting Secretary of the Commission.

[FR Doc. 94-13248 Filed 5-31-94; 8:45 am]

BILLING CODE 7590-01-P

SMALL BUSINESS ADMINISTRATION

13 CFR Part 121

Small Business Size Standards; Surety Bond Guaranty Assistance Program

AGENCY: Small Business Administration.

ACTION: Final rule.

SUMMARY: The Small Business Administration (SBA) is adopting as final a size standard for the Surety Bond Guaranty Program of $5.0 million in average annual receipts for firms in the construction and services industries. This size standard is being adopted in order to take into consideration the effect of inflation since 1978 on the current size standard and to expand eligibility for SBA surety guarantees to firms in the construction and services industries above $3.5 million that are experiencing difficulties in obtaining surety bonding in the private market.

DATES: Effective July 1, 1994.

FOR FURTHER INFORMATION CONTACT: Gary M. Jackson, Director, Size Standards Staff, Tel: (202) 205-6618.

SUPPLEMENTARY INFORMATION: The SBA has administered a program of contract surety bond guarantee assistance for small businesses since 1971. The SBA guarantee enables participating surety companies to furnish surety bonds on behalf of small contractors that would be unable to obtain bonding on reasonable terms and conditions without an SBA guarantee. The SBA guarantees the surety company against a percentage of loss it may incur under an eligible contractor's bond.

This final rule will increase the surety bond guarantee size standard to $5.0 million in average annual receipts from $3.5 million for firms in the construction and services industries which apply for such guarantees. This adopted size standard is lower than the $6 million size standard the SBA had proposed on August 27, 1993 (58 FR 45300). As stated in the proposed rule, the SBA believes the current $3.5 million size standard, established in 1978 (43 FR 21689), should be increased for three reasons: (1) to account for the effects of inflation since 1978, (2) to bring the surety size standard closer to the size standards established for other program purposes for the construction industries ($7 million for special trades and $17 million for general and heavy construction), and (3) to extend assistance to firms above $3.5 million who otherwise could not obtain surety bonds on reasonable terms and conditions. Further consideration of the proposed size standard by the SBA in light of comments received to the proposed size standard has led to the conclusion that a size standard of $5 million is more appropriate for purposes of the surety bond guaranty program.

The SBA received a total of thirty-eight comments in response to the August 27, 1993 proposed rule. The comments received show approximately half in favor and half opposed to the proposed increase to $6.0 million. Twenty of the thirty-eight comments supported the proposed rule. The affirming comments, fourteen from surety companies and surety associations and six from contractors and contractor associations, agreed that inflation over the past 15 years has reduced the availability of surety bonds for small contractors by not being eligible for an SBA guaranteed surety bond due to their business size. These commenters agreed that the Surety Bond Guaranty size standard should be revised to $6.0 million based on inflation.

The SBA received eighteen comments opposing the proposed increase to $6.0 million in annual receipts. All eighteen comments were from surety companies and surety associations (SBA's partners in the surety bonding process). These comments disagreed with the need for the proposed rule and expressed concern about its impact on the Surety Guaranty Program.

All eighteen of the respondents commenting negatively on the proposed Surety Bond Guaranty size standard disagreed with the Agency position that $6 million in revenues should define a small business in the construction and service industries, and contended that the size standard should remain at the current level of $3.5 million. The commenters argued that, based on a recent study by the National Association of Surety Bond Producers, surety bonds are readily available for small firms with less than $2.0 million in revenues. The commenters emphasized that if the purpose of the SBA surety bond program is to assist small businesses in obtaining bonds, the current market availability of surety bonds is such that

Appendix 2
Revised Section 6 to the White Mesa Mill Reclamation Plan

6 MILESTONES AND SCHEDULE COMMITMENTS FOR RECLAMATION

6.1. Background

Utah Administrative Code R313-24-4, incorporating by reference 10 CFR Part 40 Appendix A Criterion 6A ("Criterion 6A") paragraph (1), provides that: "For impoundments containing uranium byproduct materials, the final radon barrier must be completed as expeditiously as practicable considering technological feasibility after the pile or impoundment ceases operation in accordance with a written, Commission-approved reclamation plan. (The term as expeditiously as practicable considering technological feasibility as specifically defined in the Introduction of this appendix includes factors beyond the control of the licensee.) Deadlines for completion of the final radon barrier and, if applicable, the following interim milestones must be established as a condition of the individual license: windblown tailings retrieval and placement on the pile and interim stabilization (including dewatering or the removal of freestanding liquids and re-contouring). The placement of erosion protection barriers or other features necessary for long-term control of the tailings must also be completed in a timely manner in accordance with a written, Commission-approved reclamation plan."

As contemplated by Criterion 6A, this Section sets out the interim milestones and deadlines for completion of the final radon barrier for individual tailings impoundments (referred to in this Section as "tailings impoundments" or "conventional impoundments") at the Mill after each such impoundment begins final closure. It also sets out milestones for the removal and disposal of non-conventional impoundments (referred to in this Section as "evaporation ponds" or "non-conventional impoundments") after each such impoundment begins final closure, as well as an additional milestone applicable to final Mill site closure. A table that summarizes all of these milestones is included in Section 6.2.6 below.

Also included below are schedule commitments for other events or actions which are not "milestones" required under Criterion 6A, but instead are schedule commitments to be achieved in order to ensure that those events or actions are completed in a timely manner. As these schedule commitments are not milestones they do not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing those items is retained. The licensee must complete those actions in a timely way, and the Director has the authority to take action if necessary in this regard. As these schedule commitments are not milestones required under Criterion 6A(1), they are not included in the table set out in Section 6.2.6 below.

6.2. Milestones and Schedule Commitments

6.2.1. General

(a) Definition of "Operation"

"Operation" means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.

(b) When Final Closure of an Impoundment Begins

Final closure of an impoundment begins when the owner or operator provides written notice to the EPA and to the Director that:

i) In the case of a conventional impoundment (i.e., a tailings impoundment), the impoundment is no longer receiving uranium byproduct material or tailings, is no longer on standby status for such receipt and is being managed under an approved reclamation plan for that impoundment or facility closure plan; and

ii) In the case of a non-conventional impoundment (e.g., an evaporation pond), the impoundment is no longer required for evaporation or holding purposes, is no longer on standby for such purposes and is being managed under an approved reclamation plan for that impoundment or facility closure plan.

An approved reclamation plan prepared and approved in accordance with 10 CFR part 40, Appendix A is considered a reclamation plan for purposes of this paragraph 6.2.1(b).

(c) The Existing Tailings Management System at the Mill

The tailings management system at the Mill currently consists of three tailings impoundments: Cell 2, which is not in operation and is in final closure, and Cells 3 and 4A, which are in operation. Cell 1 is an evaporation pond. Cell 4B is currently being used as an evaporation pond and will continue to be used as an evaporation pond until it first starts to receive tailings sands or other byproduct material (other than solutions) for disposal. Future cells may commence as evaporation ponds, and will continue as evaporation ponds until they first receive tailings or other byproduct material (other than solutions) for disposal, at which time they will become tailings impoundments.

(d) The Proposed Cover Design and Existing Cover Design

This Plan presents a proposed evapotranspiration (ET) cover (the "Proposed Cover Design") as a component of the reclamation plan for the tailings impoundments, to replace the rock armor cover design (the "Existing Cover Design") set out in Appendix D to the Reclamation Plan Version 3.2b (Denison, 2011b).

The Stipulation and Consent Agreement described in Section 6.2.1(e) below and Section 5.0 above describe a set of circumstances under which the Final Cover Design could be the Existing Cover Design rather than the Proposed Cover Design. Section 5.0 of this Plan describes the manner in which EFRI would revert from the Proposed Cover Design to the Existing Cover Design if so required by the Stipulation and Consent Agreement.

i) <u>The Proposed Cover Design</u>

The Proposed Cover Design will have a minimum thickness of 9.5 feet, and will consist of the following layers listed below from top to bottom:

- Layer 4 - 0.5 ft (15 cm) thick Erosion Protection Layer (topsoil-gravel admixture or topsoil)
- Layer 3 - 3.5 ft (107 cm) thick Water Storage/Biointrusion/Frost Protection/Secondary Radon Attenuation Layer (loam to sandy clay)

- Layer 2 – 3.0 - 4.0 ft (91 to 122 cm) thick Primary Radon Attenuation Layer (highly compacted loam to sandy clay)
- Layer 1 - 2.5 ft (76 cm) thick (minimum) Secondary Radon Attenuation and Grading Layer (loam to sandy clay)

All the layers combined comprise the monolithic ET cover system.

ii) The Existing Cover Design

The Existing Cover Design will have a minimum thickness of 6 feet, and will consist of the following layers listed below from top to bottom:

- Layer 4 -- 3 in (7.6 cm) Rock Armor
- Layer 3 -- 2 ft (61 cm) Frost Barrier Layer (random fill)
- Layer 2 -- 1 ft (30.5) Radon Barrier (compacted clay)
- Layer 1 -- Minimum 3 ft (91.4 cm) Platform Fill (random fill)

(e) The Stipulation and Consent Agreement

EFRI and the Director of the UDEQ DWMRC have entered into a Stipulation and Consent Agreement (the "SCA"), which sets out the terms on which the Mill will test the effectiveness of the Proposed Cover Design and, together with Section 5.0 of this Plan, the circumstances in which the approved Cover Design for reclamation of tailings impoundments could be a variation of the Proposed Cover Design or the Existing Cover Design, rather than the Proposed Cover Design.

6.2.2. Deadlines, Interim Milestones and Schedule Commitments for Closure of Cell 2

The deadlines and interim milestones and schedule commitment dates for closure of Cell 2 are set out in the SCA. The requirements set out in the SCA are incorporated by reference into this Plan as if set out in this Plan. The final radon barrier for Cell 2 (Layers 1 and 2 under the Proposed Cover Design) has been put in place. Radon flux measurements taken since the final radon barrier has been placed onto Cell 2 have been well below the 20 pCi/m^2s standard set out in Criterion 6A.

6.2.3. Milestones and Schedule Commitments for Closure of a Conventional Impoundment (i.e., a Tailings Impoundment), other than Cell 2

A conventional impoundment (i.e., tailings impoundment), other than Cell 2, may begin final closure at any time, including while the Mill facility as a whole remains in operation as well as during or after final Mill site decommissioning and closure. Once final closure of a conventional impoundment begins as specified in Section 6.2.1 b) above, the final radon barrier for the impoundment shall be completed as expeditiously as practicable thereafter considering technological feasibility (including taking into consideration factors beyond the control of the licensee) in accordance with this Plan and the deadlines, milestones and schedule commitments set out below:

(a) Interim Stabilization (Including Dewatering or the Removal of Freestanding Liquids and Re-contouring) of the Tailings Impoundment.

i) Removal of Freestanding Liquids

Commencing on the date the impoundment begins final closure in accordance with Section 6.2.1 b) above, the addition of liquids to the tailings impoundment, other than by natural

precipitation, will cease, and free standing liquids will be allowed to dry out by natural evaporation. To the extent reasonably practicable, and if excess evaporative capacity is available in other cells in the tailings management system, the Mill will transfer solutions out of the tailings impoundment and into other tailings impoundments and/or evaporation ponds in order to enhance evaporation and removal of solutions from the impoundment. This item must be completed within one year after the impoundment begins final closure. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

ii) Re-contouring

Re-contouring of the tailings impoundment, in accordance with Drawings and Attachment A (Technical Specifications) of this Plan ("Re-contouring"), will commence upon removal of freestanding liquids from the impoundment and must be completed within two years after the impoundment begins final closure. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

iii) Commencement of Dewatering

Dewatering of the impoundment shall commence upon completion of re-contouring of the impoundment, and shall continue until the impoundment is dewatered as contemplated by item 6.2.3(a)(vii) below. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

iv) Placement of Layer 1

Upon completion of re-contouring of the impoundment, EFRI will complete placement of Layer 1 (Secondary Radon Attenuation and Grading Layer under the Proposed Cover Design or Platform Fill under the Existing Cover Design, as applicable) on the impoundment, in accordance with this Plan. This item must be completed within three years after the date the impoundment begins final closure. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

v) Placement of Layer 2 (Final Radon Barrier)

Upon EFRI being satisfied that there have been decreasing trends in settlement followed by a maximum of 0.1 feet (30 mm) of cumulative settlement over 12 months (for at least 90 percent of the settlement monuments), or at such earlier time as EFRI may determine, EFRI shall complete placement of Layer 2 (the Primary Radon Attenuation Layer under the Proposed Cover Design or the Radon Barrier under the Existing Cover Design, as applicable) on the impoundment. This item must be completed as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee), but in any event within seven years after the impoundment begins final closure. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

vi) Placement of Layer 3

After placement of Layer 2, EFRI will complete placement of Layer 3 (the Water Storage/Biointrusion/Frost Protection/Secondary Radon Attenuation Layer under the Proposed Cover Design or the Frost Barrier Layer under the Existing Cover Design, as

applicable) on the impoundment. Timing of commencement of this item will be at the discretion of EFRI, and Layer 3 may be placed prior to or after completion of dewatering. The schedule commitment for this item is to have it completed within the later of (A) seven years after the impoundment begins final closure and (B) two years after completion of placement of Layer 2 on the impoundment, or such later date as may be approved by the Director. This item is not a milestone required under Criterion 6A(1) because it follows placement of the final radon barrier and is not required for that action, and because there is a separate milestone for dewatering. Instead, this item is included as a schedule commitment to be achieved in order to ensure that the activity is completed in a timely manner. As this schedule commitment is not a milestone it does not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing this activity is retained. EFRI must complete this activity in a timely way, and the Director has the authority to take action if necessary in this regard.

vii) Completion of Dewatering

Dewatering shall be considered to be complete when, after the placement of Layer 2 and Layer 3 (if Layer 3 is placed prior to completion of dewatering) decreasing trends in settlement followed by a maximum of 0.1 feet (30 mm) of cumulative settlement over 12 months (for at least 90 percent of the settlement monuments) have occurred. This item must be completed within the later of (A) seven years after the impoundment begins final closure and (B) two years after completion of placement of Layer 2 on the impoundment. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

viii)Placement of Layer 4 Under the Proposed Cover Design

Placement of Layer 4 under the Proposed Cover Design (Erosion Protection Layer) on the impoundment will commence after the completion of dewatering (this item does not apply to the Existing Cover Design). The schedule commitment for this item is to have it completed within the later of (A) eight years after the impoundment begins final closure and (B) two years after completion of placement of Layer 3 on the impoundment, or such later time as may be approved by the Director. This item is not a milestone required under Criterion 6A(1), because it follows placement of the final radon barrier and is not required for that activity. Instead, this item is included as a schedule commitment to be achieved in order to ensure that the activity is completed in a timely manner. As this schedule commitment is not a milestone it does not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing this activity is retained. EFRI must complete this activity in a timely way, and the Director has the authority to take action if necessary in this regard.

ix) Vegetative Cover

If the Cover Design, as approved by the Director in accordance with the procedures described in the SCA and Section 5.0 of this Plan, is the Proposed Cover Design or otherwise calls for vegetative cover on the impoundment, then revegetation of the cover will take place at the completion of placement of Layer 4 (Erosion Protection Layer) on the impoundment, in accordance with the revegetation plan set out in Appendix J to the Updated Cover Design Report. All required seeding for re-vegetation will commence in the first available growing season after the completion of placement of Layer 4 (Erosion Protection Layer) on the impoundment, as determined by the Director, and will be completed by the end of such growing season, or such later time as may be approved by the Director. This item is not a

milestone required under Criterion 6A(1), because it follows placement of the final radon barrier and is not required for that activity. Instead, this item is included as a schedule commitment to be achieved in order to ensure that the activity is completed in a timely manner. As this schedule commitment is not a milestone it does not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing this activity is retained. EFRI must complete this activity in a timely way, and the Director has the authority to take action if necessary in this regard.

x) Rock Armor

If the Cover Design, as approved by the Director in accordance with the procedures described in the SCA and Section 5.0 of this Plan, is the Existing Cover Design or includes Layer 4 (Rock Armor) of the Existing Cover Design, then rock armor shall be placed on the tailings impoundment, in accordance with Reclamation Plan 3.2b (Denison, 2011b). In addition, rock armor is required for the exterior slopes of the impoundment under the Proposed Cover Design. Such placement, will commence within one year after completion of dewatering on the impoundment in accordance with Section 5.0 of this Plan, and will be completed within 180 days thereafter, or such later date as may be approved by the Director. This item is not a milestone required under Criterion 6A(1), because it follows placement of the final radon barrier and is not required for that activity. Instead, this item is included as a schedule commitment to be achieved in order to ensure that the activity is completed in a timely manner. As this schedule commitment is not a milestone it does not come under the specific provisions of paragraph (2) of Criterion 6A. However, a general timeliness standard for completing this activity is retained. EFRI must complete this activity in a timely way, and the Director has the authority to take action if necessary in this regard.

(b) Leaving a Portion of an Impoundment Open for Disposal of On-site Generated Trash or 11e.(2) Byproduct Material from ISR Operations

The License authorizes a portion of a specified impoundment to accept uranium byproduct material or such materials that are similar in physical, chemical, and radiological characteristics to the uranium mill tailings and associated wastes already in the pile or impoundment, from other sources, during the closure process, and on-site generated trash, provided that this does not result in a delay or impediment to emplacement of the final radon barrier over the remainder of the impoundment in a manner that will achieve levels of radon-222 releases not exceeding 20 pCi/m^2s averaged over the entire impoundment. Reclamation of the disposal area, as appropriate, must be completed in a timely manner after disposal operations cease in accordance with paragraph (1) of Criterion 6A; however, these actions are not required to be completed as part of meeting the deadline for final radon barrier construction for the impoundment.

(c) Windblown Tailings Retrieval and Placement on the Impoundment

As the Mill facility as a whole may still be in operation at the time the impoundment is being reclaimed, there may not be a need to retrieve any windblown tailings for placement on the impoundment at the time of final closure of the impoundment. Those activities will be required during final decommissioning of the entire Mill facility. Accordingly, the milestones associated with those activities are set out in Section 6.2.5 below.

6.2.4. Milestones and Schedule Commitments for Closure of a Non-Conventional Impoundment (e.g., an Evaporation Pond)

A non-conventional impoundment (e.g., an evaporation pond), may begin final closure at any time, including while the Mill facility as a whole remains in operation as well as during or after final Mill site decommissioning and closure. Once final closure of a non-conventional impoundment begins as specified in Section 6.2.1 b) above, final closure of the impoundment shall be accomplished in accordance with this Plan and the deadlines, milestones and schedule commitments set out below:

(a) Removal of Free-Standing Liquids from Evaporation Ponds

Commencing on the date the impoundment begins final closure in accordance with Section 6.2.1 b) above, the addition of liquids to the impoundment, other than by natural precipitation, will cease, and free standing liquids will be allowed to dry out by natural evaporation. To the extent reasonably practicable, and if excess evaporative capacity is available in other conventional or non-conventional impoundments in the tailings management system, the Mill will transfer solutions out of the impoundment and into other impoundments in order to enhance evaporation and removal of solutions from the impoundment. This item must be completed within five years after the impoundment begins final closure. Although this deadline is not a milestone required under Criterion 6A(1), because it is not linked to the placement of a final radon barrier in a non-operational tailings impoundment, EFRI agrees that for purposes of this Plan it shall be treated as a milestone as required by Criterion 6A(1), and as a result EFRI agrees that it will be subject to the provisions of Criterion 6A(2).

(b) Removal of Liners, Sediments and any Contaminated Soils from Evaporation Ponds

Upon removal of the free-standing liquids from the impoundment, the licensee shall commence removal of all liners, sediments and any contaminated soils from and under the impoundment and dispose of such materials into one or more conventional impoundments. This item must be completed within the earlier of (A) seven years after the impoundment begins final closure, and (B) three years after the removal of all free-standing liquids from the impoundment. Although this deadline is not a milestone required under Criterion 6A(1), because it is not linked to the placement of a final radon barrier in a non-operational tailings impoundment, EFRI agrees that for purposes of this Plan it shall be treated as a milestone as required by Criterion 6A(1), and as a result EFRI agrees that it will be subject to the provisions of Criterion 6A(2).

6.2.5. Additional Milestone for Final Mill Closure

If the Mill facility as a whole has commenced final reclamation, as defined in this Plan, then the following additional milestone shall apply after that time:

(a) Mill Demolition and Windblown Tailings Retrieval and Placement in a Tailings Impoundment

Mill demolition and windblown tailings retrieval, as contemplated by Attachment A (Technical Specifications) of this Plan and disposal into one or more tailings impoundments shall commence upon commencement of final closure of the entire Mill site ("Mill Final Closure"), and shall be completed within four years after commencement of Mill Final Closure. This deadline is a milestone as required by Criterion 6A(1), and is subject to the provisions of Criterion 6A(2).

It should be noted that individual conventional and non-conventional impoundments may begin final closure before, during or after commencement or completion of Mill Final Closure, and the decision to begin final closure on any particular impoundment is not tied to Mill Final Closure. The milestones and schedule commitments in Sections 6.2.3 and 6.2.4 above apply to final closure of conventional and non-conventional impoundments once they begin final closure in accordance with Section 6.2.1(b) above, whether during Final Mill Closure or otherwise. Further, as a tailings impoundment will be considered to be in operation so long as it is receiving byproduct material, which includes Mill decommissioning materials, windblown, slimes drain dewatering solutions etc., and an evaporation pond will be considered to be in operation so long as it is required for evaporation or holding purposes, it is expected that one or more tailings impoundments and evaporation ponds will continue in operation during all or part of the Mill decommissioning process. One or more impoundments may also continue in operation for licensed activities, such as direct disposal of 11e.(2) byproduct material from In Situ Recovery uranium operations or other licensed activities, after completion of Mill Final Closure.

6.2.6. *Summary Table of Milestones*

The following table summarizes all of the milestones required by or agreed to be subject to Criterion 6A(1), all of which are described in more detail above.

As the schedule commitments described in detail above are not milestones required under Criterion 6A(1), they are not included in the following table.

	Milestone	**Reclamation Plan 5.1 Section Number**	**Start**	**End**
1. Milestones for Closure of an Individual Conventional Impoundment (Tailings Impoundment) at any Time				
1.1.	Removal of Free Standing Liquids	6.2.3(a)(i)	Date final closure of the impoundment begins in accordance with Section 6.2.1(b)	One year after impoundment begins final closure
1.2.	Re-contouring	6.2.3(a)(ii)	Upon removal of free standing liquids	Two years after impoundment begins final closure
1.3.	Commencement of Dewatering	6.2.3(a)(iii)	Upon completion of Re-contouring	NA
1.4.	Placement of Layer 1 (Secondary Radon Attenuation and Grading Layer under the Proposed Cover Design or Platform Fill under the Existing Cover Design, as applicable)	6.2.3(a)(iv)	Upon completion of re-contouring	Three years after impoundment begins final closure

	Milestone	Reclamation Plan 5.1 Section Number	Start	End
1.5.	Placement of Layer 2 (Final Radon Barrier) (the Primary Radon Attenuation Layer under the Proposed Cover Design or the Radon Barrier under the Existing Cover Design, as applicable)	6.2.3(a)(v)	Upon EFRI being satisfied that there have been decreasing trends in settlement followed by a maximum of 0.1 feet (30 mm) of cumulative settlement over 12 months (for at least 90 percent of the settlement monuments), or at such earlier time as EFRI may determine	As expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee), but in any event within seven years after impoundment begins final closure
1.6.	Completion of Dewatering	6.2.3(a)(vii))	NA	Within later of (A) seven years after impoundment begins final closure and (B) two years after completion of placement of Layer 2
2. Milestones for Closure of a Non-Conventional Impoundment (Evaporation Pond) at any Time				
2.1.	Removal of Free Standing Liquids	6.2.4(a)	Date final closure of the impoundment begins in accordance with Section 6.2.1(b)	Five years after impoundment begins final closure
2.2.	Removal of Liners, Sediments and any Contaminated Soils from Impoundment	6.2.4(b)	Upon removal of the free-standing liquids from the impoundment	Earlier of (A) seven years after the impoundment begins final closure, and (B) three years after the removal of all free-standing liquids from the impoundment
3. Additional Milestone Applicable to Mill Final Closure				
3.1.	Mill Demolition and Windblown Tailings Retrieval and Placement in a Tailings Impoundment	6.2.5(a)	Upon commencement of Mill Final Closure	Four years after Commencement of Mill Final Closure

Appendix 3
Subpart W Preamble

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 61

[EPA–HQ–OAR–2008–0218; FRL–9957–54–OAR]

RIN 2060–AP26

Revisions to National Emission Standards for Radon Emissions From Operating Mill Tailings

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is taking final action to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Radon Emissions from Operating Mill Tailings. The revisions for this final action are based on the EPA's determination as to what constitutes generally available control technology or management practices (GACT) for this area source category. We are also adding new definitions to the NESHAP, revising existing definitions and clarifying that the NESHAP also applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

DATES: This rule is effective on March 20, 2017.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2008–0218. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: Dan Schultheisz, Office of Radiation and Indoor Air, Radiation Protection Division, Mail code 6608T, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460; telephone number: 202–343–9290; fax number: 202–343–2304; email address: *schultheisz.daniel@epa.gov*. You may also access the EPA Web site to find information related to this rulemaking at *https://www.epa.gov/radiation/*.

SUPPLEMENTARY INFORMATION: Throughout this document, "we," "us" and "our" refer to the EPA.

Preamble Acronyms and Abbreviations. We use the following acronyms and abbreviations in this document:

AEA—Atomic Energy Act
ALARA—As low as reasonably achievable
BID—Background information document
CAA—Clean Air Act
CAAA—Clean Air Act Amendments of 1990
CCAT—Colorado Citizens Against Toxic Waste
CFR—Code of Federal Regulations
Ci—Curie, a unit of radioactivity equal to the amount of a radioactive isotope that decays at the rate of 3.7×10^{10} disintegrations per second
DOE—U.S. Department of Energy
EIA—Economic impact analysis
EO—Executive Order
EPA—U.S. Environmental Protection Agency
FR—Federal Register
GACT—Generally Available Control Technology
HAP—Hazardous Air Pollutant
ISL—In-situ leach uranium recovery, also known as in-situ recovery (ISR)
mrem—millirem, 1×10^{-3} rem—a unit of radiation exposure
MACT—Maximum Achievable Control Technology
MOU—Memorandum of Understanding
NESHAP—National Emission Standard for Hazardous Air Pollutants
NRC—U.S. Nuclear Regulatory Commission
NTAA—National Tribal Air Association
OMB—Office of Management and Budget
pCi—picocurie, 1×10^{-12} curie
Ra-226—Radium-226
Rn-222—Radon-222
Radon flux—A term applied to the amount of radon crossing a unit area per unit time, as in picocuries per square centimeter per second ($pCi/m^2/sec$)
RCRA—Resource Conservation and Recovery Act
Subpart W—National Emission Standards for Radon Emissions from Operating Mill Tailings at 40 CFR 61.250–61.256
SWIPR—Subpart W Impoundment Photographic Reporting
tpy—tons per year
U_3O_8—uranium oxide, also known as "yellowcake"
UMTRCA—Uranium Mill Tailings Radiation Control Act of 1978
U.S.C.—United States Code

Background Information. In this action we are finalizing changes to the NESHAP for Radon Emissions from Operating Mill Tailings. These changes were proposed on May 2, 2014 (79 FR 25388) as part of a review of pre-1990 NESHAPs pursuant to Clean Air Act Section 112(q)(1). After review of the public comments we have made some changes to the rule since the proposal, and these will be discussed later in this document. We summarize some of the more significant comments received regarding the proposed rule and provide our responses in this preamble. A summary of all other public comments on the proposal and the EPA's responses to those comments is provided in the "Summary and Response to Public Comments" document, which is available in Docket ID No. EPA–HQ–OAR–2008–0218. The "track changes" version of the regulatory language that incorporates the changes in this final action resulting from review by the Office of Management and Budget (OMB) is also available in the docket for this rulemaking.

Outline. The information in this preamble is organized as follows:

I. General Information

A. Executive Summary

1. Introduction

This final rule amends requirements promulgated in 1989 under the Clean Air Act to control emissions of radon-222 from operating structures used to manage uranium byproduct material or tailings [1] at uranium recovery facilities. The rule does not apply to disposal of uranium byproduct material or tailings. The rule retains monitoring requirements for certain uranium byproduct material or tailings impoundments in existence on or before December 15, 1989 and establishes generally available control technology or management practices (GACT) for other impoundments and heap leach piles. This final rule completes the EPA's obligation under the requirements of CAA section 112(q)(1) to "review, and if appropriate, revise" 40 CFR part 61, subpart W (hereafter Subpart W).

Uranium recovery and processing currently occurs by one of three methods: (1) Conventional milling; (2) in-situ leach (ISL); and (3) heap leach. A conventional uranium mill is a chemical plant that extracts uranium from ore that has typically been obtained from an underground or open-pit mine. The ore is crushed and the uranium leached using chemical solutions, concentrated into uranium oxide (U_3O_8 or "yellowcake"), and transported to a uranium conversion facility to begin the processing into fuel for nuclear reactors. Solid and liquid wastes produced during this process are called uranium byproduct material or tailings. Uranium byproduct material or tailings contains residual uranium, radium and heavy metals. Radon-222 is generated by the decay of radium-226. As defined in this final rule, conventional impoundments are used to manage the mostly solid wastes from processing. Non-conventional impoundments, also known as evaporation or holding ponds, are used to manage process liquids and effluents. Non-conventional impoundments may accumulate sediments at the bottom as solids contained in the liquids settle out. Conventional impoundments are permanent structures that require long-term stewardship. Non-conventional impoundments are typically removed at facility closure and often placed into conventional impoundments for disposal. Non-conventional impoundments are sometimes also designed to be used as conventional impoundments as needed.

ISL is often used when a uranium ore body is in a formation through which ground water flows. A liquid solution containing chemicals can be injected into the formation to mobilize the uranium into solution, which is then recovered and processed. Process liquids and effluents from ISL are managed in non-conventional impoundments. ISL is now the predominant form of uranium recovery in the United States.

Heap leaching is a method of processing that is expected to be used for low-grade ore or in other situations where it is economically favorable. During heap leaching a pile of ore is sprayed with a chemical solution and uranium leaches into solution. The uranium solution is collected at the bottom of the pile and further processed. At the end of processing, the heap leach pile may be closed in place (typically by being covered), or removed and placed in a conventional impoundment. Process liquids and effluents are managed in non-conventional impoundments. At the time of this rulemaking, there are no heap leach facilities in the United States, although one such facility is planned.

There is currently one operating conventional mill in the United States, the White Mesa Mill in Utah. Two other conventional mills remain on standby, the Shootaring Canyon Mill in Utah and the Sweetwater Mill in Wyoming. There are six operating ISL facilities: Crow Butte in Nebraska; Smith Ranch, Lost Creek, Nichols Ranch, Willow Creek (which includes the Irigary and Christensen Ranch wellfields) and Ross CPP, all in Wyoming. Four other ISL facilities have operated and are now in standby. They are Alta Mesa, Kingsville Dome,[2] Rosita and Hobson/La Palangana, all located in Texas. These facilities are subject to the requirements of Subpart W. There are no heap leach facilities operating or on standby. Future heap leach facilities, as well as conventional mills and ISL facilities that have been or are being licensed, will be subject to Subpart W when they begin operating.

Subpart W was initially promulgated in 1986 and amended pursuant to a voluntary remand in 1989. For CAA section 112 standards that were in effect before November 15, 1990, CAA section 112(q)(1) requires the EPA to review, and, if appropriate, revise such standards to comply with the requirements of subsection (d). As a result of this review, we are promulgating this final rule pursuant to

[1] The EPA first defined the term "uranium byproduct material or tailings" in 1986 (51 FR 34066). The 1986 and 1989 rulemakings were primarily concerned with, but not limited to, conventional mill tailings as the most significant source of radon. We used the term "tailings" throughout those rulemakings for simplicity, reflecting that rulemaking emphasis. We understand that this has contributed to the impression among some stakeholders that Subpart W cannot apply to materials other than the mostly solid wastes resulting from conventional milling that are managed, and ultimately disposed, in permanent impoundments. We are reiterating in this action that the term "uranium byproduct material or tailings" more broadly defines the materials that are subject to Subpart W.

[2] Operating permits at the Kingsville Dome facility have lapsed and may not be renewed; however, because there are still uranium resources that could be exploited, Kingsville Dome is considered to be on standby for purposes of this discussion.

CAA sections 112(q) and 112(d) and setting standards that comply with the requirements of CAA section 112(d)(5). CAA section 112(d)(5) addresses standards for area sources and provides that section 112(d) standards for area sources may provide for the use of GACT by the affected area sources.

Subpart W regulates facilities and materials that are also regulated under the authority of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). UMTRCA directed the EPA to establish standards of general application to protect public health, safety and the environment from hazards associated with wastes from extraction or concentration of uranium or thorium. The Nuclear Regulatory Commission (NRC) implements and enforces the EPA's standards through its licensing and regulatory program. By establishing requirements to control radon emissions from uranium byproduct material or tailings during the facility's operational period, Subpart W supports and works in harmony with the NRC's UMTRCA-based provisions that limit radon concentrations at the site boundary.

2. Provisions of the 1989 Rule

When promulgated in 1989, Subpart W established monitoring requirements and work practices as methods to control radon emissions from impoundments used to manage uranium byproduct material or tailings (51 FR 51654, December 15, 1989). Existing impoundments (those operating as of December 15, 1989) were required to comply with a radon flux standard of 20 pCi/m^2-sec, monitored using Method 115. New impoundments built after December 15, 1989 were required to be operated in accordance with the provisions of 40 CFR 192.32(a) and be designed to meet one of two work practices:

- Phased disposal in impoundments no larger than 40 acres in area, with no more than two such impoundments operating at any one time; or
- Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres of tailings exposed at any one time.

All impoundments were required to be operated to comply with the requirements of 40 CFR 192.32(a),[3] notwithstanding the exemption in § 192.32(a)(1) for impoundments constructed prior to the promulgation of 40 CFR part 192. This provision was incorporated to ensure that older impoundments were equipped with liners capable of retaining liquids within the impoundment and monitoring systems capable of detecting leakages. Leaks could allow the contents of the impoundment to dry out and increase radon emissions. As originally promulgated in 1986, Subpart W envisioned that older impoundments would not be in use beyond December 31, 1992 unless granted an exemption or extension. Such impoundments were not required to comply with the provisions of 40 CFR 192.32(a). The 1989 rulemaking eliminated the prohibition on using existing impoundments beyond December 31, 1992 and required older impoundments to comply with the requirements at 40 CFR 192.32(a) (51 FR 34066, September 24, 1986 and 54 FR 51680, December 15, 1989).

3. Provisions of the Final Rule

This final rule defines and establishes GACT-based standards for conventional and non-conventional impoundments and heap leach piles; in doing so, the final rule clarifies the applicability of the 1989 rule to these different types of units and distinguishes among them. The final rule retains the radon flux standard and monitoring requirements for conventional impoundments in existence on December 15, 1989, and retains the provision that extended the construction requirements in 40 CFR 192.32(a)(1) to these conventional impoundments. The final rule also formalizes the 1989 management practices as GACT-based standards for conventional impoundments constructed after December 15, 1989, with limited changes to the 1989 standard—the final rule focuses the cross-reference regarding the impoundment construction requirements to 40 CFR 192.32(a)(1), instead of a more broad reference to 40 CFR 192.32(a) and removes the phrase "as determined by the Nuclear Regulatory Commission." In addition, the final rule establishes GACT-based standards for non-conventional impoundments and heap leach piles, as follows:

- Non-conventional impoundments must maintain solid materials in a saturated condition, with no solid materials visible above the level of liquid in the impoundment;
- Heap leach piles that have completed their operational life but not yet entered closure are limited to no more than two such piles with an area no greater than 40 acres each; and
- Conformance to the construction requirements in 40 CFR 192.32(a)(1).

The final rule changes some existing definitions and adds several new definitions. The amended definition of "operation" is finalized as proposed. The definitions of "continuous disposal," "dewatered," "existing impoundment," and "phased disposal" are amended to conform to the amended definition of "operation." New definitions of "standby," "conventional impoundment," "non-conventional impoundment," "heap leach pile," "heap leach pile operational life," and "uranium recovery facility" are also being finalized as proposed. New definitions of "final closure" and "reclamation plan" are added to the final rule to clarify when Subpart W no longer applies to an impoundment or heap leach pile.

4. Key Changes to the Proposal

The proposed rule contained several provisions that are modified in the final rule in response to public comments. We proposed to eliminate the radon flux standard and monitoring requirement for impoundments in existence on December 15, 1989. We believed this was appropriate based on information that indicated that the remaining impoundments in this category could comply with the GACT-based management practices. Information received through public comments demonstrated that the assumptions that supported our proposal were not correct and also that the pre-1989 unit that was expected to close (Cell 3 at the White Mesa Mill) remains open. Therefore, the final rule retains the radon flux standard and monitoring requirement for conventional impoundments in existence on December 15, 1989.

