International Isotopes Inc.

April 29, 2011

ATTN: Document-Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Submittal of Responses to Requests for Additional Information (RAI)
TAC L32739.

To Whom it May Concern,

The purpose of this letter is to replace the Official Responses to Environmental Protection RAIs submitted via letter on April 25, 2011 with the version enclosed with this letter. This response to RAIs pertains to the International Isotopes Fluorine Products Inc. December 30, 2009 application to license a depleted uranium hexafluoride de-conversion and fluorine extraction process facility.

(1) Official Responses to Environmental Protection RAIs

Please contact me by phone at 208 524-5300 or email at jjmiller@intisoid.com if you have any questions regarding this letter or require additional information.

Sincerely,

John J. Miller, CHP
Radiation Safety Officer

JJM-2011-29

Enclosure as Stated

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Section 9 of the LA generally follows the acceptance criteria found in the SRP, (NUREG-1520). However, Section 9 of the applicant's LA, together with the numerous references to other sections of the LA and the ER do not provide a sufficient standalone description of the environmental protection program. To be sufficient, references to chapters of the ER and other sections of the LA must focus on specific subchapters of the ER and subsections of the LA— rather than on whole topic areas—which, in some cases, are over 100 pages. For example, references must point to specific tables and figures, as appropriate, particularly when citing numeric values or equipment locations (e.g., monitoring locations). Modifications based on the following RAIs will provide greater transparency and traceability of technical presentations, facilitate a timely document review process, assure that Section 9 of the LA is complete and accurate, and allow the lay reader to follow the discussion better.

EP-1. Section 9.2.1, Radiation Safety. Please specifically identify each of the various subsections of the LA and ER that contain supplemental information related to the four acceptance criteria for Radiation Safety referenced in LA Section 9.2.1. Since the supplemental information is referenced in the individual subjects identified within LA Section 9 (e.g., under the individual headings in Sections 9.2.1.1 and 9.2.1.2), add a new last sentence to Section 9.2.1 similar to the following: "Specific references to the supplemental information are provided below, as appropriate."

Section 9.4.3.2.1 of the SRP, NUREG-1520, addresses Radiation Safety Program in accordance with 10 CFR 20.1101.

RESPONSE: The last sentence of Section 9.2.1, which states "Supplemental information can also be found in various sections of the LA as well as the IIFP ER", will be replaced with this sentence: "Specific references to supplemental information in the ER and LA are provided in each of the subsections below."

License Documentation Impact: Section 9.2.1 of the License Application will be revised as follows:

The following sections address the four acceptance criteria that describe the facility Radiation Protection Program (RPP) as it applies to Environmental Protection. The RPP is discussed further in Chapter 4, Radiation Protection, of the LA. Specific references to ~~S~~supplemental information ~~can also be found in various sections of the LA as well as the IIFP ER~~ are provided in each section, as appropriate.

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EP-2. Section 9, Environmental Protection - Section 9 of the applicant's LA relies heavily on references to the ER. Since the ER is not part of the LA, ensure that references to the ER are only used to provide additional information and do not contain commitments. 10 CFR 40.32(c) requires the application to contain adequate commitments to protect health and minimize danger to life and property.

RESPONSE: A survey of the IIFP Environmental Report (ER) and the IIFP License Application (LA) and the Integrated Safety Analysis Summary (ISA) was conducted. The ER was reviewed for statements that were made to protect health and minimize danger to life and property. The LA and ISA were also reviewed to determine if the corresponding statements covered in the ER were addressed in the LA or ISA. The table below also shows the number statements made in the ER to protect health and minimize danger to the life and property and the number of corresponding statements made and addressed in the LA or ISA. Of the 104 different statements made in the ER to protect health and minimize danger to life and property, only six of those were not addressed in the LA or ISA and five were only partially covered in the LA or ISA. Statements not addressed fully in the LA or ISA will be incorporated.

Table 1 Statements Made in the Environmental Report to Protect Health and Minimize Danger to Life and Property in Comparison to Those Addressed in the License Application and Integrated Safety Analysis Summary

ER Chapter	Title of Chapter	Statements Made in the ER to Protect Health and Minimize Danger to Life and Property	Corresponding Statement Addressed in LA or ISA
Chapter 1	Introduction of the Environmental Report	20	13 addressed 4 not addressed 3 partially addressed
Chapter 2	Alternatives	4	4 addressed
Chapter 3	Description of the affected Environment	22	21 addressed 1 partially addressed
Chapter 4	Environmental Impacts	21	20 addressed 1 not addressed
Chapter 5	Mitigation Measures	12	11 addressed 1 partially addressed
Chapter 6	Environmental Measurements and Monitoring Program	15	14 addressed 1 not addressed
Chapter 7	Cost-Benefit Analysis	0	None required
Chapter 8	Summary of Environmental Consequences	10	10 addressed
Chapter 9	References	0	None required
Chapter 10	List of Preparers	0	None required
Totals	IIFP Environmental Report	104	93 addressed 6 not addressed 5 partially addressed

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RESPONSE:

1.3.2.2 The primary applicable codes and standards (editions applicable at time of design) for the design and building requirements of the IIFP Facility include the following:

- ASME/ANSI B16 Standard for Pipe and Fittings. **Statements not addressed in LA or the ISA Summary.**
- API 620 Design and Fabrication of Atmospheric Storage Tanks. **Statements not addressed in LA or the ISA Summary.**
- AISC Standards for Steel Construction. **Statements not addressed in LA or the ISA Summary.**
- ACI for Concrete Construction. **Statements not addressed in LA or the ISA Summary.**

License Documentation Impact: The 7th paragraph of Section 1.1.2 of the IIFP License Application, Revision A, (see also RAI SS-8 and GI-6B) will be replaced with the following:

The following is a list of applicable Federal, State, and local codes and standards that the DB contractor will use during the detailed design, construction and startup stage of the project to insure adequate protection against natural phenomena, environmental conditions, and dynamic effects. The DB contractor will also ensure, as part of the written contract, that design meets these applicable federal, state and local codes and standards. Buildings, lighting, fire protection, and building support systems are designed in accordance with latest revisions, of building and construction codes including where applicable the National Fire Protection Association (NFPA) standards, local and State codes, and related codes and standards. NFPA Standards are listed in Chapter 7 of the LA, Table 7-1. The primary applicable codes and standards (editions applicable at time of design) for the design and building requirements of the IIFP Facility include the following:

