

DECOMMISSIONING

The following information is necessary for INIS to demonstrate compliance with 10 CFR 40.36(a), (c) (1), and (d).

D-1. In Section 10.1.3.8 of the application, INIS states that evaluation of the final radiation survey is based in part on an initial radiation survey performed prior to operations. The initial survey determines the natural background radiation of the area; therefore, it provides a baseline datum for measurements which determine any increase in levels of radioactivity. This initial radiation survey is not described in the application. Since uranium-238 and its decay products are likely to be present in the background, perform a baseline environmental survey of the site that is adequate to stand as a valid background survey for eventual decommissioning.

RESPONSE: IIFP will use NUREG-1575, NUREG-1505 and NUREG-1757 in developing both the initial survey for background determination and the final survey to be conducted after decommissioning in order to accomplish the free release of the site. Although the Radiological Environmental Monitoring Plan (REMP) which will include plans for the initial survey has not yet been developed, the initial sampling will be similar to the final survey sampling and approximate that final survey as indicated in Section 10.1.3.8. For the initial survey, the majority of the samples collected may be held for analysis at a later date prior to decommissioning, but some of these samples will be analyzed for informational purposes. Since IIFP will process only depleted uranium, it is anticipated that surveys will include the U-238, U-235 and U-234 isotopes of uranium.

Licensing Documentation Impact (1): The third paragraph in Section 10.1, Decommissioning Strategy, of the IIFP License Application will be revised to include the following wording:

At the end of useful plant life, the FEP/DUP Facility will be decommissioned such that the site and remaining facilities may be released for unrestricted use as defined in 10 CFR 20.1402 (CFR, 2008b). IIFP will use guidance provided in NUREG-1505, NUREG-1575 and NUREG-1757 in developing initial and final site survey plans sufficient to provide background and post-decontamination site condition to enable the free release of the site.

Licensing Documentation Impact (2): Section 10.1.3.8, Final Radiation Survey, of the IIFP License Application will be revised as follows:

A final radiation survey must be performed to verify proper decontamination to allow the site to be released for unrestricted use. The evaluation of the final radiation survey is based in part on an initial radiation survey performed prior to initial operation. The initial survey determines the natural background radiation of the area; therefore it provides a datum for measurements which determine any increase in levels of radioactivity. Since only depleted uranium will be processed at the IIFP Facility, the initial and final site surveys required as part of the decommissioning process will include isotopic analysis for the U-238, U-235 and U-234 isotopes of uranium.

The final survey will systematically and representatively measure radioactivity for the entire site and will be designed to detect any unreported spills and any generalized contamination that might accumulate over the period of operation of the facility. The intensity of the survey will vary depending on the location (i.e. the buildings, their immediate areas, and the remainder of the site). Throughout the operating life of the facility, routine surveys will be ~~are~~ conducted of licensed

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material areas and records will be maintained. These survey records will be used in conjunction with the REMP as part of the final survey evaluation and may reduce the amount of sampling in some areas where the survey history indicates that no contamination has occurred, shows low potential for contamination. The final survey in some cases is a verification of historical surveys. The survey procedures and results will be documented in a report which will include. The report will include, among other things, a map of the survey site, measurement results, and the site's relationship to the surrounding area. The results will be analyzed and shown to be below allowable residual radioactivity limits; otherwise, further decontamination will be performed.

For decommissioning funding purposes, the final site survey will consist of samples being samples will be taken within the 40-acre IIFP Restricted Area as well as at other locations outside the Restricted Area but within the 640-acre site boundary 12.1 ha (40acre) FEP/DUP Restricted Area (area within the security fence). Inside the Restricted Area, samples will be taken based on a sampling grid pattern of approximately 91 m by 91 m (100 yd by 100 yd). Additional samples will be collected within an area extending 10 feet from process building walls on the basis of one sample per 100 ft² (i.e., one sample for every 10 feet of building perimeter). It is unlikely that the area outside the Restricted Area but within the site boundary will be contaminated. Outside of the Restricted Area, but within the site boundaries, the likelihood for contamination is extremely remote. Therefore, the grid will be expanded for this area such that samples will be taken on a grid pattern of approximately 610 m by 610 m (667 yards by 667 yards). The aAnalysis of the samples will be provided by a third party since, at the time of performance of the final radiation survey, no analysis facilities will be available on site. A similar collection of samples will be performed for the initial site survey as part of the REMP to provide a background against which the final site survey will be compared.