We proposed that non-conventional impoundments maintain one meter of liquid above any solid materials in the impoundment. Our analyses indicate that liquids effectively attenuate radon emissions, and that one meter of liquid would reduce the radon emissions by greater than 99%, to a level nearly indistinguishable from background. Based on public comment regarding feasibility and cost associated with the

[3] 40 CFR 192.32(a) includes six elements, which apply during processing and prior to the end of the closure period: (1) Construction of impoundments in conformance with the requirements of 40 CFR 264.221; (2) conformance to the groundwater protection standards in 40 CFR 264.92 and related sections; (3) placement of a permanent radon barrier on nonoperational impoundments; (4) demonstration that the permanent radon barrier limits radon releases to no greater than 20 pCi/m^2-sec; (5) conformance to the requirements of 40 CFR part 190 and 40 CFR part 440; and (6) maintenance by NRC of public doses from radon emissions as far below the Federal Radiation Protection Guidance as practicable. Only § 192.32(a)(1) is directly relevant to the goals of Subpart W, which in turn facilitate NRC in achieving § 192.32(a)(6).

water demand to maintain the liquid level in the impoundment, the final rule requires only that solid materials remain saturated. Saturation will effectively reduce radon emissions by approximately 95% compared to dry uranium byproduct material or tailing. The water demand to maintain saturation should also be considerably reduced compared to the proposal.

We proposed that heap leach piles be regulated under Subpart W from the time they begin processing (*i.e.*, at the time the leaching solution is first applied), because uranium byproduct material or tailings begins to be generated at that time. We proposed they be limited in size (40 acres) and number (no more than two operating at any one time), and maintain a 30% moisture content to reduce radon emissions. Based on public comment, the final rule provides that heap leach piles become subject to Subpart W once they have finished their operational life, when their sole purpose is to manage uranium byproduct material or tailings. As commenters pointed out, this is consistent with the approach we have taken for conventional mills, where waste material that has been separated from the recovered uranium has not been regulated under Subpart W until it leaves the processing unit and is deposited in an impoundment. Further, Subpart W will only apply to post-processing heap leach piles until they enter the closure process. The final rule retains the proposed area and number limitations on piles that are between processing and closure.

5. Economic Impacts

This final rule will have limited economic impact. No new requirements are placed on conventional impoundments. Further, impacts associated with non-conventional impoundments and heap leach piles will be less than those estimated for the proposed rule. Operators of non-conventional impoundments and heap leach piles will not incur additional cost related to liners, which are required by other regulations. Operators of non-conventional impoundments will be required to maintain liquids in the impoundment such that no solids are visible above the liquid level. In addition, operators of heap leach facilities can reduce the period of time they are subject to Subpart W and thus reduce compliance costs by expeditiously beginning the closure process after the operational life of the pile has ended, and we encourage timely closure in all cases.

Table 1 presents a summary of the unit cost (per pound of U_3O_8) for implementing each GACT-based standard at each of the three types of uranium recovery facilities. In addition to presenting the GACT costs individually, Table 1 presents the total unit cost to implement all relevant GACT-based standards at each type of facility. Table 1 shows that a conventional mill will have both conventional and non-conventional impoundments, and be required to maintain saturation in the non-conventional impoundments.

TABLE 1—FINAL GACT-BASED STANDARDS COSTS PER POUND OF U_3O_8

	Unit cost ($/lb U_3O_8)		
	Conventional mills	ISL facilities	Heap leach
GACT—Double Liners for Conventional Impoundments*	$1.04	.....	.....
GACT—Double Liners for Non-conventional Impoundments*	1.04	3.07	0.22
GACT—Maintaining Non-conventional Impoundment Sediments 100% Saturated	0.015	0.026	0.0013
GACT—Liners for Heap Leach Piles*	.....	.....	2.01
GACTs—Total for All Four	2.09	3.09	2.24
Baseline Facility Costs** (EIA Section 6.2)	55.18	51.31	45.06

*Liners required by 40 CFR part 192.
**Based on a price of U_3O_8 of $55/lb.

Based on the information in Table 1, the four GACT-based standards represent about 4%, 6%, and 5% of the baseline cost (per pound of U_3O_8) at conventional, ISL, and heap leach uranium recovery facilities, respectively. The table shows that, at a market price of $55 per pound, the baseline facility costs for a conventional mill are greater than the market price of uranium. However, since the liner requirements would have to be met under 40 CFR part 192, these costs are not actually being imposed by Subpart W. The only cost associated with the final rule is the cost of maintaining saturation in the non-conventional impoundments, which is minimal.

6. Public Engagement

During development of the proposed rule and throughout the public comment period, the EPA engaged with stakeholders and sought public input. Subsequent to beginning the rulemaking process, the EPA entered into a settlement agreement in August 2009 with Colorado Citizens Against Toxic Waste (CCAT) and Rocky Mountain Clean Air Action. As part of the settlement agreement, the EPA agreed to:

- Provide three public presentations and a national webinar on the rulemaking;
- Conduct quarterly stakeholder conference calls on the status of the rulemaking; and
- Create a public Web site and post non-privileged records.

The EPA conducted public presentations in June 2009 in Cañon City, Colorado, near the Cotter Mill; in October 2009 in Rapid City, South Dakota, in conjunction with the Western Mining Action Network's semi-annual conference; and in May 2010 on lands of the Ute Mountain Ute Tribe in southeastern Utah, near the White Mesa Mill. The EPA also presented a national webinar in June 2010. Records of EPA's quarterly stakeholder calls and non-privileged records regarding this Subpart W rulemaking are available at the following public Web site: *https://www.epa.gov/radiation/subpart-w-rulemaking-activity.*

In addition to the presentations specified in the settlement agreement, the EPA conducted presentations at numerous industry-sponsored events, particularly the annual uranium recovery workshop sponsored by the NRC and the National Mining Association (NMA). Beginning in 2009, the EPA provided regular updates on the Subpart W rulemaking at these annual workshops. The EPA also provided a presentation for NMA

officials in October 2009 and participated in NRC's uranium recovery licensing workshop in January 2011.

The EPA also actively sought interactions with tribal stakeholders. Several current or proposed uranium recovery facilities are of interest to tribes. The White Mesa Mill is located just north of Ute Mountain Ute lands in southeastern Utah. The Oglala Sioux Tribe has been active in the renewal of the operating license for the Crow Butte ISL facility in northwestern Nebraska and the initial licensing of the proposed Dewey-Burdock ISL facility in southwestern South Dakota. The Navajo Nation has been active in the development of proposed ISL facilities in New Mexico.

The EPA conducted presentations at the Uranium Contamination Stakeholder Workshops in 2009 and 2010 in Gallup, New Mexico and Tuba City, Arizona, respectively. In addition to the presentations, the EPA also held discussions with representatives from the Navajo EPA and the Hopi Tribe. In June 2014, after the proposed rule was published, the EPA gave a presentation for the National Tribal Air Association (NTAA) on the monthly NTAA/EPA policy call.

Concurrent with issuance of the 2014 proposed rule, the EPA sent letters to 53 tribal leaders offering consultation on the rule, consistent with the EPA's "Policy on Consultation and Coordination with Indian Tribes." Consultation is a process of meaningful communication and coordination between the EPA and tribal officials prior to the EPA taking actions or implementing decisions that may affect tribes. The Ute Mountain Ute Tribe responded and requested a formal consultation. The consultation was held in July 2014 between officials of the EPA's Office of Radiation and Indoor Air in Washington, DC and officials from EPA Region 8 and the Tribe at Tribal headquarters in Towaoc, Colorado (Docket No. EPA–HQ–OAR–2008–0218–0120).

The EPA has also met with individual stakeholder groups. Prior to publication of the proposed rule, the EPA met with representatives from CCAT, Uranium Watch, and the Sheep Mountain Alliance. Following publication of the proposed rule, the EPA met with the Southern Environmental Law Center. Concurrent with public hearings in September 2014, the EPA met with representatives from CCAT and the Energy Minerals Law Center. Following the public comment period, in November 2014 the EPA met with representatives from Uranium Watch and the Information Network for Responsible Mining (INFORM).

B. Does this action apply to me?

The regulated categories and entities potentially affected by the final standards are shown below in Table 2:

TABLE 2—INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS FINAL ACTION

Category	NAICS code [1]	Examples of regulated entities
Industry:		
Uranium Ores Mining and/or Beneficiating	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content.
Leaching of Uranium, Radium or Vanadium Ores	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content.

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this final action. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permit authority for the entity or your EPA regional representative as listed in 40 CFR 61.04 of subpart A (General Provisions).

C. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this final action will also be available on the Internet. Following signature, a copy of this final action will be posted at the following address: *https://www.epa.gov/radiation/subpart-w-national-emission-standards-radon-emissions-operating-mill-tailings*. Following publication in the **Federal Register**, the EPA will post the **Federal Register** version and key technical documents at this same Web site.

D. Judicial Review and Administrative Reconsideration

Under CAA section 307(b)(1), judicial review of this final action is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by March 20, 2017. Under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce the requirements.

Section 307(d)(7)(B) of the CAA further provides that "[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review." This section also provides a mechanism for the EPA to reconsider the rule "[i]f the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, EPA WJC West Building, 1200 Pennsylvania Ave. NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

II. Background

A. What is the Agency's legal authority for taking this action?

Section 112(q)(1) of the Clean Air Act (CAA) requires that NESHAPs "in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990] . . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112]." The EPA promulgated 40 CFR part 61, subpart W, "National Emission Standards for Radon Emissions from Operating Mill

Tailings," (Subpart W) on December 15, 1989.[4] The EPA conducted this review of Subpart W under CAA section 112(q)(1).

Section 112(d) of the CAA requires the EPA to establish emission standards for major and area sources. A major source is any stationary source that emits or has the potential to emit 10 tons per year (tpy) or more of any single HAP or 25 tpy or more of any combination of HAPs. An area source is a stationary source of HAP that is not a major source. For operating uranium byproduct material or tailings impoundments, the HAP of concern is radon-222 (hereafter referred to as "radon" or Rn-222). Radon emissions from operating uranium recovery facilities are far below the statutory thresholds[5] and EPA has not set alternative criteria for identifying major sources of radionuclide emissions; thus, all sources regulated under Subpart W are area sources (EPA–HQ–OAR–2008–0218–0001, 0002). See Section IV.A.2.

Section 112(q)(1) does not dictate how the EPA must conduct its review of those NESHAPs issued prior to 1990. Rather, it provides that the Agency must review, and, if appropriate, revise the standards to comply with the requirements of section 112(d). Determining what revisions, if any, are appropriate for these NESHAPs is best assessed through a case-by-case consideration of each NESHAP. As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which addresses standards for area sources. After our review, we determined it was appropriate to revise Subpart W to clarify the applicability of the rule to non-conventional impoundments and heap leach piles and promulgate standards that are more appropriate for controlling radon emissions at those sources, consistent with the requirements of CAA section 112(d)(5). All units regulated by Subpart W are area sources and we determined that promulgating GACT-based standards under CAA section 112(d)(5) is appropriate for these sources.

For area sources, the Administrator has the discretion under CAA section 112(d)(5) to set standards based on GACT in lieu of maximum achievable control technology (MACT) under sections 112(d)(2) and (d)(3), which is required for major sources. Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants." Consistent with section 112(d)(5), we are revising Subpart W to reflect GACT-based standards.

B. What source category is affected by the final rule?

The source category regulated under Subpart W, first defined in 1986, is facilities licensed to manage uranium byproduct material during and following the processing of uranium ores, commonly referred to as uranium mills and their associated tailings. Licenses are issued by the U.S. Nuclear Regulatory Commission (NRC) or NRC Agreement States. As promulgated in 1986 and 1989, Subpart W defines "uranium byproduct material or tailings" as "the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content."[6] Neither of these definitions is affected by this action. For clarity, in this action we refer to this source category by the term "uranium recovery facilities," and we are adding this phrase to the definitions section of the rule. Use of this term encompasses the existing universe of facilities whose HAP emissions are currently regulated under Subpart W. Uranium recovery facilities process uranium ore to extract uranium. The HAP emissions from any type of uranium recovery facility that manages uranium byproduct material or tailings are subject to regulation under Subpart W. This currently includes three types of uranium recovery facilities: (1) Conventional uranium mills; (2) ISL facilities; and (3) heap leach facilities. Subpart W requirements specifically apply to the affected sources at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, tailings piles, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on what these structures contain and the use of these structures to manage or contain uranium byproduct material or tailings.

C. How does Subpart W regulate HAP emissions from the source category?

Subpart W was initially promulgated on September 24, 1986 (51 FR 34056) and amended pursuant to a voluntary remand on December 15, 1989 (54 FR 51654). At the time of promulgation in the 1980s, the predominant form of uranium recovery was through the use of conventional mills. As promulgated in 1989, Subpart W contained two separate standards. The first standard applied to "existing" impoundments, *i.e.*, those in existence and licensed by the NRC (or its Agreement States) on or prior to December 15, 1989. Owners or operators of existing tailings impoundments were required to ensure that emissions from those impoundments did not exceed a radon (Rn-222) flux standard of 20 picocuries per meter squared per second (pCi/m^2-sec). As stated at the time of promulgation: "This rule will have the practical effect of requiring the mill owners to keep their piles wet or covered" (54 FR 51689). Keeping the piles (impoundments) wet or covered with soil would reduce radon emissions to a level that would meet the standard. This is still considered an effective method to reduce radon emissions at all uranium byproduct material or tailings impoundments.

The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found at 40 CFR part 61, Appendix B. The owners or operators of existing impoundments were required to report to the EPA the results of the compliance testing for any calendar year by no later than March 31 of the following year.

There is currently one operating mill with impoundments that pre-date December 15, 1989, and two mills that are currently in standby mode. All of

[4] On April 26, 2007, Colorado Citizens Against Toxic Waste (CCAT) and Rocky Mountain Clean Air Action filed a lawsuit against EPA (EPA–HQ–OAR–2008–0218–0013) for EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009 (EPA–HQ–OAR–2008–0218–0020, 0021).

[5] Annual emissions of radon from a 40-acre impoundment, assuming a radon flux of 20 pCi/m^2-sec, can be calculated to be approximately 2.5 Ci. The specific activity of radon is about 150,000 Ci/g. Reasonably anticipated emissions from sources subject to Subpart W do not approach the 10 tpy threshold established in CAA § 112(a)(1) to define major sources.

[6] Pursuant to the Atomic Energy Act of 1954, as amended, the Nuclear Regulatory Commission defines "source material" as "(1) Uranium or thorium or any combination of uranium or thorium in any chemical or physical form; or (2) Ores that contain, by weight, one-twentieth of one percent (0.05 percent), or more, of uranium or thorium, or any combination of uranium or thorium" (10 CFR 20.1003). For a uranium recovery facility licensed by the Nuclear Regulatory Commission under 10 CFR part 40, "byproduct material" means the "tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes" (10 CFR 20.1003 and 40.4).)

these impoundments are subject to Subpart W until they begin closure.

The second standard applied to "new" impoundments constructed after December 15, 1989. The requirements applicable to new impoundments were work practice standards that regulated either the size and number of impoundments, or the amount of tailings that may remain uncovered at any time. After December 15, 1989, "no new tailings impoundment can be built unless it is designed, constructed and operated to meet one of the following two work practices:

1. Phased disposal in lined tailings impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by the Nuclear Regulatory Commission. The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.

2. Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and operated in accordance with § 192.32(a) as determined by the Nuclear Regulatory Commission."

The basis of the work practice standards was to (1) limit the size of the impoundment, which limits the radon source; or (2) use the continuous disposal system, which prohibits large accumulations of dewatered uncovered uranium byproduct material or tailings, limiting the amount of radon released.

D. What changes to Subpart W did we propose?

Pursuant to CAA Section 112(d)(5), in the May 2, 2014 notice we proposed GACT-based standards for the affected sources at conventional uranium mills, ISL facilities and heap leach facilities. Subpart W has always applied to these sources; however, given the evolution of uranium recovery facilities over the last 20 years, we thought it appropriate to revise Subpart W to tailor the requirements of the NESHAP to the different types of facilities in existence at this time and reaffirm Subpart W's applicability to these facilities. For the conventional impoundments the GACT-based standards were based upon the requirements established in 1989. We also proposed to revise Subpart W to add appropriate definitions, standards and other requirements that are more applicable to HAP emissions at these different types of uranium recovery facilities. Specifically, we proposed to:

- Remove monitoring requirements for impoundments constructed prior to December 15, 1989 and to have these "existing" impoundments demonstrate compliance with the proposed GACT-based standards;
- clarify that any impoundment at a uranium recovery facility that contained uranium byproduct materials or tailings is regulated under Subpart W and subject to the liner requirements referenced at 40 CFR 192.32(a)(1), including "evaporation" or "holding" ponds;
- establish as GACT-based standards that these "non-conventional" or liquid-holding impoundments meet the design and construction requirements of 40 CFR 192.32(a)(1), with no size/area restriction or monitoring requirement, and that during the active life of the pond at least one meter of liquid be maintained in the pond;
- establish as GACT-based standards that heap leach piles meet the phased disposal management practice standard (which limits an owner/operator to no more than two operating heap leach piles of no more than 40 acres each at any time) and the design and construction requirements at 40 CFR 192.32(a)(1) as GACT-based standards, and maintain minimum moisture content of 30%;
- add a definition of "standby" to clarify the term and how it relates to the operational phase of an impoundment;
- amend the definition of "operation" of an impoundment so that it is clear when the owner or operator is subject to the requirements of Subpart W;
- add definitions of "conventional impoundment," "non-conventional impoundment," "heap leach pile," "uranium recovery facility" and "heap leach pile operational life" to be consistent with the GACT-based standards;
- determine whether Subpart W adequately addresses protection from extreme weather events;
- revise 40 CFR 61.252(b) and (c) to accurately reflect that it is only 40 CFR 192.32(a)(1) that is applicable to Subpart W; and
- remove the phrase "as determined by the Nuclear Regulatory Commission" in 40 CFR 61.252(b)(1) and (2).

E. Comments on the Proposed Rule

The public comment period began on May 2, 2014 and was originally proposed to end on July 31, 2014. The comment period was extended by public request until October 29, 2014. We held two days of public hearings in Denver, CO on September 4 and 5, 2014. During the public comment period for the proposed rule, the EPA met with tribal leaders from the Ute Mountain Ute Tribe, consistent with the "EPA Policy on Consultation and Coordination with Indian Tribes" (*http://www.epa.gov/tribal/forms/consultation-and-coordination-tribes*). The consultation was held on July 10, 2014. The Tribe had numerous comments regarding the White Mesa uranium mill. Tribal land is several miles from the mill. The mill is the only operating conventional mill in the country, and the Tribe presented valuable information and comments for the rulemaking. The Tribe also raised enforcement issues that are concerns for the State of Utah and the EPA Region 8 office, but are not relevant to this rulemaking. The EPA has delegated to the State of Utah authority for implementation and enforcement of Subpart W (60 FR 13912, March 15, 1995).

The EPA received approximately 45 separate sets of comments on the proposed rule, including multiple submittals by the same author(s). The comments range in size from one page to several hundred pages, and in many cases contain dozens of individual comments. All told the EPA identified over 4,000 individual comments. A mass mailer that contains over one thousand signatures is also in the docket for this rulemaking (Docket No. EPA–HQ–OAR–2008–0218). The docket also includes the transcripts of the two public hearings held in Denver, CO on September 4 and 5, 2014. All of the comments received are in the docket for this rulemaking. All comments can be accessed electronically through the Federal Document Management System (FDMS), available at *http://www.regulations.gov*. This Web site provides instructions on how to access the electronic docket. Some submittals may be duplicated in FDMS, as a commenter may have used several methods to ensure the comments were received, such as statement at a public hearing, fax, email, U.S. mail, or directly through FDMS.

There are two primary mechanisms by which we explain the issues raised in public comments and our reactions to them. First, we discuss broad or major comments in the following sections of this document. Second, we are including in the docket a document, accompanying this action, entitled "Summary of Public Comments and Responses." The Response to Comments document addresses all other significant comments on the proposal. We gave all the relevant comments we received, whether written or oral, consideration in developing the final rule.

III. What final amendments are we issuing with this action?

This action finalizes the EPA's determinations pursuant to its review of

Subpart W under CAA section 112(q)(1) to "review, and if appropriate, revise" NESHAPs promulgated prior to November 15, 1990. After review of the comments we determined that commenters provided reasons and presented information supporting revision to certain aspects of the proposed rule. In this section we describe the final amendments to Subpart W for this action and identify revisions made to the proposed rule in response to comments.

A. Application of Generally Available Control Technologies (GACT) to Uranium Recovery Facilities

We determined that the management practices promulgated in 1989 for conventional impoundments constructed after December 15, 1989 remain suitable for controlling radon from uranium byproduct material or tailings. We also concluded that these management practices qualify as elements of GACT-based standards for these impoundments. We further determined that there are management practices which constitute generally available control technologies that could be applied to non-conventional impoundments and heap leach piles. The final rule establishes the following elements as GACT-based standards for conventional impoundments constructed after December 15, 1989, non-conventional impoundments and heap leach piles:

- Construction of all impoundments containing or managing uranium byproduct material in accordance with the requirements in 40 CFR 192.32(a)(1);
- Operation of conventional impoundments in accordance with either the phased disposal or continuous disposal method;
- Operation of non-conventional impoundments such that solid materials in the impoundment are not visible above the liquid level, to be verified by daily visual inspection and documented by digital photograph no less frequently than weekly; and
- Maintenance of heap leach piles that have completed their operational life but have not yet entered closure in accordance with the phased disposal method (piles no larger than 40 acres in area and no more than two such piles at any time).

For conventional impoundments constructed before December 15, 1989, we retained the radon flux standard originally promulgated in 1989, and retained the requirement that the impoundments comply with the construction requirements in 40 CFR 192.32(a)(1), notwithstanding the exemption in § 192.32(a)(1) for impoundments constructed prior to the promulgation of 40 CFR part 192.

B. Definitions, References and Conforming Editorial Revisions

We are making revisions to several existing definitions and references, deleting a phrase and providing several new definitions. These revisions are:

- The definition of "operation" is revised as proposed;
- The definitions of "continuous disposal," "dewatered," "existing impoundment," and "phased disposal" are revised to conform to the revised definition of "operation";
- Definitions of "standby," "conventional impoundment," "non-conventional impoundment," "heap leach pile," "uranium recovery facility," and "heap leach pile operational life" are added as proposed, with minor conforming changes;
- The reference in the 1989 rule at 40 CFR 61.252(b) and (c) is revised to 40 CFR 192.32(a)(1), as proposed, to clarify that the liner requirements are the portion of interest; as finalized, the reference to 40 CFR 192.32(a)(1) is included in § 261.252(a)(2)(i), (a)(2)(ii), (b) & (c) and the reference at § 61.252(c) in the 1989 rule is incorporated into § 61.252(a)(1) in the final rule;
- The phrase "as determined by the Nuclear Regulatory Commission" is eliminated from 40 CFR 61.252(b)(1) and (2), as proposed (§ 61.252(a)(2)(i) and (ii) in the final rule);
- The definition of "final closure" is added for completeness and clarity, in response to comments regarding the applicability of Subpart W; and
- The definition of "reclamation plan" is added to further clarify the concept of closure.

C. What are the recordkeeping, notification and reporting requirements?

New and existing affected sources are required to comply with the existing requirements of the General Provisions (40 CFR part 61, subpart A). The General Provisions include specific requirements for notifications, recordkeeping and reporting, including provisions for notification of construction and/or modification and startup as required by 40 CFR 61.07, 61.08 and 61.09.

We are also requiring that all affected sources maintain certain records pertaining to the design, construction and operation of conventional impoundments, non-conventional impoundments and heap leach piles. These records must be retained at the facility and contain information demonstrating that the impoundments and/or heap leach pile meet the requirements in 40 CFR 192.32(a)(1), including but not limited to, all tests performed that prove the liner is compatible with the material(s) being placed on the liner. For non-conventional impoundments, this requirement also includes records showing compliance with the requirement to maintain liquid in the impoundment such that solid materials are not visible above the liquid.[7] Documents showing that the impoundments and/or heap leach pile meet the requirements in § 192.32(a)(1) are already required as part of the pre-construction application submitted under 40 CFR 61.07, so these records should already be available. Written and other records showing compliance with the liquid requirement for non-conventional impoundments can be created during the daily inspections of the tailings and waste retention systems required by the NRC (and Agreement States) under the inspection requirements of 10 CFR part 40, Appendix A, Criterion 8A.

Because we are retaining the radon flux standard for conventional impoundments in existence on December 15, 1989, we are also retaining the associated reporting requirements at 40 CFR 61.254 and these units must also comply with the revised recordkeeping requirements at 40 CFR 61.255, as applicable.

Because we are promulgating new recordkeeping requirements for uranium recovery facilities, we are required by the Paperwork Reduction Act (PRA) to prepare an estimate of the burden of such record-keeping on the regulated entity, in both cost and hours necessary to comply with the requirements. We have submitted the Information Collection Request (ICR) containing this burden estimate and other supporting documentation to the Office of Management and Budget (OMB). See Section VII.B for more discussion of the PRA and ICR.

We believe the record-keeping requirements promulgated today will not create a significant burden for operators of uranium recovery facilities. As described earlier, we are requiring retention of two types of records: (1) Records demonstrating that the impoundments and/or heap leach pile meet the requirements in § 192.32(a)(1) (e.g., the design and liner testing information); and (2) records showing that liquid is maintained to cover any

[7] The liquid requirement pertains to having the level of liquid cover any and all solid uranium byproduct material or tailings. We do not anticipate a large quantity of solid uranium byproduct material or tailings in these non-conventional impoundments (EPA–HQ–OAR– 2008–0218–0088).

solid uranium byproduct material or tailings present in non-conventional impoundments.

Documents demonstrating that the affected sources comply with § 192.32(a)(1) requirements are necessary for the facility to obtain regulatory approval from the NRC (or an NRC Agreement State) and the EPA to construct and operate the affected sources (this includes any revisions during the period of operations). Therefore, these records will exist independent of Subpart W requirements and will not need to be continually updated as a result of this record-keeping requirement in Subpart W; however, we are including this record-keeping requirement in Subpart W to require that the records be maintained at the facility and available for inspection during its operational lifetime (in some cases the records might be stored at a location away from the facility, such as corporate offices). This might necessitate creating copies of the original records and providing a location for storing them at the facility.

Keeping a record to provide confirmation that liquid is maintained above the solid uranium byproduct material or tailings present in non-conventional impoundments should also be relatively straightforward. This would involve visual inspection and documentation, such as written notes and digital photographs with embedded date and time and other identifying metadata, using photographic capabilities that are readily available, such as smartphones or small digital cameras. As noted earlier, NRC and Agreement State licenses require operators to inspect the facility on a daily basis. Only minimal effort will be necessary to make observations of saturation and record the information in inspection log books that are already kept on site and available to inspectors. Inspections for saturation can occur during the daily inspections that are already required by NRC and Agreement States. The final rule requires that operators record written observations daily and collect photographic evidence of liquid depth no less frequently than weekly. Beginning on the effective date of this final rule, digital photographs are to be uploaded on at least a monthly basis to the EPA's Subpart W Impoundment Photographic Reporting (SWIPR) system. If that system is unavailable, digital photographs are to be retained by the facility and provided to the EPA or the authorized state upon request.

The final rule also includes a definition of "final closure" that refers to notification by the facility owner/operator. Subpart W applies to operating sources used to manage uranium byproduct material or tailings. Sources cease to be operating when they enter the closure process. The definition of "final closure" in the final rule clarifies that closure does not begin until the owner or operator provides written notification to the EPA and the NRC that the impoundment or heap leach pile is no longer used for its operational purpose and is being managed under an approved reclamation plan for that impoundment or pile, or the facility closure plan. Such notifications should involve limited effort on the part of facility owners or operators. A reclamation plan is required by NRC regulation and is not a new requirement under Subpart W.

We estimate the burden in hours and cost for uranium recovery facilities to comply with the proposed recordkeeping and notification requirements are as follows:

TABLE 3—BURDEN HOURS AND COSTS FOR RECORDKEEPING REQUIREMENTS

[Annual figures except where noted]

Activity	Hours	Costs
Maintaining Records for the 40 CFR 192.32(a)(1) requirements	*20	*$1,430
Verifying saturation for non-conventional impoundments, including collecting and uploading digital photographs	291	14,650

* These figures represent a one-time cost to the facility.

IV. What is the rationale for our final decisions and amendments to Subpart W?

A. Legal Authorities and GACT

1. What is the legal authority for GACT based standards and management practices in the final rule?

Section 112(q)(1) of the CAA requires that NESHAPs "in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990] . . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112]." The EPA promulgated 40 CFR part 61, subpart W, "National Emission Standards for Radon Emissions from Operating Mill Tailings," ("Subpart W") on December 15, 1989.[8] The EPA conducted this review of Subpart W under CAA section 112(q)(1).

Section 112(d) establishes the requirements for emission standards for HAP promulgated under section 112. It establishes different requirements for major sources and area sources. A major source is any stationary source that emits or has the potential to emit 10 tpy or more of any single HAP or 25 tpy or more of any combination of HAPs. An area source is a stationary source of HAP that is not a major source. See Sections II.B and IV.A.2 for discussion of area sources as they relate to Subpart W.

Pursuant to CAA section 112(d), standards for major sources "shall require the maximum degree of reduction in emissions of the hazardous air pollutants . . . that the Administrator . . . determines is achievable." For area sources, the Administrator has the discretion under CAA section 112(d)(5) to set standards based on GACT in lieu of MACT. Specifically, CAA section 112(d)(5) provides that the Administrator may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants."

Section 112(q)(1) does not dictate how the EPA must conduct its review of those NESHAPs issued prior to 1990. Rather, it provides that the Agency must review, and if appropriate, revise the standards to comply with the requirements of section 112(d). Determining what revisions, if any, are appropriate for these NESHAPs is best assessed through a case-by-case consideration of each NESHAP. In other rulemakings, the EPA has determined that GACT standards are appropriate for

[8] On April 26, 2007, CCAT and Rocky Mountain Clean Air Action filed a lawsuit against the EPA (EPA–HQ–OAR–2008–0218–0013) for the EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009 (EPA–HQ–OAR–2008–0218–0020, –0021).

a number of different area sources, including, for example, industrial, commercial and institutional boilers (promulgated at 40 CFR part 63, subpart JJJJJJ) and oil and natural gas production facilities (promulgated at 40 CFR part 63, subpart HH). Using a GACT evaluation, the EPA has historically established both emission standards and management practices, as appropriate.

As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which addresses standards for area sources. After our review, we determined it was appropriate to revise Subpart W to clarify the applicability of the rule to non-conventional impoundments and heap leach piles and promulgate standards that are more appropriate for controlling radon emissions at those sources. All units regulated by Subpart W are area sources and we determined that promulgating GACT-based standards under CAA section 112(d)(5) is appropriate for these sources. Consistent with section 112(q)(1) we are revising Subpart W to comply with the requirements in section 112(d) relating to emission standards for area sources and are thus revising the Subpart W standards to reflect GACT-based standards.

2. What key comments did we receive on our legal authorities and the GACT approach?

We received several comments challenging our use of GACT for this rulemaking. Commenters specifically asserted that the EPA may not set GACT-based standards for sources subject to Subpart W and challenged our conclusion that facilities subject to Subpart W are area sources.

Commenters further argued that the work practices instituted for conventional impoundments in 1989, which we are finalizing today as GACT-based standards, are contrary to CAA section 112(h), which allows the EPA to promulgate work practices in lieu of MACT standards only when "it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard."

We summarize below a number of comments received on this topic and present our responses. Additional comment responses on this topic appear in the Response to Comments document in the docket for this rulemaking.

Comment: A commenter argued that uranium recovery operations should be considered, by definition, major sources of hazardous air pollutants and should be subject to major source requirements. The commenter further stated that the EPA's document Background Information for Proposed Area Source Standards is misleading because it uses the standard major source threshold at CAA section 112(a)(1), that any stationary source that emits or has the potential to emit 10 tpy or more of any single HAP or 25 tpy or more of any combination of HAPs, to support its conclusion that uranium recovery facilities regulated under Subpart W are area sources. The commenter stated that radon is not measured in tpy and that the CAA section 112 threshold of 10 or 25 tpy was not intended to apply to radon or other radionuclides.

Response: Under section 112(a)(1) of the CAA major sources are defined as stationary sources or groups of stationary sources that emit, or have the potential to emit, any single HAP at a rate of 10 tpy or more, or 25 tpy or more of any combination of HAP. An area source, in turn, is any stationary source of HAP that is not a major source. CAA section 112(a)(2). The statute also allows the EPA to establish lower thresholds, or for radionuclides to establish different criteria based on the characteristics of the air pollutant and relevant factors, but the statute is clear on its face that the EPA is not required to set alternative criteria. CAA section 112(a)(1). In the absence of alternative criteria, the statutory criteria of 10 tpy of a single HAP or 25 tpy of a combination of HAP applies, and any source that does not meet or exceed those thresholds is an area source. By allowing the EPA to set different criteria only for radionuclides, the statute implicitly recognizes that an alternative to the statutory thresholds based on tpy may be appropriate for sources of radionuclides. Nonetheless, the statute neither requires the EPA to set alternative criteria for defining major sources of radionuclides, nor obligates the EPA to designate any or all radionuclide sources as major sources. In sum, the statute explicitly leaves open the possibility that all sources of radionuclides will be regulated as area sources unless the EPA decides to establish alternate criteria. Moreover, even if the EPA had decided to set alternate criteria, nothing in the CAA would have required the EPA to establish criteria that would have the effect of making some sources that manage uranium byproduct material or tailings major sources of HAP. Thus, there is no basis for the commenter's assertion that uranium recovery operations should be considered, by definition, major sources of HAP.

In addition, regulating sources that manage uranium byproduct material or tailings as area sources does not constrain the EPA's regulatory options. For area sources, the EPA can set GACT standards under CAA section 112(d)(5) or MACT standards under CAA section 112(d)(2). EPA's decision to retain this flexibility by regulating these sources as area sources is reasonable and consistent with the discretion given to the EPA by the statutory text.

It is also worth noting that, under Subpart W, radon emissions from sources that manage uranium byproduct material or tailings are regulated regardless of whether they qualify as major or area sources. For source categories not regulated before 1990, the EPA has discretion to decide whether to list and thus whether to regulate area sources. Radon emissions from uranium byproduct material or tailings, however, were regulated prior to 1990 and CAA section 112(q) explicitly provides that such standards remain in force and effect after the effective date of the 1990 CAA Amendments. The distinction between major and area sources thus does not affect whether sources subject to Subpart W are regulated under CAA section 112. Nothing in CAA section 112(q)(1) or CAA section 112(d) limits EPA's discretion to set standards under CAA section 112(d)(5), for sources regulated prior to the 1990 CAA Amendments whose emissions do not exceed the major source threshold established by Congress.

Comment: Commenters stated that the EPA must establish a source category pursuant to CAA section 112(c)(1) before promulgating CAA section 112(d) standards. One of these commenters cites to a 2007 EPA rulemaking which stated that listing pursuant to section 112(c) is a critical aspect and a condition precedent to issuing CAA section 112(d)(5) standards. Commenters also argued that the EPA must determine all HAPs present at uranium recovery facilities before the EPA can establish a source category, develop criteria to differentiate between major and area sources of radionuclides, and promulgate emission standards, whether MACT or GACT.

Another commenter asserted that because CAA section 112(q) requires pre-1990 regulations to be reviewed and, if appropriate, revised in accordance with the requirements of subsection (d), the revision must comply with all applicable requirements in CAA section 112, including all parts of CAA section 112 enacted as part of the 1990 CAA Amendments.

One commenter also argued that the EPA must establish a source category or subcategory before promulgating standards under CAA section 112(d)(5) for facilities licensed to manage

uranium byproduct materials. The comments state that the EPA has not complied with the requirements of CAA section 112 and has not taken the requisite preliminary actions and evaluations to support establishing revised standards for uranium recovery facilities, specifically GACT. Another commenter stated that the EPA has no basis for setting GACT standards in lieu of MACT standards.

Response: The EPA originally promulgated Subpart W in 1989, before Congress enacted the 1990 CAA Amendments. The 1990 Amendments introduced the requirement to list major and area sources of HAPs. *See* CAA sections 112(c)(1) & (c)(3), 42 U.S.C. 7412(c)(1) & (c)(3). The 1990 Amendments also added CAA section 112(q), which explicitly provides that section 112 standards in effect prior to the date of enactment of the 1990 CAA Amendments shall remain in force and effect after that date. CAA section 112(q)(1) also provides that: "Each [standard in effect before the enactment of the CAA Amendments of 1990] shall be reviewed and, if appropriate, revised to comply with the requirements of subsection (d) of this section . . ." In sum, Congress clearly intended that (1) standards promulgated prior to 1990 remain in effect; and (2) the EPA may update the standards, as appropriate. However, there is no indication that Congress intended to require that the EPA go through the process of listing source categories that were subject to regulations prior to 1990 and thus, effectively already "listed." CAA section 112(c)(4) provides that, "The Administrator may, in the Administrator's discretion, list any category or subcategory of source previously regulated under this section as in effect before November 15, 1990." The EPA reviewed Subpart W pursuant to section 112(q)(1) and has not listed uranium recovery operations pursuant to section 112(c).

The EPA disagrees with the commenters' assertions that the EPA must list the regulated source category pursuant to section 112(c) before revising the existing Subpart W. Section 112(q)(1), on its face, does not require the EPA to list such sources pursuant to subsection (c) as part of a section 112(q) review. It does not contain any cross reference to the listing provisions of section 112(c). Instead, section 112(q) requires revision, if appropriate, in accordance with subsection (d)—the subsection that governs standard setting under section 112. Moreover, section 112(c)(4) explicitly grants the Administrator discretion to decide whether or not to list categories and subcategories of sources regulated under section 112 prior to the 1990 CAA Amendments. Thus, neither of the provisions addressing standards promulgated prior to the 1990 CAA Amendments, nor any other statutory provision, support the commenters' assertion that listing under section 112(c) is a necessary part of a section 112(q) review.