2006	New Mexico Commercial Building Code (adopts by reference the 2006 International Building Code (IBC) with amendments)
2006	New Mexico Energy Conservation Code (adopts by reference the 2006 international energy conservation code (IECC) with amendments)
2006	New Mexico Plumbing Code (adopts by reference the 2006 Uniform Plumbing Code (UPC) with amendments)
2006	New Mexico Mechanical Code (adopts by reference the 2006 Uniform Mechanical Code (UMC) with amendments)
2008	New Mexico Electrical Code (adopts by reference the 2008 national electrical code (NEC) with amendments)
2007	New Mexico Electrical Safety Code (adopts by reference the 2007 national electrical safety code (NESC) with amendments)
2006	International Fire Code
2007	American Society for Mechanical Engineering (ASME) Section VIII, Division 1 Design and Fabrication of Pressure Vessels.
2007	ASME B31.1 "Power Piping"
2008	ASME B31.3 "Process Piping"
2006	ASME B31.5 "Refrigeration Piping and Heat Transfer Components"
2008	ASME B31.9 "Building Services Piping" and National Fire Protection Association NFPA applicable codes as detailed in Table 7-1

"NFPA Standards of this License Application.

RESPONSE:

1.4.3.2 As part of this permitting process, a Stormwater Pollution Prevention Plan (SWPPP) will be developed and a Notice of Intent (NOI) will be filed with the EPA at least two days prior to the commencement of construction activities. **SWPPP is not addressed in LA.**

1.4.4.15 NMAC, Title 20, Chapter 5, Part 2, "Registration of Tanks," establishes the state standards for the regulation of petroleum storage tanks. If needed, such storage tanks will be designed in accordance with state requirements and registration application made. **NMAC Title 20 is not addressed in the LA.**

1.4.4.16 NMSA Chapter 74, Article 12, "Night Sky Protection," establishes requirements to preserve and enhance the state's dark sky while promoting safety, conserving energy and preserving the environment for astronomy. These requirements will be addressed during detailed design of the facility. **NMSA Chapter 74 is not addressed in the LA.**

1.4.4.17 NMSA, Chapter 50, Sections 1-25, and implementing regulations at NMAC Title 11, "Labor Workers Compensation," Chapter 5, "Occupational Safety and Health" establishes state requirements for assuring safe and healthful working conditions for every employee. These state regulations are being followed to ensure any additional requirements beyond the federal OSHA regulations are adequately addressed. **NMSA Chapter 50 and implementing regulations are not addressed in the LA.**

1.4.5.5 Permits will be obtained to conduct rare, threatened and endangered (RTE) surveys for both plants and animals, in accordance with the timeframe requirements prior to construction. **Permits for ecological surveys are not addressed in the LA.**

1.5 A number of licenses and permits will be required for construction and operation of the IIFP Facility. A summary of licenses and permits that are currently known to be required are listed in ER Table 1-3 (former Table 1-4). During the federal and State permitting process, any changes in requirements will be re-evaluated. **NPDES General Permit for Industrial Stormwater, General Construction Permit, and State Access Permit are addressed in the LA. Groundwater Discharge Permit/Plan, EPA ID Number, Endangered Species Survey Permit, and the Stormwater Pollution Prevention Plan are not addressed in the LA.**

License Documentation Impact: Section 9.1.4 of the IIFP License Application, Revision A will be revised as follows: (Also see RAI GI-11B for revisions in the LA, former Section 1.6.3.6 (new 1.7.3.4 "Groundwater Hydrology").

In addition to the NRC licensing and regulatory requirements, a variety of environmental regulations apply to the IIFP Facility during the construction, and operation phases. These regulations require permits from, consultations with, or approvals by, other governing or regulatory agencies. IIFP ER Chapter 1(IIFP, 2009a) summarizes the applicable environmental regulatory requirements, permits, licenses, or approvals, as well as the current status of each, as of the effective date of the ER. Permits include the following:

- NPDES General Permit for Industrial Stormwater,
- General Construction Permit,
- Air Construction (Air Quality: New Source Review/Authority to Construct) Permit,
- Air Operations Permit if required,
- NESHAP Permit if required,
- Groundwater Discharge Permit/Liquid Waste (sewage) Permit,
- EPA Hazardous Waste ID Number,
- Drinking Water System Permit
- Radiation Protection Permit,
- Above Ground Storage Tank Registration,
- NPDES Storm Water Pollution Prevention Plan (SWPPP)/Notice of Intent (NOI),
- State Access (Highway Right of Way) Permit,
- Clean Water Act, Section 404, and
- Rare, Threatened, and Endangered Species Survey Permit.

IIFP will also develop a Storm Water Pollution Prevention Plan (SWPPP) and file a Notice of Intent (NOI) with the EPA at least seven days prior to the commencement construction activities. An agreement has been obtained with the New Mexico Environment Department (NMED) on the type and maximum quantities of depleted uranium and container possession limits. The NMED Agreement is incorporated into this IIFP LA. Miscellaneous regulations include the following:

- NMSA Chapter 74, Article 12, "Night Sky Protection," establishes requirements to preserve and enhance the state's dark sky while promoting safety, conserving energy and preserving the environment for astronomy. These requirements will be addressed during detailed design of the facility.
- NMSA, Chapter 50, Sections 1-25, and implementing regulations at NMAC Title 11, "Labor Workers Compensation," Chapter 5, "Occupational Safety and Health" establishes state requirements for assuring safe and healthful working conditions for every employee. These state regulations are being followed to ensure any additional requirements beyond the federal OSHA regulations are adequately addressed.
- Groundwater monitoring wells are permitted through Office of the State Engineer (OSE) and well locations along with the boring logs are submitted to the OSE. Site-wide groundwater levels will be monitored routinely, and the groundwater monitoring well and pumping well networks will be analyzed to confirm that the changes in groundwater levels associated with the operation of the IIFP are minimal. Future detailed engineering and hydrological studies will identify the appropriate systems and locations.