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D-2. *In the Environmental Report, Section 6.1.2, “Radiological Environmental Monitoring Program” (REMP), INIS describes the REMP and proposes to initiate it at least 12 months prior to plant operations. However, the REMP includes only five soil samples and does not identify the isotopes for which the samples will be analyzed. NUREG-1757 (see reference below) includes guidance for determining background radiation. Consistent with the guidance in NUREG-1757, demonstrate a more rigorous initial survey than that described in the application and ER. Provide the sampling locations inside the footprint of the buildings and along the perimeter. Also identify the isotopes for which the soils will be analyzed.*

The following NRC references contain NRC guidance for determining background radiation and selecting background reference areas:

- *NUREG-1757, Consolidated Decommissioning Guidance, Volume 2 Characterization, Survey, and Determination of Radiological Criteria, Volume 2, Revision 1, September 2006;*
- *NUREG-1505, A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys, Revision 1, June 1998, Section 2.2.5; and*
- *NUREG-1575, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Revision 1, August 2000, Section 4.5.*

RESPONSE: The REMP has not been developed at this time. However, IIFP is committing to the use of guidance provided in NUREGs 1505, 1575 and 1757 in the response to decommissioning question D-1. The numbers of samples to be collected for the initial survey and their locations have not yet been determined, but IIFP is committed to perform this survey sampling prior to construction. More specific information can be provided after the REMP has been developed and written. It is anticipated that sample analysis for the U-238, U-235 and U-234 isotopes of uranium will suffice since only depleted uranium will be processed at the facility.

Building footprint and perimeter sampling has not been determined for initial site sampling since the REMP has not yet been developed. However, since the building structures are expected to be decontaminated and left standing, the final site survey will include sampling of the floors of those structures for residual contamination at a frequency of one sample per 100 ft². Process building perimeter sampling for the final site survey will involve collecting samples at 10 foot intervals and within a distance 10 feet from the walls of the structures resulting in one sample per 100 ft² around the perimeter of the structures.

License Documentation Impact: Sections 10.1, Decommissioning Strategy and 10.1.3.8, Final Radiation Survey, of the IIFP License Application will be revised as indicated in response to question D-1.

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D-3. *Section 10.1.3.8, Final Radiation Survey, of the LA describes the initial survey and a final survey that will systematically measure radioactivity over the entire site. Tables 10-10, 10-11, and 10-12 of the LA do not specifically include a final survey of site soils. Notes 1 and 2 to these tables state that there is a low likelihood of contaminating the facility grounds at levels that would require excavation or restoration, and small spills will be cleaned immediately.*

Specify that the final status survey will be designed to detect any unreported spills and any generalized contamination that might accumulate over the period of operation of the facility. Identify the parameters or isotopes for which the grid samples will be analyzed, and describe how these results will be compared to the initial survey results to demonstrate that the site is suitable for unrestricted release. Revise the Decommissioning Cost Estimate (DCE) to include costs for designing and performing a final survey of the site.

RESPONSE: Revisions are being made to Section 10.1.3.8 of the LA (See response to RAI D-1) to reflect the intent to detect unreported spills and generalized contamination. The isotopes for which grid samples will be analyzed are also being included in this revision. However, IIFP expects both routine and REMP monitoring to also be important in the identification of such occurrences. IIFP contends that the most comprehensive sampling will be performed in conjunction with normal facility operations over the lifetime of the facility and that this information will be at least as useful as samples obtained at facility closure. IIFP proposes to use this extensive amount of historical information in the development of its decommissioning plan rather than depending solely on the use of grab samples collected at the end of the facility's lifetime. Once final site survey results are obtained, they will be compared to the initial survey results using guidance provided in NUREGs 1505, 1575 and 1757.

Final survey labor costs are shown in the Decommissioning Funding Plan (DFP) but originally did not include soil sampling and analysis costs. Estimates for these costs will be made based on the final site survey grid provided in LA Section 10.1.3.8 and will also include process building perimeter sampling as specified in this revised section. The draft responses for the Financial Assurance RAIs have already been submitted. These soil sampling and analysis costs will be included in applicable Chapter 10 Tables as an update in the final Financial Assurance RAI responses.

License Documentation Impact (1): Section 10.1.3.8, Final Radiation Survey, of the IIFP License Application will be revised as indicated in response to question D-1.

License Documentation Impact (2): The third bullet in Section 10.1.2.2, Radioactive Contamination Control, will be revised to include the following information:

Routine radiological surveys will be conducted throughout the operating lifetime of the facility facilities' operations life that will minimize the likelihood that radioactive contamination goes undetected and will provide a historical record which will simplify the site characterization process. **The historical REMP will also be used to provide guidance for the final site survey. Samples will be collected to verify the historical data collected via the REMP. Additional samples will be collected if areas of contamination are found.**