There is also no basis for commenters' statements that the EPA must determine all HAPs present at uranium recovery facilities and develop criteria to differentiate between major and area sources of radionuclides before it can promulgate emission standards, whether MACT or GACT. The EPA's task under section 112(q) is to review and, if appropriate, revise standards in effect before the date of enactment of the 1990 CAA Amendments. Prior to the 1990 CAA Amendments, section 112 standards were promulgated for individual pollutants and Subpart W only establishes standards for radon resulting from management of uranium byproduct material or tailings at uranium recovery operations. The EPA's obligation under section 112(q) therefore is limited to reviewing and, if appropriate, revising standards for radon resulting from management of uranium byproduct material or tailings at uranium recovery operations. The statutorily required review does not encompass listing the source category under section 112(c) or evaluating HAPs not previously regulated under the subpart being reviewed. As explained in the previous response, the statute also does not require the EPA to set alternate criteria for distinguishing between major and area sources of radionuclides.

The commenter's reliance on a 2007 rulemaking is misplaced. In that rulemaking, the EPA promulgated NESHAPs for the first time for the identified source categories. The present rulemaking is governed by CAA section 112(q)(1), which only requires that the review and revision comply with the standard setting requirements of subsection (d). As explained above, the section 112(q)(1) review does not require listing the source category under section 112(c). The 2007 rulemaking set new standards and was not subject to the narrow review requirements of CAA section 112(q)(1). Further, CAA section 112(c)(4) explicitly provides the EPA with discretion regarding whether to list source categories regulated prior to the 1990 CAA Amendments. CAA section 112(c)(4) applies to the sources subject to Subpart W but was not applicable to the sources impacted by the 2007 rulemaking. For these reasons, the statements made in the 2007 rulemaking are inapposite.

The commenter's assertion that the EPA must revise Subpart W to comply with all provisions of section 112 is also based on an overly broad reading of CAA section 112(q)(1). The statute only instructs the EPA to "review[ ] and, if appropriate, revise[ ], to comply with the requirements of subsection (d) of this section . . ." It does not require the EPA to revise the pre-1990 rules to comply with every provision in the section 112 CAA Amendments of 1990. Indeed, to read section 112(q)(1) as requiring the EPA to revise the rules to comply with all provisions in section 112 would be to read the reference to subsection (d) out of the statute.

Finally, listing a source category under section 112(c) is not a pre-requisite to establishing GACT standards for area sources as part of a section 112(q) review. As explained in the previous response, section 112(d)(5) allows the EPA to set GACT instead of MACT standards for area sources. Specifically, CAA section 112(d)(5) provides that with respect only to categories and subcategories of area sources listed pursuant to section 112(c), the Administrator may, in lieu of setting standards under sections 112(d)(2) and 112(f), decide to promulgate standards based on generally available control technologies. Such standards are commonly referred to as GACT standards.

CAA section 112(d)(5) is ambiguous to the extent that it is not clear whether it provides that the EPA may set GACT standards "only" for "area sources" or whether it also prohibits the EPA from setting section 112(d)(5) GACT standards for area sources regulated under section 112 but not listed pursuant to section 112(c)—that is, area sources that are regulated pursuant to section 112 standards promulgated before the 1990 CAA Amendments but not added to the section 112(c) list. For the reasons explained below, the EPA does not interpret section 112(d)(5) as limiting its discretion to promulgate GACT standards as part of a section 112(q) review simply because the area source category has not been added to the section 112(c) list.

As an initial matter, the specific statutory provisions addressing section 112 standards that pre-dated the 1990 Amendments appear in sections 112(q)(1) and 112(c)(4). As discussed above, these provisions require the EPA to review and, if appropriate, revise such standards to comply with the requirements of subsection (d) and also establish that the EPA has discretion to decide whether or not to list source

categories under section 112(c). In the event of any conflict with other more general provisions in section 112, the more specific provisions of sections 112(q)(1) and 112(c)(4) govern.

The general standard setting obligation in section 112(d)(1) also provides helpful context. Specifically, CAA section 112(d)(1) states that "The Administrator shall promulgate regulations establishing emission standards for each category or subcategory of major sources and area sources of hazardous air pollutants listed for regulation pursuant to subsection (c) of this section . . ." Section 112(d)(1) grants the EPA authority to set emission standards under both section 112(d)(2) (MACT standards) and section 112(d)(5) (GACT standards). Like section 112(d)(5), it cross references the listing provision of subsection (c). Neither provision explicitly addresses how it applies in the context of a section 112(q) review. And neither provision explicitly overrides either the section 112(q) review requirements or the discretion granted to the Administrator under section 112(c)(4). Therefore, for standards promulgated prior to the 1990 CAA Amendments, it is reasonable for the EPA to interpret sections 112(d)(1) and (d)(5) to not require listing pursuant to § 112(c) before the EPA can review the standards under section 112(q)(1) and, if appropriate, revise them to comply with subsection (d). In contrast, if the EPA were to take the approach suggested by commenters, and read the cross references to subsection (c) in sections 112(d)(1) and 112(d)(5) as a limitation on the EPA's authority under section 112(q) to revise standards to comply with subsection (d) it would be inconsistent with CAA sections 112(q)(1) and 112(c)(4).

Given the statutory context outlined above, for this CAA section 112(q)(1) review, it is reasonable for the EPA to interpret CAA section 112(d)(5) as restricting the EPA's ability to set GACT standards to "only area sources," but not prohibiting the EPA from setting GACT standards as part of a section 112(q) review simply because the area source category is not listed pursuant to subsection (c).

Comment: Several commenters argued that the EPA improperly proposed to promulgate design and work practice standards in lieu of emissions standards. Specifically, commenters stated that the EPA cannot promulgate design and work practice standards without the Administrator first making a finding pursuant to CAA section 112(h) that emission standards are not feasible. Commenters took the position that the EPA has not and cannot make a finding pursuant to CAA section 112(h) that radon emissions standards are not feasible at uranium recovery facilities. These and another commenter assert that the EPA has not and cannot make the "not feasible" showing, so the EPA must promulgate an emissions standard.

One of these commenters stated that the EPA has no legal basis for the promulgation of a design, equipment, work practice, or operational standard, or combination thereof, in lieu of a radon emission standard, because design, equipment, work practice, or operational standards are meant to supplement, not replace, a standard that places specific numerical limitations on HAP emissions. The commenter also asserts that the EPA has no legal basis for eliminating the emission standard for existing mill tailings impoundments.

The other commenter pointed to text from the legislative history of the 1990 CAA Amendments and stated that work practice standards must achieve the same or greater level of emissions reduction as a numerical emission standard. The commenter argues that radon emissions will be higher under the GACT standards than they would be under a numerical emission standard and therefore the EPA should promulgate an emission standard.

Response: The EPA disagrees with these comments. The statute does not require the EPA to make a finding pursuant to CAA section 112(h) prior to promulgating management practices for area sources pursuant to section 112(d)(5). While section 112(d)(2) requires the EPA to make such a finding prior to setting work practice standards in lieu of an emission standard, section 112(d)(5) contains no such requirement.

Instead, CAA section 112(d)(5) provides the EPA with discretion regarding the type of standards it sets for area sources by permitting the EPA to set standards or requirements "which provide for the use of generally available control technologies or management practices" (42 U.S.C. 7412(d)(5)). The EPA determined that the management practices required in this final rule constitute generally available management practices and effectively control radon emissions from conventional impoundments constructed after December 15, 1989, non-conventional impoundments and heap leach piles.

Because CAA section 112(d)(5) provides the EPA with the option of establishing management practices, the EPA was not required to make a showing under CAA section 112(h) that an emissions standard is not feasible before we set management practices. Further, CAA section 112 does not provide that management practices must supplement emission standards; the EPA may set management practices to control emissions pursuant to CAA section 112(d)(5).

With respect to existing conventional impoundments in existence on December 15, 1989, the EPA is retaining the emissions standard originally promulgated in 1989. During the comment period, the EPA learned that the information on which it relied when proposing to remove the emission standard requirement for existing conventional impoundments designed or constructed prior to December 15, 1989 was not accurate. Because the conventional impoundments in existence on December 15, 1989 are constructed in such a way that they are unable to comply with the standards being promulgated for conventional impoundments constructed after December 15, 1989, the EPA determined that it is appropriate to retain the emissions standard and monitoring requirement for conventional impoundments in existence on December 15, 1989. Because these units have been subject to a radon flux standard of 20 pCi/m^2-sec since 1989, this method of compliance is generally available and effectively regulates radon emissions from these units.

The EPA evaluated all types of units regulated by Subpart W: Conventional impoundments in existence as of December 15, 1989, conventional impoundments constructed after December 15, 1989, non-conventional impoundments, and heap leach piles. Each type of unit has different characteristics. Also, not all units were subject to the same requirements at the time of their construction, and the feasibility of compliance with emissions standards and/or management practices also varies between types of units. The EPA took these variations into consideration when we conducted our GACT analysis for each type of unit. Because the three remaining conventional impoundments in existence as of December 15, 1989 were subject to different construction requirements than units constructed after that date, and are not amenable to the management practices established in 1989 for those newer units, different standards are appropriate.

The legislative history language referenced by the commenter is concerned with the stringency of work practice standards promulgated under CAA section 112(h), when an emissions standard is not feasible. This passage of the legislative history is not discussing

the stringency of management practices promulgated under CAA section 112(d)(5) and thus is not relevant. Further, the commenter's claim that radon emissions will be higher under the GACT-based standards than they would be under a numerical emission standard is speculative. The commenter has not shown that the management practices promulgated in Subpart W will not effectively result in the same emissions reductions that would be achieved if the EPA had set a MACT standard under CAA section 112(d)(2). The GACT-based standards finalized in the rule will effectively control radon emissions from uranium byproduct material or tailings.

Comment: Several commenters challenged the EPA's authority to regulate impoundments associated with management of process liquids or effluents, referred to as non-conventional impoundments in the Subpart W rulemaking. One commenter submits that Subpart W does not apply to evaporation ponds at currently operating and future operating uranium recovery facilities, specifically in-situ facilities, because of the significant amount of process or waste water present. This and another commenter assert that evaporation ponds should not be regulated in Subpart W because the liquid cover substantially eliminates radon emissions. The second commenter further supports excluding evaporation ponds because the original 1989 rulemaking stated that science did not support the EPA exercising jurisdiction over fluid retention impoundments.

This commenter similarly argues that the EPA has no legal or regulatory bases to apply Subpart W to evaporation ponds at uranium recovery facilities. Further, the commenter states that after 20 years of consistent interpretation that Subpart W is only applicable to uranium mill tailings impoundments, the EPA is now asserting that Subpart W applies to evaporation ponds at in-situ recovery and conventional mill tailings facilities. The commenter argues that the EPA's position is inconsistent with the language and the rulemaking history associated with Subpart W since the regulations discuss uranium mill tailings "piles" and the rulemaking record states that the radon cover requirements in Subpart W's work practice standards are not intended to apply to such fluid retention impoundments.

The commenter also challenges that evaporation ponds are not covered by Subpart W because the specific examples in the regulations do not include evaporation ponds.

Another commenter argues that the liquid impoundments should not be regulated as tailings impoundments and should not be subject to 40 CFR part 192.

Alternatively, one commenter supported the EPA's confirmation that ISL facilities and liquid impoundments are subject to the EPA's CAA NESHAP jurisdiction. The commenter also stated that where the rule does not include emissions limits confirmed by monitoring and reporting requirements, the EPA has not carried out its CAA duty to minimize or eliminate radon emissions.

Response: Non-conventional impoundments (which include evaporation and holding ponds) are associated with all types of uranium recovery facilities, but especially ISL facilities. Non-conventional impoundments receive liquids containing uranium byproduct material or tailings from conventional milling, ISL operations or heap leach piles and the uranium byproduct material or tailings may be suspended or dissolved in the liquids. Some portion of the material will precipitate out and settle on the bottom of the impoundment. In fact, the liquid itself constitutes uranium byproduct material or tailings because it is a waste from the concentration or extraction process.

Commenters' arguments that the EPA lacks authority to regulate non-conventional impoundments lack merit. As an initial matter, commenters do not and could not support their assertion that the EPA lacks legal authority to regulate these impoundments. Radionuclides, including radon, are listed as HAPs in CAA section 112(b)(1), and the EPA has authority under sections 112(d) and 112(q) to regulate radionuclide emissions from sources that manage uranium byproduct materials or tailings.

In addition, commenters' alternate arguments, that these impoundments are not currently and should not be regulated by Subpart W, are incorrect. As promulgated in 1989, Subpart W requirements specifically apply to the structures at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings during and following the processing of uranium ores. 40 CFR 61.250. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on what these structures contain. Uranium byproduct material or tailings produced by ISL is covered by the definition of uranium byproduct material or tailings included in the 1989 Subpart W NESHAP, which is not altered by this final rule.

The EPA understood that there was previously some confusion regarding the applicability of Subpart W to different units that manage uranium byproduct material or tailings, including impoundments and evaporation ponds at ISL facilities (non-conventional impoundments) and heap leach facilities. The EPA also acknowledges that the provisions of the 1989 rule applied imperfectly to these units. The industry is shifting toward ISL as the dominant method of uranium recovery and, while it is not expected to be as significant a source of radon emissions as conventional impoundments, it is reasonable for the EPA, as part of this section 112(q) review, to clarify that the standards in Subpart W apply to non-conventional impoundments. To eliminate any potential confusion, the final rule reaffirms that Subpart W continues to regulate radon emissions from all management of uranium byproduct material or tailings at uranium recovery facilities. Subpart W has always applied to these units; this final rule clarifies that applicability and confirms that these impoundments are covered by Subpart W by establishing management practices tailored to non-conventional impoundments.[9]

The EPA has authority to interpret its own regulations, *Auer* v. *Robbins*, 519 U.S. 452 (1992), and may clarify its interpretation when justified. In this rulemaking, the EPA did not revise its interpretation of Subpart W, rather we clarified the applicability of the regulations. Moreover, the EPA also provided notice and opportunity for comment on these clarifications.

Commenters incorrectly state that evaporation ponds are not covered by Subpart W because evaporation ponds are not used as an example in the regulation. Similarly, commenters' claims that the radon cover requirements are not intended to apply

[9] Note that the BID supporting the 1989 final rule stated: "The licensed uranium mill tailings source category comprises the tailings impoundments *and evaporation ponds* created by conventional acid or alkaline leach processes at uranium mills licensed by the Nuclear Regulatory Commission (NRC) or the Agreement States" (BID Volume 2, Risk Assessments, EPA/520/1–89–006–1, page 9–1, emphasis added). The risk assessment evaluated the contribution of evaporation ponds to total radon emissions at some, but not all, of the operating and standby mills. If allowed to dry out, evaporation ponds could represent a non-negligible portion of the overall radon emissions subject to control under Subpart W. See Tables 9–2, 9–3, 9–26.

to fluid retention impoundments is inaccurate.[10] As explained previously, the determining factor of whether evaporation ponds are subject to Subpart W and whether the radon cover requirements apply is whether the unit contains uranium byproduct material or tailings. Since promulgated in 1989, Subpart W has applied to facilities licensed to manage uranium byproduct material or tailings; units that manage uranium byproduct material or tailings must comply with the applicable GACT-based standard.

In addition, to the extent commenters are challenging the EPA's interpretation of the applicability provisions in 40 CFR part 192, such comments are beyond the scope of this rulemaking and the EPA has no obligation to respond. This rulemaking addresses only Subpart W. The EPA's May 2, 2014 proposal did not reopen or take comment on any aspects of part 192. The applicability provisions of part 192 appear at 40 CFR 192.00. Subpart W does not expand the scope of applicability of part 192 as liners meeting the requirements at 40 CFR 192.32(a)(1) are already mandated by other regulations (79 FR 25407).

In response to one commenter's argument that Subpart W should not regulate evaporation ponds at ISL facilities because of the amount of water present in the ponds, the EPA disagrees. While the EPA agrees that the presence of sufficient liquid significantly reduces the radon emissions, that is not itself a reason to exclude evaporation ponds from regulation as a pond may still contain uranium byproduct material or tailings, which have the potential to emit radon. As stated above, the presence of uranium byproduct material or tailings in the pond determines whether the pond is regulated by Subpart W. The management practices the EPA is promulgating in Subpart W ensure that the radon emissions are continuously effectively controlled. The EPA requires that owners and operators of non-conventional impoundments ensure that the uranium byproduct material or tailings remains saturated, meaning that the material is covered in liquid, which will effectively control radon emissions from these impoundments.

The EPA acknowledges and appreciates the commenter's support of the EPA's clarification that uranium in-situ leach facilities are subject to Subpart W. The EPA's response to the comment regarding the requirement to establish emissions limits confirmed by monitoring and reporting requirements is contained in the response to the previous comment.

Comment: Commenters questioned the appropriateness of including groundwater protection requirements in a NESHAP promulgated under the CAA since they do not affect air pollution. Further, one commenter added that the rule is unnecessary because it is designed to regulate HAPs yet it incorporates groundwater protection standards. The commenters stated that the additional requirements for fluid retention impoundments imposed by the imposition of 40 CFR 192.32(a)(1) and, by extension 40 CFR 264.221, are not justified.

Both commenters asserted that if the NRC believed that the imposition of the part 192 requirements were justified, the NRC would have explicitly referenced 40 CFR 192.32(a)(1) and by extension 40 CFR 264.221 in 10 CFR part 40 Appendix A, but it does not.

Alternatively, another commenter asserted that the EPA cannot allow a situation where the reduction of radon emissions comes at the expense of increased pollution of the groundwater or surface water. The commenter is concerned that the rule works at cross-purpose with 40 CFR part 192.

Response: The EPA may evaluate the non-air quality impacts of rules issued under CAA section 112. CAA section 112(d)(2) explicitly provides that the EPA has authority to consider non-air quality health and environmental impacts when promulgating standards under that section. For area sources, the EPA may promulgate standards under CAA section 112(d)(5) in lieu of CAA section 112(d)(2). Since the CAA provides for the EPA to consider such impacts under CAA section 112(d)(2), it is reasonable for the EPA to consider such impacts under CAA section 112(d)(5). Further, the CAA does not prohibit the EPA from considering non-air quality health and environmental impacts for CAA section 112(d)(5) standards. Additionally, we believe the Legislative History of the CAA Amendments of 1990 provides for the EPA generally taking environmental protection into account when promulgating standards for area sources (Senate Report Number 101–228, December 20, 1989).

Subpart W does not regulate groundwater or establish groundwater protection standards. Groundwater contamination is controlled by pre-existing regulations prepared under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). During Subpart W rule development, the EPA considered the other regulations that impact sources subject to Subpart W and understood that surface impoundments subject to Subpart W are also subject to the standards in 40 CFR part 192 and part 264, subpart K. The part 192 groundwater protection regulations and liner requirements independently apply to the units subject to Subpart W. Through part 192 and part 264, subpart K, requirements were already in place at the time Subpart W was originally promulgated to protect groundwater from sources that manage uranium byproduct material or tailings. As the EPA explained in 1986, "potential effects of various alternatives on ground water were considered as part of the analysis of the impacts of this rule, since EPA has a responsibility to consider the impacts that its rules may have on the total environment. In part, this is done to ensure that regulations do not control pollution in one environmental medium only to degrade another" (51 FR 34058–34059). See also 54 FR 51680.

The EPA has considered the potential effects on groundwater from industry practices under this rule. The EPA also considered the separate, already existent, groundwater protection requirements when initially developing Subpart W. The EPA recognized that if water cover is maintained or expanded in order to limit radon emissions to the atmosphere, the potential for impacting groundwater increases because of the greater hydraulic head. It thus reasonably considered the extent to which existing requirements would limit potential groundwater impacts in determining reasonable management practices to limit radon emissions to the ambient air.

Additionally, the liner requirements have a direct connection to the effectiveness of Subpart W in limiting radon emissions from uranium byproduct material or tailings. It is well established that moisture reduces the rate of radon emanation. An unlined or poorly lined impoundment is more likely to lose moisture through the bottom of the impoundment. This not only increases the potential for ground water contamination, but increases the potential for the uranium byproduct material or tailings in the impoundment to dry out, thereby increasing radon emissions. Thus, the liner requirements

[10] In amending 40 CFR part 192 pursuant to an MOU with NRC, EPA stated the following in response to comments that evaporation ponds should remain open after emplacement of the final radon barrier: "EPA reiterates that the Agency does not intend the expeditious radon cover requirements to extend to areas where evaporation ponds are located, even if on the pile itself, *to the extent that such evaporation pond is deemed by the implementing agency (NRC or an affected Agreement State) to be an appropriate aspect to the overall remedial program for the particular site*" (emphasis added) (58 FR 60354, November 15, 1993).

boost the impoundment's ability to retain moisture and continue to control radon emissions. Because the liner requirements directly relate to the effectiveness of controlling radon emissions by retaining moisture and because the EPA considered the existing groundwater protection standards when evaluating the non-air environmental impact of using water to control air emissions, it was appropriate to acknowledge those standards and incorporate them into Subpart W. Further, nothing in this final action expands the applicability of 40 CFR part 192 to sources that would not otherwise be covered by part 192. See also Section IV.F.1.b.

Comments on the NRC regulations contained in 10 CFR part 40 Appendix A are beyond the scope of this rulemaking and, in any event, the regulations in 10 CFR part 40 Appendix A speak for themselves. In 10 CFR part 40 Appendix A, the NRC references and recognizes that the standards promulgated by EPA in 40 CFR part 192 achieve the minimum level of stabilization and containment of the sites concerned and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites. Additionally, 10 CFR part 40 Appendix A incorporates the basic groundwater protection standards imposed by the EPA in 40 CFR part 192 which apply during operations and prior to the end of closure. 10 CFR part 40 Appendix A requires groundwater monitoring to comply with these standards.

In response to the other commenter, the EPA considered the regulations that independently apply to sources subject to Subpart W. The EPA recognized that the scope of units required to operate with liners pursuant to part 192 is consistent with the Subpart W regulations. Subpart W does not lessen the effectiveness of part 192.

Comment: Commenters concurred with the EPA's authority under Section 112 of the CAA to regulate radionuclide emissions at holding or evaporation ponds at conventional mills, at ISL facilities and at heap leach facilities. However, the commenters contend that the EPA should not only regulate uranium byproduct material or tailings in conventional impoundments, liquid effluent ponds, and heap leach piles, but should also regulate the large amounts of radon emitted from wellfields and other parts of ISL operations. One commenter used the Smith Ranch-Highland operation in Wyoming as an example.

The commenters also advocated for the EPA expanding the scope of operations covered by Subpart W at heap leach facilities. Specifically, the commenters encouraged the EPA to regulate radon emissions from the time ore is placed on the pile, to the placement of a final radon barrier, including periods of standby, and time periods prior to and during the placement of lixiviant on a heap leach pile. The commenters also took the position that heap leach piles that are drying out should be subject to a radon emission standard.

Response: The EPA acknowledges and appreciates the commenters' concurrence with the EPA's authority to regulate radionuclide emissions at holding or evaporation ponds at conventional mills, at ISL facilities and at heap leach facilities.

When the EPA initially promulgated Subpart W in 1986, we identified radon as the radionuclide released to air that presented the highest risk at uranium recovery facilities and determined that units managing uranium byproduct material or tailings were the most significant source of radon emissions (51 FR 34056). Since 1986 and re-promulgation in 1989, Subpart W has only regulated units that manage uranium byproduct material or tailings at uranium recovery facilities (40 CFR 61.250). Other potential emission points in these facilities were not previously the subject of Subpart W regulation and were not assessed for the 1989 rulemaking. The EPA's CAA section 112(q) review of Subpart W was limited to the existing standard. Because Subpart W did not regulate other potential emission points, the EPA did not include any other potential emission points in its CAA section 112(q) review. In this final rule, the EPA continues to regulate the management of uranium byproduct material or tailings from conventional mills, from ISL facilities and from heap leach piles.

With respect to regulation of heap leach piles, the EPA similarly retained the scope of Subpart W's applicability to sources that manage uranium byproduct material or tailings from heap leach operations. The EPA determined that, for purposes of Subpart W, while lixiviant is being sprayed on heap leach piles, the piles are part of the milling process rather than an impoundment whose function is to manage uranium byproduct material or tailings. The final rule does, however, cover the other impoundments used to manage the uranium byproduct material or tailings associated with the heap leaching operation and covers the heap leach pile during the period between the conclusion of processing and the day that final closure begins. See Section IV.D.

Comment: Several commenters stated that the NRC has exclusive jurisdiction over the radiological and non-radiological aspects of uranium mill operations and the nuclear energy business and that the EPA lacks jurisdiction, particularly once the NRC promulgates conforming regulations. Commenters question the need to retain Subpart W at all, with one commenter contending that the existence of the Atomic Energy Act (AEA) makes Subpart W redundant and not necessary.

One commenter takes the position that the EPA does not have authority to define when uranium recovery facilities are considered to be "active" or involved in "operations." Instead, the commenter states that the NRC, not the EPA, has authority over decommissioning and decontamination of AEA-licensed source material recovery facilities, including the mill itself, site soil cleanup, final tailings stabilization, and groundwater restoration or corrective action. Further, the commenter states it is inefficient for uranium recovery operations to obtain two separate authorizations with essentially the same requirements for radon risk from fluid retention impoundments (*i.e.*, the NRC operating license or license amendment and the EPA Subpart W construction approval), and that these duplicative requirements are inconsistent with the EPA's past efforts towards regulatory efficiency evidenced by the rescissions of 40 CFR part 61, subparts I and T.

Another commenter states the Department of Energy also has authority to regulate this industry.

Alternatively, some commenters supported the EPA's authority under the CAA to regulate HAPs, particularly radon, from uranium processing and do not believe that the CAA limits the EPA's regulatory authority with respect to 11e.(2) byproduct material [11] at uranium recovery mill operations. Similarly, a commenter supported the proposed clarification to 40 CFR 61.252(b) (§ 61.252(a)(2) in the final rule) that the EPA, and not the NRC, is the regulatory agency administering the radon NESHAP requirements.

Response: The EPA disagrees that it lacks authority to regulate, under CAA section 112, the radionuclide air

[11] UMTRCA amended the AEA definition of "byproduct material" by adding a second category. Section 11e.(2) byproduct material is "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

emissions of sources also regulated pursuant to the AEA by the NRC. The CAA lists radionuclides as a HAP under CAA section 112(b)(1), and section 112(q) explicitly retains standards such as Subpart W that were in effect before the date of enactment of the CAA Amendments of 1990. In addition, UMTRCA resolves this issue by quite explicitly stating that "[n]othing in this chapter applicable to byproduct material . . . shall affect the authority of the [EPA] under the Clean Air Act of 1970, as amended . . ." (42 U.S.C. 2022(e)). The legislative history is similar: "Authorities of the EPA under other laws would not be abridged by the new requirements" (H. Rep. No. 1480, 95th Cong., 2d Sess. 6, p. 21). There is no indication that Congress intended UMTRCA to preempt the EPA's regulatory authority under the CAA; rather Congress expressly contemplated the EPA authority to simultaneously regulate under both legislative schemes (54 FR 51690–51691). Similarly, the EPA's regulation of the uranium processing industry works in concert with the AEA and the NRC's regulations.

Comment: Some commenters stated that the NRC, not the EPA, has exclusive authority over the definition of 11e.(2) byproduct material, as well as the material itself. Commenters question the EPA's authority to promulgate a new definition for "11e.(2) byproduct material" or to equate the definition to the term "mill tailings." The commenters opine that the EPA may not infringe on NRC authority by proposing an alternative definition of 11e.(2) byproduct material.

One commenter also thinks that the EPA does not have statutory authority to define tailings as restoration fluid because that authority rests exclusively with the NRC.

Response: The EPA disagrees with these comments. The EPA has authority to regulate radon emissions and this authority is not limited by the AEA or the NRC. Radionuclides, including radon, are listed HAPs in CAA section 112(b). The EPA regulated radon emissions from uranium byproduct material or tailings impoundments before the list of HAPs in CAA section 112(b) was added as part of the CAA Amendments of 1990 and CAA section 112(q) explicitly retains standards that were in effect before the 1990 CAA Amendments were enacted. The EPA's regulation of the uranium processing industry works in concert with the NRC's regulation. The EPA has authority to promulgate definitions under the CAA as it deems appropriate and is not limited to the AEA's definition of "byproduct material" or "tailings," or the NRC's definition in 10 CFR 40.4. The EPA first defined "uranium byproduct material or tailings" when promulgating Subpart W in 1986 (51 FR 34066, September 24, 1986). The EPA's definition identifies the scope of material covered by the Subpart W regulations and does not preempt the NRC's AEA authority. The definition in Subpart W of uranium byproduct material or tailings is not substantially or meaningfully different from the NRC's definition of byproduct material in 10 CFR 40.4 or the definition of 11e.(2) byproduct material and should not result in conflict. See also Section IV.F.2.

Regarding the question of restoration fluids, we note that the designation of restoration fluids as "waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content" is consistent with the approach taken by the NRC. See Staff Requirements Memorandum—SECY–99–013, "Recommendation on Ways to Improve the Efficiency of NRC Regulation at *In Situ* Leach Uranium Recovery Facilities," July 26, 2000.

Comment: One commenter opposed comments of the regulated industry which argued that the EPA does not have authority to directly regulate radon emissions from uranium processing facilities. The commenter argued that the industry's arguments amount to an argument the EPA lacks authority over emissions from uranium mill tailings impoundments. The commenter opined that if industry wishes to remove a tailings facility from NESHAP regulation, it should submit a petition showing that radon emissions are not hazardous, but believes that such an effort would fail. The commenter continued that the EPA's proposed rule continues to recognize the health hazards of uncontrolled radon emissions from uranium mill tailings and the rulemaking record confirms that CAA NESHAP regulation is a necessary part of the EPA's role in regulating uranium mill tailings pursuant to its CAA and UMTRCA authorities.

Numerous commenters supported the EPA's decision to regulate radon emissions from uranium mill facilities. Specifically, two commenters state that the EPA has authority to regulate all radon at mills and another commenter confirmed that the EPA has a role in regulating uranium mill tailings. A third commenter stated that the EPA has authority to conduct radon flux measurements.

Response: The EPA acknowledges and appreciates these comments. The EPA agrees that it has authority under the CAA to regulate radionuclide emissions from uranium byproduct material or tailings as radionuclides, including radon, are listed HAPs in CAA section 112(b)(1). Data confirm conclusively that radon-222 emissions, ambient concentrations, bioaccumulation or deposition of radon and its decay products cause adverse effects on public health and the environment.

B. Retaining the Radon Flux Requirement for Impoundments in Existence on December 15, 1989

1. How did we address the radon flux requirement in the proposed and final rules?

After reviewing stakeholder comments and verifying the information provided in them, we are not eliminating the radon flux standard of 20 pCi/m^2-sec for all impoundments in existence prior to or on December 15, 1989. In the proposed rule, we provided information to show that the impoundments in existence prior to December 15, 1989 met the management practice requirements of impoundments constructed after that date (79 FR 25394). Since the conventional impoundments in existence prior to or on December 15, 1989 appeared to meet those management practice standards, we proposed that all conventional impoundments would be subject to the same management practices, regardless of the date of construction. We also proposed that all conventional impoundments (including those in existence prior to or on December 15, 1989) must meet the requirements of one of the two management practice standards, and that the flux standard of 20 pCi/m^2-sec would no longer be required for any impoundments.

During the comment period we received information that led us to conclude that we had erred in stating an equivalency between the two types of impoundments. We originally stated that the Sweetwater and Shootaring impoundments had a double liner system equivalent to the impoundments designed after December 15, 1989. We were incorrect. Commenters [12] showed that the liner systems at these two facilities were not double liners. Additionally, we were originally informed that Cell 3 at the White Mesa facility would be closed by 2014. In fact,

[12] EPA–HQ–OAR–2008–0218–0151, –0153, –0155, –0162. To be clear, our error was in believing that these impoundments were constructed in a manner that allowed them to meet the more stringent standards that were put in place after they were constructed. The standards applicable to these impoundments at the time of the 1989 rulemaking did not require double liners.

it has not.[13] After reviewing the information obtained during the public comment period, we concluded that these impoundments do not meet the management practice standards we proposed for impoundments constructed after 1989. Our analysis also showed that the impoundments in existence on December 15, 1989 can monitor radon emissions to determine compliance with the existing 20 pCi/m^2-sec standard. It is a generally available management practice standard that successfully limits radon emissions from these area sources, as provided for in CAA section 112(d)(5). Therefore, we decided to retain the radon flux standard (20 pCi/m^2-sec) and monitoring requirement for conventional impoundments in existence on or before December 15, 1989 as the applicable GACT-based management practice. Because the 1989 rule required these impoundments to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2.

Some commenters also supported requiring compliance with the flux standard for all impoundments, including those not now subject to it, but we have concluded that to be unnecessary if the owner/operator of an impoundment follows the design and other management practices outlined in the GACT-based standard because these measures are expected to effectively control total radon emissions.

2. What did our updated risk assessment tell us?

As described in the preamble to the proposed rule, we updated the risk analysis we performed when we promulgated Subpart W in 1989 (79 FR 25395, May 2, 2014). We performed a comparison between the 1989 risk assessment and current risk assessment approaches, focusing on the adequacy and the appropriateness of the original assessments.[14]

Because we proposed to establish GACT-based standards to limit radon emissions from the management of uranium byproduct material or tailings at uranium recovery facilities, thereby eliminating any emissions standards and monitoring requirements, it was not necessary for us to update the risk assessment. GACT is not determined on the basis of risk. We conducted the analysis to inform ourselves regarding the continued protectiveness of the radon flux standard as we considered whether the proposed GACT approach could be extended to impoundments in existence on December 15, 1989. We concluded that, even using updated risk analysis procedures (*i.e.*, using procedures updated from those used in the 1980s), the existing radon flux standard appears to be protective of the public health and the environment.

The updated risk assessment involved evaluating exposures to off-site (maximally exposed) individuals and populations from reported total site radon emissions at a number of uranium recovery facilities. In doing so, we found that the risks to individuals and populations were comparable to or lower than those estimated in the 1989 rulemaking. The updated risk assessment employed the most recent risk factors for radon inhalation, which are age-averaged to incorporate the sensitivity of children to radiation. The factors used in the 1989 risk assessment were based on exposures to adults.

This final rule retains the flux standard for conventional impoundments in existence on December 15, 1989. The updated risk assessment and our conclusion that the radon flux standard continues to be protective support our decision to retain the flux standard in the rule. The updated risk assessment is included in the Background Information Document (BID) for the final rule.

In developing the risk assessment and BID, we also conducted environmental justice analyses for the immediate areas (*i.e.*, counties) surrounding the existing and proposed uranium recovery facilities. For all of the sites considered together, the data did not reveal a disproportionately high incidence of minority populations being located near uranium recovery facilities. However, certain individual sites may be located in areas with high minority populations. Those sites would need to be evaluated during their individual licensing processes. The data also did not reveal disproportionately high incidence of low-income populations being located near uranium recovery facilities. We also considered environmental justice analyses that were performed during the EPA's review of construction applications under 40 CFR 61.08. These analyses were conducted by EPA Region 8 in connection with the Piñon Ridge Uranium Mill in Colorado and the Lost Creek ISL uranium project in Wyoming.

3. What key comments did we receive on the radon flux requirement?

We received comments stating that the monitoring requirements for impoundments in existence on December 15, 1989 should be retained and that our proposal was based on faulty information. We also received comments recommending that monitoring be extended to all impoundments. Some commenters supported lowering the flux standard.

Comment: Many commenters opposed the proposed elimination of the monitoring requirement for conventional impoundments in existence on December 15, 1989. Commenters expressed a general concern that no data would be available, but several also specifically questioned our rationale for doing so. They provided information indicating that the three "existing" (*i.e.*, pre-1989) impoundments would not be able to meet the work practice standards (now designated as GACT). By contrast, a few commenters supported eliminating the monitoring requirement based on the effectiveness of the management practices.

Response: We are retaining both the radon flux standard and the monitoring requirement for conventional impoundments in existence on December 15, 1989. Commenters provided information demonstrating that the conventional impoundments previously required to monitor radon emissions (*i.e.*, Cell 3 at the White Mesa Mill and the impoundments at Shootaring Canyon and Sweetwater) are unable to meet the GACT-based standards. Although we agree with the other commenters that the GACT-based standards are effective in limiting radon emissions, they were predicated on the impoundments meeting certain minimum requirements. Because comments included information demonstrating some conventional impoundments in existence on December 15, 1989 do not meet these minimum requirements or did not enter closure as the EPA expected, it is necessary and appropriate to retain the radon flux standard and monitoring requirement for these units.

Comment: A number of commenters expressed the view that monitoring should not be limited to conventional impoundments constructed before December 15, 1989. They asserted that they have little confidence that the management practices in place for newer impoundments are effectively being implemented, and argue that it is not possible to verify their effectiveness without monitoring. The commenters

[13] EPA–HQ–OAR–2008–0218–0151, –0170.

[14] "Risk Assessment Revision for 40 CFR part 61 Subpart W: Task 4—Detailed Risk Estimates," prepared by S. Cohen & Associates, November 2011, Docket No. EPA–HQ–OAR–2008–0218–0078.

also expressed concern that impoundments that are drying out ("dewatering") are emitting larger amounts of radon, and that without monitoring the operators are not compelled to provide additional soil cover.