RESPONSE:

6.2.6 In order to monitor and characterize meteorological phenomena (e.g., wind speed, direction, and temperature) during facility operation as well as consider interaction of meteorology and local terrain, conditions will be monitored with a meteorological tower located on site. **A meteorological tower is not addressed in the LA.**

License Documentation Impact: The IIFP License Application, Revision A, Section 9.2.2 paragraph one will be revised by adding a second sentence as follows:

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Effluent and environmental controls and monitors are maintained at and around the facility to ensure that doses to the workers, the public, and the environment remain ALARA. In order to monitor and characterize meteorological phenomena (e.g., wind speed, direction, and temperature) during plant operation, conditions will be monitored using a meteorological tower located on site. In addition, monitors provide indication of potential off-normal occurrences requiring further investigation. Guidance provided in Regulatory Guide 4.16, "Monitoring and Reporting Radioactivity in Releases of Radioactive Material in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants " (NRC, 1985) has been utilized in the preparation of the environmental protection aspects of the RPP (IIFP, 2009b) where applicable.

RESPONSE:

5.2.12.2 Mitigation measures associated with DUF_6 cylinder storage areas as follows: ... **The DUF_6 cylinder management program is addressed in LA Sections 1.1.3.2, 6.3, 6.3.1.2, 7.2, 7.3.6, and 7.4. DUF_6 cylinder valves and protectors are not addressed in the LA.**

License Documentation Impact: The IIFP License Application, Revision A, Rev A Section 1.1.3.2, fifth paragraph will be revised as follows:

Upon receipt, full cylinders of DUF_6 are visually inspected for damage and surveyed for radiation and removable contamination. Cylinders and cylinder valves shall be inspected for ANSI N14.1 requirements. Documents that contain information regarding cylinder ID, weight and uranium assay that accompany the shipment are reviewed and verified for accuracy. Uranium assay is qualitatively verified by performing a non-destructive ~~gamma~~ survey measurement. Once accepted for receipt, the cylinder is unloaded using the facility cylinder hauler vehicle and placed in the Full DUF_6 Cylinder Storage Pad area until it is scheduled for feed to the de-conversion process. Only designated vehicles with less than 280 liters (74 gal) of fuel shall be allowed on the cylinder storage pads.

RESPONSE:

3.2.2.2 ...If any DUF_4 is received, it will be contained in approved shipping containers in accordance with DOT regulations. **Shipping of DUF_4 is not addressed in the LA.**

Transportation routes for both incoming DUF_6 feed and outgoing uranium wastes will be those routes designated by the U.S. Department of Transportation to minimize the potential impacts to the public from the transportation of radioactive materials. **Using DOT transportation routes is not addressed in LA.**

4.2.6 Radioactive material shipments will be transported in packages that meet the requirements of 10 CFR 71 and 49 CFR 173 (CFR, 2009m; CFR, 2009ii). **10 CFR 71 and 49 CFR 173 are not addressed in the LA.**

License Documentation Impact: In the IIFP License Application, Revision A, Section 1.1.3.2, a final sentence will be added to the third paragraph and will read as follows:

The IIFP F~~f~~acility in Hobbs, New Mexico receives DUF_6 material in a solid physical state typically contained in 14-ton type 48-Y (or 48-G) or in 10-ton type 48-X cylinders owned by the

supplier (the IIFP de-conversion customer). These cylinders are built to American National Standards Institute (ANSI) standards (ANSI, 2001) and are transported by truck trailers that are Department of Transportation (DOT) approved. The type 48-Y and type 48-X cylinders ~~is~~ are approved for multi-shipments, provided the ANSI standards; which include a 5 year hydrostatic test requirement are met. Empty 48-Y or 48-X type cylinders are returned to the customer following de-conversion. Radioactive material shipments will be transported in packages that meet the requirements of 10 CFR 71 and 49 CFR 171-173. Transportation routes for both incoming DUF_6 feed and outgoing uranium wastes will be those routes designated by the U.S. Department of Transportation to minimize the potential impacts to the public from the transportation of radioactive materials. If any DUF_4 is received, it will be contained in approved shipping containers in accordance with DOT regulations.

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EP-3. Section 9.2.1.1, Radiological (ALARA) Goals for Effluent Control – This subsection states that ALARA Goals are typically 10-20 percent of the 10 CFR 20 Appendix B values. Please provide the specific ALARA Goals for air and liquid effluents and provide a more specific reference to LA Section 4; provide a more detailed discussion regarding how compliance with ALARA goals is demonstrated by discussing how each of the listed items (monitoring, analysis, and evaluations) contributes to compliance; and as part of that discussion, include greater detail addressing each of the three numbered items in LA Section 9.2.2.1 that are to be evaluated in order to assess trends.

Section 9.4.3.2.1(1) of the SRP, NUREG-1520, provides that ALARA goals are to be set at a modest fraction (from 10-20%) of the 10 CFR 20, Appendix B values.

RESPONSE: In the absence of current effluent measures, the ALARA goals for air and liquid effluents will be initially set at 20% of the 10 CFR 20 Appendix B values. As described in Section 9.2.1.1, these goals will be reviewed annually and adjusted as appropriate. ALARA goals are further described in LA Section 4.2.2, "ALARA Goals."

License Documentation Impact: LA Section 9.2.1.1, "Radiological (ALARA) Goals for Effluent Control," will be revised including a new first paragraph and will read as follows to include the specific ALARA goals stated above and to clarify the reference to LA Section 4.2.2.

Monitoring of facility effluents, analysis of monitoring samples, and evaluation of sampling data allow for the determination of the quantity of radioactive material released from the facility during normal operating conditions and thereby demonstrating attainment of ALARA goals and effluent limit compliance. Identification of the quantity of material released from the facility permit the evaluation of the success of control and containment of contamination. In addition, the determined quantity of radioactive material released from the facility will allow for the estimation of potential off-site dose to the public. Finally, identification of an unexpected increase in material quantities released from the facility allows for the detection of any unexpected release pathways previously unidentified.

ALARA Goals are set to demonstrate compliance with 10 CFR 20, "Standards for Protection Against Radiation" (CFR, 2009c) with respect to doses to the public, doses to the worker, and environmental effluents, and ~~are typically 10-20%~~will initially be set at 20% of the 10 CFR 20 Appendix B values (CFR, 2007). Goals are set by the IIFP ALARA Committee and reviewed annually to assess the need to adjust specific values based on what may be ALARA for the particular measure. Compliance with the ALARA goals is demonstrated through monitoring, analysis, and evaluation of air emissions, liquid effluents, and disposition of solid waste. Trends are assessed using the monitoring results to evaluate the following: (1) facility operations control and containment of contamination; (2) projections of potential dose to offsite populations; and (3) detection of any unanticipated pathways for transport of radionuclide(s) within the environment. In accordance with the ALARA Program, these monitoring results are summarized and presented to the ALARA Committee on an annual basis. The ALARA Program and associated goals are further described in LA ~~Chapter~~ Section 4.2.2, "~~Radiation Protection~~ALARA Goals."

License Documentation Impact: The LA, Section 4.2.2 will be revised to reflect the initial establishment of the ALARA Goals at 20% of the 10 CFR 20 Appendix B values as shown below.

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Specific goals of the ALARA Program include maintaining occupational exposures, as well as environmental releases, as far below regulatory limits as is reasonably achievable. With respect to environmental effluents, ALARA Goals will be initially set at 20% of the 10 CFR 20 Appendix B values (CFR, 2007). The ALARA concept is also incorporated into the design and operation of the facility. The size and number of areas with higher dose rates are minimal. Per approved written procedures, the time spent in these areas is controlled and projects are evaluated to ensure workers receive the minimum exposure. Areas where personnel spend significant amounts of time are designed to maintain the lowest dose rates reasonably achievable.

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EP-4. Section 9.2.1.2, Effluent Controls to Maintain Public Doses ALARA – Please provide more specific references to subchapters within ER Chapters 2 and 6, and provide relevant tables or figures, if any (e.g., facility diagram of referenced equipment or buildings). Section 9.4.3.2.1(2) of the SRP, NUREG-1520, provides that the applicant describe and commit to the use of effluent controls to maintain public doses ALARA in accordance with 10 CFR 20.1101.

RESPONSE: LA Section 9.2.1.2, "Effluent Controls to Maintain Public Doses ALARA," will be revised to provide more specific references to ER Chapter 2 and ER Chapter 6 as requested and to references to the ISA, where applicable. Note: ISA Table 3-5 "Stack Heights and Estimated Flow Rates" will be removed and replaced to match new ER Table 2-3 to match information in RAI ER-9D.

License Documentation Impact: LA Section 9.2.1.2, paragraph one will be revised and a new second paragraph will be added to provide references to effluent controls to read as follows:

Effluent controls are used to maintain public doses ALARA. Gaseous effluents, that may contain depleted uranium, pass through pre-filters, high efficiency filters, and carbon-bed filters prior to entering the Pplant KOH Sscrubber Ssystem (three-stages, in series). After scrubbing, the effluents are discharged to the atmosphere via the scrubber system stack. Certain storage vessels, powder transfer systems, and packaging stations, where depleted uranium particles are involved, are connected to two-or-three –stage dust removal systems to ensure capture and recovery of depleted uranium particles, prior to being vented to the atmosphere. The stacks are continuously sampled and are routinely analyzed to measure radioactivity of the exhaust gases. ~~Chapter 2 of the IIFP ER (IIFP, 2009) addresses the process description and the effluent controls incorporated into the design of the facility, and Chapter 6 (IIFP, 2009) of the IIFP ER describes the stack sampling and measurements.~~

Effluent controls are described in the IIFP FEP/DUP ER (IIFP, 2009a) as part of the facility process descriptions in Subsections 2.1.3.6, 2.1.3.7, and 2.1.3.9. In addition, IIFP FEP/DUP ER Table 2-2 (former Table 2-1) provides a list of design efficiencies for process vent off-gas treatment equipment, and IIFP FEP/DUP ER Table 2-3 (former Table 2-2) provides a list of major process vent stacks. ER Section 6.1 identifies the proposed sampling and monitoring locations for gaseous effluents, liquid effluents, and groundwater, and provides an overview of the effluent monitoring program to achieve ALARA. IIFP ER Figure 6-1 illustrates the planned monitoring locations at the site. IIFP ER subsections 6.1.1 and 6.1.2 provide additional details about effluent and radiological monitoring. Effluent control and conservation features are described in subsections of IIFP FEP/DUP ER Section 4.13.4. Section 3.1.10 of the IIFP Integrated Safety Analysis Summary (ISA) (IIFP, 2009d) describes the process vent stacks at the IIFP Facility. Table 3-4 in the ISA provides the listing of design efficiencies for the off-gas treatment equipment as does Table 2-2 (former Table 2-1) of the ER. Table 3-5 of the ISA provides the stack heights and estimated flow rates of the major process vent stacks.

License Documentation Impact: Remove and replace ISA Table 3-5 which provides the stack heights and estimated flow rates of the process vent stacks as referenced in Section 9.2.1.2, paragraph one revised above to match new ER Table 2-3 to match updated information in RAI ER-9D.

Table 3-5 Stack Heights and Estimated Flow Rates

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Stack Identification (Number) and Description	Approximate Location	Approximate Height[a] (ft)	Estimate Range of Vent Flow Rates[b] (ft^3/min)	Main Constituents in Flow Stream	Stack Diameter (in) Stack Velocity (ft/min) Temperature
(01) Plant KOH Scrubbing System Stack	Slightly East of the DUF_4 Process Building	90	20-100	$HF/SiF_4/BF_3$	4 229-1,149 Ambient
(02) DUF_4 Dust Collector System	Slightly East of DUF_4 Process Building	80	3,800-7,600	UF_4/HF	8 10,888-21,776 Ambient
(03) FEP Dust Collector System	West Side of FEP Process Building	80	3,800-7,600	Uranium Oxide/ HF/BF_3	8 10,888-21,776 Ambient
(04) Utilities Boiler Stack	Roof of Utilities Building	40	250-500	Particulates/SO_2/ NO_x/VOC/ Methane/CO/TOC/ CO_2	8 716-1,432 300 °F
(05) (Future Phase 2 Plant) Oxide Dust Collector System	Northeast Corner of Future Oxide Process Building	80	3,800-7,600	Uranium Oxide/HF	8 10,888-21,776 Ambient
(06) Laboratory Hood Stack	East of Laboratory	30	3,000-4,000	Various trace reagent chemicals	12 3,800-5,100 Ambient
(07) Calcium Fluoride Dust Collector	Southwest Corner of the EPP	35	3,000-5,000	Particulates as CaF_2	8 8,600-14,334 Ambient
(08) Decon Dust Collector Stack	East of Decon Building	80	3,000-5,000	Trace Uranium & Metal Grit or Sand	8 8,600-14,334 Ambient

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Table 3-5 Stack Heights and Estimated Flow Rates