Response: The EPA reviewed the management practices prescribed for conventional impoundments constructed after December 15, 1989 and reaffirmed its determination that they effectively reduce radon emissions. The radon flux standard and monitoring requirement were instituted in the 1989 rulemaking to provide a means to control radon emissions from impoundments that were constructed and operated according to earlier industry practices. The EPA found that the management practices would represent a demonstrable improvement compared to those industry practices. The Agency has concluded that the appropriate action to satisfy its CAA review is to establish these management practices as GACT-based standards. We agree that operators need to take appropriate action to control radon during the period when the impoundment is operating, and not allow excessive drying during standby or other periods of limited activity. The management practices are intended to limit radon emissions. For conventional impoundments and heap leach piles, the management practices limit the exposed area and/or number of impoundments at a uranium recovery facility, which effectively limits the opportunity for radon emissions. For non-conventional impoundments, ensuring that the material is saturated will limit radon emissions by approximately 95% compared to dry materials.

Comment: Some commenters favored retaining the emissions standard for conventional impoundments constructed before December 15, 1989, but at a more stringent level. One commenter stated that a standard below 10 pCi/m^2-sec would be appropriate, and also that a review of current control technologies would support a standard of 1 to 5 pCi/m^2-sec. Another commenter noted that the 1989 Background Information Document found that a 6 pCi/m^2-sec standard was achievable and cost effective. This general view was supported by other commenters, with one stating that the 20 pCi/m^2-sec standard was established "for economic reasons." One commenter also expressed concern that the EPA did not evaluate monitoring methods other than Method 115, and specifically referred to the Landauer RadTrak.

Response: Because the proposal involved eliminating all monitoring, the EPA did not evaluate the impacts of implementing other standards or monitoring methods. However, we did reaffirm that the 20 pCi/m^2-sec standard remains protective, and we also find that Method 115 remains an appropriate method to measure radon emissions from conventional impoundments.[15] We disagree with the characterization of the 20 pCi/m^2-sec flux standard as based on economics. As stated in the preamble to the 1989 final rule, when determining an ample margin of safety for the rule, "As explained above, the risks from current emissions are very low. A NESHAP requiring that emissions from operating mill tailings piles limit their emissions to no more than 20 pCi/m^2-sec represents current emissions. EPA has determined that the risks are low enough that it is unnecessary to reduce the already low risks from the tailings piles further" (54 FR 51680, December 15, 1989). The update of the 1989 risk assessment conducted for this rulemaking confirms that the risk to public health from uranium byproduct material or tailings managed at operating uranium recovery facilities is comparable to, if not lower than, the level of risk considered presumptively acceptable in the 1989 rulemaking. See Section IV.B.2.

C. GACT for Conventional Impoundments Constructed After December 15, 1989

1. How did we address conventional impoundments constructed after December 15, 1989 in the proposed and final rules?

We proposed to designate the management practices promulgated in the 1989 rulemaking for impoundments constructed after December 15, 1989 as GACT-based standards for all conventional impoundments. In doing so, we evaluated the reasoning used in the 1986 and 1989 Subpart W rulemakings to determine that the phased disposal and continuous disposal management practices protect public health with an ample margin of safety (54 FR 51681).

We initially defined these two management practices because they provided a means for newly-designed impoundments to limit radon emissions, either by limiting the overall size of the impoundment or by limiting the area of dried (dewatered) uranium byproduct material or tailings that can be exposed at any time. We found the two management practices to improve performance (risk to exposed individuals and population) by approximately 35% to more than 50%, respectively, compared to earlier practices of constructing larger impoundments without limiting their number or the exposed area. The potential for larger impoundments or many smaller impoundments to remain uncovered and their radon emissions uncontrolled if bankruptcy prevented proper closure was considered to provide a further advantage to the two management practices (54 FR 51680).

Owners and operators of uranium recovery facilities in the United States have all used the phased disposal method for management of uranium byproduct material or tailings in conventional impoundments, making it a generally available management practice to control radon emissions. We have found no reason to believe that this method is unworkable, unreasonably burdensome or ineffective in limiting radon emissions. Keeping the uranium byproduct material or tailings wet or partially covered, as is typical practice, further reduces radon emissions. These industry practices also clearly demonstrate that the phased disposal method is a generally available technology. In addition, while there has been no use of the continuous disposal method in the United States, it has been successfully employed in other countries, and was proposed for use by some U.S. companies in the 1980s. Therefore, this final rule designates the phased disposal and continuous disposal methods as elements of GACT-based standards for conventional impoundments constructed after December 15, 1989. Because these impoundments are separately required to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2. Conventional impoundments must also comply with the construction requirements in 40 CFR 192.32(a)(1).

2. What key comments did we receive on conventional impoundments constructed after December 15, 1989?

We received some comments questioning the effectiveness of the 1989 management practices and our decision to adopt those practices as GACT-based standards. These commenters argued that there is no basis for concluding that these practices are effective in limiting radon emissions when no confirmatory monitoring has been done. They further

[15] "Report on the Review of Method 115 to Monitor Radon Emissions From Uranium Tailings," prepared by S. Cohen & Associates, September 2008, Docket No. EPA–HQ–OAR–2008–0218–0122.

assert that the work practices were inadequate because practices that are actually effective in reducing radon emissions, such as maintaining a soil or water cover, were not elements of the 1989 work practices or the proposed GACT management practices.

Comment: Several commenters believe our GACT standards are unsupported because there is no monitoring data to demonstrate the effectiveness of the measures for post-1989 impoundments. Commenters criticize the analysis of control technologies in the BID prepared to support the proposal as flawed and insufficient. One commenter states that limiting the size of the impoundment is not in itself an effective means to limit radon emissions without monitoring, reporting, and the requirement of liquid or soil application. This and another commenter also believe that any new impoundments should be required to use the continuous disposal method, as the commenters view the phased disposal method as ineffective in controlling radon emissions, particularly when using water cover. The first commenter further disputes the reliance on 40 CFR 192.32(a)(1) as an effective control technology to limit radon emissions. Another commenter also suggests that the most effective control technology is an emissions limit coupled with monitoring, and believes the rule should be re-crafted along those lines.

Commenters also asserted that we have not sufficiently examined other technologies employed either in other countries or in related industries. One commenter argues that other technologies (*e.g.,* dry-stack placement, paste tailings, solidification) may be superior to open-air storage and cover in conventional impoundments, but were not evaluated in the BID.

Response: Our review under CAA section 112(q)(1) focused on the management practices applicable to post-1989 conventional impoundments (*i.e.,* continuous or phased disposal). However, as noted in the proposal, we also considered control technologies employed at other facilities in the same industrial sector and internationally. We found that the continuous and phased disposal methods adequately control radon emissions and meet the requirements for GACT—these management practices are generally available and effectively prevent adverse health impacts from radon emissions. We recognize the commenter's position that the design and engineering requirement in 40 CFR 192.32(a)(1) does not directly limit radon emissions. However, the design requirement serves two purposes. Retaining moisture or maintaining liquid levels within the impoundment does effectively inhibit radon flux while at the same time preventing releases to ground water. It is possible and important to achieve both goals.

Regarding the area limitation, we disagree with the commenters. The focus of the 1989 analysis was on limiting the surface area from which radon would be emitted.[16] Surface area is directly correlated with radon emanation—the smaller the surface, the lower the overall emissions, given similar materials. While the 1989 rulemaking clearly recognized that the use of soil cover or water are also effective in reducing radon emissions and were commonly employed by industry, the acceptability of the promulgated work practices was not predicated on those additional measures being employed, except to the extent that it was necessary to limit the exposed area when using the continuous disposal method.

Comment: Some commenters stated that the designation as an area source is not in itself sufficient to justify use of GACT. Commenters cite the legacy of contamination associated with the uranium industry as justifying the "strongest preventive measures." Similarly, other commenters accuse the industry of "cutting corners" and believe GACT "runs counter to everything EPA knows" about past practices. Another commenter argues that the Agency's "discretion" must be supported by full and complete explanation and justification. These and other commenters also believe the EPA has not sufficiently considered MACT approaches.

Response: When setting standards, the EPA aims to ensure that the promulgated standards effectively protect against adverse environmental and health impacts, regardless of whether such standards are based on GACT or MACT. For area sources, the Administrator has the discretion under CAA section 112(d)(5) to set standards based on GACT in lieu of setting MACT standards under sections 112(d)(2) and (d)(3), which is required for major sources. See Section IV.A.2 for discussion of regulating these units as area sources. Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants." Consistent with section 112(d)(5), we are revising Subpart W to reflect GACT-based standards. Based on the EPA's evaluation of available information, the GACT-based approach in the final rule provides the necessary protections from management of uranium byproduct material or tailings. The emission standards and management practices established in Subpart W will appropriately reduce radon emissions from uranium recovery facilities.

D. GACT for Heap Leach Piles

1. How did we address heap leach piles in the proposed and final rules?

a. When are heap leach piles regulated under Subpart W?

We proposed to regulate the heap leach pile from the moment that uranium begins leaching from the ore pile. This approach was based on the view that uranium byproduct material or tailings is produced the moment the lixiviant passes through on its first pass and uranium begins to be leached from the ore (79 FR 25403). At the point of uranium movement out of the heap, what remains is uranium byproduct material or tailings as defined by 40 CFR 61.251(g). In other words, what remains in the heap is the waste produced by the extraction or concentration of uranium from ore processed primarily for its source material content. The heap leach pile manages that uranium byproduct material or tailings, even as the pile is further leached to extract uranium. The proposal placed the emphasis on the presence of uranium byproduct material or tailings in the heap leach pile.

We also requested comment on an alternative approach we described in the proposal (79 FR 25398). Under this approach, heap leach piles would not fall under Subpart W until after leaching is permanently discontinued. This approach is based on the view that, as long as the heap is being leached, the ore on the heap leach pad is being processed. While uranium byproduct material or tailings may *exist* in the heap, the heap does not become engaged in managing uranium byproduct material or tailings until leaching is permanently discontinued. This view places the emphasis on the continued extraction of uranium from the heap leach pile. Only after that extraction potential is exhausted, and only uranium byproduct material or tailings remains, would the pile fall under Subpart W.

Many commenters (primarily those from industry) supported basing the

[16] "Either one of these technologies will ensure that future risks will be kept under control by assuring that *only small amounts of tailings are uncovered at any time*" (54 FR 51681 (emphasis added)).

final rule on this alternative view. These commenters argued that the heap leaching cycle is essentially serving the same function as the successive leaching of uranium that occurs in the leach and counter current decantation circuits of a conventional mill, where the ore pulp is successively leached in a series of leach tanks and thickeners. The material does not become uranium byproduct material or tailings (*i.e.*, waste) and fall under the requirements of Subpart W until it leaves the final thickener and is discharged to the tailings impoundment.

Although we proposed to bring the heap under the jurisdiction of Subpart W based upon the presence of uranium byproduct material or tailings within the pile, after further consideration we find the commenters' reasoning compelling and more consistent with previous application of the rule. Subpart W has historically not regulated radon emissions from the milling or extraction process, even at the intermediate points where residuals from uranium extraction make up the bulk of the material being processed, which may be the situation as processing of the heap progresses. Subpart W has regulated only the disposition of the wastes at the end of the separations process. Consistent with this precedent, the heap leach pile is like a conventional impoundment and will be subject to Subpart W once uranium extraction is complete and only uranium byproduct material or tailings remains. Until that time, the heap is considered to be either an unprocessed ore pile or a uranium recovery facility. Thus, heap leach piles are regulated by Subpart W only during the period between the end of processing (*i.e.*, after the pile's operational life) and the beginning of closure. As described in Section IV.F.1.a, and consistent with the requirements applicable to conventional and non-conventional impoundments, the final rule requires that operators provide written notification to the EPA and the NRC that the heap leach pile is being managed under an approved reclamation plan for that pile or the facility closure plan. Impoundments used to manage liquids resulting from the heap leach operation, to the extent they contain uranium byproduct material or tailings, are considered non-conventional impoundments subject to Subpart W, as defined in today's final rule.

There is a significant aspect of heap leach pile management that is important to these regulations. Several commenters from industry stated that a heap leach pile, unlike a conventional impoundment, will immediately begin closure after processing has concluded (either closure in place, or possibly removal for placement in a conventional tailings impoundment). If that is the case, there will be no period when the heap is subject to the requirements of Subpart W. Because there are no heap leach facilities operating in the United States, we have no basis for disputing these statements of industry's intent. Nevertheless, we have concerns that these good intentions may prove insufficient to ensure that closure takes place as expeditiously as the commenters believe. There is some potential that heap leach piles will complete processing but not immediately enter closure. During such a period the owner or operator is only using the pile to manage uranium byproduct material or tailings, and the heap leach pile is then subject to the requirements of Subpart W. The specification in the final rule that final closure does not begin until the operator has provided a written notification to the EPA and the NRC will minimize the potential for confusion regarding the applicability of Subpart W. A further concern might be that operators continue "processing" the pile indefinitely, thereby postponing the costs associated with closure. This would be a matter for the NRC or NRC Agreement States to consider.

We recognize that heap leach piles will emit radon while they are being processed. However, as explained above, Subpart W has traditionally been applied to uranium byproduct material or tailings after exiting the extraction process. Thus, Subpart W has not been applied to other sources of radon at uranium recovery facilities where wastes are present, such as material in thickeners or other processing units. The NRC, or NRC Agreement State, regulates the radionuclide emissions from all sources at a uranium recovery facility. The operator is required to report particulate radionuclide and Rn-222 concentrations at the facility boundary. Thus, radon emissions from sources not covered under Subpart W, including those from the raw ore in heap leach piles or processed yellowcake, are captured by the NRC reporting requirements. However, we emphasize that the best way to control radon emissions from heap leach piles after they have completed processing is to expeditiously close them and install a permanent radon barrier.

b. Phased Disposal

As described in the preceding section, after reviewing comments, we have decided to require that heap leach piles conform to the standards for other uranium recovery facility impoundments only during the period between processing (*i.e.*, after the pile's operational life) and closure. Heap leach piles meeting this description will conform to the GACT-based standard of phased disposal (piles that are 40 acres or less in area, and no more than two in this status at any time) and follow the construction requirements of 40 CFR 192.32(a)(1). We note that piles that will close in place would separately be required by NRC or Agreement State license to meet the construction requirements.

Since heap leach piles are in many ways similar to the design of conventional impoundments, the same combination of phased disposal management practices (limitation to no more than two heap leach piles that are no longer being processed but have not yet entered closure, each one no more than 40 acres in area) that limit radon emissions from conventional impoundments will also limit radon emissions from heap leach piles. Because this management practice is generally available for conventional impoundments, heap leach piles can control radon emissions through the same practice. We determined that phased disposal is a GACT-based management practice that will effectively limit radon emissions from these units. Use of the phased disposal management practice will limit the amount of exposed uranium byproduct material or tailings that can emit radon. Because these units will be separately required to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2.

c. Regulating the Moisture Content of Heap Leach Piles

The third issue we are addressing is the proposed requirement for heap leach piles to maintain a 30% moisture content. In the proposal we recognized that owners and operators of conventional impoundments also limit the amount of radon emitted by keeping the uranium byproduct material or tailings in the impoundments covered, either with soil or liquids (79 FR 25398). At the same time, we recognized that keeping the uranium byproduct material or tailings in the heap in a saturated or near-saturated state (in order to reduce radon emissions) is not a similarly practical solution. In the definitions at 40 CFR 61.251(c) we have defined "dewatered" tailings as those where the water content of the tailings does not

exceed 30% by weight. We proposed to require operating heaps to maintain moisture content of greater than 30% so that the uranium byproduct material or tailings in the heap is not allowed to become dewatered, which would allow more radon emissions. We specifically asked for comment on the amount of liquid that should be required in the heap, and whether the 30% figure was a realistic objective.

After considering stakeholder comments and information, we conclude that it is physically impossible to maintain a 30% moisture content within the heap leach pile and have it remain stable.[17] Calculations submitted by numerous commenters showed that maintaining a 30% moisture content across the heap leach pile would require the pile to be almost submerged. Further, such a condition would place a great amount of hydraulic head on the liner system, potentially causing failure. So, the final rule does not include the requirement to maintain 30% moisture content, even for the period between the end of processing and the beginning of closure, when the pile will be allowed to "dry" in preparation for placing a permanent radon barrier. We do encourage the NRC and facility operators to consider the appropriate use of soil and liquid to limit radon emissions from heap leach piles, as well as methods to reduce the potential for wind erosion (*e.g.*, by spraying or covering the pile when not actively being leached). However, we emphasize that the best way to control radon emissions from heap leach piles after they have completed processing is to expeditiously close them and install a permanent radon barrier.

2. What key comments did we receive on heap leach piles?

Comments submitted on heap leach piles focused on the proposed approach to regulation and the proposed requirement to maintain a 30% moisture content.

Comment: Most commenters on this topic disagreed with our proposal to regulate heap leach piles under Subpart W while they are being processed. These commenters expressed the view that material in the heap leach pile does not become uranium byproduct material or tailings until processing is complete, including a final rinse. As stated by one commenter, "Heap leaching is part of the milling process, and the proposed rules would interfere with such processing operations." The commenter believes that, in essence, the heap leach pile is analogous to the conventional mill, which we have not previously proposed to regulate under Subpart W.

Further, several of these commenters stated that heap leach piles will immediately enter into closure upon the cessation of processing, so there is no period when they are "operating" simply as uranium byproduct material or tailings management units. As a result, they see no time at which Subpart W can apply to heap leach piles.

Some commenters raised the distinction between "close in place" piles and "on-off" piles. Commenters explain that the latter operations involve the removal of the processed heap and placement in a conventional impoundment. In this case, the commenters agree that the uranium byproduct material or tailings from the heap, and the impoundment into which it is placed, would be subject to Subpart W.

Response: The final rule does not include requirements related to heap leach piles undergoing processing. We acknowledge the comments that indicate that uranium byproduct material or tailings is generated once processing begins. To ensure that heap leach piles are regulated consistent with other units subject to Subpart W, we conclude that the heap leach pile is, for purposes of Subpart W, more appropriately considered part of the milling process than as an impoundment whose function is to manage uranium byproduct material or tailings. In other words, while the pile may *contain* uranium byproduct material or tailings, the pile itself *is* the ore from which uranium is being extracted, and does not become a waste until that process is completed. The rule does, however, cover the other impoundments used to manage the uranium byproduct material or tailings associated with the heap leaching operation.

We appreciate the commenter's description of the "on-off" heap leach piles and agree that if a processed heap is removed and placed in a conventional impoundment, that impoundment is subject to Subpart W.

We emphasize the importance of closing piles "as expeditiously as practicable considering technological feasibility" once processing concludes. Industry commenters provided assurances that there would be no untoward delay in beginning the closure process. We encourage NRC to ensure that this is the case. Closure is a more comprehensive system to assure that emissions are minimized for the long term. Once processing has ended, the heap leach pile serves only as a uranium byproduct material or tailings management structure. Such a pile will be subject to Subpart W if the operator has not informed regulators that it is being managed under an approved reclamation plan. As set forth in the final rule, in such a situation, the phased disposal restrictions will apply (no more than two such piles at any time, with area no greater than 40 acres each). Heap leach piles subject to Subpart W must also comply with the construction requirements at 40 CFR 192.32(a)(1). Timely closure of heap leach piles will be better for public health than maintaining piles in an interim state in which they fall under Subpart W.

Comment: Some comments supported our proposed approach, and recommended that we establish an emissions standard and monitoring requirements for heap leach piles. These commenters agree that, because uranium byproduct material or tailings is generated within the heap leach pile at the time processing begins, the pile serves to manage that material during the operation of the facility. These commenters believe this function brings it under the scope of Subpart W. These commenters also take a more expansive view, and believe the EPA is obligated under the CAA to address the entire process at heap leach facilities in the final rule. In this approach, Subpart W would apply to ore stockpiles, ore crushing and heaps that are awaiting processing, as well as to the heap until placement of the final cover. One commenter further recommends that open-air heap leaching not be approved, when leaching can be conducted more safely and with lower emissions inside a designed enclosure.

Response: As stated in the response to the previous comment, Subpart W will not regulate heap leach piles while they are being processed (*i.e.*, during the heap leach pile's operational life). We proposed to apply certain management practices to heap leach piles, but did not propose to establish a radon emission standard and monitoring requirements. Regarding the extension of Subpart W to ores and other similar materials, when the EPA initially promulgated Subpart W in 1986, we identified radon as the radionuclide released to air that presented the highest risk at uranium recovery facilities and determined that units managing uranium byproduct material or tailings were the most significant source of radon emissions (51 FR 34056). Since 1986 and re-promulgation in 1989, Subpart W has only regulated units that manage uranium byproduct material or tailings

[17] EPA–HQ–OAR–2008–0218–0144, –0162, –0169, –0170.

at uranium recovery facilities. 40 CFR 61.250. Other potential emission points in these facilities were not previously the subject of Subpart W regulation and were not assessed for the 1989 rulemaking. The EPA's CAA section 112(q) review of Subpart W was limited to the existing standard. Because Subpart W did not regulate other potential emission points, the EPA did not include any other potential emission points in its CAA section 112(q) review. In this final rule, the EPA continues to regulate the management of uranium byproduct material or tailings from conventional mills, from in situ leach facilities and from heap leach piles.

Comment: A significant number of commenters raised objections to the proposed requirement that heap leach piles be maintained at 30% moisture content as a means to limit radon emissions. Calculations submitted by numerous commenters have shown that to maintain a 30% moisture content across the heap leach pile would require the pile to be almost submerged. The commenters broadly agreed that this is an unrealistic goal that could severely undermine the stability of the pile. Further, it would result in a significantly greater hydraulic head, which raises the risk of liner failure. Several commenters also consider the monitoring requirement to be difficult to implement. As with the proposal to maintain one meter of liquid in non-conventional impoundments, concern was also expressed regarding the source of the water. Commenters suggested that a simpler water balance, which would involve calculations of the amount of liquid entering and leaving the pile, would be a more implementable method of estimating moisture content.

Response: Recognizing the difficulties associated with maintaining a 30% moisture content across the heap leach pile, the final rule does not include a requirement related to the moisture content of heap leach piles. That being said, keeping the pile wet or covered will help reduce radon emissions. We encourage operators as well as the NRC and NRC Agreement States to consider methods that can be applied during the operational life of the heap leach pile.

E. GACT for Non-Conventional Impoundments

1. How did we address non-conventional impoundments in the proposed and final rules?

The purpose of non-conventional impoundments, also known as evaporation or holding ponds, is to manage liquids generated during and after uranium processing operations. We proposed to require one meter of liquid to remain in the impoundment at all times (79 FR 25411). The liquid cover was proposed as a management practice that would limit radon emissions from the uranium byproduct material or tailings.

The Subpart W regulation as promulgated in 1989 did not clearly distinguish between conventional tailings impoundments and those operating as ponds (*i.e.*, those defined as "non-conventional impoundments" in this final rule). The proposed regulation intended to clarify this distinction.

For non-conventional impoundments, the proposed rule allowed for an unlimited number of units to be operating, with no size limitation, but required that a depth of one meter of liquid be kept above any precipitated solids (uranium byproduct material or tailings). The use of the word "liquid" is important here. Typically, operators divert process water to evaporation or holding ponds, where it may be recycled, treated, evaporated, or disposed by injection. Thus, it is likely that the liquid entering the impoundment will contain uranium byproduct material or tailings in solution or suspension. Some portion of this uranium byproduct material or tailings will settle out into sediments. In our proposal we did not specify that the one meter of liquid covering a non-conventional impoundment be fresh water; however, we did refer to "water" in the preamble, and the comments demonstrate that there has been some confusion about this point.

Various commenters described the cost of locating fresh water in the semi-arid and arid western portions of the United States in order to meet the one meter requirement. Other comments focused on the limitations in operational flexibility that a fresh water cover would create by changing the chemistry of a stream that is often recycled back into the extraction process, or noted that this requirement would require re-design of impoundments.

We recognize that this requirement could result in the need to use large volumes of water that may not be readily available in the arid to semi-arid areas in which most uranium recovery facilities operate. Even for facilities that maintain large volumes of process water in ponds, there would likely be some demand for fresh water as a supplement to maintain the required liquid level. Further, maintaining this level of liquid cover would result in placing significantly more hydraulic head on the liner systems for the impoundments, which is counter to existing state and federal regulations and guidelines for operating these systems, as well as a concern to the Agency that the liner would be more susceptible to failure.

In light of these comments, we took a closer look at the proposed requirement. The best indicator of potential Rn-222 emissions during the impoundment's operating period is the concentration of Ra-226 in the liquid and sediment. The BID to support the 1989 rulemaking indicates that the Ra-226 concentrations in conventional uranium byproduct material or tailings is as much as an order of magnitude higher than evaporation pond sediments at the same uranium recovery facility (1989 BID Volume 2, Risk Assessments, EPA/520/1–89–006–1, Table 9–2, Docket No. EPA–HQ–OAR–2008–0218). We have recognized that keeping uranium byproduct material or tailings in conventional impoundments wet helps to limit radon emissions. Moreover, this management practice is used throughout the industry, even in arid regions, and can thus be considered "generally available." We have further recognized that the difference between uranium byproduct material or tailings that are saturated and those covered with one meter of liquid is negligible (79 FR 25398). Therefore, the final rule's requirement that solids remain saturated achieves the same goal as the proposed standard of maintaining a one-meter liquid cover.

Commenters also expressed concern over Rn-222 emissions resulting from Ra-226 dissolved in the liquid present in non-conventional impoundments, as opposed to solid materials in the bottom of the impoundment. A number of commenters questioned our conclusion that radon emissions from uranium byproduct material or tailings in non-conventional impoundments could be greatly reduced by keeping the solids saturated, and reduced to nearly zero by maintaining a liquid cover. The BID shows in Figure 12 that 100% saturated soil reduces radon emanation by nearly 95% compared to dry material, while one meter of liquid provides a further reduction of about 93%, or an overall reduction of greater than 99% (BID Equation 5.1).[18] In either case, radon emissions from non-conventional impoundments would be controlled to levels that represent limited risk to public health. However, commenters argued that actual data on the liquid contents of non-conventional impoundments (primarily from the

[18] See also "Risk Assessment Revision for 40 CFR part 61 Subpart W: Task 5—Radon Emissions from Evaporation Ponds," S. Cohen & Associates, November 2010, Docket No. EPA–HQ–OAR–2008–0218–0123.

White Mesa mill), when evaluated using a correlation in the updated risk assessment, showed radon emissions well in excess of 20 pCi/m^2-sec.

We carefully evaluated the data and emissions analyses submitted by commenters. We determined that the data cited by the commenters did not support their conclusions. We conclude that our analysis in the proposal was correct regarding the characteristics of non-conventional impoundments and the radon attenuation that could be achieved. See Section IV.E.2 for more detail on this issue.

To summarize, we received comments that raise concerns regarding the economic and technical feasibility, as well as the practical effect, of specifying a liquid level for non-conventional impoundments. We further confirmed that keeping the sediments in a non-conventional impoundment at 100% saturation is nearly as effective as maintaining one meter of water (liquid) cover (Figure 12 in the BID for the final rule). The cost and logistics of maintaining a one-meter liquid cover in arid regions also favor maintaining saturation, especially given that saturation effectively controls emissions and will limit economic impacts.

We evaluated management practices in use at non-conventional impoundments in the industry that could achieve the goal of limiting radon-222 emissions from these units. These units are designed to hold liquid, and typically any uranium byproduct material or tailings contained in these impoundments is covered by liquid. Maintaining a liquid cover over the uranium byproduct material or tailings would effectively control radon and is a practice that is generally available to owners and operators of non-conventional impoundments. Therefore, we have revised the proposed rule language to indicate that the solids in a non-conventional impoundment must remain saturated at all times. In this final rule, we are establishing this condition, along with the liner requirements in 40 CFR 192.32(a)(1), as GACT-based standards for non-conventional impoundments. As noted above, this will reduce radon emissions by approximately 95% compared to dry conditions. We recognize that operators may still have to add water at times to ensure that the uranium byproduct material or tailings remain saturated, particularly during standby or high-evaporation periods. However, we anticipate that the need for additional water will be much less than would be necessary to maintain one meter of liquid. Because these impoundments are separately required to comply with the requirements at 40 CFR 192.32(a)(1), we concluded that such a management practice is generally available and contributes to the control of radon emissions as described more fully in Section IV.A.2.

The final rule requires that visual evidence of saturation must be recorded and maintained by the owner/operator of the non-conventional impoundment, which we anticipate can be obtained using a smartphone or a digital camera during the routine daily inspections required by NRC regulations. Written observations must be recorded daily, with digital photographs to be taken at least weekly. Photographs including embedded metadata must be uploaded to the Subpart W Impoundment Photographic Reporting (SWIPR) Web site maintained by the EPA on at least a monthly basis, beginning on the effective date of this final rule.[19] Until that time, and subsequently should the SWIPR site be unavailable, digital photographs must be maintained by the facility owner/operator and provided to the EPA or authorized State upon request. Should the operator determine that the liquid has fallen to a level that exposes solid materials, the operator must correct the situation within one week, or other such time as specified by the EPA or the authorized State. This provides flexibility if the operator needs to take the impoundment out of service for a longer period to address the situation, such as to repair the liner. Photographs must be taken that show conditions before and after the liquid level is adjusted to verify that appropriate corrective actions have been taken. There is no limit on the size or number of non-conventional impoundments.

2. What key comments did we receive on non-conventional impoundments?

We received a variety of comments related to non-conventional impoundments. Many were related to the proposed requirement to maintain one meter of liquid in the impoundment. Others related to the potential for radon emissions from liquids in the impoundments, and whether those risks were properly characterized.

Comment: Many commenters opposed the proposed requirement to maintain one meter of liquid in the impoundment. Commenters primarily cited cost and the logistical difficulty of obtaining and transporting water as making this proposed requirement overly burdensome, particularly in the arid West. A few commenters noted that impoundments that had already been approved and operating were not constructed with a depth that could accommodate an additional meter of water, potentially necessitating costly renovation. Other commenters noted that this requirement would have effects on the facility operation, where it is necessary to manage evaporative or holding capacity, and to control the characteristics of liquids that may be recycled through the process. The additional stress on the impoundment liner was also raised.

Some commenters questioned the need for this requirement, and noted statements in previous rulemakings that the difference between saturation and one meter of water is negligible. Commenters further argued that non-conventional impoundments present a small risk in any case. A few commenters suggested that a better approach would be to require that solid materials in the impoundment remain saturated, with no solids visible above the liquid level.

Response: We recognize the concerns raised regarding maintaining one meter of liquid in non-conventional impoundments. Because we determined that radon emissions can be controlled if the solids in non-conventional impoundment remain saturated, the final rule does not include a requirement to maintain one meter of liquid in the impoundments. Instead, the final rule adopts the approach suggested by the commenters. Solid materials in the impoundment must remain saturated, with no solids visible above the liquid level. This will achieve a reduction of roughly 95% compared to emissions from dry material. Saturation must be documented by written and visual records, with digital photographs taken on at least a weekly basis. We disagree that the non-conventional impoundments present such a small risk that they need not be regulated under Subpart W.

Comment: Commenters find difficulties in measuring compliance with the proposed one meter liquid requirement. One commenter believes direct measurements will be difficult because of the density of sediments and may present health and safety risks to workers. The commenter suggests that calculations based on mass and liquid balances would be more effective. Another commenter makes a similar suggestion, that the one meter requirement be replaced with a calculation to take into account site-specific factors and give operators

[19] SWIPR is accessed through the EPA's Central Data Exchange (CDX) (*https://cdx.epa.gov*). Information submitted to SWIPR is available to the public after review.

greater flexibility. A third commenter sees problems with the slope of the impoundment and the distance that must be observed, and notes that past experience suggests that measuring devices (such as pressure transducers) will need frequent maintenance and calibration. The commenter prefers to have a simple permanent indicator allowing visual confirmation, rather than measurement.

Response: We appreciate these comments and thoughtful suggestions. The final rule does not include a requirement to maintain one meter of liquid in the impoundments. Instead, the final rule requires that solid materials in the impoundment must remain saturated, with no solids visible above the liquid level. Although we proposed a one meter liquid cover, comments and further evaluation persuaded us that keeping solids saturated controls emissions nearly as effectively as maintaining a one-meter liquid cover. As explained in Section IV.E.1, we have recognized that keeping uranium byproduct material or tailings wet helps to limit radon emissions. We have further recognized that the difference between uranium byproduct material or tailings that are saturated and those covered with one meter of liquid is negligible. See Section IV.E.1 and 79 FR 25398.

Comment: Some commenters argue that the potential for radon emissions from non-conventional (liquid) impoundments has been greatly understated. They state that the general position taken by regulatory agencies (including the EPA) and industry that these impoundments represent a negligible source of radon compared to the solids in conventional impoundments is not supported by data. In particular, the commenters believe that radium in solution or suspension in the liquids has been overlooked as a potential source of radon, compared to solids or sediments in the bottom of the non-conventional impoundments. Commenters cited data from the 2013 and 2014 "Annual Tailings System Wastewater Sampling Report" submitted by Energy Fuels to the State of Utah to support this contention. Using radium data from liquid samples collected from Cells 1, 3, 4 and 4A at the White Mesa Mill and a correlation to radon flux from liquids in the EPA's risk assessment to support the rulemaking (the "Task 5" report, Docket No. EPA–HQ–OAR–2008–0218–0123), the commenters calculate radon fluxes well in excess of 20 pCi/m^2-sec (up to 2,317 pCi/m^2-sec from Cell 1 in 2014). The commenters further note a significant increase in the radium measurements for three of the four impoundments from 2013 to 2014, likely attributable to evaporation and concentration of the radium in solution (Cell 3 showed a significant increase from 2012 to 2013, but dropped in 2014). They conclude that the risk to public health associated with radon emissions from non-conventional impoundments is much greater than the EPA has acknowledged.

Response: The EPA disagrees that the data provided by commenters support their conclusion that the liquids have been underestimated as a source of radon. First, the laboratory analyses included in the sampling report refer to "Total Alpha Radium" (or "Gross Radium Alpha") and specify the analytical method as EPA Method 900.1.[20] This method cannot distinguish between different alpha-emitting isotopes of radium, which are all chemically identical. In addition to Ra-226, the isotope of concern that decays to form Rn-222, the sample may also contain Ra-224 (a decay product of Thorium-232) and Ra-223 (a decay product of Uranium-235). Because of the vast difference in their decay rates,[21] Ra-224 and Ra-223 need be present in much smaller amounts (by mass) to have the same activity as Ra-226. For example, one gram of Ra-226 will have the same activity as about 6.25 micrograms (6.25 x 10^{-6} grams) of Ra-224. It is known that the White Mesa Mill has processed materials containing Th-232, which makes it likely that Ra-224 is present in some amount. Given these sources of uncertainty, these results cannot definitively represent Ra-226 concentrations. Other sources of uncertainty could include interference from barium present in the liquid sample, as Method 900.1 relies upon precipitation with barium sulfate to separate the radium. Moreover, while Method 900.1 can essentially separate uranium from the sample, it is less effective at separating other alpha-emitting radionuclides, such as isotopes of thorium. Thus, some small amounts of uranium and thorium could solubilize and "carryover" into the precipitated sample, which would also affect the analysis. Given the numerous uncertainties associated with the data relied upon by the commenters, these data cannot reliably serve as a surrogate for Ra-226. Without specific isotopic analyses, which were not performed on the samples presented in the 2013 and 2014 reports, the actual Ra-226 concentrations cannot be determined.

The 2015 annual wastewater sampling report for White Mesa[22] contains additional information to clarify this situation. Samples taken on two separate occasions from each of the cells (compared to the single sampling conducted in previous years) were analyzed not only for total alpha radium, but also for the isotope Ra-226, using EPA Method 903.1 ("Prescribed Procedures for Measurement of Radioactivity in Drinking Water," Docket No. EPA–HQ–OAR–2008–0218). These results confirm that total alpha radium is not the correct basis for calculations of radon emissions. Table 4 below shows the 2015 results for Cell 1, compared to the 2013 and 2014 results that were cited by the commenters. Cell 1 has been in use since 1981, and has only been used to manage liquids (*i.e.*, no solids from the mill have been placed in it). It consistently shows among the highest levels of total alpha radium.

TABLE 4—MONITORING RESULTS FROM CELL 1 AT THE WHITE MESA MILL

	Total alpha radium (pCi/L)	Ra-226 (pCi/L)
2013	32,700	Not analyzed.

[20] "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA–600/4–80–032, August 1980, Docket No. EPA–HQ–OAR–2008–0218.

[21] Radium-226 has a half-life of 1,600 years, while Radium-224 and -223 have half-lives of 3.66 days and 11.43 days, respectively. EPA Method 900.1 has been used by drinking water systems to show compliance with the regulatory standard of 5 pCi/L for combined Ra-226 and Ra-228, which is well below the activity found in effluents from uranium processing. Ra-228 is a pre-cursor of Ra-224 that decays by beta emission and has a half-life of 5.75 years. If the result is below 5 pCi/L using Method 900.1, there is no need for additional analysis. Half-life is the amount of time for one-half of the radionuclide to decay. Further, although Ra-223 and Ra-224 decay to form Rn-219 and Rn-220 (also known as "thoron"), respectively, these isotopes of radon are also very short-lived (half-lives less than one minute each) and therefore are not considered to be of concern for exposures to the public.

[22] Environmental reports for the White Mesa Mill are available from the Utah Department of Environmental Quality at *http://www.deq.utah.gov/businesses/E/energyfuels/whitemesamill.htm.*

TABLE 4—MONITORING RESULTS FROM CELL 1 AT THE WHITE MESA MILL—Continued

	Total alpha radium (pCi/L)	Ra-226 (pCi/L)
2014	331,000	Not analyzed.
2015 Sample 1	73,800	829.
2015 Sample 2	735,000	1,110.

Source: "2015 Annual Tailings System Wastewater Sampling Report," Energy Fuels.