Stack Identification (Number) and Description	Approximate Location	Approximate Height[a] (ft)	Estimate Range of Vent Flow Rates[b] (ft^3/min)	Main Constituents in Flow Stream	Stack Diameter (in) Stack Velocity (ft/min) Temperature
(09) Lime Dust Collector Stack	Northwest Corner of EPP	35	1,500-3,000	Particulates as $Ca(OH)_2$	42 39-78 Ambient
(10) CaF_2 Combustion Dryer Stack	Roof of EPP Building	35	30-100	Particulates/SO_2/NO_x/VOC/ Methane/CO/TOC/ CO_2	8 86-300 500
(11)Water Evaporator Stack	East of EPP Building	35	50-100	Steam/Particulates/SO_2/NO_x/VOC/Methane/CO/TOC/CO_2	8 143-300 212 °F
(12) H_2 Generation Stack	East side of Plant near sanitary waste treatment	35	214-283	O_2/N_2/H_2O/CO_2/ CO	4 2,454-3,245 250
(13) DUF_4 Vacuum Transfer Dust Collector Stack	Roof of FEP Building	80	4,800-10,600	Particulates as UF_4	8 13,753-30,372 Ambient
(14) B_2O_3 Silo Dust Collector Stack	Above B_2O_3 Silo Building	80	2,000-4,200	Particulates as B_2O_3	8 5,733-12,041 Ambient

[a]feet-multiply by 0.3048 to get meters
[b]cubic feet-multiply by 0.028317 to get cubic meters

HF – Hydrogen Fluoride SiF_4 – Silicon Tetrafluoride BF_3 – Boron Trifluoride UF_4 – Uranium Tetrafluoride
SO_2 – Sulfur Dioxide NO_x – Nitrogen Oxides VOC – Volatile Organic Chemicals CO – Carbon Monoxide
TOC – Total Organic Chemicals CO_2 – Carbon Dioxide CaF_2 – Calcium Fluoride $Ca(OH)_2$ – Calcium Hydroxide
N_2 – Nitrogen O_2 – Oxygen H_2O – Water B_2O_3 – Boron Trioxide

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EP-5. Section 9.2.1.3, ALARA Reviews and Reports to Management – Section 9.4.3.2.1(3) of the SRP, NUREG-1520, provides, among other things, that the applicant commit to report the results of the annual review of the ALARA effluent control program to senior management. Please identify the senior management to whom the results of the ALARA review are reported. Also, provide a more specific reference to subsections within LA Section 4.

RESPONSE: The result of the ALARA review and recommendations for changes in facilities or procedures that are necessary to achieve ALARA goals are reported to the ALARA committee. Senior management members of the ALARA committee include the COO/Plant Manager, the Radiation Protection Manager, selected Department Managers, and the ESH Manager. The arrangement is described in LA Section 4.2.3.

License Documentation Impact: LA Section 9.2.1.3 will be revised as follows:

In accordance with the ALARA Program, the environmental protection aspects of the Radiation Protection Program (RPP) are reviewed as part of the annual ALARA review. Review of the ALARA Program is addressed in LA Chapter 4, ~~Radiation Protection~~ Section 4.2.3. The ALARA review includes analysis of trends in release concentrations, environmental monitoring data, and radionuclide usage; the review then determines the need for operational changes to achieve the ALARA effluent goals and evaluate designs for system installations or modifications. The results of the ALARA review are reported to senior management, along with recommendations for changes in facilities or procedures that are necessary to achieve ALARA goals. The senior management members on the ALARA Committee include the Chief Operations Officer, Plant Manager, Radiation Protection Manager, selected Department Managers, and the ESH Manager

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EP-6. Section 9.2.1.4, Waste Minimization – Please identify and, if appropriate, provide a specific description of waste-minimization systems and operational procedures regarding conservation and recycling important compounds. Also, please identify the waste minimization practices that are consistent with Regulatory Guide 4.21.

Section 9.4.3.2.1(4) of the SRP, NUREG-1520, identifies, among other things, the elements of an acceptable waste minimization program under 10 CFR 20.1406.

RESPONSE: Specific descriptions of waste minimization systems and procedures will be added to the IIFP License Application Section 9.2.1.4. The additional descriptions will include the waste minimization practices that are consistent with Regulatory Guide 4.21.

License Documentation Impact: Section 9.2.1.4 will be amended as follows (with new text shown in red):

~~The highest priority has been assigned to minimizing the generation of waste through reduction, reuse, or recycling. The IIFP facility utilizes various engineered waste-minimization systems and operational procedures that aim at conserving materials and recycling important compounds; such as the regeneration and reuse of the plant scrubbing system potassium hydroxide solution.~~ The facility is designed and operated in accordance with 10 CFR 20.1406, "Minimization of Contamination" (CFR, 2009d) to minimize contamination, facilitate eventual decommissioning, and minimize to the extent practicable the generation of radioactive waste. The waste minimization practices during design, construction, and operation of the facility are consistent with the guidance in Regulatory Guide 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning" (NRC, 2008).

The IIFP Facility incorporates several waste minimization systems in its operational procedures and design that aim at a high priority of conserving materials and preventing the spread of contamination. The major of those systems and procedures are discussed below.

Recycling on-site is an important strategy of the waste minimization program; for example: 1) regenerating and recycling of potassium hydroxide (KOH) scrubbing solution for use in the Plant KOH Scrubbing System. This design and operation eliminates the need to otherwise discharge the flow as treated wastewater and also conserves the use of the treating agent and saves cost; 2) collection and recycling of steam condensate back to the facility steam boilers, where applicable, for saving energy and minimizing disposal, and 3) conserving valuable water resources by using air coolers and recirculation of process cooling water thereby avoiding once-through flow of water.

Another important aspect of the IIFP waste minimization program is the employment of waste segregation methods and procedures to facilitate recycling and to minimize contamination. Various receptacles are provided to allow for segregation of clean and contaminated materials. To prevent cross contamination, training is provided with emphasis on minimizing waste and controlling disposal costs. The outer packaging associated with consumables is removed prior to use in a contaminated area to minimize potential for contamination and to facilitate recycling and disposal of the clean segregated materials.

Collected waste such as trash, compressible dry waste, scrap metals, and other candidate wastes will be volume reduced, where feasible, at a centralized on-site or/and off-site waste processing facility. An off-site facility will be used for the segregated "clean waste", such as cardboard,

office paper waste, aluminum cans and scrap metal, where recycling is practical and can be best operated by a commercial vendor. ALARA controls will be maintained during facility operation to account for standard waste minimization practices as directed in 10 CFR 20.1406 (CFR, 2009d).