The Ra-226 concentrations found in 2015 are consistent with historical data, also included in the sampling reports. For the period 1980–2003, the maximum concentration of Ra-226 recorded is 1,690 pCi/L, based on sampling from Cell 1, Cell 2, and Cell 3 (it is not specified which cell recorded the maximum concentration). Table 6 of the Task 5 report estimates that, based upon site-specific conditions at the White Mesa Mill, a Ra-226 concentration of 1,000 pCi/L in impoundment liquids would result in a radon flux of approximately 7 pCi/m^2-sec. Using this correlation, the average radon flux from Cell 1 in 2015 would be slightly less than 7 pCi/m^2-sec. The highest level of Ra-226 in 2015 from the other impoundments was 772 pCi/L in Cell 4A, which translates to a radon flux of about 5.4 pCi/m^2-sec. Further, based on the maximum Ra-226 concentration recorded from 1980–2003, the calculated radon flux would be roughly 11.8 pCi/m^2-sec. These results indicate that the radon flux from Ra-226 suspended or dissolved in liquids in the non-conventional impoundments at White Mesa is controlled to a level that is within the range that the EPA determined to be acceptable during the development of Subpart W, without taking additional measures.

These results are also consistent with information reported for liquid impoundments at ISL facilities (see Tables 7, 8 and 9 of the Task 5 report). They also suggest that the noteworthy fluctuations in recent years may not be directly attributable to the radium content of the liquids, but may result from the analytical method used. "Total" or "gross" analytical methods are generally considered screening tools whose results are more susceptible to other influences. Energy Fuels states that the individual isotopic analyses "show that the increasing gross alpha results are being caused by matrix interference due to the nature of the tailings solution and are not representative of gross alpha from radium concentrations in the solution" (Energy Fuels, 2015 annual wastewater sampling report, page 15). Similar fluctuations occurred for all the impoundments (although, as noted earlier, Cell 3 showed a significant increase in 2013, with a decrease in 2014).

As an additional source of information, the facility's 2015 "Semi-Annual Effluent Monitoring Report" (July through December) provides radon monitoring data from air monitoring stations posted around the impoundments. The facility resumed monitoring for radon in 2013 and the data presented in Attachment J of the report show that emissions have been within the limits calculated to correspond to a 25 mrem annual dose for continuous exposure at each monitoring station. These limits serve as As Low As Reasonably Achievable (ALARA) goals for the facility.

In most cases, results are well below that level. The highest annual result (four consecutive quarters) can be seen for Station BHV–4, which is located directly south of the impoundments but still within the White Mesa facility boundary. A person located at this point during 2015 would have incurred a dose of approximately 16 mrem [23] (average quarterly results of roughly 0.31 pCi/L, compared to a calculated limit of 0.5 pCi/L). The single highest quarterly reading is listed at Station BHV–6, which is to the southeast of the impoundments at the facility boundary. The reading for the fourth quarter of 2013 is approximately 88% of the calculated limit (0.73 compared to 0.83, translating to a quarterly dose of about 5.5 mrem at that location). However, readings for the previous two quarters were recorded as zero and readings for the next quarters were significantly lower as well. There is fluctuation in these results as well, which depends to some extent on wind direction, but overall the results indicate that radon from the impoundments is not a significant public health concern.

Both the sampling data from the non-conventional impoundment cells and the radon data from the air monitoring stations at the White Mesa Mill support the EPA's conclusion that emissions from the liquids in non-conventional impoundments represent a limited source of radon and does not support commenters' argument to the contrary.

Comment: Some commenters request clarification that Subpart W should not apply to impoundments that only contain water that has been treated to meet effluent limits. The commenters see this as having no regulatory benefit, but a potential additional cost to operators who must meet the more stringent requirements in 40 CFR 192.32(a)(1). Commenters also suggest we define a threshold level of radium or uranium content below which liquids no longer must be managed as uranium byproduct material or tailings.

Response: The purpose of Subpart W is to control radon emissions from sources containing uranium byproduct material or tailings at uranium recovery facilities. The EPA agrees that if an impoundment does not contain uranium byproduct material or tailings, it is not subject to the requirements of Subpart W. The EPA is not defining a concentration or level of radium or uranium at which treated liquids would no longer be considered uranium byproduct material or tailings. Instead, such impoundments can be identified and their status can be addressed during the construction application review under 40 CFR part 61, subpart A.

Subpart W also does not apply to impoundments constructed for the purpose of managing liquids generated by closure or remediation activities, when they are used solely for that purpose. Impoundments that do not contain uranium byproduct material or tailings resulting directly from uranium recovery operations are not considered to be non-conventional impoundments as defined in Subpart W.

However, non-conventional impoundments remain subject to the requirements of Subpart W until they enter final closure pursuant to an approved reclamation plan for that impoundment, even if at some point in their operational life they are used for the purpose of managing liquids from closure or remediation activities. EPA recognizes that non-conventional impoundments that are subject to

[23] Corresponding to an annual risk of fatal cancer of less than 1×10^{-5}. See Section 4 of the BID.

Subpart W may subsequently transition to a use that supports facility closure or site remediation (*e.g.,* when an ISL wellfield enters into the groundwater restoration phase, and is no longer recovering uranium). Some parties may argue that a non-conventional impoundment's receipt of waste associated with facility closure or site remediation appears analogous to the ability of licensees to obtain a license amendment and have a reclamation plan which provides for placement of remediation wastes in conventional impoundments during the closure process. Using this analogy, some may contend that non-conventional impoundments should not be subject to Subpart W when receiving such wastes. However, such a non-conventional impoundment could later be used to manage liquids from uranium recovery operations at the next wellfield. To ensure that non-conventional impoundments that receive uranium byproduct material and tailings are managed in accordance with Subpart W, and to promote clarity and consistency with the promulgated regulations, Subpart W applies to non-conventional impoundments during the entire operating life of an impoundment which receives, or has received, uranium byproduct material or tailings directly from active uranium recovery operations. Changing a non-conventional impoundment's Subpart W applicability based on the primary use of the impoundment at any particular time during its operational life would cause unnecessary confusion and would be inconsistent with the regulations.

Operationally, this should not represent a burden to licensees. If the impoundment is being used to manage liquids from closure or remediation activities, it should remain in compliance with the requirement to retain sufficient liquid to cover solid materials in the impoundment. Further, because there is no restriction on the number of such impoundments that may be operating at one time, the licensee will not face the same pressure to begin closure as applies to conventional impoundments using the phased disposal approach.

Comment: A commenter finds the discussion of non-conventional impoundments confusing. The commenter believes we have inconsistently and inaccurately described the purpose of these impoundments, the nature of the materials in them, and our regulatory approach. The commenter wishes us to clarify that the liquids are not held in the impoundments for the purpose of covering uranium byproduct material or tailings, but the liquid in fact contains (or is) uranium byproduct material or tailings. The commenter questions how the liquid can be used to control radon emissions, when the liquid is itself in need of control, and requests that we consider that liquids high in radium content may actually cause an increase in emissions.

Response: The purpose of non-conventional impoundments (evaporation or holding ponds) is to receive liquids generated by the uranium processing operation. Uranium byproduct material or tailings may be suspended or dissolved in these liquids. Some portion of the material will precipitate out and settle on the bottom of the impoundment. In some sense, the liquid itself is uranium byproduct material or tailings because it is a waste from the concentration or extraction process. The definition of "non-conventional" impoundment accurately conveys the concept that these impoundments "contain uranium byproduct material or tailings suspended in and/or covered by liquids." As noted in the previous comment response, impoundments containing only treated water and impoundments constructed for the purpose of managing liquids from closure or remediation activities are not non-conventional impoundments as defined by Subpart W, because they do not contain uranium byproduct material or tailings resulting directly from active uranium recovery operations.

While radium contained in the liquid will contribute to radon emissions, those emissions will be attenuated to some degree by the liquid in which it is contained. Further, liquid on top of solid materials will effectively limit radon emissions from those solids reaching the air, even if the liquid itself contains radium. While higher concentrations of radium in the liquid will generate more radon, concentrations in non-conventional impoundments have not been seen to reach levels of concern. See the response to the earlier comment in this section.

Comment: Many commenters expressed opinions related to limiting the size of impoundments. Some commenters believe Subpart W should contain limits on the size of non-conventional impoundments. The commenters believe that larger impoundments are more likely to fail and limits must be imposed to minimize the potential for ground water contamination. One commenter also believes the number of impoundments should be limited. Another commenter does not believe we have adequately supported our conclusion that the requirements of 40 CFR 192.32(a)(1) will provide protection against extreme weather events and may be subject to greater turbulence. Regarding our reference to an impoundment of 80 acres, one commenter wishes us to clarify that no actual impoundment has been as large as 80 acres, but this size has been used only for modeling purposes. Another disputes our statement that it is reasonable to assume that such impoundments will not exceed 80 acres in area, simply because one never has.

Response: We have chosen not to limit the size of non-conventional impoundments because they are not as significant a source of radon emissions and can be readily controlled by maintaining saturation of solid materials, but also because they provide operational flexibility to uranium recovery facilities that may need to manage, on a temporary basis, large volumes of water that can then be recycled into the process. Regarding the maximum size of such impoundments, we referred to 80 acres as a "reasonable maximum approximation" for estimating cost, clearly noting that it is "the largest size we have seen" (79 FR 25401).

Comment: A commenter states that the current and proposed rules do not actually contain any measures to control releases of impoundment contents to the surface or subsurface during extreme weather events. The commenter asserts that the EPA has not provided any data to support the conclusion that the requirements of 40 CFR 264.221 will prevent dispersion of contents in severe events. The commenter expresses concern that generally available technologies do not exist that could prevent dispersion of contents or failure of the impoundment in a severe event such as a tornado or hurricane.

Response: As discussed in the proposal, we believe the design and engineering requirements for impoundments in 40 CFR 264.221, referenced in 40 CFR 192.32(a)(1), provide a sound basis for protection against reasonably foreseeable weather events. The provisions related to avoiding overtopping (essentially, spillage or dispersion) from "normal or abnormal operations," "wind and wave action," or "rainfall," as well as the requirement to maintain integrity and prevent massive failure of the dikes, lay a foundation for addressing the commenter's concerns. To satisfy these conditions, design of impoundments at any specific site would likely take into account regional climate and the

magnitude of events such as 100- or 500-year precipitation, or the likelihood of tornados or hurricanes.

F. Definitions, References and Conforming Editorial Revisions

1. How did we address definitions, reference and conforming editorial revisions in the proposed and final rules?

a. Definition of "Operation" and "Final Closure"

We proposed a relatively minor change to the definition of "operation" (79 FR 25404). Under Subpart W as promulgated in 1989, an impoundment was in operation when new tailings were being emplaced, from the day that tailings are first placed in the impoundment until the day that final closure begins. There has been some confusion over this definition. We proposed to amend the definition of "operation" in the Subpart W definitions at 40 CFR 61.251 to replace the reference to "new" tailings with the broader term "uranium byproduct material or tailings" at 79 FR 25405.

We received comments from across the spectrum of stakeholders who disliked this definition. Commenters from industry said we did not take into account the period between cessation of placement of uranium byproduct material or tailings into an impoundment and physical closure with an approved closure plan. This period can sometimes last for years while the uranium byproduct material or tailings are dewatered to an extent that heavy machinery can be used to emplace the final closure radon barrier. Also, the impoundment(s) are often used for dismantling the facility, for disposal of other liners, etc. Extending the operational period and Subpart W jurisdiction during the entire closure period could result in a milling facility having two operating impoundments in the closure process and no ability to operate a third impoundment to receive uranium byproduct material or tailings from operations. Other commenters claimed that operators were taking advantage of the existing definition by claiming that an impoundment is "in closure" but taking no concrete action to implement a closure plan or apply a final cover.

We do not intend to extend the jurisdiction of Subpart W to include the period during which closure activities are being conducted. The proposal was intended to clarify that an impoundment remains "operating" until it enters closure, even if it is not receiving newly-generated uranium byproduct material or tailings from facility processing (79 FR 25405). Further, we note that the definition in Subpart W is consistent with those in 40 CFR 192.31 and 10 CFR part 40, Appendix A, which were in fact derived from Subpart W. Thus, we find this concern to be misplaced. The final rule adopts the definition of "operation" as it was proposed.

We did not propose to include a definition of "closure"; however, we realize that a lack of clarity on the concept of closure, what it involves and when it begins has affected the understanding of Subpart W. In particular, the use of the term "final closure" in the definition of "operation" does not, by itself, provide sufficient clarity on the end of operation. As described earlier, we received a number of comments making suggestions or raising concerns on this point. As noted above, the definition of "operation" in Subpart W served as the basis for the definitions later adopted in 40 CFR part 192 and 10 CFR part 40, Appendix A. Further, both 40 CFR part 192 and 10 CFR part 40, Appendix A adopted definitions and requirements related to closure that address some aspects of the comments we received related to Subpart W. The more appropriate action is to retain the definition of "operation" and clarify the meaning of final closure in a separate definition. Therefore, the final rule incorporates a new definition of "final closure" at 40 CFR 61.251(n).

We emphasize two aspects of this new definition that we believe will help address concerns regarding the timeliness and predictability of closure activities. First, impoundments or heap leach piles will remain subject to Subpart W until the owner or operator provides written notice that the impoundment is entering final closure. Second is the reference to the reclamation plan for the impoundment or heap leach pile. We have heard some comments, specifically related to the Cotter mill, that the facility should still be subject to Subpart W because it has never had an approved reclamation or closure plan; however, the facility no longer has an operating license under which it would conduct activities subject to the requirements of Subpart W.

The reference to a reclamation plan in the definition of "final closure" does not affect that Subpart W only applies to operational units and does not cover units that are in closure. Rather, it makes clear our expectation, also found in 40 CFR part 192 and 10 CFR part 40, Appendix A, that the NRC or the Agreement State require and approve such a plan. It also establishes that notice to the NRC or the Agreement State and an approved reclamation plan are necessary prerequisites for determining that the impoundment in question is no longer subject to the requirements of Subpart W. The final rule is adopting the terminology employed in NRC regulations. In 10 CFR part 40, Appendix A, NRC identifies a reclamation plan as applicable to individual impoundments, while the closure plan is a more comprehensive document that addresses all aspects of facility closure and decommissioning, including any necessary site remediation. A reclamation plan prepared and approved in accordance with NRC requirements in 10 CFR part 40, Appendix A, is considered a reclamation plan for purposes of Subpart W. The reclamation plan may be incorporated into the larger facility closure plan.

A number of commenters expressed concern that the issue of delayed closure would have been addressed by 40 CFR part 61, subpart T (40 CFR 61.220–226), which required that impoundments that are no longer accepting tailings be brought into compliance (*i.e.*, covered) within two years, or in accordance with an approved compliance agreement if it is not feasible to complete closure within two years. In accordance with a 1991 Memorandum of Understanding (MOU), the EPA and the NRC amended 40 CFR part 192 and 10 CFR part 40, Appendix A, respectively, to incorporate provisions related to the timing and requirements of activities conducted during the closure period. The EPA subsequently rescinded subpart T in 1994, finding that the NRC regulatory program protected public health with an ample margin of safety to the same level as would implementation of subpart T (59 FR 36280, July 15, 1994). The commenters correctly noted that in that action the EPA retained the authority to reinstate subpart T should we determine that the NRC was not implementing it as we intended. The Agency has no plans to reinstate subpart T at this time, but takes this opportunity to emphasize that closure of impoundments should be conducted expeditiously, taking only the time that is truly necessary to dewater or otherwise prepare the uranium byproduct material or tailings before application of interim and final covers.

b. Liner Requirements in 40 CFR 192.32(a)(1)

We proposed specific provisions for conventional impoundments, non-conventional impoundments and heap leach piles to explicitly convey that any impoundment at a uranium recovery

facility that contains uranium byproduct materials or tailings would be subject to the Subpart W liner requirements. The 1986 and 1989 versions of Subpart W included a reference to 40 CFR 192.32(a); 40 CFR 192.32(a) incorporates the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. Briefly, 40 CFR 264.221(c) requires that, for new impoundments constructed after January 29, 1992,[24] the liner system must include:

1. A top liner designed and constructed of materials (*e.g.*, a geomembrane) to prevent the migration of hazardous constituents into the liner during the active life of the unit.

2. A composite bottom liner consisting of at least two components. The upper component must be designed and constructed of materials (*e.g.*, a geomembrane) to prevent the migration of hazardous constituents into this component during the active life of the unit. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least three feet of compacted soil material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

3. A leachate collection and removal system between the liners, which acts as a leak detection system. This system must be capable of detecting, collecting and removing hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to the waste or liquids in the impoundment.

There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump requirements and liquid removal requirements. As part of the proposed rule, we examined these provisions to help determine whether Subpart W adequately addresses extreme weather events. We determined that the requirements in 40 CFR 264.221 satisfactorily address such events.

The proposal did not adopt a new approach. Instead, it carried forward the approach adopted in the 1989 rulemaking. That rulemaking included § 61.252(c), which broadly required all impoundments, including those in existence prior to the promulgation of 40 CFR part 192, to comply with the requirements of 40 CFR 192.32(a). The 1986 rulemaking had not applied the requirements of 40 CFR 192.32(a) to impoundments in existence when the 1986 rule was promulgated, as these impoundments were anticipated to cease accepting uranium byproduct material or tailings by the end of 1992 (51 FR 34066). The 1989 rulemaking lifted this restriction as well as the exemption from the requirements of 40 CFR 192.32(a) (54 FR 51680).

We did not propose to remove the liner requirements or request comment on whether they should be retained. We proposed to refer only to 40 CFR 192.32(a)(1) because § 192.32(a) includes provisions that extend well beyond the design and construction of impoundments, such as ground water monitoring systems and closure requirements. These aspects do not fall under the purview of Subpart W, and they are removed in this action.

This final rule incorporates the revised reference to 40 CFR 192.32(a)(1) for all impoundments that contain uranium byproduct material or tailings and establishes this requirement as an element of GACT-based standards for conventional impoundments, non-conventional impoundments, and heap leach piles. The provision in the 1989 rule that extended this requirement to conventional impoundments in existence as of December 15, 1989 is moved to § 61.252(a)(1), which addresses those impoundments.

We received a comment suggesting that we explicitly cite 40 CFR 264.221(c) as the criteria that all impoundments are required to meet. This provision was not incorporated into regulation until 1985 (50 FR 28747). Adopting the commenter's approach would require impoundments constructed before 1985 to upgrade or close, which we did not propose to require. Those older impoundments are required to comply with the provisions of 40 CFR 264.221 that are applicable to them. The commenter's approach would also eliminate consideration of § 264.221(d), which allows for an alternative design or operating practices if "such design and operating practices, together with location characteristics" would prevent migration of hazardous constituents and allow detection of leaks at least as effectively as the requirements of § 264.221(c). It is not appropriate to eliminate this flexibility, particularly for sites that may employ improved liner materials or have exceptional natural characteristics that lend themselves to such a demonstration.

c. Eliminating "As Determined by the Nuclear Regulatory Commission"

As described in the preceding section, Subpart W as promulgated in 1989 required impoundments to be constructed in accordance with the requirements cited in 40 CFR 192.32(a). This provision also included the phrase "as determined by the Nuclear Regulatory Commission."

As described in the preceding section, 40 CFR 192.32(a) also contains provisions related to ground water protection and closure activities, which are not within the scope of Subpart W. It is appropriate that the NRC be the sole regulatory agency for implementing and enforcing these provisions. We proposed to eliminate the phrase "as determined by the Nuclear Regulatory Commission" from Subpart W to clarify that EPA is an approval authority for Subpart W, but specifically for the impoundment engineering and construction requirements in 40 CFR 192.32(a)(1).

We received a number of comments from industry objecting to this change on the grounds that it would create dual regulation with NRC, thus leading to inefficiencies and the potential for one agency to approve an application while the other denied it. We disagree with these commenters, as described in detail in the next section. The final rule eliminates the phrase "as determined by the Nuclear Regulatory Commission" from 40 CFR 61.252(a)(2)(i) and (ii).

2. What key comments did we receive on definitions, references and conforming editorial revisions?

We received a number of comments related to the issue of operation and closure, either to extend the jurisdiction of Subpart W or to limit it. Commenters also expressed views on the liner requirements and their relation to groundwater protection or older impoundments. In connection with the liner requirements, a number of commenters disagreed with the proposal to eliminate the phrase "as determined by the Nuclear Regulatory Commission," suggesting that it will create dual regulation and exceeds our rulemaking authority. Although we did not propose to revise it, we also received some comment related to the definition of "uranium byproduct material or tailings."

[24] 57 FR 3487, January 29, 1992. These specifications also apply to lateral expansions of existing surface impoundment units or replacements of existing surface impoundment units beginning construction or reuse after July 29, 1992. At the time of the 1986 and 1989 Subpart W rulemakings, double liners and leachate collection systems were specified for new impoundments, but the requirements did not contain this level of detail. The requirement for double liners was promulgated on July 15, 1985 (50 FR 28747).

Comment: A number of commenters advocated that the scope of Subpart W be extended to include all activities undertaken to achieve final closure of the impoundment (see also the next comment in this section). As defined in Subpart W, "operation" ends "the day that final closure begins" (40 CFR 61.251(e)). Many of the commenters would like this definition extended and explicitly stated that Subpart W should apply until the final cover is installed on the impoundment (or, for non-conventional impoundments, until the impoundment is removed, if that is the closure approach).

Response: Subpart W has never addressed remediation or reclamation activities undertaken to close the impoundment or the site and EPA did not propose to expand the scope of the rule to cover such activities. Comments on whether the separate regulations that apply during closure and until the final cover is installed are sufficient or whether additional regulations are needed to cover activities during that time period are beyond the scope of this section 112(q) review of Subpart W and thus EPA has no obligation to respond. However, a goal of this rulemaking was to provide clarity regarding when the management of uranium byproduct material or tailings is no longer subject to Subpart W. The final rule specifies that Subpart W no longer applies at the beginning of closure and further defines when closure begins. For informational purposes only, EPA discusses below some of the regulations that apply during the closure period. EPA did not reopen or accept comment on any aspects of these regulations.

In 1989, in conjunction with the promulgation of Subpart W, the EPA promulgated 40 CFR part 61, subpart T (40 CFR 261.220–226) to address the closure period and final disposal for conventional tailings impoundments (54 FR 51682). Subpart T required closure of impoundments to be complete within two years after ceasing operations.

In 1991, by Memorandum of Understanding (MOU) with the NRC, the two agencies agreed to take action to clarify the timing for closure of impoundments and processing sites. As part of this agreement, the EPA amended 40 CFR part 192 (58 FR 60341, November 15, 1993) and rescinded subpart T (59 FR 36302, July 15, 1994). The NRC subsequently amended 10 CFR part 40, Appendix A, consistent with the EPA's amended 40 CFR part 192 (59 FR 28220, June 1, 1994). The MOU included the goal that all sites could be closed and in compliance with radon emission standards by 1997 or within seven years of the date on which existing operations cease and standby sites enter disposal status. The MOU did not address Subpart W because Subpart W does not apply during closure.

The MOU and subsequent regulatory actions created a more comprehensive and coordinated framework for managing uranium processing wastes. Further, a settlement agreement with stakeholders provided additional detail to the MOU that, in part, allowed the EPA to make a finding under the CAA that the NRC's regulatory program protected public health with an ample margin of safety. This supported the Agency's decision to rescind subpart T.

In their respective rulemakings, the agencies essentially adopted the Subpart W definition of "operation" and included provisions related to closure that would allow certain activities related to waste management during the closure process. Among these were provisions that would allow wastes to be placed in impoundments that were also either in closure or had completed closure (final cover). These authorizations would not change the status of the impoundment or site, as we explained in our rulemaking to amend 40 CFR part 192: "Even if a portion of a site is authorized to remain accessible for disposal of byproduct materials during the closure process or after placement of a permanent radon barrier consistent with the Settlement Agreement, as described above, this will not cause a nonoperational uranium mill tailings disposal site to revert to an operational site as defined by 40 CFR 192.31(q)" (58 FR 60348, November 15, 1993).

Similarly, the NRC addressed this point in its 1993 proposed rule to amend 10 CFR part 40, Appendix A in response to a comment from an NRC Agreement State:

[Agreement State] Comment. The word "portion" should be deleted from paragraph (3) of Criterion 6A.

[NRC] Response. This provision allows limited disposal during closure as an exception to the definition of *operation*. If the whole impoundment is involved in waste disposal and no reclamation activities are proceeding, the impoundment would be considered operational and continue to be under appropriate requirements for operation. Note, one site may have both an operational impoundment and a non-operational impoundment with the applicable regulations applying to each (58 FR 58659, November 3, 1993, emphasis in original).

The final rule includes the definition of "operation" as it was proposed, which makes it fully consistent with the definitions in 40 CFR part 192 and 10 CFR part 40, Appendix A. We are also adopting a definition of "final closure" that clarifies that Subpart W does not apply to impoundments that are being managed under an approved reclamation plan for that impoundment or the facility closure plan.

Comment: Several commenters stated that the current regulatory scheme allows an unacceptable period during closure activities when impoundments are not being monitored or otherwise managed to limit radon emissions. They further argue that closure is not being conducted in a manner that will lead to timely installation of a final cover or removal of an evaporation or holding pond. They cite periods of decades during which tailings are being "dewatered" or impoundments are used to deposit wastes from decommissioning activities, while the drying-out of impoundments allows increased radon emissions. Commenters attribute this in some part to the Agency's rescission of subpart T, which called for installation of final covers on conventional tailings impoundments within two years of the cessation of operations. One commenter notes that an impoundment undergoing closure will be required to demonstrate compliance with the 20 pCi/m^2-sec radon emissions standard only if it requests extension of the milestones in the closure plan, where it may not have been required to monitor previously under Subpart W.

Response: The EPA did not propose to extend the jurisdiction of Subpart W beyond the operational phase, nor did we request comment on regulations that are applicable to closure activities. We are under no obligation to respond to such comments. However, one purpose of this rulemaking was to clarify at what point Subpart W no longer applies to the management of uranium byproduct material or tailings. The final rule specifies that Subpart W no longer applies at the beginning of closure and further defines when closure begins. The following response is provided in the interest of further clarifying this issue.

As described in the response to the previous comment, the EPA and the NRC entered into an MOU in 1991, after industry efforts to stay the implementation of subpart T, due, in part, to the fact that the requirement to complete closure of impoundments was unrealistically stringent. As part of the MOU, the EPA rescinded subpart T and modified its UMTRCA standards at 40 CFR 192.32 to address activities conducted during closure, including allowing placement of decommissioning wastes in non-operating impoundments. The EPA and the NRC agreed that such activities can, for the most part, be

conducted and a final cover installed within seven years of the end of operations. Similar timeframes should be possible for non-conventional impoundments, which are likely to be removed altogether. We note that both 40 CFR 192.32(a)(3) and 40 CFR part 40, Appendix A were modified and require that closure take place "as expeditiously as practicable considering technological feasibility." They further state that such placement of wastes during closure will not be approved if it would cause delays in emplacement of the final radon barrier to meet the disposal requirements. The MOU did not address Subpart W because Subpart W does not apply during closure.

The Agency has no plans to reinstate subpart T, although EPA is not precluded from doing so (40 CFR 261.226). Nor is the final rule extending the scope of Subpart W to cover closure activities. While this does leave a period of time when conventional and non-conventional impoundments are more likely to have increased radon emissions because they are not managed as they would be during operations, such a period is necessary to facilitate final closure activities. However, "dewatering" tailings for decades, particularly in the arid West, is certainly not consistent with the seven-year period envisioned by both the EPA and the NRC. Most conventional tailings are emplaced using the phased disposal method. To avoid extended dewatering periods, sites may consider using the continuous disposal method, in which tailings are dewatered before emplacement and immediately covered. Regardless of the method of emplacement, we emphasize the importance of timely closure in achieving the safe end state of these sites, and encourage the NRC and NRC Agreement States to give appropriate attention to controlling radon emissions during closure activities.

Comment: Some commenters expressed concern that impoundments are not being closed in accordance with closure plans, because the plans do not exist, milestones are absent or unclear, or milestones are not being enforced. One commenter states that the EPA should not consider an impoundment in closure until such plans are incorporated into the facility license. Another commenter recommends that we amend 40 CFR part 192 to include a provision that the EPA will verify the existence of a closure plan. Several commenters offer specific comments related to the White Mesa and Cotter sites and what they perceive as a lack of closure plans.

Response: Activities related to closure or closure plans are beyond the scope of this rulemaking and the EPA is under no obligation to respond to comments on that topic. However, one purpose of this rulemaking was to clarify at what point Subpart W no longer applies to the management of uranium byproduct material or tailings. This final rule specifies that an approved reclamation plan is a prerequisite for entering closure, thereby removing a unit managing uranium byproduct material or tailings from the jurisdiction of Subpart W. The response below is provided in the interest of clarity in conveying the provisions of the final rule. The EPA does not require, review, approve or enforce reclamation or closure plans.

As noted by one commenter, closure plans with milestones are required under 40 CFR part 192 and 10 CFR part 40, Appendix A. Closure plan requirements, closure activities and revisions to part 192 are not within the scope of this Subpart W rulemaking. The EPA typically does not see closure plans when reviewing construction applications under 40 CFR part 61, subpart A. The NRC or the Agreement State is responsible for enforcement of reclamation or closure plans. The Cotter site ceased operations several years ago, no longer has an operating license and is therefore no longer subject to the requirements of Subpart W. The site is currently a Superfund site and is conducting activities under a decommissioning license from the State of Colorado.

The final rule includes a definition of "final closure" that specifies notification that the impoundment in question is being managed according to the requirements and milestones in the approved reclamation plan. This should provide clarity when determining whether an impoundment is in closure, and whether Subpart W still applies.

Comment: A few commenters took the opposite view of that addressed earlier in this section. These commenters wish us to clarify that the period of operations for either a conventional or non-conventional impoundment only extends to the management of uranium byproduct material or tailings produced by the concentration or extraction of ore processed primarily for its source material content (which may include the commercial management of such wastes produced at other facilities), and not to the management of wastes (byproduct material or otherwise) generated during closure or decommissioning activities.

Response: The final rule clarifies that Subpart W does not apply during closure activities, and further defines when final closure begins. As described above in this section, this is essentially the position agreed to in the 1991 MOU between the EPA and the NRC. Both 40 CFR 192.32(a)(3) and 10 CFR part 40 Appendix A, Criterion 6(A) provide for the use of impoundments while they are undergoing closure. However, impoundments that are used to manage uranium byproduct material or tailings generated during closure or remediation activities, while remaining open to manage operational wastes, would continue to fall under Subpart W until they formally enter the closure process and implement the approved reclamation plan for that impoundment. The definition of "final closure" adopted in the final rule makes clear that Subpart W does not apply to impoundments that are being managed under an approved reclamation plan.

In addition to the use of an impoundment for wastes generated during closure or remediation activities, NRC regulations also provide for waste from other sources to be emplaced in the impoundment during the closure process (10 CFR part 40, Appendix A, Criterion 6(A)(3)). Approval of such emplacement requires a license amendment and must not delay complete closure of the impoundment. Subpart W does not apply to such authorized emplacements while the impoundment is undergoing closure because the unit is subject to an approved reclamation plan and, therefore, no longer operating. Depending on the terms of the license amendment, authorized emplacements at impoundments may include waste from ISL sites, which are not expected to construct permanent impoundments, thereby facilitating the overall goal of limiting the number of small disposal sites. Authorization to allow emplacement of waste from other sources during the closure process must be reflected in both the facility license and the applicable reclamation plan.

Comment: One commenter disagreed with comments described earlier and pointed out that maintaining impoundments under Subpart W jurisdiction while they are undergoing closure may cause facilities to be out of compliance with the restriction on the number of conventional impoundments. The commenter posits that this situation could arise if a facility opened a new conventional impoundment for operational uranium byproduct material or tailings, while having another one in operation and one in closure (or multiple impoundments in closure). To avoid compliance issues, the commenter explained that facilities may have to

defer opening new impoundments, which could lead to temporary shutdown of the facility's processing operations if there is no outlet for the wastes. The commenter specifically notes that non-conventional impoundments may continue in operation when conventional impoundments are in closure.

Response: We did not propose to extend the scope of Subpart W to apply during closure activities and thus did not open this issue as part of our review under CAA section 112(q). Also, we are neither finalizing such an extension of applicability, nor limiting the number of non-conventional impoundments that may be in operation at any one time.

Comment: Several commenters stated that definitions in or proposed for Subpart W are inconsistent with the NRC's definitions in 10 CFR part 40 (and Appendix A). For example, two commenters state that "[t]he definition of *Operation* conflicts with existing regulations, specifically those in 10 CFR part 40 Appendix A following the rescission of 40 CFR part 61 Subpart T." These commenters also suggest that we look to the Appendix A definition of "closure" and they note that the closure period is tied to the "end of milling operations" in Criterion 6.

One commenter requests clarification of the term "day that final closure begins," which the commenter believes has never been adequately explained. Another commenter requests clarification on the steps that must take place for closure to begin. Commenters also stated that we did not include non-conventional impoundments in the definition of operation.

Response: It is important to make the distinction between closure of an impoundment and closure of a facility. Subpart W applies to impoundments that are operating. An individual impoundment may enter and complete the closure process, thus removing it from Subpart W jurisdiction, while other impoundments and the facility continue to operate. When the facility (site) itself enters the closure process, and is no longer operating (and generating uranium byproduct material or tailings), impoundments will also be managed according to the overall site closure plan. Tying Subpart W to the "end of milling operations" in NRC regulations, as suggested by the two commenters, would essentially preclude the closure of individual impoundments until overall site closure begins. This is likely contrary to the commenters' intentions. We also note that the NRC definition of "closure" cited by these commenters clearly refers to activities undertaken to close the entire site and is not directed specifically at impoundment closure.

Additionally, commenters have misinterpreted our proposal. The Agency does not intend to apply Subpart W to impoundments that have entered the closure process. The proposed modification of the definition of "operation," which we are adopting in the final rule, clarifies that impoundments that have not yet entered closure remain subject to Subpart W, even if the material they are receiving is not newly-generated uranium byproduct material or tailings ("new tailings" in the original). This also makes the definition more consistent with those in 40 CFR part 192 and 10 CFR part 40, Appendix A. See the proposed rule at 79 FR 25405, May 2, 2014. To further clarify this situation, the final rule includes a definition of "final closure" specifying that closure begins upon written notification that the impoundment is being managed according to the requirements and milestones in the approved reclamation plan for that impoundment.

This definition of "final closure" adopts a suggestion provided by one commenter. The commenter proposed tying "closure period" to a written notification from the licensee that the impoundment is no longer being used for emplacement of tailings or for evaporative or holding purposes, and is also no longer on standby for such purposes. The commenter suggests that it would be useful to explicitly address both conventional and non-conventional impoundments in the definitions, as there may be situations where non-conventional impoundments continue to operate when conventional impoundments are in closure. We are also adopting this suggestion in the definition of "final closure."

Adding this language should eliminate some uncertainty regarding impoundment status. This uncertainty is reflected in a statement by the same commenter regarding the White Mesa Mill. In providing information about the different impoundments, the commenter notes that ". . . Cell 3 *could be considered* to have already commenced the closure process" (emphasis added). The written notification requirement will help eliminate such ambiguous situations. There should be no question as to whether an impoundment is undergoing closure, and similarly no ambiguity regarding the applicability of Subpart W.

Regarding the perceived conflicts with NRC regulations, we do not see such a conflict, and note that the definition of "operation" in existing and proposed Subpart W is substantively identical to and served as the basis for that in 10 CFR part 40, Appendix A (we note the NRC's statement in its proposal that "the definition of operations is in conformance with the definition of 'operational' in the proposed EPA amendment to [40 CFR part 192] subpart D and in 40 CFR part 61, subpart W" (58 FR 58659, November 3, 1993). The commenters did not suggest that the NRC's definition is in conflict with its own regulations. Further, the same definition is used in 40 CFR 192.31(p). As noted above, we are also adding a definition of "final closure" in the final rule. This will provide additional clarity as to what steps the operator must take to remove an impoundment from the jurisdiction of Subpart W while remaining consistent with the definitions in 10 CFR part 40 and 40 CFR part 192. The definition of final closure explicitly addresses conventional impoundments, non-conventional impoundments and heap leach piles.

The phrase "day that final closure begins" was included in the original promulgation of Subpart W in 1986 (51 FR 34056, September 14, 1986). "Final closure" is a term defined under RCRA hazardous waste regulations in 40 CFR 260.10. "Final closure" in that context refers to the closure of all hazardous waste management units at a site, and is distinguished from "partial closure," which refers to closure of individual units. However, as the term is used in Subpart W, and as it is being adopted in the final rule, it refers to individual impoundments, not the entire site (so is more like "partial closure" in the RCRA context). Subpart W differs in this respect from 40 CFR part 192 and 10 CFR part 40, Appendix A, which are both also concerned with closure of the overall site. We also note that, as described earlier, the definition of "operations" in Subpart W served as the basis for corresponding definitions in 40 CFR part 192 and 10 CFR part 40, Appendix A, and this phrasing has also been adopted in and provides consistency with those regulations. We did not propose to change it and we are not finalizing any changes.

Comment: The State of Utah commented on the status of liners at two of the facilities regulated by the State under its Subpart W delegation. The conventional impoundment at the Shootaring Canyon Mill was constructed in 1981 and "was not required to be constructed in accordance with" the requirements of 40 CFR 192.32(a). However, the State will require the liner to be upgraded if the mill goes back into production. The Shootaring Canyon Mill operated for

only a short period and has been in standby for nearly 35 years. The State also addresses Cell 1 at the White Mesa Mill, which is a non-conventional impoundment also constructed in 1981. The State has not considered this impoundment to be subject to Subpart W and believes that EPA must conduct a cost-benefit analysis if the liner is required to be upgraded.

Response: Comments indicate that some stakeholders have not always clearly understood the true scope of the 1989 Subpart W rulemaking. The 1989 rulemaking revised the approach taken in 1986, which required impoundments existing at that time to cease operations by December 31, 1992 unless they could receive an exemption or extension (51 FR 34066). These impoundments were not required by Subpart W to meet the requirements of 40 CFR 192.32(a). The 1989 rulemaking lifted the operating restriction on older impoundments, but also removed the exemption from the requirements of 40 CFR 192.32(a) (54 FR 51680). This provision, promulgated as 40 CFR 61.252(c), explicitly addressed the exemption for impoundments constructed prior to the promulgation of 40 CFR part 192 and established that all impoundments used to manage uranium byproduct material or tailings became subject to the liner requirements in 40 CFR 192.32(a) when the 1989 rule became effective, regardless of when they were constructed. These liner requirements have remained in place because CAA section 112(q) explicitly retains standards that were in effect before the date of enactment of the CAA Amendments of 1990, unless and until the EPA revises them.

The two impoundments identified by the State of Utah are both required to comply with the liner requirements in 40 CFR 192.32(a)(1), and by extension 40 CFR 264.221. The standby status of the Shootaring Canyon Mill makes no difference in this regard. We understand that some stakeholders did not view the 1989 rulemaking as applicable to liquid (non-conventional) impoundments. This final rule clarifies that non-conventional impoundments did fall under the 1989 rule and are also subject to the requirements in 40 CFR 192.32(a)(1). We note that Denison Mines, the previous owner of the White Mesa Mill, stated in its response to the EPA's section 114 request for information that Cell 1 meets the requirements of 40 CFR 264.221(a).

Comment: Many commenters objected to the proposal to eliminate the phrase "as determined by the Nuclear Regulatory Commission" from provisions related to review of the impoundment construction requirements in 40 CFR 192.32(a)(1). Commenters in general argued that eliminating the phrase "as determined by the Nuclear Regulatory Commission" would result in unnecessary dual regulation if both the EPA and the NRC need to review and approve construction applications, with limited if any benefit. One commenter suggests this will have significant cost implications that were not considered during the rulemaking. Another commenter questions how disagreements between the agencies will be resolved, and suggests that appeals will be "inappropriately complicated".

A number of these commenters asserted that our proposal was contrary to the legal framework established by Congress for management of byproduct material as defined in Section 11e.(2) of the AEA. Commenters cite to the framework in Section 275 of the AEA, which directs the EPA to establish standards for management of byproduct material and which gives the NRC sole authority over implementation and enforcement of the EPA's standards through its licensing process (one commenter cites Title 42 of the United States Code, Section 2022(d) rather than Section 275 of the AEA). Several commenters refer specifically to that section's statement that "no permit issued by the Administrator is required . . . for the processing, possession, transfer, or disposal of byproduct material, as defined in section 11e.(2) to this subsection." Another commenter suggests that the EPA is attempting to expand its role by improperly assuming or duplicating the NRC's responsibilities.

One commenter does not make these specific statutory references, but more generally criticizes the EPA for "grossly inefficient, dual regulation" that is "inconsistent with efficient regulatory practices" and goes against previous efforts by the two agencies to avoid such situations, as illustrated by the EPA's rescission of 40 CFR part 61, subparts I and T. The commenter suggests that Subpart W could also be rescinded, and notes that the EPA's separate rulemaking related to 40 CFR part 192 may be used to incorporate elements of Subpart W as needed.

We also received some comments in support of the proposal to remove the phrase "as determined by the Nuclear Regulatory Commission." One commenter believes this is a welcome clarification that the EPA is administering the NESHAP program. Another commenter notes that it is not unusual for an industry to be regulated under more than one statute or agency. A third commenter points out that this situation has existed for several decades. A fourth commenter agrees and cites the EPA approvals under 40 CFR part 61, subpart A, as well as the division of responsibilities at the state level in Utah as they relate to the White Mesa Mill.

Response: The EPA disagrees that the change will be burdensome to licensees or create additional barriers to regulatory approval. We proposed this change to be consistent with the proposal to narrow the reference to the impoundment engineering and construction requirements. As explained in the preamble to the proposed rule, the requirements at 40 CFR 61.252(b) and (c) required compliance with 40 CFR 192.32(a) (79 FR 25406). However, we focus the Subpart W requirements on the impoundment design and construction requirements found specifically at 40 CFR 192.32(a)(1). The remainder of 40 CFR 192.32(a) goes beyond this limited scope by including requirements for ground-water detection monitoring systems and closure of operating impoundments. These other requirements, along with all of the part 192 standards, are implemented and enforced by the NRC through its licensing requirements for uranium recovery facilities at 10 CFR part 40, Appendix A. It is appropriate for compliance with those provisions to be solely determined by the NRC. However, when referenced in Subpart W, the requirements in 40 CFR 192.32(a)(1) would also be implemented and enforced by the EPA as the regulatory authority administering Subpart W under its CAA authority. Therefore, we revised 40 CFR 61.252(b) and (c) to specifically define which portions of 40 CFR 192.32(a) are applicable to Subpart W. Section 61.252(b) is re-numbered as 61.252(a)(2) and section 61.252(c) is incorporated into 61.252(a)(1) in the final rule.

The comments confirm that there is a misimpression that this reference to the NRC precluded the EPA from reviewing applications for compliance with 40 CFR 192.32(a)(1) in its pre-construction and modifications reviews under 40 CFR 61.07 and 61.08. That is an incorrect interpretation of the 1989 rule. To the contrary, in promulgating the 1989 rule, we stated "Mill operators will not be allowed to build any new mill tailings impoundment which does not meet this work practice standard. EPA will receive information on the construction of new impoundments through the requirements for EPA to approve of new construction under 40 CFR part 61, subpart A" (54 FR 51682). The referenced "work practice standard" includes the requirement for

conformance with 40 CFR 192.32(a). We are eliminating the reference to the NRC to clarify that the EPA is an approval authority for the impoundment engineering and construction provisions in 40 CFR 192.32(a)(1). This change will have no effect on the licensing requirements of the NRC or its regulatory authority under UMTRCA to implement the part 192 standards through its licenses.

Commenters' references to AEA Section 275 as limiting our authority are incorrect. The commenters have overlooked a salient point, which is that the Subpart W rulemaking is being undertaken pursuant to our CAA authority, not under the AEA. Another relevant provision in Section 275, 275e (42 U.S.C. 2022(e)), states: "Nothing in this Act applicable to byproduct material, as defined in section 11e.(2) of this Act, shall affect the authority of the Administrator under the Clean Air Act of 1970, as amended, or the Federal Water Pollution Control Act, as amended." The Federal Water Pollution Control Act is also known as the Clean Water Act.

Further, commenters who cited the prohibition on EPA permitting neglected to note the context for this provision and the specificity of the language regarding the standards of general application to be developed by the EPA. AEA section 275b.(2) reads as follows: "Such generally applicable standards promulgated pursuant to this subsection for nonradiological hazards shall provide for the protection of human health and the environment consistent with the standards required under subtitle C of the Solid Waste Disposal Act, as amended, which are applicable to such hazards: *Provided, however,* That no permit issued by the Administrator is required under this Act or the Solid Waste Disposal Act, as amended, for the processing, possession, transfer, or disposal of byproduct material, as defined in section 11e.(2) to this subsection" (emphasis in original). Thus, Congress required the EPA's standards to be consistent with standards applicable to nonradiological hazardous waste (subtitle C of the Solid Waste Disposal Act, better known as the Resource Conservation and Recovery Act, or RCRA) in lieu of the Agency exercising permitting authority under either the AEA or RCRA. The EPA is not contravening this restriction by exercising regulatory authority under the CAA. Responses to other comments on our legal authorities for this action may be found in Section IV.A.2.

Regarding the view of appropriate and efficient regulation, our action will not have such far-reaching consequences. The EPA and the NRC have not examined the prospect of rescinding Subpart W. As with the rescission of 40 CFR part 61, subparts I and T, and in accordance with CAA section 112(d)(9), the EPA would need to determine that the NRC's regulatory program will protect public health with an ample margin of safety. The EPA's separate rulemaking under 40 CFR part 192 specifically addresses ground water protection at ISL facilities.

Comment: Several commenters addressed the definition of "uranium byproduct material or tailings" in Subpart W. Commenters generally raised the distinction between "tailings" and "byproduct material" under the AEA as germane to the scope of this rulemaking. One commenter suggests that the historical focus on conventional mill tailings impoundments (or "piles") is linked to the CAA, and that we are impermissibly re-defining non-tailings byproduct material as "tailings" as a means to address them under the CAA. Another commenter noted the following in reference to the AEA definition: "All tailings are byproduct material, but not all byproduct materials are tailings." A third commenter asks for clarification on how restoration fluids may be considered byproduct material. Several commenters suggested that we adopt the NRC's definition in 10 CFR 40.4 as a means to improve clarity and consistency.

Another commenter raised a question regarding wastes at uranium recovery facilities that are not derived from ores. The commenter stated that such wastes may derive from "alternate feed" materials that contain sufficient uranium to make processing worthwhile (*e.g.*, tailings from other mineral extraction operations), or could include wastes placed directly into conventional impoundments because they are physically or chemically similar to the material already being managed.

Response: Although we received suggestions to adopt the AEA's and the NRC's definition of byproduct material, we did not propose to revise the definition of uranium byproduct material or tailings. CAA section 112(q) explicitly retains standards such as Subpart W that were in effect before the date of enactment of the CAA Amendments of 1990, so the existing definition of uranium byproduct material or tailings remains unless or until the EPA revises it. Because we did not propose to revise the definition of uranium byproduct material or tailings, we did not open it for comment. The EPA first defined the term "uranium byproduct material or tailings" in 1986 and has generally used the term "tailings" in Subpart W for simplicity. This rulemaking clarifies the scope of the EPA's term "uranium byproduct material or tailings" and provides reassurance that it is not in conflict with NRC's definitions. The following discussion is provided for informational purposes to further clarify this issue.

We note that the EPA has clear authority to promulgate definitions under the CAA as it deems appropriate and is not limited to the AEA's definition of "byproduct material" or the NRC's definition in 10 CFR 40.4. The EPA's definition identifies the scope of material covered by the Subpart W regulations and does not preempt the NRC's AEA authority. See Section IV.A.2 for more discussion of legal authorities as they relate to this issue.

The definition of "uranium byproduct material or tailings" in Subpart W, as it was promulgated in 1989 and not modified by this rule, establishes that Subpart W broadly addresses radon emissions from operating structures used to manage wastes produced during and following the concentration or extraction of uranium from ore processed primarily for its source material content. The EPA acknowledges that the definition of "uranium byproduct material or tailings," as originally promulgated in 1989, may not wholly conform with the common understanding of "tailings." However, the scope and applicability of Subpart W is determined by the regulatory definition of "uranium byproduct material or tailings," not the common understanding of tailings. Subpart W applies to the structures at uranium recovery facilities that are used to manage or contain "uranium byproduct material or tailings" during and following the processing of uranium ores. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, tailings piles, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on what these structures contain. To clarify any potential confusion created by the Subpart W definition, any references to "uranium byproduct material" or "tailings" are now references to "uranium byproduct material or tailings." These changes reaffirm the scope of Subpart W and are not substantive.

The defined scope of materials subject to Subpart W becomes more meaningful when one considers the current

dominance of ISL in uranium recovery. At these sites, where conventional impoundments are not present, non-conventional impoundments managing uranium byproduct material or tailings are the most significant potential source of radon during operations. Although we do not generally expect non-conventional impoundments to be as large a source of potential emissions as conventional impoundments, non-conventional impoundments manage uranium byproduct material or tailings and emit or have the potential to emit sufficient radon that it is appropriate for the EPA to address them under Subpart W.

The designation of restoration fluids as uranium byproduct material or tailings is consistent with the approach taken by the NRC. See Staff Requirements Memorandum—SECY–99–013, "Recommendation on Ways to Improve the Efficiency of NRC Regulation at *In Situ* Leach Uranium Recovery Facilities," July 26, 2000.

It is not necessary for us to explicitly address waste not resulting from the concentration or extraction of ores because Subpart W applies to impoundments, both conventional and non-conventional, that are used to manage uranium byproduct material or tailings. Such impoundments that also contain non-ore wastes continue to be subject to Subpart W. It is unlikely that an operator would construct impoundments for the sole purpose of managing wastes that do not derive from the processing of ores. As explained in Section IV.E.2, the purpose of Subpart W is to control radon emissions from sources containing uranium byproduct material or tailings at uranium recovery facilities. If an impoundment does not contain uranium byproduct material or tailings, it is not subject to the requirements of Subpart W. If construction of such impoundments is planned, they can be identified and their status can be addressed during the construction application review under subpart A.

Comment: Commenters requested clarification regarding whether liquids in impoundments *contain* byproduct material or *are* byproduct material. One commenter asked us to clarify that solids *and* liquids in impoundments are byproduct material.

Response: Subpart W applies to conventional and non-conventional impoundments to the extent they are used to manage uranium byproduct material or tailings, with the primary concern being the potential to emit radon. The uranium byproduct material or tailings may be in solution or suspension in liquids that are discharged to these impoundments, or in sediments after settling out from the liquids.

V. Summary of Environmental, Cost and Economic Impacts

As discussed earlier, uranium recovery activities are carried out at several different types of facilities. We are revising Subpart W based on how uranium recovery facilities manage uranium byproduct materials during and after the processing of uranium ore at their particular facility. As discussed in Sections III and IV, we are establishing GACT-based requirements for three types of affected sources at uranium recovery facilities: (1) Conventional impoundments; (2) non-conventional impoundments; and (3) heap leach piles.

For purposes of analyzing the impacts of the final rule, we assumed that approximately five conventional milling facilities, 50 ISL facilities (although this is only a projection since only 12 are fully licensed) and one heap leach facility, each with at least one regulated impoundment, are subject to the final Subpart W. The following sections present our estimates of the final rule's air quality, cost and economic impacts. For more information, please refer to the Economic Impact Analysis (EIA) report that is included in the public docket for this final rule (EPA–HQ–OAR–2008–0218).

A. What are the air quality impacts?

The requirements in this final rule should eliminate or reduce radon emissions at all three types of affected sources. The GACT-based standards being established by this action are based on control technologies and management practices that have been used at uranium recovery facilities for the past twenty or more years. These standards will minimize the amount of radon that is released to the air by keeping the impoundments wet or covered with soil and/or by limiting the area of exposed uranium byproduct material or tailings.

B. What are the cost and economic impacts?

Table 5 presents a summary of the unit cost (per pound of U_3O_8) for implementing each GACT-based standard at each of the three types of uranium recovery facilities. Because the requirements for liners are not attributable to Subpart W, but are required by other regulations, the only costs attributable to this rulemaking are related to maintaining liquids in non-conventional impoundments. In addition to presenting the GACT costs individually, Table 5 presents the total unit cost to implement all relevant GACT-based standards at each type of facility. For example, the table shows that conventional mills will have both conventional impoundments and non-conventional impoundments, and will also be required to maintain saturation in the non-conventional impoundments.

TABLE 5—FINAL GACT STANDARDS COSTS PER POUND OF U_3O_8

	Unit cost ($/lb U_3O_8)		
	Conventional mills	ISL facilities	Heap leach
GACT—Double Liners for Conventional Impoundments*	$1.04		
GACT—Double Liners for Non-conventional Impoundments*	1.04	$3.07	$0.22
GACT—Maintaining Non-conventional Impoundment Sediments 100% Saturated	0.015	0.026	0.0013
GACT—Liners for Heap Leach Piles*			2.01
GACTs—Total for All Four	2.09	3.09	2.24
Baseline Facility Costs** (EIA Section 6.2)	55.18	51.31	45.06
Baseline Facility Costs***	51.56	52.49	46.08

* Liners required by 40 CFR part 192.
** Based on Price of U_3O_8 at $55/lb.
*** Based on Price of U_3O_8 at $65/lb (used in proposed rule).

A reference facility for each type of uranium recovery facility is developed and described in Section 6.2 of the EIA, including the base cost estimate to construct and operate each of the three types of reference facilities. For comparison purposes, the unit cost (per pound of U_3O_8) of the three uranium recovery reference facilities is presented at the bottom of Table 5. In developing the baseline cost, it was assumed that the price of U_3O_8 is $55 per pound. At that price, baseline facility costs increase somewhat for the conventional mill because the cost of financing (*i.e.*, interest) also increases as revenues are lower. The baseline cost for a conventional mill actually exceeds the $55/lb, which suggests that the mill cannot operate profitably. Baseline costs at $65 per pound, which was used to support the proposed rule, are also shown for comparison. This illustrates the sensitivity of facility cost to market price, which is more significant than the cost of implementing the GACT-based standards.

Based on the information in Table 5, the four GACT-based standards represent about 4%, 6%, and 5% of the baseline cost (per pound of U_3O_8) at conventional, ISL, and heap leach uranium recovery facilities, respectively. The baseline costs were estimated using recently published cost data for actual uranium recovery facilities. For the model conventional mill, we used data from the recently licensed new mill at the Piñon Ridge project in Colorado. For the model ISL facility, we used data from two proposed new facilities: (1) The Centennial Uranium project in Colorado; and (2) the Dewey-Burdock project in South Dakota. The Centennial project is expected to have a 14- to 15-year production period, which is a long duration for an ISL facility, while the Dewey-Burdock project is expected to have a shorter production period of about 9 years, which is more representative of ISL facilities. For the heap leach facility, we used data from the proposed Sheep Mountain project in Wyoming.

Baseline costs for conventional impoundment liner construction [25] will remain the same, since the final rule does not impose additional requirements. Liners meeting the requirements at 40 CFR 192.32(a)(1) are already mandated by other regulations and were mandated by the 1989 rule and, therefore, are built into the baseline cost estimate. As a result, there are no costs (or benefits) resulting from the inclusion of these requirements in the final rule.

The average cost to construct one of these impoundments is $13.8 million. We estimate that this cost is less than 2% of the total baseline costs to construct and operate a conventional mill, per pound of U_3O_8 produced.

We have estimated that for an average 80-acre non-conventional impoundment the average cost of construction of an impoundment is $24.7 million. Requiring impoundments to comply with the liner requirements in 40 CFR 192.32(a)(1) will contain the uranium byproduct material and reduce the potential for ground water contamination. The only economic impact attributable to the final rule is the cost of complying with the new requirement to maintain liquids such that solids in the non-conventional impoundments are not visible above the liquid level during operation and standby. As explained in Section IV.B.3. of this preamble, as long as solid materials are maintained in a saturated state in the non-conventional impoundments the effective radon emissions from the ponds are reduced by approximately 95%. In order to maintain a liquid surface above the sediments within a pond, it is necessary to replace the water that is evaporated from the pond. Depending on the source of water chosen, we estimate that this requirement will cost owners or operators of non-conventional impoundments between $2,909 and $37,527 per year.[26] This value also varies according to the size of the non-conventional impoundment, up to 80 acres, and the location of the impoundment. Evaporation rates vary by geographic location. The requirement to maintain a liquid surface above solid materials in the ponds is estimated to cost less than $0.03 per pound of uranium produced.

Designing and constructing heap leach piles to meet the requirements at 40 CFR 192.32(a)(1) will minimize the potential for leakage of uranium enriched lixiviant into the ground water. Specifically, this will require that a double liner, with drainage collection capabilities, be provided under heap leach piles. Baseline costs for heap leach pile liner construction will remain the same, since the final rule does not impose additional requirements. Liners meeting the requirements at 40 CFR 192.32(a)(1) are already mandated by other regulations and, therefore, built into the baseline cost estimate. Therefore there are consequently no costs (or benefits) resulting from the inclusion of these requirements in Subpart W. Baseline costs for construction will be essentially the same as for conventional impoundments. Since the liner systems are equivalent to the systems used for conventional and non-conventional impoundments, we have been able to estimate the average costs associated with the construction of heap leach pile impoundments that meet the liner requirements we are proposing, and compare them to the costs associated with the total production of uranium produced by the facility. The average cost of constructing such an impoundment is estimated to be approximately $12.6 million. The costs of constructing this type of liner system are less than 5% of the estimated total baseline costs of a heap leach facility.

In summary, we estimate that for conventional impoundments there will be no additional costs incurred through this proposed rule. For non-conventional impoundments we estimate that the additional costs incurred by this proposed rule will be to maintain a layer of liquid above solid materials in each non-conventional impoundment, and we have estimated those costs between approximately $2,909 and $37,527 per year, which represents less than $0.03 per pound of U_3O_8 produced. For heap leach piles, no additional costs will be incurred.

C. What are the non-air environmental impacts?

Water quality will be maintained by implementation of this final rule. This final rule does contain requirements (by reference) related to water discharges and spill containment. In fact, the liner requirements cross referenced at 40 CFR 192.32(a)(1) will significantly decrease the possibility of contaminated liquids leaking from impoundments into ground water (which can be a

[25] These liner systems (conventional, non-conventional and heap leach piles) are already required by 40 CFR 192.32(a)(1), which, as explained above, are requirements promulgated by the EPA under UMTRCA that are incorporated into NRC regulations and implemented and enforced by the NRC through its licensing requirements. Therefore, we are not placing any additional liner requirements on facilities or requiring them to incur any additional costs to build their conventional or non-conventional impoundments or heap leach piles above and beyond what an owner or operator of these impoundments must already incur to obtain an NRC license. Therefore, there are no projected costs (or benefits) beyond the baseline resulting from the inclusion of these requirements in Subpart W.

[26] These figures are higher than those estimated for the proposed rule. We received information during the comment period that resulted in an increase in the estimated cost of obtaining makeup water, so the final rule requirement of 100% saturation is still lower than the proposed requirement to maintain one meter of liquid, using the same base water costs.

significant source of drinking water). Section 192.32(a)(1) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under RCRA, found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. There are other requirements in 40 CFR 264.221 for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements. These liner systems for conventional and non-conventional impoundments and heap leach piles are already required by 40 CFR 192.32(a)(1), which, as explained above, are requirements promulgated by the EPA under UMTRCA that are incorporated into NRC regulations and implemented and enforced by the NRC through their licensing requirements. Therefore, we are not placing any additional liner requirements on facilities or requiring them to incur any additional costs to build their conventional or non-conventional impoundments or heap leach piles above and beyond what an owner or operator of these impoundments must already incur to obtain an NRC license.

Including a double liner in the design of all onsite impoundments that would contain uranium byproduct material or tailings will reduce the potential for groundwater contamination. Although the amount of the potential reduction is not quantifiable, it is important to take this into consideration due to the significant use of ground water as a source of drinking water.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *http://www2.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to OMB for review. The Executive Order (E.O.) defines "significant regulatory action" as one that is likely to result in a rule that may "raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order." Any changes made in response to OMB recommendations have been documented in the docket for this action. The EPA prepared an economic analysis of the potential costs and benefits associated with this action. This analysis, "Technical and Regulatory Support to Develop a Rulemaking to Modify the NESHAP Subpart W Standard for Radon Emissions from Operating Mill Tailings (Background Information Document and Economic Impact Analysis)," Docket No. EPA–HQ–OAR–2008–0218, is available in the docket and summarized in Section V of this preamble. This action is not a significant economic action.

B. Paperwork Reduction Act (PRA)

The information collection requirements in this rule have been submitted for approval to OMB under the PRA. The Information Collection Request (ICR) document prepared by the EPA has been assigned EPA ICR number 2464.02. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

The information to be collected for the rule is based on the requirements of the CAA. Section 114 authorizes the Administrator of the EPA to require any person who owns or operates any emission source or who is subject to any requirements of the Act to:

—Establish and maintain records
—Make reports, install, use, and maintain monitoring equipment or method
—Sample emissions in accordance with EPA-prescribed locations, intervals and methods
—Provide information as may be requested

EPA's regional offices use the information collected to ensure that public health continues to be protected from the hazards of radionuclides by compliance with health based standards and/or GACT.

The rule requires the owner or operator of a uranium recovery facility to maintain records that confirm that the conventional impoundment(s), non-conventional impoundment(s) and heap leach pile(s) meet the requirements in § 192.32(a)(1). Included in these records are the results of liner compatibility tests and documentation that a layer of liquid above solid materials has been maintained in non-conventional impoundments. This documentation should be sufficient to allow an independent auditor (such as an EPA inspector) to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the mill or facility for the operational life of the facility and, upon request, be made available for inspection by the Administrator, or his/her authorized representative. The rule requires the owners or operators of operating non-conventional impoundments to submit digital photographs taken during the compliance inspections required in section 61.252(b). The recordkeeping requirements require only the specific information needed to determine compliance. We have taken this step to minimize the reporting requirements for small business facilities.

The annual monitoring and recordkeeping burden to affected sources for this collection (averaged over the first three years after the effective date of the final rule) is estimated to be 6,693 hours with a total annual cost of $336,950 for the requirements related to documenting the liquid level in non-conventional impoundments, and a one-time expenditure of 460 hours and $32,890 to maintain records of impoundment design and construction. This estimate includes a total capital and start-up cost component annualized over the facility's expected useful life and a purchase of services component. We estimate that this total burden will be spread over 23 facilities that will be required to keep records.

Burden is defined at 5 CFR 1320.3(b). An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The small entities subject to the requirements of this action are small businesses whose company has less than 250 employees and is primarily engaged in leaching or beneficiation of uranium, radium or vanadium ores as defined by NAICS code 212291.

The EPA has determined that small entities subject to the requirements of

this action are approximately 18 uranium recovery facilities that are currently operating or plan to operate in the future. The Agency has determined that the ten small businesses that own these facilities may experience an impact of less than 1% of total annual production costs, or less than $0.03 per pound of uranium produced. Details of this analysis are presented in Section 6 of the BID/EIA prepared to support this rulemaking (Docket No. EPA–HQ–OAR–2008–0218).

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The final rule imposes no enforceable duty on any state, local or tribal governments or the private sector. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments because it contains no requirements that apply to such governments nor does it impose obligations upon them.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. None of the facilities subject to this action are owned and operated by State governments and nothing in the final rule will supersede State regulations. Thus, E.O. 13132 does not apply to this final rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175. The action imposes requirements on owners and operators of specified area sources and not tribal governments. Thus, Executive Order 13175 does not apply to this action.

The EPA notes, however, that several tribes or tribal groups expressed interest in this rulemaking due to the proximity of some of the facilities regulated under Subpart W to tribal lands. Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, the EPA consulted with tribal officials of the Ute Mountain Ute Tribe during development of this action. A summary of that consultation is provided in Docket No. EPA–HQ–OAR–2008–0218–0120.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866. This action's health and risk assessments are contained in Section IV.B.2 of this preamble and in the Background Information Document prepared to support this action (Docket No. EPA–HQ–OAR–2008–0218). The updated risk assessment described in Section IV.B.2 incorporated the risk coefficients from Federal Guidance Report (FGR) No. 13, "Cancer Risk Coefficients for Environmental Exposure to Radionuclides," which includes age-averaged factors to convert radionuclide exposure (intake) to health risk. FGR 13 was developed subsequent to the risk assessment conducted to support the 1989 rulemaking, which relied upon factors applicable to adults. FGR 13 is undergoing revision.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a "significant energy action" because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This final rule will not adversely directly affect productivity, competition, or prices in the energy sector.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards. The rule retains requirements for radon monitoring using Method 115 that were promulgated in 1989.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The documentation for this decision is contained in Section IV.B.2 of this preamble and the Background Information Document prepared to support this action (Docket No. EPA–HQ–OAR–2008–0218).

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 61

Environmental protection, Air pollution control, Hazardous substances, Radon, Tailings, Byproduct, Uranium, Reporting and recordkeeping requirements.

Dated: December 20, 2016.

Gina McCarthy,

Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency amends title 40, Chapter I of the Code of Federal Regulations as follows:

PART 61—NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS

■ 1. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart W—National Emission Standards for Radon Emissions From Operating Mill Tailings

■ 2. Section 61.251 is amended by revising paragraphs (b) through (f) and adding paragraphs (h) through (o) to read as follows:

§ 61.251 Definitions.

* * * * *

(b) *Continuous disposal* means a method of uranium byproduct material or tailings management and disposal in which uranium byproduct material or tailings are dewatered by mechanical methods immediately after generation. The dried uranium byproduct material or tailings are then placed in trenches or other disposal areas and immediately covered to limit emissions consistent with applicable Federal standards.

(c) *Dewatered* means to remove the water from recently produced uranium byproduct material or tailings by mechanical or evaporative methods such that the water content of the uranium byproduct material or tailings does not exceed 30 percent by weight.

(d) *Existing conventional impoundment* means any conventional uranium byproduct material or tailings impoundment which is licensed to accept additional uranium byproduct material or tailings and is in existence on December 15, 1989.

(e) *Operation.* Operation means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.

(f) *Phased disposal* means a method of uranium byproduct material or tailings management and disposal which uses lined impoundments which are filled and then immediately dried and covered to meet all applicable Federal standards.

* * * * *

(h) *Conventional impoundment.* A conventional impoundment is a permanent structure located at any uranium recovery facility which contains mostly solid uranium byproduct material or tailings from the extraction of uranium from uranium ore. These impoundments are left in place at facility closure.

(i) *Non-conventional impoundment.* A non-conventional impoundment is used for managing liquids from uranium recovery operations and contains uranium byproduct material or tailings suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds and can be located at any uranium recovery facility. They are typically not permanent structures unless they transition to become used as conventional impoundments. Impoundments constructed for the purpose of managing liquids from closure or remediation activities (*e.g.*, contaminated groundwater), and which are used solely for that purpose, are not subject to the requirements of this subpart.

(j) *Heap leach pile.* A heap leach pile is a pile of uranium ore placed on an engineered structure and stacked so as to allow uranium to be dissolved and removed by leaching liquids.

(k) *Standby.* Standby means the period of time that an impoundment is not accepting uranium byproduct material or tailings but has not yet entered final closure.

(l) *Uranium recovery facility.* A uranium recovery facility means a facility licensed by the NRC or an NRC Agreement State to manage uranium byproduct material or tailings during and following the processing of uranium ores. Common names for these facilities are a conventional uranium mill, an in-situ leach (or recovery) facility and a heap leach facility or pile.

(m) *Heap leach pile operational life.* The operational life of a heap leach pile means the time period from the first time that lixiviant is placed on the heap leach pile until the time the final rinse is completed.

(n) *Final closure* means the period during which an impoundment or heap leach pile is being managed in accordance with the milestones and requirements in an approved reclamation plan. Final closure for the impoundment or heap leach pile begins when the owner or operator provides written notice to the Administrator and to the Nuclear Regulatory Commission or applicable NRC Agreement State that:

(1) A conventional impoundment is no longer receiving uranium byproduct material or tailings, is no longer on standby for such receipt and is being managed under an approved reclamation plan for that impoundment or facility closure plan; or

(2) A non-conventional impoundment is no longer required for evaporation or holding purposes, is no longer on standby for such purposes and is being managed under an approved reclamation plan for that impoundment or facility closure plan; or

(3) A heap leach pile has concluded its operational life and is being managed under an approved reclamation plan for that pile or facility closure plan.

(o) *Reclamation plan* means the plan detailing activities and milestones to accomplish reclamation of impoundments or piles containing uranium byproduct material or tailings. Activities and milestones to be addressed include, but are not limited to, dewatering and contouring of conventional impoundments and heap leach piles, and removal and disposal of non-conventional impoundments. A reclamation plan prepared and approved in accordance with 10 CFR part 40, Appendix A is considered a reclamation plan in this subpart.

■ 3. Section 61.252 is revised to read as follows:

§ 61.252 Standard.

(a) Each owner or operator of a conventional impoundment shall comply with the following requirements:

(1) Radon-222 emissions to the ambient air from an existing conventional impoundment shall not exceed 20 pCi/(m^2-sec) (1.9 pCi/(ft^2-sec)) of radon-222 and all owners or operators shall comply with the provisions of 40 CFR 192.32(a)(1) in the operation of the impoundment notwithstanding the exemption for existing impoundments in 40 CFR 192.32(a)(1).

(2) After December 15, 1989, no new conventional impoundment may be built unless it is designed, constructed and operated to meet one of the two following management practices:

(i) Phased disposal in lined impoundments that are no more than 40 acres in area and comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two conventional impoundments, including existing conventional impoundments, in operation at any one time.

(ii) Continuous disposal such that uranium byproduct material or tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and shall comply with the requirements of 40 CFR 192.32(a)(1).

(b) Each owner or operator of a non-conventional impoundment shall comply with the following requirements: Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins, the liquid level in the impoundment shall be maintained so that solid materials in the impoundment are not visible above the liquid surface, verified by daily inspections documented through notations and by digital photographic evidence collected at least weekly. Should inspection reveal that solid materials in the impoundment are visible above the liquid surface, the owner or operator must correct the situation within seven days, or other such time as specified by the Administrator.

(c) Each owner or operator of a heap leach pile shall comply with the following requirements: Heap leach piles that have completed their operating life but have not yet entered final closure shall be managed in compliance with the phased disposal management practice in paragraph (a)(2)(i) of this section. Heap leach piles shall be constructed in lined impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two heap leach piles, including existing heap leach piles, subject to this subpart at any one time.

■ 4. Section 61.255 is revised to read as follows:

§ 61.255 Recordkeeping requirements.

(a) The owner or operator of any uranium recovery facility must maintain records that confirm that the conventional impoundment(s), non-conventional impoundment(s) and heap leach pile(s) subject to this subpart at the facility meet the requirements in 40 CFR 192.32(a)(1). These records shall

include, but not be limited to, the results of liner compatibility tests.

(b) The owner or operator of any uranium recovery facility with non-conventional impoundments must maintain written records from daily inspections and other records confirming that any sediments have remained saturated in the non-conventional impoundments at the facility. Periodic digital photographic evidence, with embedded date stamp and other identifying metadata, shall be collected no less frequently than weekly to demonstrate compliance with the requirements of § 61.252(b). Should inspection reveal that a non-conventional impoundment is not in compliance with the requirements of § 61.252(b), the owner or operator shall collect photographic evidence before and after the non-compliance is corrected.

(c) The records required in paragraphs (a) and (b) in this section must be kept at the uranium recovery facility for the operational life of the facility and must be made available for inspection by the Administrator, or his authorized representative.

(1) Digital photographs taken to demonstrate compliance with the requirements of § 61.252(c) shall be submitted electronically using the Subpart W Impoundment Photographic Reporting (SWIPR) system that is accessed through EPA's Central Data Exchange (CDX) (*cdx.epa.gov*) at least monthly.

(i) Owners and operators must also submit information identifying the facility and facility location, the name or other designation of each impoundment, and the date and time of each photograph.

(ii) If the reporting form specific to this subpart is not available in SWIPR, the owner or operator must retain the digital photographs at the facility and provide them to the EPA or authorized State upon request, with the supporting information required in paragraph (c)(1)(i) of this section.

(2) [Reserved]

[FR Doc. 2016–31425 Filed 1–13–17; 8:45 am]

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Appendix 4
Subpart D Preamble

6-8-93
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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 192

[FRL–4212–8]

RIN 2020–AB23

Health and Environmental Standards for Uranium and Thorium Mill Tailings

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: EPA is proposing minor amendments to its general environmental regulations pertaining to uranium mill tailings disposal sites pursuant to the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. An advanced notice of proposed rulemaking describing the preliminary basis for this action was published on December 31, 1991. The proposed amendments clarify the current rule by ensuring timely emplacement of a permanent radon barrier and by requiring appropriate monitoring for nonoperational uranium mill tailings disposal sites that are licensed by the Nuclear Regulatory Commission (NRC) or one of its Agreement States (affected Agreement States). These affected Agreement States are Colorado, Washington, and Texas, which are the states that license sites to manage uranium byproduct materials pursuant to the Atomic Energy Act (AEA). This action is related to another action by EPA to rescind its National Emissions Standard for Hazardous Air Pollutants (NESHAPs) for radon emissions from the disposal of uranium mill tailings at nonoperational sites which was promulgated on December 15, 1989, as it applies to sites licensed by the NRC or an affected Agreement State.

DATES: Comments concerning this proposed rule must be received by EPA on or before July 21, 1993. A public hearing will be held on June 21, 1993.

ADDRESSES: Comments should be submitted (in duplicate if possible) to: Central Docket Section LE–131, Environmental Protection Agency, Attn: Air Docket No. A–91–67, Washington, DC 20460. Requests to participate in the public hearing to be held at the Sheraton Crystal City Hotel, Arlington, VA from 10 a.m. to 4 p.m. on June 21, 1993, should be made in writing to the Director, Criteria and Standards Division, 6602J, Office of Radiation and Indoor Air, Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. Comments and requests to participate in the hearing may also be faxed to EPA at (202) 233–9629.

FOR FURTHER INFORMATION CONTACT: Gale Bonanno, Air Standards and Economics Branch, Criteria and Standards Division, 6602J, Office of Radiation Programs, Environmental Protection Agency, Washington, DC 20460, (202) 233–9219.

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Background

A. Description of Uranium Mill Tailings

Uranium mill tailings are sand-like wastes that result from the processing of uranium ore. Tailings are stored in large surface impoundments, called piles, in amounts from less than one million tons to over thirty million tons, over areas that may cover hundreds of acres. Most piles are located in the Western United States and all piles emit radon gas, a decay product of the waste material processed at the uranium mills.