Lubrication oils and other oils are segregated to prevent cross contamination. The oils are collected and stored in sealed-concrete pad area utilizing curbs and dikes for containment in accordance with Resource Conservation and Recovery Act (RCRA) requirements. Non-contaminated waste oil is sent to an off-site recycle facility, where applicable. Oil that cannot be recycled is disposed at an off-site licensed disposal facility.

Facility ventilation systems are designed to confine airborne radioactive materials within the process area and as close to the point of origin as practicable. Construction materials for ventilation materials are selected as to have a smooth internal surface finish and IIFP minimizes the number of changes in direction to the extent practicable.

Mechanical integrity and preventative maintenance procedures are utilized in accordance with the facility Process Safety Management (Chemical Safety Plan) program. In part, the inspections, surveillance, scheduled and planned maintenance and audits provide a means by which potentials for leaks on piping and equipment are prevented or minimized. Design and operational procedures provide early detection if leaks do occur thus allowing prompt assessment to support timely and appropriate response. Monitoring and surveillance programs are extremely important in minimizing contamination. IIFP uses fluoride detector instrumentation, particulate detectors and personnel surveillance techniques to minimize contamination. If leaks are suspected, the use of area samplers is utilized to investigate and identify the area for correction. Where leaks of hazardous materials are suspected, posted areas and warning lights are utilized to protect employee health and communicate potential contamination problems. Suspected or known leakage problems are investigated, the equipment operation curtailed if needed and the leakage resolved including any clean up where applicable.

The IIFP Facility is designed to minimize the usage of natural resources. Closed-loop cooling systems have been incorporated in the designs to reduce water usage. Power usage is minimized by efficient design of lighting systems, selection of high-efficiency motors, and use of proper insulation materials. Solar panels and geothermal heating systems, where practical, are utilized to reduce carbon based fuel requirements.

The Plant KOH Scrubbing System and Environmental Protection Process are designed to recycle KOH thus conserving the treating agent. Secondary containment for tanks and tank systems are provided with a margin of safety to ensure containment in the event of a leak or spill of the largest tank capacity per EPA requirements. Tank sampling stations are designed to minimize the possibility of sample fluid leaking to the ground. Areas involving diesel refueling are also provided with secondary containment.

Radioactive, hazardous and mixed wastes are generated at the IIFP Facility. Such wastes are collected in labeled containers in each restricted area and transferred to a waste storage area for inspection. Suitable waste is volume reduced, if feasible, then disposed at a licensed waste disposal site.

A retention basin is used for the collection and monitoring of general site storm water runoff. Sanitary sewage effluent is discharged into a package unit where it receives primary, secondary

and tertiary treatment. The effluent from sanitary treatment is used in the facility for process water make-up or for landscape and watering of the site tree farm.

An area (Decontamination Building) is provided in the operating facility for decontaminating equipment that may need to be cleaned before repair or for cleaning of materials, where feasible, prior to disposal. This system helps minimize the spread of contamination. Some of the equipment and systems provided in this area include:

- High pressure water/steam/air equipment, with a sloped sealed-type floor runoff and collection double contained sump pit;
- Totally enclosed grit blast unit with dust collection system;
- Ion-exchange units suitable to collect soluble uranium from solution;
- High efficiency filters suitable to remove small particulates of uranium from solution; and
- Tanks to provide hold capability and precipitation capacity for soluble uranium.

The operating facility Decontamination Building includes an area to perform a series of steps following equipment disassembly including degreasing, decontamination, drying, and inspection. Items from uranium processing systems, waste handling systems, and miscellaneous other items can be decontaminated in this system. To minimize worker exposure, prevent airborne radiological contamination resulting from dismantling, air suits or portable ventilation units are available. Decontamination of chemicals and wastes is provided by components, designated containers, and air filtration systems. Pipe and vessels in the Decontamination Building are provided with design measures to protect against spillage or leakage. Hazardous wastes and materials are contained in tanks and other appropriate containers and are strictly controlled by procedures.

Practices Consistent with Regulatory Guide 4.21 include:

A. Minimizing Facility Contamination

- Worker access to contaminated areas is controlled to assure that workers wear proper protective equipment and limit their time in the areas. Protective equipment is cleaned, stored or disposed in proper locations and receptacles;
- Waste volume reduction is considered and implemented at every opportunity, including training of employees;
- Leak and spill collection areas are provided;
- Floor liners and catch basins are included in areas of higher leak potential;
- Personnel surveillance techniques are part of the leak identification program;
- Monitoring is conducted for leaks or spills in area Control Room; for example, fluoride detectors and airborne particulate detectors;
- Radiological boundary control and monitoring stations are used in strategic locations to prevent carrying of uranium materials from Restricted areas into Unrestricted areas.
- Controlled purge and evacuation systems are used to prevent area contamination and potential out-leakage during maintenance and inspection;
- Decontamination Building and equipment are provided to clean equipment, where applicable, that has been removed for repair and re-installation;
- Floors are appropriately sloped for spills;

- Drains from locker rooms and cleanup showers in potential contamination areas are routed selectively to the Decontamination Building;
- Proper ventilation systems maintain positive pressure in control room areas;
- Secondary containment is provided in outside areas and includes excess capacity to capture leaks or spills from the largest vessel in the area in accordance with EPA requirements;
- Monitoring wells are provided and sampled both up gradient and down gradient with established baselines;
- Storm water retention basins have two impermeable barriers;
- Exterior tanks are located on or above concrete pads above grade and with curbs and dikes;
- Areas to support radioactive material handling are in contained areas;
- Drains for storm water are piped to retention basins with capability for sampling;
- Sanitary wastewater is piped to a tertiary treatment system and monitored prior to discharge, and
- Facility ventilation system designs confine airborne radioactive materials within the process area and as close to the point of origin as practicable. Construction materials for ventilation materials are selected as to have a smooth internal surface finish and minimize the number of changes in direction to the extent practicable.

B. Minimizing Contamination of the Environment

- Building areas where uranium is processed and handled are separated physically from other building rooms and areas where there is no need to have uranium present. These areas have separate ventilation and filtration systems to preclude contamination spread. Boundary control stations and hand/foot and portable monitors are used at applicable locations to verify that personnel and items exiting uranium process areas are not spreading radiological materials into non-uranium areas. The DUF_4 Process Building, FEP Oxide Staging Building, the facility operations Decontamination Building, DUF_4 Container Storage Building, DUF_4 Container Staging Building and the FEP Process Building (in areas where licensed material is processed) meet these specific design features.
- All areas of the facility are sectioned into Unrestricted and Restricted Areas. Restricted Areas limit access for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Radiation Areas and potential Airborne Contamination Areas have additional controls to inform workers of the potential hazard in the area and to help prevent the spread of contamination. All procedures for these areas fall under the Radiation Protection Program, and serve to minimize the spread of contamination and simplify the eventual decommissioning.
- Routine radiological surveys will be conducted throughout the 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.
- Non-radioactive process equipment and systems are minimized in locations subject to potential contamination. This limits the size of the Restricted Areas and limits the activities occurring inside these areas.
- Local air filtration is provided for areas with potential airborne contamination to preclude its spread. Containment equipment with hoods that exhaust through dust collectors, that are designed with high removal efficiencies, are used where uranium materials are being packaged or withdrawn from process systems.

- The hazardous material processes include designs for purge and evacuation (P&E) systems and dust-collection equipment as a means to provide effective clean out of residual chemicals or dust from equipment or piping prior to opening systems for maintenance. The P&E and dust collector systems have multiple collection equipment in series (defense-in-depth) to ensure removal and treatment efficiency, redundancy, effectiveness and reliability.
- Storm water runoff via the storm sewer system flows to a "double lined" retention basin for either evaporation or for landscape (tree farm) watering. Prior to discharging collected storm water can be sampled if needed. It is not likely that collected storm water would exceed acceptable or regulated levels, but routine sampling for reuse or discharge are conducted for further assurance. Domestic sanitary waste water is tertiary treated to meet all discharge standards, and is either evaporated or used as harvested water for facility trees, grass and shrubs. The facility is designed for no liquid process water discharges. Engineered systems are used to provide for regeneration of scrubbing solutions and recycle within the process systems.

C. Facilitating Decommissioning

- During construction, a washable coating is applied to designated floors and walls in the Restricted Areas that have the higher potential to become radioactively contaminated during operation. The coating serves to lower waste volumes during decontamination and simplify the decontamination process;
- Sealed, nonporous pipe insulation is used in areas with higher potential to become contaminated. This facilitates cleaning in event of a spill and will reduce waste volume during decommissioning;
- Ample access is provided for efficient equipment dismantling and removal of equipment that may be contaminated. This minimizes the time of worker exposure;
- Tanks have access for entry and decontamination. Design provisions are also made to allow for removal of the wastes or materials contained in the tanks;
- Connections in the process systems, provided for required operation and maintenance, allow for thorough purging at facility shutdown. This system and procedure remove a significant portion of radioactive contamination prior to disassembly and prevent leakage to the general environment upon opening of equipment or piping;
- Design drawings, produced for all areas of the facility, will simplify the planning and implementing of decontamination procedures. This in turn will shorten the durations that workers are exposed to radiation;
- Worker access to contaminated areas is controlled to assure that workers wear proper protective equipment and limit their time in the areas;
- Radioactive and hazardous wastes produced during decommissioning will be collected, handled, and disposed of, in accordance with all regulations applicable to the facility at the time of decommissioning. Generally, procedures will be similar to those described for wastes produced during normal operation. These wastes will ultimately be disposed in licensed radioactive or hazardous waste disposal facilities located elsewhere. Non-hazardous and non-radioactive wastes will be disposed in a manner consistent with good industrial practice, and in accordance with applicable regulations and
- To facilitate decommissioning, the information relating to the facility design, facility construction, design, modifications, site conditions before and after construction, onsite contamination and results of monitoring and radiological surveys will be readily recoverable through the IIFP document control and management process.

Official Responses to Environmental Protection RAIs

EP-7. Section 9.2.2, Effluent and Environmental Controls and Monitoring – Please identify or provide specific cross references to the subchapters of the ER and subsections of the LA that identify the effluent and environmental controls that are at and around the facility. Also, please provide a specific description of the portions of the Radiation Protection Plan (RPP) that address environmental protection.

Section 9.4.3.2.2(1) of the SRP, NUREG-1520, identifies, among other things, the criteria of an acceptable effluent monitoring program.

RESPONSE: Administrative and engineered controls for environmental effluents are described in the LA, subsections 4.1 through 4.7, and in the IIFP FEP/DUP ER (IIFP, 2009a), subsections 2.1.3, 4.2.2, 6.1.1, 6.1.2, and 6.1.3. As described in LA Section 4.2, the ALARA program is a subset of the Radiation Protection Program. With regard to effluent and environmental controls, the ALARA principle demands that radioactive effluents are monitored, and that environmental releases stay far below the regulatory limits. An additional aspect of the ALARA program includes the preparation and review of an annual report to evaluate effluent release trends as a means to ensure the ALARA programs are effectively implemented.

License Documentation Impact: In response to RAI-EP-7, a second paragraph will be added to LA Section 9.2.2 (paragraph one was modified in response to RAI EP-2) and will read as follows to include additional information:

Effluent and environmental controls and monitors are maintained at and around the facility to ensure that doses to the workers, the public, and the environment remain ALARA. In order to monitor and characterize meteorological phenomena (e.g. wind speed, direction, and temperature) during plant operation, conditions will be monitored with a meteorological tower located on site. In addition, monitors provide indication of potential off-normal occurrences requiring further investigation. Guidance provided in Regulatory Guide 4.16, "Monitoring and Reporting Radioactivity in Releases of Radioactive Material in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants" (NRC, 1985) has been utilized in the preparation of the environmental protection aspects of the RPP (IIFP, 2009b), where applicable.

Administrative and engineered controls for environmental effluents are described in ISA Sections 2.4.10, 2.4.11 and 3.1 and the following subsections of the ISA. These controls are also described in the LA, Section 1.1.3 and the following subsections and Section 4.6 and the following subsections. These controls are also described in the IIFP FEP/DUP ER (IIFP, 2009a), subsections 2.1.3, former 4.6.2.2 (now 4.6.4.1), former 4.6.2.3 (now 4.6.4.2), 6.1, 6.2, and 6.3. The Radiation Protection Plan (RPP) that addresses environmental protection is described in ER Sections 6.1, 6.2 and 6.3 and is also described in LA Section 4.1-4.7. As described in LA Section 4.2, the ALARA program is a subset of the Radiation Protection Program. With regard to effluent and environmental controls, the ALARA principle demands that radioactive effluents are monitored and that environmental releases stay significantly below the regulatory limits. An additional aspect of the ALARA program includes the preparation and review of an annual report to evaluate effluent release trends as a means to ensure the ALARA programs are effectively implemented.