To deal specifically with the risks associated with these piles, Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978 (42 U.S.C. 2022, 7901–7942). In enacting UMTRCA, Congress found that uranium mill tailings may pose a potential and significant radiation health hazard to the public, and that every reasonable effort should be made to provide for the stabilization, disposal, and control in a safe and environmentally sound manner of such tailings in order to prevent or minimize radon diffusion into the environment and to prevent or minimize other environmental hazards from such tailings. See 42 U.S.C. 7901(a). Under UMTRCA, two programs were established to protect public health and the environment from the hazards associated with uranium mill tailings. One program (Title I) required the Department of Energy (DOE) to conduct the necessary remedial actions at designated inactive uranium mill tailing sites to achieve compliance with the general environmental standards to be promulgated by EPA. These sites were generally abandoned uranium processing sites for which a license issued by the NRC or its predecessor, the Atomic Energy Commission (AEC), was not in effect on January 1, 1978.

The other program (Title II) pertained to active sites, which are those that are licensed by the NRC or an affected Agreement State. Requirements for licensed sites include the final disposal of tailings, including the control of radon after milling operations cease. UMTRCA also required that EPA promulgate standards for these licensed sites, including standards that protect human health and the environment in a manner consistent with standards established under subtitle C of the Solid Waste Disposal Act, as amended. The NRC, or the licensing Agreement State, is responsible for implementing the EPA standards at licensed uranium milling sites.

As part of NRC's 1982 authorization and appropriations, Congress amended UMTRCA on January 4, 1983. Public Law 97–415, sections 18(a) and 22(b), *reprinted in* 2 1982 U.S. Code Cong. & Admin. News at 96 Stat. 2077 and 2080. As partially amended thereby, EPA's rulemaking authority for these sites is such that the Administrator must, by rule, propose, and within 11 months thereafter promulgate in final form, standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, e.g., uranium mill tailings. Requirements established by the NRC with respect to byproduct material must conform to the EPA standards. Any requirements of such standards adopted by the NRC shall be amended as the NRC deems necessary to conform to EPA's standards. In

establishing such standards, the Administrator must consider the risk to the public health, safety, and the environment, the environmental and economic costs of applying such standards, and such other factors as the Administrator determines to be appropriate. See 42 U.S.C. 2022(b)(1).

B. EPA and NRC's UMTRCA Rulemakings

EPA is authorized to promulgate general environmental standards to govern the remediation process. 42 U.S.C. 2022(a) and 7918 (as to DOE sites); 42 U.S.C. 2014 and 2022(b) (as to NRC-licensed sites). On January 5, 1983, EPA promulgated final rules for the disposal and cleanup of the inactive uranium mill tailings sites under UMTRCA title I (48 FR 605). Title I requires the Department of Energy (DOE) to conduct remedial action at inactive uranium mill tailings sites to ensure compliance with EPA's regulations for properly managing uranium byproduct materials. The program for inactive sites requires the disposal of tailings and the clean-up of on-site locations contaminated with tailings. DOE is responsible for implementing the standards established by EPA, with the concurrence of the NRC, and in cooperation with the host states. The requirements developed to implement the title I program are not the subject of today's proposed rulemaking.

On April 29, 1983, EPA proposed general environmental standards for title II uranium and thorium mill tailings sites (48 FR 19584). These rules were promulgated on September 30, 1983 (48 FR 45926), and are codified at 40 CFR part 192, subparts D and E. Title II applies to currently operating uranium mill tailings facilities licensed by the NRC or an Agreement State. The Title II program established requirements for the final disposal of tailings, the control of effluents into ground water, and radon emissions [1] during and after milling operations. The requirements are divided into two parts. The first part applies to the management of tailings during the active life of the pile and during the subsequent closure period, which begins after cessation of milling operations but prior to completion of final disposal, including the period of time when the tailings are drying out. The second part of the requirements specifies the standards that must be met once the piles are closed. These standards govern the design of disposal systems, and therefore guide the activities carried out during the closure period to ensure the adequacy of the final cover. For NRC licensed mill tailings sites that are being closed, Subpart D calls for reclamation plans designed to control radon emissions to a flux not to exceed an average release rate of 20 pCi/m^2-s for 1000 years to the extent reasonably achievable, but in any event for at least 200 years. 40 CFR 192.32(b)(1) (i) and (ii).

Both the UMTRCA title I and title II standards were challenged by several parties in the Tenth Circuit Court of Appeals. On September 3, 1985, the court upheld all aspects of EPA's standards, excepting the ground water provisions of the title I regulations at 40 CFR 192.20(a)(2)-(3). *American Mining Congress* v. *Thomas*, 772 F.2d 617 (10th Cir. 1985), *cert. denied* 426 U.S. 1158 (1986). On September 24, 1987, EPA proposed new regulations to replace those set aside (40 CFR part 192, subpart C, 52 FR 36000). The final rulemaking action is pending and is not affected by today's action.

On October 16, 1985, NRC promulgated rules at 10 CFR part 40 to conform the previous NRC regulations issued five years earlier to the provisions of EPA's general UMTRCA standards at 40 CFR part 192, as it affected matters other than ground water protection (50 FR 41852). On November 13, 1987, NRC promulgated final rules for ground water protection at uranium mill tailings sites that conformed to provisions of EPA's standards for ground water protection at 40 CFR part 192, subparts D and E (52 FR 43553).

Under the NRC regulations, uranium milling operations that mine, process or dispose of uranium and thorium, and their byproduct materials, must apply to the NRC for a license. In its application for an NRC license, the owner or operator of the mill must demonstrate the expected compliance with the technical, financial, ownership and long-term surveillance requirements of NRC's implementing regulations during the siting and construction of the mill, its operation, the decontamination and decommissioning of the mill after operations cease, and the reclamation of the milling facility and its surrounding environs. In accordance with 10 CFR 40.41(e), the NRC may incorporate in any license or later amend the license to include additional requirements and conditions with respect to the licensee's receipt, possession, use, and transfer of source or byproduct material as it deems appropriate or necessary to protect health or to minimize danger of life or property.

C. EPA's Clean Air Act Rulemaking

Both the UMTRCA standards promulgated by EPA in 1983 and the implementing NRC standards promulgated in 1985, failed to require or otherwise establish compliance schedules to ensure that the tailings piles would be expeditiously closed, and that the 20 pCi/m^2-s standard would be met, within a reasonable period of time. Moreover, the NRC criteria also failed to require monitoring to verify compliance with the flux standard (50 FR 41852). In response to the separate requirements of the Clean Air Act, and in light of the shortcomings to the current UMTRCA program for NRC-licensed uranium mill tailings sites, EPA promulgated standards under the Clean Air Act to ensure that the piles would be closed in a timely manner. These NESHAPs were published on December 15, 1989 (54 FR 51654) codified at 40 CFR part 61, subpart T (nonoperational) and subpart W (operational).

The NESHAP for nonoperational uranium mill tailings, codified at 40 CFR part 61, subpart T, applies to both title I and title II sites. The standard has three primary requirements. First, it imposes an emission limit of 20 pCi/m^2-s of radon-222 from a disposed pile, consistent with the UMTRCA standard. Second, it requires that, once a uranium mill tailings pile or impoundment ceases to be operational, it must be disposed of and brought into compliance with the emission limit within two years of the effective date of the standard (by December 15, 1991) or within two years of the day it ceases to be operational, whichever is later. If it was not physically possible for a mill owner or operator to complete disposal within that time, EPA contemplated a negotiated compliance agreement with the mill owner or operator pursuant to EPA's enforcement authority to assure that disposal will be completed as quickly as possible. Third, it requires monitoring of the disposed pile to demonstrate compliance with the radon emission limit.

As noted earlier, the numerical radon emission limit, is the same as the UMTRCA standard at 40 CFR part 192, subpart D (subpart D) (although under UMTRCA, the limit is to be met through proper design of the disposal impoundment, and is to be implemented by DOE and NRC for the individual sites, while under the CAA, the standard is a straight emissions limit). However, the two year disposal requirement and the radon monitoring

[1] The term "release" is used in 40 CFR part 192, subpart D. EPA intends "release" as used in today's proposed amendments to subpart D and this rulemaking to mean "emission" as that term is used in 40 CFR part 61, subpart T.

requirement are not separately required by the existing UMTRCA regulations.

II Challenge to Subpart T

A Petitions for Reconsideration

After promulgating subpart T, EPA received several petitions for reconsideration, the most notably filed by NRC and the American Mining Congress (AMC). Among other concerns set forth in these petitions is the argument that the overlap between EPA's subpart D of UMTRCA and subpart T of the CAA NESHAP has resulted in regulations that are unnecessarily burdensome and duplicative. It was also alleged that subpart T was unlawful because it was physically impossible to come into compliance with subpart T in the time required. While these petitions remain pending before EPA (at least in part), EPA has taken several actions to address the issues they raise.

B. Section 112(d)(9) of the Clean Air Act Amendments of 1990 (the "Simpson Amendment")

In November 1990, Congress amended the CAA and included a new section, section 112(d)(9), which authorized EPA to decline to regulate radionuclide emissions from NRC-licensees under the CAA provided that EPA found, by rule, after consultation with NRC, that the regulatory scheme implemented by NRC protects the public health with an ample margin of safety. Today's action is needed to assist EPA in making the "Simpson Amendment" finding for NRC-licensed uranium mill tailings disposal sites, as it seeks to fill the timing gaps and other concerns that underlie EPA's 1989 decision to promulgate subpart T.

C. Memorandum of Understanding between EPA and NRC

In July of 1991, EPA, NRC and the affected Agreement States entered into discussions over the dual regulatory programs established under UMTRCA and the CAA. In October 1991, those discussions resulted in a Memorandum of Understanding (MOU) between EPA, NRC and the Agreement States which outlines the steps each party will take to both eliminate regulatory redundancy and to ensure uranium mill tailings piles are closed as expeditiously as practicable. See 56 FR 55434 (MOU reproduced as part of proposal to stay subpart T); see also 56 FR 67537 (final rule to stay subpart T). The primary purpose of the MOU is to ensure that owners of uranium mill tailings disposal sites that have ceased operation, and owners of sites that will cease operation in the future, bring those piles into compliance with the 20 pCi/m^2-s flux standard as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee) with the goal that all current disposal sites be closed and in compliance with the radon emission standard by the end of 1997, or within seven years of the date on which existing operations and standby sites enter disposal status. This goal comports with Congress's concern over timing as reflected in CAA section 112(i)(3), as amended.

In accordance with the MOU, the NRC and affected Agreement States have agreed to amend the licenses of all sites whose milling operations have ceased and whose tailings piles remain partially or totally uncovered. The amended licenses would require each mill operator to establish a detailed (radon) tailings closure plan to include key closure milestones and a schedule for timely emplacement of a permanent radon barrier on all nonoperational tailings impoundments to ensure that radon emissions do not exceed a flux of 20 pCi/m^2-s. The licenses must be amended as soon as practicable, but in any event no later than September 1993.

D. Current Regulatory Proceedings

On December 31, 1991, EPA took several steps towards fulfilling its responsibilities under the MOU and in implementing the "Simpson Amendment" by publishing three Federal Register (FR) notices. In the first notice (56 FR 67537), EPA published a final rule to stay the effectiveness of 40 CFR part 61, subpart T, as it applies to owners and operators of nonoperational uranium mill tailings disposal sites. The stay will remain in effect until the Agency rescinds the uranium mill tailings NESHAP at 40 CFR part 61, subpart T, and amends the UMTRCA standards at 40 CFR part 192 to ensure that the remaining rules are as protective of public health with an ample margin of safety, as would implementation of the CAA rule being rescinded. If EPA fails to complete these rulemakings by June 30, 1994, the stay will expire and the requirements of subpart T will become effective.

In a second notice published on December 31, 1991, the Agency proposed to rescind the NESHAPs for radionuclides that appear at 40 CFR part 61, subpart T, as they apply to nonoperational uranium mill tailings disposal sites licensed by the NRC or an Agreement State (56 FR 67561).

In the third notice, EPA published an advanced notice of proposed rulemaking to amend 40 CFR part 192, subpart D (56 FR 67569) to provide for site closure to occur as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee), and appropriate monitoring requirements for nonoperational uranium mill tailings piles. These amendments would ensure timely compliance and add monitoring requirements currently lacking in the UMTRCA regulations.

EPA has tentatively concluded that with the modifications to the general UMTRCA regulations proposed today, as properly implemented by the NRC and the Agreement States to ensure specific, enforceable closure deadlines and monitoring requirements, the NRC's regulatory program for nonoperational uranium mill tailings piles would protect the public health with an ample margin of safety. However, prior to finalizing its rule to rescind subpart T, and after EPA takes final action herein, NRC conforms its regulations to the UMTRCA rules if modified, and all nonoperational site licenses are modified in accordance therewith, EPA currently intends to propose a finding in the Federal Register and provide an additional 30 day comment period on whether the NRC regulatory program protects public health with an ample margin of safety. After this occurs, EPA will take final action on its proposal to rescind 40 CFR part 61, subpart T.

Consistent with their responsibilities under the MOU, as well as EPA's proposal to rescind the NESHAP at 40 CFR part 61, subpart T, NRC and the affected Agreement States have agreed to amend the licenses of all nonoperational uranium mill tailings sites to ensure inclusion of schedules for emplacing a permanent radon barrier on the tailings impoundments, as well as interim milestones. To this end, NRC and the Agreement States have already requested the licensees to voluntarily seek amended licenses and have processed those requests. Moreover, NRC and the affected Agreement States have agreed to enforce the provisions of the amended licenses to ensure compliance with the new schedules for emplacing a permanent radon barrier, including interim milestones, and to ensure (and verify) compliance with the 20 pCi/m^2-s flux standard.

III. Legal Basis for Proposal

A. Statutory Authority for Proposal

1. Emphasis Upon Expeditious Radon Control

The crux of today's proposal is additional regulatory means to ensure expeditious and permanent control of radon emissions from uranium mill

tailings piles after active milling operations have ceased. The importance of timeliness is inherent to UMTRCA. It is evidenced by Congress' action in amending UMTRCA to require prompt EPA rulemaking action, and by the actual terms of title II. It is also evidenced by the legislative history for title II, contained in UMTRCA's two-part House Report, which confirms UMTRCA's purpose to require expeditious public health protection. See H.Rep. 95–1480(I) (Aug. 11, 1978) ("HR 1") (Interior and Insular Affairs Committee) and H.Rep. 95–1480(II) (Sept. 30, 1978) ("HR 2") (Interstate and Foreign Commerce Committee), *reprinted in* 6 1978 U.S. Code Cong. & Admin. News at 7433–7478 (UMTRCA passed the House on October 14, 1978, and was signed into law on Nov. 8, 1978).

Both parts of the House Report mirror UMTRCA's statutory language by: (1) Making clear that UMTRCA is primarily directed to health risks associated with radon–222 releases into the environment from uranium mill tailings disposal; and (2) calling for "every reasonable effort * * * to provide for the disposal, stabilization and control in a safe and environmentally sound manner of such (uranium mill) tailings." HR 1 at 11, HR 2 at 25; HR 1 at 13. Expeditious control of disposed tailings was paramount. At title I sites, DOE (in consultation with EPA, NRC and the host State) was required to quickly remediate disposed tailings sites "in accord with necessity for reducing the most threatening hazards first." HR 1 at 15. The same expeditiousness was expected of title II disposal sites, which should "in all cases be controlled and regulated by States and the Commission, to the maximum extent allowed by the state of the art, to insure that the public and the environment will be protected from the hazards from the tailings for as long as they remain a hazard." *Id.* at 17–18. To further underscore the urgent purpose, the Report states:

> The committee is convinced that all tailings pose a potential and significant radiation health hazard to the public. Legislation is needed now to stabilize and control all such tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public * * *.
>
> The committee, however, is also convinced that it would be a grievous and costly mistake to authorize a remedial program for inactive mill sites without also enacting regulatory legislation to control the even more serious problem at active (i.e., Title II) mill sites.

HR 2 at 29 (emphasis added).

This intent is implemented by provisions in title II. For instance, NRC implements EPA's general standards for title II through licensing of active tailings sites, which licenses must be timely modified to conform to environmental standards. NRC licenses issued or renewed after enactment of UMTRCA must contain the terms and conditions which the NRC determines to be necessary to assure that, prior to termination of the license the licensee will comply with decontamination, decommissioning, and reclamation standards prescribed by the NRC consistent with EPA's general standards. Any license in effect on the enactment date of 42 U.S.C. 2113(a) must either contain the terms and conditions of renewal, or comply with paragraphs (1) and (2) of section 2113(a) upon the termination of the license, whichever first occurs. See 42 U.S.C. 2113(a). This provision, which went into effect upon enactment, meant that Congress expected action at each title II site within three, or at the most five years of enactment:

> For each licensee, such period (for implementing UMTRCA requirements) would be 3 years following enactment, or until the time at which the licensee's license would first be required to be renewed, whichever is the longer period * * *. In no case may such grace period be longer than 5 years following enactment of (UMTRCA).

HR 1 at 22; see also Id. at 23 (authorizing immediate expenditures by DOE and NRC on remediation).

Moreover, while timely implementation of title II could financially or otherwise burden licensees, rather than delay implementation, Congress recognized these burdens and instructed NRC to take such hardships into account. H. Rep. No. 95–1480(I) at 44. While NRC was provided some authority to reasonably implement EPA's regulations on a site-by-site basis, it was assumed that in general the regulations would be implemented expeditiously.

The statute placed deadlines upon EPA, NRC and the Agreement States to promulgate and conform their respective regulations. See 42 U.S.C. 2021 and 2022. As noted above, EPA delay in promulgating standards led to UMTRCA's amendment in 1983, which added language requiring that EPA promulgate final title II standards by October 1983 or lose the right to do so. 42 U.S.C. 2022(b) (as amended by Pub. L. 97–415); see H. Conf. Rep. No. 97–884 at 44–45, *reprinted in* 4 1982 U.S. Code Cong. & Admin. News at 3614–15 (expressing concern over EPA delay and emphasizing the importance of timeliness).

During the time period for NRC to conform its regulations to EPA's, NRC is not expected to "suspend the implementation or enforcement of its regulations." H. Conf. Rep. No. 97–884 at 45. Congress further made clear its view that UMTRCA implementation proceed immediately, going so far as to note that for title I sites "the '7-year clock' for the completion of cleanup * * * begins to run (for DOE) October 1, 1982." *Id.* As to title II sites, during the transition period for EPA to propose and promulgate regulations (and although its rules would be suspended during that period) "NRC is authorized to take such action as it may deem necessary, on a licensee-by-licensee basis, to protect public health, safety, and the environment." *Id.* at 47.

Thus, the legislative scheme is one of urgency. EPA is to promptly promulgate regulations that will promptly be implemented at each site through licensing by NRC. Radon emissions are identified as the primary threat to public health, and all tailings are to be controlled without exception.

In its February 1983 proposal for the existing UMTRCA rules, EPA took note of the January 1983 amendments to UMTRCA calling for EPA to promulgate rules or lose its authority to do so: "WE (sic) are therefore proceeding to establish these standards expeditiously." 48 FR 19585. EPA noted that of the 27 licensed uranium mills, only 16 were operating, 8 had recently closed, and others had been closed for some time. *Id.* EPA mirrored Congress in referencing radon emissions as the primary source of public health risk from these sites, and noted that radon emissions rates are currently at their peak. *Id.* EPA then listed the panoply of existing guidance materials, including the ALARA principle (that radiation exposure be limited to a level "as low as reasonably achievable"), and proposed that its UMTRCA standards "supplement" the existing guidance in a manner that

> (1) take(s) account of the tradeoffs between health, safety, and environmental and economic costs and benefits in a way the assures adequate protection of the public health, safety, and the environment; (2) can be implemented using *presently available techniques and measuring instruments*; and (3) are reasonable in terms of overall costs and benefits.

Id. at 19587 (emphasis added). In soliciting comment, EPA explicitly stated that it "*assumed (a) 15-year operating and 5-year* dry-out" period, and that the Agency was concerned about potentially significant risks to public health during those periods. *Id.* at 19600. Taken together—by basing its

regulations on "presently available" means, and by expressing concern over the transition periods—EPA was assuming that compliance would occur expeditiously, without delay. While EPA recognized that there would be some lag in time before final closure could occur (i.e., to allow the tailings to dry), EPA certainly was not contemplating a period of additional or indefinite delay between ceased operations and final closure.

These purposes and assumptions were further augmented by EPA in taking final action on the rules. In listing the major provisions, EPA stated that the rule "(4) (r)equires that disposal of uranium mill tailings piles be designed so that, after disposal, radon emissions will be limited to 20 (pCi/m^2-s)." 48 FR 45927. The tone is one of immediacy, suggesting that the requirements will apply as soon as possible, without any more delay than is necessary to implement the design standard. This is emphasized by EPA noting the danger of lung cancer from inhaling radon emissions, a danger that exists as much today as it will later in time. *Id.* at 45928:

> Tailings pose a *present* hazard to human health. Beyond this *immediate* but generally limited health threat, the tailings are vulnerable to human misuse and to dispersal by natural forces for an essentially indefinite period.

Thus, EPA acted to immediately limit the present hazards and immediately halt hazards in the future by requiring that final closure expeditiously occur following ceased operations.

2. UMTRCA's Scheme and Purposes are Consistent With Today's Proposal Which Clarifies and Better Implements EPA's Existing Regulations

Today's proposal is intended to fill gaps and otherwise clarify EPA's existing regulations in order to ensure the expeditious, effective, and permanent control of radon emissions. By making minor amendments to EPA's existing regulations to explicitly require emplacement of a radon barrier as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee), interim milestones toward emplacement, and monitoring to assure that the design of the radon barrier is effective, EPA is better fulfilling Congress' purposes in enacting UMTRCA for Title II sites. As set forth above, Congress quite clearly was seeking, through UMTRCA, to protect public health from the dangers associated with radon emissions, both today and into the future, and has taken measures to require that EPA and the implementing agencies (DOE and NRC) do so expeditiously. Nothing in today's proposal is intended to modify the essential purposes or the essential aspects of the existing regulatory scheme; rather, EPA intends to better fulfill Congress' mandates by clarifying the existing requirements.

In promulgating the 1983 regulations, EPA intended and expected expeditious progress toward radon control once an active site ceased milling operations. EPA "assumed * * * (a) 5-year dry-out" period after milling operations had ceased, and based its regulations on that assumption. EPA did not, however, explicitly mandate a set period for drying out, in part due to the variable circumstances at each site, and also because expeditiousness was implicit to regulatory and statutory schemes, viewed as a whole.

Today's proposal does not seek to change EPA's rationale or scheme set forth in its 1983 rule. Rather, through minor amendments, it seeks to clarify and supplement that scheme in a manner that will better support its initial intent. Without setting forth mandatory schedules, EPA generally requires that once a site becomes nonoperational (i.e., milling operations cease), a barrier to control radon will be emplaced as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee). Interim milestones toward emplacement will support and better assure this progress, and post-emplacement monitoring will serve as confirmation that the design of the cover is working as intended.

B. Interpretive Caselaw

Judicial review of EPA's and NRC's regulations has resulted in several written opinions by the United States Court of Appeals for the 10th Circuit. Those opinions interpret UMTRCA in much the same manner as does EPA—radon control is paramount, and Congress intends that EPA and NRC promulgate regulations to protect public health in a manner that has immediate and long lasting effect. More particularly, with exception only as to matters not at issue today, the courts upheld EPA's and NRC's regulations, including the agencies' consideration of costs and benefits.

It is worthwhile to review the four opinions interpreting UMTRCA:

(1) *American Mining Congress* v. *Thomas*, 772 F.2d 617 (10th Cir. 1985) ("*AMC I*") (addressing EPA's UMTRCA inactive site regulations);

(2) *AMC* v. *Thomas*, 772 F.2d 640 (10th Cir. 1985) ("*AMC II*") (addressing EPA's UMTRCA active site regulations);

(3) *Quivira Mining Co.* v. *NRC*, 902 F.2d 781 (10th Cir. 1989) (addressing NRC's implementing criteria); and

(4) *AMC* v. *NRC*, 902 F.2d 781 (10th Cir. 1990) ("*AMC III*") (addressing amendments to NRC's implementing criteria).

1. AMC I and AMC II

The inactive site regulations at issue in *AMC I* are codified at 40 CFR part 192, subparts A–C; the active site regulations at issue in *AMC II* are codified at 40 CFR part 192, subpart D, and are the subject of today's proposal. Stated generally, the court in *AMC I* upheld EPA's inactive site regulations under UMTRCA, except as regards a failure to adopt provisions to protect surface and groundwater. The court in *AMC II* likewise upheld EPA's active site regulations (including the groundwater protection provisions), and in so doing relied upon the extensive statutory interpretation set forth in *AMC I*.

The court in *AMC I* began its analysis with UTMRCA's statutory purposes and structure, quoting the Congressional findings at 42 U.S.C. 7901(a) (set forth above), 772 F.2d. at 621. The court also noted that the 1982 UMTRCA amendments meant that Congress strongly desired that the public health protection regulations quickly go into effect: "Anxious to institute standards for the mill tailings, Congress also provided that should the EPA miss the extended deadline, remedial action would commence using the proposed standards." *Id.* at 623 (citations omitted).

The court addressed the contention that a prerequisite to any regulations is that EPA find that uranium mill tailings present a significant risk to public health. *Id.* at 627. The court disagreed, finding that Congress had already spoken strongly on this issue:

> It would be disingenuous to hold, after reading Congress' own statement of its findings and purposes, that the EPA must make its own determination of whether radon emissions present a risk significant to warrant regulation under the UMTRCA.

Id. The court also reviewed the legislative history, and concluded that "Congress chose to consider protecting future generations by enacting the UMTRCA and requiring the *immediate stabilization and disposal of those tailings.*" *Id.* (emphasis added).

After dispensing with other less pertinent issues, the court then addressed EPA's consideration of costs and benefits. In drawing a middle course between cost-benefit "optimization" (advanced by industry), and feasibility analysis (advanced by

environmental groups), the court determined only that "EPA must consider the costs involved in the regulations and, with the guidance of Congress' intent, find that these costs bear a reasonable relationship to the benefits derived." *Id.* at 632.

In *AMC II*, the court applied its analysis to the subpart D active site regulations (that EPA is proposing today to clarify and otherwise amend). 772 F.2d at 643. The court upheld EPA's regulations in their entirety, commenting that even though EPA's cost estimates were "significant" (if accurate), "Congress placed the responsibility for evaluating them upon the EPA without imposing a specific cost-benefit requirement." *Id.* at 646.

2. Quivira Mining and AMC III

The *Quivira Mining* case involved industry challenges to NRC's 1985 UMTRCA criteria, which conform their 1980 criteria to EPA's UMTRCA regulations for active sites as promulgated in 1983 and upheld in *AMC I* and *AMC II*, discussed above (the underlying EPA regulations are the subject of today's proposal). Industry primarily argued that NRC had failed to properly consider costs and benefits in promulgating its 1985 criteria. 866 F.2d at 1249. The court disagreed and upheld NRC's 1985 criteria, finding that NRC's consideration of costs in its 1980 rulemaking, coupled with EPA's consideration of costs in its 1983 active site rulemaking, adequately fulfilled the relatively deferential "cost-benefit rationalization" required by UMTRCA. *Id.* at 1250, 1257–58.

Regarding NRC's reliance upon EPA's earlier consideration of costs, the court acknowledged ambiguity as to whether UMTRCA requires that NRC consider costs "anew." *Id.* at 1257. The court resolved the ambiguity in favor of NRC, deferring to the agency's reasonable construction: "It is a permissible construction of the 'due consideration' command for the NRC to accept the EPA cost-benefit analysis for the revised criteria." *Id.* at 1258.

The court in *AMC III* addressed renewed industry challenges, this time to 1987 amendments to NRC's UMTRCA criteria. 902 F.2d at 782. Among other things, industry again pressed its argument that NRC had failed to adequately consider costs and benefits under UMTRCA. *Id.* at 783. And again the court held that because EPA had properly considered costs and benefits in 1983, "NRC performed its due consideration obligation here when it conformed to the EPA's regulations it was required to adopt." *Id.* at 784.

3. Caselaw Supports The Proposed Action

The judicial interpretations set forth above are relevant to today's proposal in two ways: (1) The *AMC I* and *AMC II* decisions affirm Congress' strong interest in the expeditious control of radon at active (i.e., NRC-licensed) uranium mill tailing disposal sites; and (2) the *Quivira Mining* and *AMC III* decisions set forth the scope of cost-benefit considerations, including the propriety of relying upon earlier efforts to the extent the regulations are not charting a new course.

This proposal is directed at clarifying and better effecting EPA's intent in promulgating the 1983 rules that there not be any undue delay in controlling radon emissions once a disposal site ceases milling operations. The proposed regulatory language, including interim milestones of progress towards control and monitoring provisions, fulfill Congress' intent regarding expeditious public health protection, and are intended to better implement EPA's 1983 rules.

EPA has duly considered costs in its draft Background Information Document (BID) which addresses EPA's consideration of costs and benefits. Few if any additional costs will be incurred by site owners or operators as a result of this proposal, since timely radon control has always been required. Moreover, the cost analysis which EPA conducted for its 1983 rulemaking remains relevant, since today's proposal encompasses amendments to the UMTRCA regulations to clarify and enhance implementation of the fundamental regulatory scheme contained in EPA's 1983 UMTRCA rules.

C. Settlement Agreement

Two additional items further explain the legal basis and rationale for today's proposal:

(1) Clean Air Act section 112 (including EPA rulemaking thereunder); and

(2) A litigation settlement agreement thereunder, recently entered into by EPA and the effected industry and environmental groups.

In response to the risks associated with litigation, in light of the Simpson Amendment and in order to foster a consensus approach to regulation in this area, EPA commenced discussions with NRC, the American Mining Congress ("AMC"), Homestake Mining Co., the Environmental Defense Fund ("EDF") and the Natural Resources Defense Counsel ("NRDC"). Each has a direct interest in the matter, all but NRC had challenged EPA's promulgation and/or stay of subpart T and each had historically found little common ground in this area.

As a result (and as discussed above), in October 1991, a Memorandum of Understanding ("MOU") was signed by EPA and NRC setting forth the outline to a regulatory approach that would best resolve the differences between EPA and NRC. As contemplated by the MOU, on December 31, 1991, EPA took final action to stay and propose rescission of subpart T under the Simpson Amendment, and to issue an advance notice of proposed rulemaking under UMTRCA. See 55 FR 67537, 67561 and 67569. In order to preserve its rights, EDF filed a lawsuit challenging the legality of the stay. *EDF* v. *Reilly*, No. 92–1082 (D.C. Cir.). Litigation had previously been filed by EDF, NRDC, AMC, Homestake and others, challenging subpart T. *AMC, et al.* v. *EPA*, Nos. 90–1058, 90–1063, 90–1068, and 90–1074 (D.C. Cir.). NRC, AMC and Homestake had also filed an administrative petition for reconsideration of subpart T.

Discussions continued with the litigants and NRC, and in February 1993, final agreement was reached to settle the pending litigation and the administrative proceeding, avoid potential future litigation, and otherwise agree to a consensus approach to regulations of NRC-licensed nonoperational uranium mill tailings disposal sites. See 58 FR 17230 (April 1, 1993) (notice announcing settlement agreement under CAA section 113(g)). A copy of the settlement agreement is also in the docket to this action.

The settlement agreement adds comprehensive detail to, and thereby continues, the approach set forth in the MOU. If implemented, the agreement will result in the expeditious control of radon-222 emissions at nonoperational uranium mill tailings disposal sites without the delays and resource expenditures engendered by litigation and contentious administrative process. It will enable EPA to fulfill the Simpson Amendment requirement that EPA find, by rule, that the NRC regulatory program protects public health with an ample margin of safety. It does this, in part, by conforming EPA's UMTRCA regulations to the CAA such that public health will be as well protected under UMTRCA as would implementation of Subpart T under the CAA.

Under the agreement, the pending litigation will not be dismissed until after certain terms in the agreement are fulfilled. Moreover, the agreement does not legally bind or otherwise restrict EPA's rights or obligations under law;

rather, by its terms (paragraph 12), there is no recourse for a court order to implement the agreement. Indeed, the only remedy for failure to meet the terms of the final agreement is activation of the underlying litigation.

This proposal is consistent with the settlement agreement. By clarifying and filling gaps in EPA's UMTRCA regulations, EPA may, after the other elements in the settlement agreement are also implemented, be able to make the finding necessary to rescind subpart T under the Simpson Amendment. If properly implemented, a unified regulatory scheme under UMTRCA has the advantage of avoiding confusing and unnecessarily duplicative regulation, while also protecting public health with an ample margin of safety.

IV. Proposed Rule to Amend 40 CFR Part 192, Subpart D

A. Limited Scope of this Action

The proposed amendments to the general UMTRCA regulations for nonoperational uranium mill tailings disposal sites at 40 CFR part 192, subpart D (subpart D) fill specific regulatory gaps that currently exist in subpart D. While subpart D, as currently written, requires eventual compliance with the 20 pCi/m²-s flux standard, it does not mandate that compliance occur by a specific date. Rather, as promulgated by EPA under subpart D and implemented by NRC pursuant to its regulations at 10 CFR part 40, appendix A, a title II site licensed by NRC or an Agreement State, could indefinitely continue to emit radon at the same numerical emission limit as allowed under the CAA. It was this possibility which compelled EPA to promulgate subpart T under CAA section 112. In addition, the current UMTRCA regulations call for an impoundment design that will likely achieve compliance with the 20 pCi/m²-s flux standard for 1000, or at least 200 years, but they do not include any requirement that monitoring occur to verify the efficacy of the design. This proposal would also fill this gap.

The amendments are not intended to substantively alter the current regulatory scheme; instead, they are merely intended to fill these regulatory gaps with respect to timely compliance and appropriate monitoring which presently exists. Once these gaps are filled by today's proposed amendments and are implemented by NRC, EPA may then have the basis for rescinding subpart T, thereby avoiding unnecessarily duplicative and burdensome regulation.

The Agency's finding, pursuant to section 112(d)(9) of the Clean Air Act Amendments of 1990, that NRC's regulatory program protects the public health with an ample margin of safety must include a finding that NRC and the affected Agreement States are implementing and enforcing, in significant part, the regulations governing disposal of tailings and the operating license requirements that establish milestones for emplacement of a permanent radon barrier that will achieve compliance with the 20 pCi/m²-s flux standard on a programmatic and a site-specific basis. In other words, the Agency must find that NRC or an affected Agreement State has not failed to implement and enforce the requirements in a manner that may reasonably be expected to materially (i.e., more than de minimis) interfere with compliance with the 20 pCi/m²-s standard as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee).

B. Closure Requirements

EPA proposes to amend 40 CFR Part 192, subpart D to require:

(1) Emplacement of a permanent radon barrier constructed to achieve compliance with, including attainment of, the 20 pCi/m²-s flux standard by all sites that, absent rescission, would be subject to subpart T;

(2) Interim milestones to assure appropriate progress in emplacing the final radon barrier; and

(3) That site closure occur as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee) after the impoundments cease operation, with a goal that this occur by December 31, 1997, for those nonoperational uranium mill tailings piles listed in the MOU between EPA and NRC (at 56 FR 67568), or seven years after the date on which the impoundments cease operation for all other piles.

EPA recognizes that the UMTRCA regulatory scheme encompasses a design standard. EPA is today proposing minor amendments to this scheme to better facilitate implementation of the regulation without fundamentally altering the current method of compliance. Sites are required to construct a permanent radon barrier pursuant to a design to achieve compliance with the 20 pCi/m²-s flux standard. The proposed new requirement for demonstrating the flux standard with monitoring is only meant to assure the efficacy of the design of the permanent radon barrier following construction and is not intended to relieve licensees of other existing requirements.

Site control shall be carried out in accordance with a written (radon) tailings closure plan, and in a manner which ensures that closure activities are initiated as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees). The (radon) tailings closure plan, either as originally written or subsequently amended, will be incorporated into the individual site licenses, including provisions for and amendments to the milestones for control, after NRC or an affected Agreement State finds that the schedule reflects compliance as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee). Under the Settlement Agreement, to which NRC has agreed in principle to uphold, such finding will constitute final agency action. The compliance schedules are to be developed consistent with the targets set forth in the MOU as reasonably applied to the specific circumstances of each site with a goal that final closure occur by December 31, 1997, for those nonoperational uranium mill tailings piles listed in the MOU between EPA and NRC (at 56 FR 67568), or seven years after the date on which the impoundments cease operation for all other piles. These schedules must include key closure milestones and other milestones which are reasonably calculated to promote timely compliance with the 20 pCi/m²-s standard. The phrase "milestones" refers to enforceable dates by which action, or the occurrence of an event, is required for purposes of achieving compliance with the 20 pCi/m²-s flux standard.

Milestones which are not reasonably calculated to advance timely compliance with the radon air emissions standard, e.g. installation of erosion protection and groundwater corrective actions, are not relevant to the (radon) tailings closure plans. In addition, today's proposed regulations, if finalized, will require that licensees ensure that radon closure milestone activities, such as wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and radon barrier construction, are constructed and undertaken to achieve compliance with, including attainment of, the 20 pCi/m²-s flux standard as expeditiously as practicable considering technological feasibility.

The goal of this regulation is for existing sites, or those that become nonoperational in the future, to achieve compliance as expeditiously as practicable considering technological feasibility (including factors beyond the control of licensees) with the time periods set forth in the MOU, including Attachment A thereto, and for new sites to achieve compliance no later than seven years after becoming nonoperational. However, if the NRC or an Agreement State makes a finding that compliance with the 20 pCi/m²-s flux standard has been demonstrated through appropriate monitoring, and after providing an opportunity for public participation, the performance of the milestone(s) may be extended. Only under this circumstance and during the period of the extension must compliance with the 20 pCi/m²-s flux standard be demonstrated each year. Additionally, licensees may request, based upon cost, that the final compliance date for emplacement of the permanent radon barrier, or relevant milestone set forth in the applicable license or incorporated in the (radon) tailings closure plan, be extended. The NRC or an affected Agreement State may approve such a request if it finds, after providing the opportunity for public participation, that:

(1) The licensee is making good faith efforts to emplace a permanent radon barrier constructed to achieve the 20 pCi/m²-s flux standard;

(2) Such delay is consistent with the definition of "available technology;"; and

(3) Such delay will not result in radon emissions that are determined to result in significant incremental risk to the public health.

Such a finding should be accompanied by new deadlines which reasonably correspond to the target dates identified in attachment A of the MOU. (58 FR 67569)

EPA expects the NRC and Agreement States to act consistently with their commitment in the MOU and provide for public participation on proposals or requests to: (1) Incorporate radon tailings closure plans or other schedules for effecting emplacement of a permanent radon barrier into licenses, and (2) amend the radon tailings closure schedules as necessary or appropriate for reasons of technological feasibility (including factors beyond the control of the licensees). Under the terms of the MOU, NRC should do so with notice timely published in the Federal Register. In addition, consistent with the MOU, application may be made to NRC for public participation on these matters pursuant to 10 CFR 2.206. EPA also expects the Agreement States to provide comparable opportunities for public participation pursuant to their existing authorities. While EPA desires to keep the public informed and provide for public participation, such provisions are not intended to transform the licensing (and amendment) process into notice and comment rulemaking in accordance with Administrative Procedure Act (APA) requirements.

Under the existing regulatory scheme, NRC and the affected Agreement States may have the authority to allow, at a licensee's request, a portion of a site to remain accessible, either during the closure process or after placement of a permanent radon barrier, to accept byproduct material as defined in section 11(e)(2) of the AEA, (e.g., wastes from in-situ mining operations, or from groundwater corrective action programs), or to accept materials from other sources that are similar to the physical, chemical and radiological characteristics of the in-situ uranium mill tailings and associated wastes. Nothing in today's proposal alters, ratifies, or otherwise affects this authority. However, EPA notes that, consistent with the MOU and the Settlement Agreement, such authorization shall not to be used as a method to impede emplacement of the permanent radon barrier over the remainder of the site in a manner to achieve compliance with the 20 pCi/m²-s flux standard, averaged over the entire impoundment as demonstrated by the licensee's monitoring described below.

EPA does not intend to substantively alter the 1983 scheme with today's proposal, but instead seeks to clarify and supplement that scheme to fill a regulatory gap which currently exists. By acknowledging NRC's apparent authority to allow a portion of a site to remain accessible for disposal, EPA is acknowledging a current NRC practice. EPA believes that placement of "materials similar to the physical, chemical and radiological characteristics of uranium mill tailings and associated wastes from other sources" on a portion of an impoundment is consistent with on-going disposal activities currently authorized by NRC. See 57 FR 20525. For instance, mining uranium by using uranium solution extraction processes produces "discrete (radioactive) surface wastes" which, although they do not have the same physical form as uranium mill tailings, have historically been disposed of in uranium mill tailings impoundments. See Definition of "Byproduct Material" at 10 CFR 40.4 (a) through (i). In addition to wastes from in-situ uranium mining operations and groundwater corrective actions, wastes which arise from processing non-source material for its source material content may produce wastes which are physically and chemically similar to tailings, and may be disposed of in a tailings impoundment. For instance, the tailings produced from processing ore for its copper content may produce tailings containing greater than 0.05 percent uranium, a source material, and thus, would be subject to licensure by the NRC. See 57 FR at 20527. EPA understands that NRC's disposal of associated wastes and other byproduct materials in uranium mill tailings impoundments will not be used as a means of circumventing such other applicable regulations as 40 CFR part 61, subpart W. See 57 FR 20533. Moreover, while NRC may grant such authorization, licensees may not use this authorization to avoid emplacing a permanent radon barrier and complying with the 20 pCi/m²-s flux standard. In addition, under the Settlement Agreement NRC or an Agreement State may authorize a portion of a site to remain accessible for disposal of byproduct material after placement of a permanent radon barrier provided NRC or the Agreement State makes a finding, constituting final agency action and providing for public participation, that the site will continue to achieve the 20 pCi/m²-s flux standard when averaged over the entire impoundment. Even if a portion of a site is authorized to remain accessible for disposal of byproduct materials during the closure process or after placement of a permanent barrier consistent with the Settlement Agreement, as described above, this will not cause a nonoperational uranium mill tailings disposal site to revert to an operational site as defined by § 192.31(c).

As intended by EPA, the phrase "as expeditiously as practicable considering technological feasibility," means as quickly as possible considering: (1) The physical characteristics of the tailings and sites; (2) the limits of available technology; (3) the need for consistency with mandatory requirements of other regulatory programs; and (4) factors beyond the control of the licensee, as explained below. While this phrase does not preclude economic considerations to the extent provided by the phrase "available technology," it also does not contemplate utilization of a cost-benefit analysis in setting compliance schedules. The radon control compliance schedules are to be developed consistent with the targets set forth in the MOU as reasonably applied

to the specific circumstances of each site.

The term "available technology" includes technologies and methods for emplacing a permanent radon barrier on nonoperational uranium mill tailings disposal sites, but does not include extraordinary measures or techniques that would impose grossly excessive costs as measured by practice within the industry (or one that is reasonably analogous), and provided there is reasonable progress towards emplacement of the permanent radon barrier (such as, by way of illustration only, unreasonable overtime, staffing or transportation requirements, etc. considering normal practice in the industry; laser fusion of soils, etc.). To determine whether costs are grossly excessive, the closure cost estimate contained within the licensee's (radon) tailings closure plan may be used as a baseline. However, costs which are determined to be greater than the estimated costs contained in the plan will not automatically be considered grossly excessive.

The phrase "factors beyond the control of the licensee" includes factors causing delay in the schedule in the applicable license for timely emplacement of the permanent radon barrier to achieve compliance with the 20 pCi/m²-s flux standard (and 10 CFR part 40, appendix A, Criterion 6) despite the best and good faith efforts of the licensee to achieve compliance. These factors may include, but are not limited to, physical conditions at the site; inclement weather or climatic conditions; an act of God; an act of war; a judicial or administrative order or decision, or change to the statutory, regulatory, or other legal requirements applicable to the licensee's facility that would preclude or delay the performance of activities required for compliance; labor disturbances; any modifications, cessation or delay ordered by state, federal or local agencies; delays beyond the time reasonably required in obtaining necessary governmental permits, licenses, approvals or consent for activities described in the (radon) tailings closure plan proposed by the licensee that result from agency failure to take final action after the licensee has made a good faith, timely effort to submit legally sufficient applications, responses to requests (including relevant data requested by the agencies), or other information, including approval of the tailings closure plan by NRC or the affected Agreement State; and an act or omission of any third party over whom the licensee has no control.

EPA considers the examples enumerated in the preceding definitions important in evaluating the scope of the definitions proposed.

C. Appropriate Monitoring

After emplacement of a permanent radon barrier designed and constructed to achieve compliance with, including attainment of, the 20 pCi/m²·s flux standard, the licensee shall conduct appropriate monitoring and analysis of the radon flux through the barrier. This monitoring will verify that the design of the permanent radon barrier is effective in ensuring that emissions of radon-222 will not exceed compliance with the 20 pCi/m²-s, as contemplated by 40 CFR 192.32(b)(1)(ii). Appropriate monitoring shall be conducted pursuant to the procedures described in 40 CFR part 61, appendix B, Method 115, or any other measurement method proposed by a licensee and approved by NRC or the affected Agreement State as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m²-s flux standard.

EPA intends that the permanent radon barrier be designed to ensure sustained compliance with the 20 pCi/m²-s flux standard by all sites, but does not propose continuous emissions monitoring. Rather, a single monitoring event should suffice to verify the design of the permanent radon barrier to ensure continued compliance.

If the NRC or an Agreement State extends the time for performance of milestones after making a finding that compliance with the 20 pCi/m²-s flux standard has been demonstrated by appropriate monitoring, compliance with the 20 pCi/m²-s flux standard must be demonstrated each year during the period of the extension.

When a site's (radon) tailings closure plan provides for phased installation of the radon barrier, the licensee will be allowed to conduct radon flux monitoring for each portion of the tailings area on which the radon barrier has been placed by conducting flux monitoring on the closed portion as described above.

V. Discussion of Comments and Response to Comments from ANPR

A public hearing on the advanced notice of proposed rulemaking (ANPR) (58 FR 67569) was held in Washington, DC, on January 15, 1992, and in Santa Fe, New Mexico on January 21 and 22, 1992. Representatives from NRC, AMC, the Southwest Research and Information Center and private companies testified at the hearings. Written comments were also received from EDF, AMC, the Department of Energy and several private companies. To the extent they are specifically restricted to EPA's proposed modification to its UMTRCA regulations, the comments have been preliminarily evaluated by the Agency, and a summary and general response are set forth below. Those comments which are not directed to the ANPR to amend subpart D, but instead relate to the proposal to rescind 40 CFR part 61, subpart T (56 FR 67561) are not addressed here. Still other comments, that are also not addressed here, are directed to EPA's earlier promulgation of subpart T, a rulemaking decision that is not being revisited by the proposed amendment to subpart D. Those comments were made and responses provided by EPA, at the time the Agency promulgated subpart T, and have also been repeated in subsequent petitions to reconsider that action, which are pending before the Agency, but which might be addressed or otherwise resolved should 40 CFR part 61, subpart T be rescinded.

General

In response to the ANPR, EPA received comments generally supporting the proposed amendments to the regulations promulgated under the Uranium Mill Tailings Radiation Control Act (UMTRCA). While most commenters believe that the current regulatory program under UMTRCA is sufficient to allow EPA to find that it protects the public health with an ample margin of safety, they would support limited amendments to the EPA UMTRCA regulations if the EPA determines such amendments are necessary to support rescission. Most commenters stress that the EPA should limit its rulemaking to amend 40 CFR part 192, subpart D, to amendments that rectify the lack of assurance of timely control of radon, e.g. compliance schedules and monitoring requirements.

EPA maintains that the MOU standing alone is not a regulatory scheme and does not provide justification for the rescission at this time. Although there is an MOU between EPA and NRC, the MOU lists a series of actions to be taken by EPA and NRC in the future. These actions, coupled with NRC's commitment to enforce the amended licenses, are intended to provide the basis for EPA to make the requisite findings for rescission of subpart T under CAA Section 112(d)(9), as amended. Although both subpart T and 40 CFR part 192 impose the same 20 pCi/m²-s flux standard, the timing issue was central in justifying the promulgation of subpart T.

As part of the existing regulatory program, NRC promulgated its own implementing regulations in the form of "criteria" to implement EPA's general UMTRCA standards for its licensees (as did its Agreement States). See generally 10 CFR part 40, Appendix A. While these criteria set forth a variety of specific requirements—financial, technical, and administrative—to govern the final reclamation (i.e., closure) design for each disposal site, they also provide for ("site-specific") flexibility by authorizing alternatives that are at least as stringent as EPA's general standards and NRC's criteria, ("to the extent practicable") as provided in Section 84c of the Atomic Energy Act of 1954, as amended. *Id.* at Introduction. NRC's implementation criteria set forth a rigorous program governing the reclamation of the disposal sites so that closure will:

(1) Last for 1,000 years to the extent reasonable, but in any event at least 200 years, and

(2) Limit radon release to 20 pCi/m^2-s throughout that period.

Upon review, EPA believes the NRC criteria comprise a comprehensive response to EPA's general standards at 40 CFR part 192, subpart D. However, nothing in either EPA's general standards or NRC's implementing criteria compel sites to proceed toward final closure by a date certain. Moreover, neither EPA's general UMTRCA regulations, nor NRC's implementing criteria require appropriate monitoring to demonstrate the efficacy of the closure design to ensure compliance with the 20 pCi/m^2-s standard. Thus, EPA believes that UMTRCA should be amended to include timing requirements and monitoring provisions. These changes might enable EPA to then find that the NRC program protects public health with an ample margin of safety pursuant to section 112(d)(9) of the CAA, as amended.

One commenter believes that it is not necessary to amend 40 CFR part 192, subpart D, since EPA made a finding in 1983 that the standards being promulgated under UMTRCA would provide the same degree of protection (i.e., an ample margin of safety) as required under section 112 of the Clean Air Act (CAA).

At the time of the 1983 promulgation of the UMTRCA standard, the Agency believed that such standard was comparable to the CAA standard established in the proposed NESHAP for radionuclides (48 FR 15076), since both standards were based on comparable considerations (48 FR 45939–40, October 7, 1983). However, the Agency subsequently withdrew its proposed NESHAP standards (49 FR 43906, October 31, 1984), and promulgated an Advanced Notice of Proposed Rulemaking for radon-222 emissions from licensed uranium mills. EPA promulgated a final rule under section 112 regulating radon-222 emissions from licensed uranium mill processing sites in September 1988 (51 FR 34056, September 24, 1986). In 1987, the Court of Appeals for the D.C. Circuit remanded a standard for vinyl chloride, a hazardous air pollutant which, like radionuclides, was regulated by section 112. In the vinyl chloride case, the court concluded that the Agency improperly considered costs and technological feasibility without first making a determination based exclusively on risk to health. The court required the Administrator to first determine a "safe" or "acceptable" level of risk considering only health factors, and then to determine a standard which would provide an "ample margin of safety," considering costs, feasibility and other relevant factors in addition to health. *NRDC* v. *EPA*, 824 F.2d 1146 (D.C. Cir. 1987). In the wake of the court decision, EPA requested a voluntary remand for its standard for licensed uranium mill tailings. EPA promulgated the NESHAP for the disposal of uranium mill tailings piles in December of 1989, even though there was already the UMTRCA standard with the same numerical limit of 20 pCi/m^2-s. In promulgating subpart T, EPA noted that "(S)ome piles have remained uncovered for decades emitting radon. Although recent action has been taken to move toward disposal of these piles, some of them may still remain uncovered for years" (54 FR 51683, December 15, 1989).

EPA promulgated subpart T to address the timing issue, which was not addressed in the UMTRCA regulations. Although EPA has already determined that the UMTRCA standard would protect the public health with an ample margin of safety, EPA believes that the existing regulatory scheme does not ensure that sites will achieve the standard as soon as practicable considering technological feasibility. Thus, the Agency believes that UMTRCA should be amended to include timing requirements and monitoring provisions in order to find that the NRC program protects the public health with an ample margin of safety pursuant to section 112(d)(9) of the CAA, as amended.

Compliance Schedules

Many commenters cautioned that the compliance schedules must be sufficiently flexible to accommodate site-specific circumstances so that other environmental goals, such as groundwater restoration, are not compromised.

EPA believes the proposed regulations to be reasonable and requisite to a finding that the NRC program protects the public health with an ample margin of safety. EPA is maintaining the specific standard of compliance with the 20 pCi/m^2-s standard, with a general goal of compliance by December 31, 1997, or within seven years after the date a pile ceases to be operational for all other piles. The details of implementing the compliance goal are left to the NRC, as is the monitoring requirement. The MOU and this rule are directed to timely compliance with the 20 pCi/m^2-s standard and not erosion and groundwater remediation.

Monitoring

All commenters, except one, opposed a continuous monitoring requirement, noting that prolonged monitoring could result in degradation to the radon barrier by allowing excessive drying and/or erosion. One commenter contends that the one-time monitoring requirement envisioned by the EPA is inconsistent with the monitoring requirements in title V of the CAA.

The proposed amendments require that monitoring occur after construction of the permanent radon barrier. Subpart T currently requires monitoring to occur only once to demonstrate compliance with the standard. EPA believes that conducting a single test and analysis of the radon emissions through the radon barrier is sufficient to verify that the design of the permanent radon barrier is effective in ensuring that emissions of radon-222 do not exceed the 20 pCi/m^2-s as required by § 192.32(b)(1)(ii).

Evaporation Ponds

Additionally, the Agency received many comments noting that evaporation ponds should be excluded from the expeditious cover requirement proposed today.

EPA does not intend that the expeditious radon cover requirement extend to areas where evaporation ponds are located, even if on the pile itself, to the extent that such evaporation pond is deemed by the implementing agency (NRC or an affected Agreement State) to be an appropriate aspect to the overall remedial program for the particular site. Rather, the evaporation pond area may be covered to control radon after it is no longer in use and ready for covering. EPA believes the overall public health interest in comprehensively resolving

the problems associated with each site is best served by requiring that the radon cover be expeditiously installed in a manner that does not require interruption of this aspect of remediation. Moreover, the ponds themselves serve as an effective radon barrier. Thus, this decision is bolstered by the absence of any evidence that there is a significant public health risk presented by the radon emissions from these evaporation ponds during the period they are employed as part of the overall remediation of the site. EPA believes that provided all other parts of the pile are covered with the radon barrier, compliance with the 20 pCi/m^2-s standard will result, and this will be maintained by covering the evaporation pond area when it is no longer in use.

Opposition to Proposed Amendments—NRC Waiver Authority

Two commenters contend that the MOU and this rulemaking will not ensure that the more protective EPA regulations apply, since the NRC has a waiver power under the AEA which may be exercised due to cost or technological feasibility. Although EPA believes that the NRC has authority under the AEA to waive for economic reasons strict compliance with the dual requirement that sites meet the 20 pCi/m^2-s standard as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee), the full exercise of this authority is not contemplated by the MOU. If this authority is used in a manner inconsistent with the purposes and objectives of the MOU, EPA will not rescind subpart T. If the waiver authority is used after subpart T is rescinded, the proposal to rescind subpart T includes procedural and substantive provisions designed to facilitate reconsideration of the rescission and possible reinstatement of that subpart.

The subpart T provisions were proposed in order to ensure that the NRC's waiver authority is not utilized to defeat the finding that the NRC regulatory program protects public health with an ample margin of safety. In this way, EPA may base its rescission finding upon its view of the NRC regulatory program contemplated by the MOU at the time of taking final action, while also providing some assurance that EPA will revisit that finding should NRC or the affected Agreement States substantially deviate from that program.

Opposition to Amendments—Seven Year Compliance Goal

Additionally, one commenter asserts that the seven year compliance goal fails to provide an ample margin of safety because there is no requirement that sources allot resources to meet a specific deadline. The EPA disagrees because the (radon) tailings closure plans which include schedules for final closure and which would require a source to invest resources, will be included in licenses amended by the NRC or affected Agreement States pursuant to the MOU. NRC and the Agreement States have already requested the licensees to voluntarily seek amended licenses and have processed those requests.

Opposition to Proposed Amendments—Lack of Citizen Suit Provisions

Two commenters also noted the lack of citizen suit provisions to enforce compliance if subpart T is rescinded and UMTRCA amended as proposed. One commenter believes that since UMTRCA does not provide authority for citizen suits, that it cannot provide the requisite ample margin of protection required under section 112 of the CAA, as amended. In addition, another commenter requested that the EPA include some legally enforceable means of compelling compliance with the UMTRCA requirements.

In enacting the "Simpson Amendment," Congress authorized EPA to decline to regulate radionuclide emissions from NRC-licensed facilities if EPA finds, by rule, after consultation with NRC, that the regulatory scheme implemented by NRC protects public health with an ample margin of safety. The Agency believes that Congress was aware that the legislative authority under the CAA provided for citizen suits while the AEA did not contain such provisions. Congress clearly envisioned that circumstances might be such that EPA would make the finding required by the Simpson Amendment. In making the ample margin of safety finding EPA must look at the specific circumstances and will consider whether NRC is implementing and enforcing, in significant part, the regulations governing disposal of tailings and the operating license requirements which establish milestones for emplacement of a permanent radon barrier that will achieve compliance with the standard on a programmatic and site-specific basis.

EPA is constrained by Congress in the scope of the UMTRCA amendments which the Agency may promulgate. EPA does not have the authority to provide for a legally enforceable means of compelling compliance with the UMTRCA requirements that are implemented by NRC. EPA has tentatively concluded that it is necessary to amend UMTRCA to include timing and monitoring provisions in order to enable the Agency to find that UMTRCA, as implemented by NRC, protects the public health with an ample margin of safety, thereby enabling EPA to rescind Subpart T. EPA's role in amending UMTRCA encompasses promulgating generally applicable standards without specifying any particular method of control. (H.R. Rep. No. 1480, 95th Cong., 2nd Sess., Pt. I, p. 17.) UMTRCA gives NRC and the Agreement States the responsibility to implement and enforce UMTRCA. If NRC or the Agreement States are not protecting the public health, the Settlement Agreement executed between EPA, EDF, NRDC and AMC, and EPA's proposed rescission of subpart T contain provisions which would allow EPA to reconsider its rescission of subpart T, and thus, possibly reinstate the CAA standards.

VI. Request for Comments

EPA is soliciting public comments on today's proposed rule to amend 40 CFR part 192, subpart D. Please submit comments to the Docket listed above on or before July 21, 1993. EPA is especially interested in receiving information related to current radon emissions and installed radon emission control methods currently in use, and what generally applicable timing requirements EPA should impose to achieve compliance as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensees).

VII. Miscellaneous

A. Paperwork Reduction Act

In light of NRC's conforming regulations and any recordkeeping regulations adopted thereunder, and the designation in UMTRCA of NRC and Agreement State authority to implement and enforce such regulations, any issues under the Paperwork Reduction Act are properly considered by NRC in its conforming regulations.

B. Executive Order 12291

Under Executive Order 12291, EPA is required to judge whether this regulation, if promulgated, would be a "major rule" and therefore subject to certain requirements of the Order. The EPA has determined that amending subpart D would not result in one of the adverse economic effects set forth in

section I of the Order as grounds for finding a regulation to be a "major rule." This regulation is not major because the nationwide compliance costs do not meet the $100 million threshold, the regulation does not significantly increase prices or production costs, and the regulation does not cause significant adverse effects on domestic competition, employment, investment, productivity, innovation or competition in foreign markets.

The Agency has not conducted a Regulatory Impact Analysis (RIA) of this purposed regulation because this action does not constitute a major rule. This regulation has been reviewed by the Office of Management and Budget and their written comments (if any) are available in the public docket.

C. Regulatory Flexibility Analysis

Section 603 of the Regulatory Flexibility Act, 5 U.S.C. 603, requires EPA to prepare and make available for comment an "initial regulatory flexibility analysis" which describes the effect of the proposed rule on small business entities. However, section 605(b) of the Act provides that an analysis not be required when the head of an Agency certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.

It was found in the 1989 rule for 40 CFR part 61, subpart T that there was no significant impact on small business entities. There has been no change in this finding, since no new tailings piles have been constructed since 1989. Pursuant to section 605(b) of the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Administrator certifies that this rule will not have a significant economic impact on a substantial number of small entities.

List of Subjects in 40 CFR Part 192

Air pollution control, Environmental protection, Groundwater protection, Hazardous constituents, Hazardous materials, Radiation protection, Radium, Radon, Thorium, Uranium.

Dated: May 26, 1993.

Carol M. Browner,

Administrator.

Part 192 of chapter I, subchapter F of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

PART 192—[AMENDED]

1. The authority citation for part 192 continues to read as follows:

Authority: Sec. 275 of the Atomic Energy Act of 1954, 42 U.S.C. 2022, as added by the Uranium Mill Tailings Radiation Control Act of 1978, Pub. L. 95-604, as amended.

Subpart D—[Amended]

2. Section 192.31 is amended by adding new paragraphs (k), (l), (m), (n), (o) and (p) to read as follows:

§ 192.31 Definitions and cross-references.

* * * * *

(k) ***As expeditiously as practicable considering technological feasibility*** means as quickly as possible considering: the physical characteristics of the tailings and the site; the limits of available technology; the need for consistency with mandatory requirements of other regulatory programs; and factors beyond the control of the licensee. The phrase permits consideration of the cost of compliance only to the extent specifically provided for by use of the term "available technology."

(l) *Available technology* means technologies and methods for emplacing a permanent radon barrier on uranium mill tailings piles or impoundments, which term shall not be construed to include extraordinary measures or techniques that would impose costs that are grossly excessive as measured by practice within the industry (or one that is reasonably analogous), and provided there is reasonable progress toward emplacement of a permanent radon barrier. To determine grossly excessive costs, the relevant baseline against which cost increases shall be compared is the cost estimate for tailings impoundment closure contained in the licensee's tailings closure plan, but costs beyond such estimates shall not automatically be considered grossly excessive.

(m) *(Radon) Tailings Closure Plan* means the Nuclear Regulatory Commission or Agreement State approved plan detailing activities to accomplish closure of the tailings impoundment through timely emplacement of a permanent radon barrier constructed to achieve compliance with, including attainment of, the 20 pCi/m^2-s flux standard. A tailings closure plan shall include a schedule for key radon closure milestone activities such as wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and radon barrier construction to achieve compliance with the 20 pCi/m^2-s flux standard as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee).

(n) ***Factors beyond the control of the licensee*** means factors proximately causing delay in the schedule in the applicable license for timely emplacement of the permanent radon barrier to achieve compliance with, including attainment of, the 20 pCi/m^2-s flux standard notwithstanding the good faith efforts of the licensee to achieve compliance.

(o) ***Operational*** means that a uranium mill tailings pile or impoundment is being used for the continued placement of uranium byproduct material or is in standby status for such placement. A tailings pile or impoundment is operational from the day that uranium byproduct material is first placed in the pile or impoundment until the day final closure begins.

(p) *Milestone* means an enforceable date by which action, or the occurrence of an event, is required for purposes of achieving compliance with the 20 pCi/m^2-s flux standard.

3. Section 192.32 is amended by redesignating paragraphs (a)(3) and (a)(4) as paragraphs (a)(5) and (a)(6), and by adding new paragraphs (a)(3) and (a)(4), to read as follows:

§ 192.32 Standards.

(a) * * *

(3)(i) Uranium mill tailings piles or impoundments that are nonoperational and subject to a license by the Nuclear Regulatory Commission or an Agreement State shall limit releases of radon-222 by emplacing a permanent radon barrier constructed to achieve compliance with, including attainment of, the limit on releases of radon-222 in § 192.32(b)(1)(ii). This permanent radon barrier shall be constructed as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee) after the pile or impoundment ceases to be operational. Such control shall be carried out in accordance with a written (radon) tailings closure plan to be incorporated by the Nuclear Regulatory Commission or Agreement State into individual site licenses.

(ii) The Nuclear Regulatory Commission or Agreement State may approve a licensee's request to extend the time for performance of milestones if, after providing an opportunity for public participation, the Nuclear Regulatory Commission or Agreement State finds that compliance with the 20 pCi/m^2-s flux standard has been demonstrated by the licensee in the manner required in § 192.32(a)(4)(i). Only under these circumstances and during the period of the extension must compliance with the 20 pCi/m^2-s flux standard be demonstrated each year.

The Nuclear Regulatory Commission or Agreement State may extend the final compliance date for emplacement of the permanent radon barrier, or relevant milestone, based upon cost if the new date is established after a finding by the Nuclear Regulatory Commission or Agreement State, after providing an opportunity for public participation, that the licensee is making good faith efforts to emplace a permanent radon barrier constructed to achieve, including attainment of, the 20 pCi/m²-s flux standard; the delay is consistent with the definition of "available technology" in § 192.31(l); and the delay will not result in radon releases that are determined to result in significant incremental risk to the public health.

(iii) The Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of the site to remain accessible to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act, 42 U.S.C. 2014(e)(2), or to accept such materials that are similar to the physical, chemical, or radiological characteristics of in-situ uranium mill tailings and associated wastes, from other sources, either during the closure process or after emplacement of a permanent radon barrier constructed to achieve compliance with, including attainment of, the limit on releases of radon-222 in § 192.32(b)(1)(ii), and the monitoring requirements of § 192.32(a)(4). No such authorization applicable during the closure process may be used as a means for delaying or otherwise impeding emplacement of the permanent radon barrier over the remainder of the site and in a manner that will achieve compliance with the 20 pCi/m²-s flux standard, averaged over the entire impoundment. Authorization to remain accessible or to accept materials after emplacement of a permanent radon barrier may only be made provided the Nuclear Regulatory Commission or Agreement State makes a finding, constituting final agency action and after providing an opportunity for public participation, that the site will continue to achieve the 20 pCi/m²-s flux standard when averaged over the entire impoundment.

(4)(i) Upon emplacement of the permanent radon barrier pursuant to § 192.32(a)(3), the licensee shall conduct appropriate monitoring and analysis of the radon-222 releases to demonstrate that the design of the permanent radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m²-s as required by § 192.32(b)(1)(ii). This monitoring shall be conducted using the procedures described in 40 CFR part 61, appendix B, Method 115, or any other measurement method proposed by a licensee that the Nuclear Regulatory Commission or Agreement State approves as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m²-s flux standard.

(ii) When phased emplacement of the permanent radon barrier is included in the applicable (radon) tailings closure plan, then radon flux monitoring required under § 192.32(a)(4)(i) shall be conducted, however the licensee shall be allowed to conduct such monitoring for each portion of the pile or impoundment on which the radon barrier has been emplaced by conducting flux monitoring on the closed portion.

* * * * *

4. Section 192.32(b)(1), footnote number 1 is revised to read as follows:

§ 192.32 Standards.

* * * * *

(b) * * *

(1) * * *

[1] The standard applies to design with a monitoring requirement.

[FR Doc. 93-13377 Filed 6-7-93; 8:45 am]
BILLING CODE 6560-50-P

Appendix 5
Memorandum of Understanding Between EPA, NRC and The State of Colo., Tex., and Wash. Concerning Clean Air Act Standards for Radon Releases from Uranium Mill Tailings, Subparts T and W, 40 C.F.R. Part 61, 56 Fed. Reg. 55434 (October 25, 1991).

Memorandum of Understanding Between EPA, NRC and The State of Colorado, Texas, and Washington Concerning Clean Air Act Standards for Radon Releases from Uranium Mill Tailings, Subparts T and W, 40 CFR Part 61

In accordance with Sections 112 (d)(9) and 122 (c)(2) of the Clean Air Act, as amended in 1990, and in order to minimize regulatory duplication and conserve resources in the control of radionuclide emissions to air from uranium mill tailings sites licensed by the Nuclear Regulatory Commission (NRC) or its Agreement States under the Atomic Energy Act of 1954, as amended, NRC, the Environmental Protection Agency (EPA), and the States of Colorado, Texas, and Washington (the affected Agreement States) agree as follows:

General Goal of Agreement

EPA, NRC and affected Agreement States are entering into this MOU to ensure that owners and operators of existing uranium mill tailings disposal sites licensed by the NRC, or the affected Agreement States, who have ceased operations and those owners and operators that will in the future cease operation, effect emplacement of a final earthen cover to limit radon emissions to a flux of no more than 20 $pCi/m^2/s$, as expeditiously as practicable considering technological feasibility. A guiding objective is that this occur to all current disposal sites (see Attachment A) by the end of 1997, and within seven years of when the existing operating and standby sites cease operation. The final closure requirement shall be enforceable by NRC or the affected Agreement States.

NRC and Affected Agreement State Lead Actions

1. NRC or the affected Agreement States will complete review and approval of detailed reclamation (i.e., final closure) plans, including schedules for emplacement of earthen covers on non-operational tailing impoundments such that radon emissions will not exceed a flux of 20 $pCi/m^2/s$, as soon as practicable but in any event not later than September of 1993. NRC or the affected Agreement States will immediately solicit voluntary requests by uranium mill tailings disposal site licensees to amend their licenses to set forth, or incorporate by reference, the schedule for reclamation. Once approved by NRC or the Agreement States, these reclamation schedules will be enforceable. If any licensee fails to voluntarily have a firm reclamation schedule (consistent with this MOU) incorporated into its license, NRC or the Agreement States will impose the appropriate license amendments by order (in accordance with applicable regulatory procedures).

NRC or the affected Agreement States will ensure that the schedules and conditions for effecting final closure are flexible enough to contemplate technological feasibility and that cover emplacement on the tailings impoundments occurs as expeditiously as practicable considering both short-term reductions in radon releases and long-term stability of the uranium tailings.

2. NRC agrees to provide for public notice and comment by publishing in the *Federal Register* receipt of requests, intent to issue amendments, or intent to issue orders which (1) incorporate reclamation plans or other schedules for effecting final closure into licenses, and (2) amend reclamation schedules as necessary for reasons of technological feasibility (including inclement weather, litigation which compels delays to emplacement, or other factors beyond control of the licensee) after the reclamation plans have been incorporated into the licenses. The affected Agreement States agree to provide comparable public notice and comment.

3. NRC will conduct enforcement actions in accordance with 10 CFR Part 2, Appendix C, to compel licensee adherence to reclamation schedules, except when the licensee both demonstrates that compliance was not technologically feasible and has made written application to NRC for a license amendment to reflect that concern. The affected Agreement States shall act pursuant to their authority to similarly enforce. NRC and the affected Agreement States will consider and act within a reasonable time period upon requests from EPA or other interested parties to institute a proceeding to modify, suspend, or revoke a license or other enforcement action as may be proper. NRC will consider such requests in accordance with the procedures in 10 CFR 2.206; the affected Agreement States will consider such requests in accordance with State law and existing State procedures.

EPA Lead Actions

4. In or about October 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking to stay existing 40 CFR Part 61, Subpart T pending implementation of this agreement, including the rulemaking initiatives described in paragraphs 5 and 6, below, and the license amendments described in paragraphs 1 and 2, above. Final action will be taken on or about December 15, 1991.

5. On or about December 15, 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking or an Advance Notice of Proposed Rulemaking, pursuant to its authority under Atomic Energy Act Section 275, to make specific amendments to 40 CFR Part 192 that would require emplacement of a final earthen cover on non-operational tailing impoundments such that radon emissions will not exceed a flux of 20 $pCi/m^2/s$, as expeditiously as practicable, but with a goal that such occur no later than December 31, 1997 or seven years after the date on which the impoundment ceased operations, whichever is later. This proposal will include generic performance obligations towards closure. NRC and the affected Agreement States will assist EPA in developing the technical basis to support this rulemaking. Final action will be taken as soon as practicable.

6. On or about December 15, 1991, EPA will develop and publish in the *Federal Register* a Notice of Proposed Rulemaking, pursuant to its authority under Clean Air Action Section 112(d)(9), to rescind its existing uranium mill tailings disposal regulations at 40 CFR Part 61, Subpart T. This proposal, which will occur only if the purposes and provisions of this MOU are proceeding expeditiously, requires that the Administrator find that the regulatory program implemented by NRC and the affected Agreement States will protect public health with an ample margin of safety. It is expected, subject to public notice and comment, that the basis for this finding will ultimately be provided through compliance by NRC, the affected Agreement States, and EPA with all aspects of this agreement, including finalized, enforceable reclamation plans and expeditious closure schedules for all affected facilities. Final action will be taken as soon as practicable after completion of the rulemaking described in paragraph 5 and the licensing described in paragraphs 1 and 2.

7. During or after performance of the actions described in paragraphs 1, 4, 5 and 6, EPA, NRC and the affected Agreement States will cooperate in addressing pursuant to CAA Section 112 (d)(3) duplication of regulation presented by 40 CFR Part 61, Subpart W, which relates to radionuclide emissions from uranium mill tailings piles that are operational or in standby status.

Effective Date, Revision, and Termination

This memorandum shall be effective immediately and shall continue in effect until revised by mutual agreement, unless terminated by any party after 120 days notice in writing.

NUCLEAR REGULATORY COMMISSION,

Robert M. Bernero, Director
Office of Nuclear Material Safety and Safeguards

October 17, 1991

ENVIRONMENTAL PROTECTION AGENCY,

William G. Rosenberg, Assistant Administrator
For Air and Radiation

October 18, 1991

STATE OF COLORADO,

Joel Kohn, Interim Executive Director
Department of Health

October 23, 1991

STATE OF TEXAS,

Robert A. MacLean, MD
Acting Commissioner of Health

October 23, 1991

STATE OF WASHINGTON,

Kristine Gebbie, Secretary
Department of Health

October 28, 1991

# # #

ATTACHMENT A

Non-Operational Tailings Impoundments

FACILITY		TARGET DATE[1]
ANC, Gas Hills, WY -1 impoundment operational for in-situ waste disposal -1 non-operational impoundment		1995
ARCO Coal, Bluewater, NM		1995
Atlas, Moab, UT		1996
Conoco, Conquista, TX		1996
Ford-Dawn Mining, Ford, WA -1 operational impoundment -3 non-operational impoundments		2010
Hecla Mining, Durita, CO		1997
Homestake, Milan, NM	(large impoundment) (small impoundment)	1996 2001
Pathfinder-Lucky Mc, Gas Hills, WY		1998
Petrotomics, Shirley Basin, WY		1995
Quivira, Ambrosia Lake, NM -2 operational impoundments -1 non-operational impoundment		1997
Rio Algom, Lisbon, UT		1996
Sohio-L-Bar, Cebolleta, NM		1992
UMETCO, Gas Hills, WY -1 operational impoundment -1 non-operational impoundment		1995

[1] For completing emplacement of final earthen cover to limit radon emissions to a flux of no more than 20 $pCi/m^2/s$.

FACILITY	TARGET DATE[1]
UMETCO, Maybell, CO	1997
UMETCO, Uravan, CO	2002[2]
UNC, Church Rock, NM	1997
Union Pacific, Bear Creek, WY	1996
WNI, Sherwood, WA	1996
WNI, Split Rock, WY	1995

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[1] For completing emplacement of final earthen cover to limit radon emissions to a flux of no more than 20 $pCi/m^2/s$.

[2] CERCLA Consent Decree requires final cover over tailings by 1997 but allows small portion (roughly 1% of the impoundment) to remain open to receive residues from groundwater restoration activities.