Official Responses to Environmental Protection RAIs

EP-8. Section 9.2.2.1, Expected Concentrations – Please identify the concentrations, calculations, and modeling of airborne and solid radioactive materials listed in this section. If available, provide specific references to the ER and LA subsections (including specific tables or Figures) which contain the information. Also, please identify or reference the conservative assumptions used in calculations and modeling of those concentrations.

Section 9.4.3.2.2(1)(a) of the SRP, NUREG-1520, identifies Expected Concentrations for effluent monitoring that are to be below limits specified in 10 CFR 20, Appendix B.

RESPONSE: Table 4-38 (former Table 4-24) of the ER (IIFP, 2009a) illustrates "Estimated and Bounding Radiological Releases from the Stacks." Calculations and modeling of airborne radioactive materials, and the conservative assumptions used in the calculations and modeling, are documented in Section 4.12.2 of the ER (IIFP, 2009a).

License Documentation Impact: The second sentence in LA Section 9.2.2.1, under subsection "Expected Concentrations" will be replaced and the subsection will read as follows:

The expected concentrations, based on calculations and modeling, of radioactive materials in airborne and solid effluents were estimated using conservative assumptions~~. Those estimated values are proved in the IIFP ER, Chapter 4.~~ are shown in ER Table 4-38 (former Table 4-24), "Estimated and Bounding Radiological Releases from the Stacks during Phase 1 Operations " of the IIFP FEP/DUP ER (IIFP, 2009a). Calculations and modeling of airborne radioactive materials, with the conservative assumptions used in the calculations and modeling, are documented in Section 4.12.2 of the ER. The concentrations controlled to be ALARA and below the limits specified in 10 CFR 20, Appendix B, Table 2 (CFR, 2009c). As stated above, the plant liquid effluents, that have potential for containing uranium, are recycled, reused and maintained on the IIFP S~~s~~ite.

Official Responses to Environmental Protection RAIs

EP-9. Section 9.2.2.1, Calculations of Total Effective Dose Equivalent – It appears that compliance with dose limits for individual members of the public is demonstrated by calculation of the Total Effective Dose Equivalent (TEDE) as opposed to calculation of annual average concentrations of radioactive material released. Please provide more detailed discussions of the calculation of the TEDE by pathway analyses to demonstrate that the appropriate models, codes, and assumptions accurately represent the facility, site, the surrounding area, and the pathways considered. Also, please provide citations to any relevant tables and discussion within the ER, e.g., Subsection ER-4.12.

Section 9.4.3.2.2(1)(b) of the SRP, NUREG-1520, identifies Calculations of Expected Dose for effluent monitoring within limits in 10 CFR 20.1301 through calibrations identified in 10 CFR 20.1302.

RESPONSE: To demonstrate compliance with 10 CFR 20.1301 (via calculation of the TEDE to the individual likely to receive the highest dose), IIFP will apply the EPA Radiation Risk Assessment software, CAP-88 or COMPLY. References to committed dose equivalents are also provided.

License Documentation Impact: The subject paragraph in Section 9.2.2.1, "Calculations of Total Effective Dose Equivalent" of the LA Revision A will be revised as follows:

Dose projections to members of the public are performed routinely to ensure the annual dose to members of the public are kept ALARA and within the regulatory limit in accordance with approved written procedures. Compliance as described in 10 CFR 20.1302, "Compliance with Dose Limits for Individual Members of the Public" (CFR, 2009e); is demonstrated through either the calculation of the total effective dose to the individual likely to receive the highest dose, or through the calculation of annual average concentrations of radioactive material released in gaseous and liquid effluents. To demonstrate compliance with 10 CFR 20.1301 (via calculation of the TEDE to the individual likely to receive the highest dose), IIFP will apply the EPA Radiation Risk Assessment software, CAP-88 or COMPLY. There are four primary exposure pathways associated with plant effluent: inhalation; immersion in an effluent plume; direct radiation due to deposited radioactivity on the ground surface (ground plane exposure) and ingestion of contaminated food products. Of these four exposure pathways, inhalation exposures are expected to be the predominant pathways at site boundary locations and also at off-site locations that are relatively close to the site boundary. Input assumptions for the EPA codes will reflect the configuration and location of the release points, site-specific meteorology, the potential location of the maximally exposed individual, and the regional land use. Input assumptions similar to those applied in the ER dose calculations (documented in ER Section 4.12.2.2.2 "Public and Occupational Exposure Impacts") will be used as necessary. Table 4-41 (former Table 4-25) of the ER provides the annual and committed dose equivalents for exposures to the maximally exposed individual (MEI) from gaseous effluents. Table 4-42 (former Table 4-26) from the ER provides annual and committed dose equivalents for exposures to the nearest resident from gaseous effluents. The estimated dose rate for sit boundary locations, the MEI, and the nearest resident is provided in Table 4-45 (former 4-27). The guidance in Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other than Power Reactors" (NRC, 1996), is followed to determine compliance with dose limits to members of the public. Compliance with the dose limits to the members of the public is reported to the NRC in the semi-annual effluent report as required by 10 CFR 40.65 "Effluent Monitoring Reporting Requirements"~~ (CFR, 2009f)~~.

Official Responses to Environmental Protection RAIs

EP-10. Section 9.2.2.1, Effluent Discharge Locations – Please identify the locations of airborne effluent discharges and monitoring. Also identify contributing sources, if any, for discharge points.

Section 9.4.3.2.2(1)(c) of the SRP, NUREG-1520, addresses Effluent Discharge Locations for effluent monitoring.

RESPONSE: The subject paragraph from LA Section 9.2.2.1 will be revised to locate the airborne discharges and contributing sources for discharge points. See also RAI EP-4.

License Documentation Impact: Section 9.2.2.1, "Effluent Discharge Locations" of the LA Revision A will be revised as follows:

There will be two types of airborne effluent discharges from the IIFP site – stack effluent discharges and roof exhaust fan discharges. The locations of stack effluent discharges are illustrated in the plot plan, "Modified Site Features with Sampling Stations and Monitoring Locations" (Figure 6-1) of the IIFP FEP/DUP ER. Roof exhaust fans are located on buildings which house areas where uranium is processed or handled. Both discharge types will be monitored as described in Section 6.1.1.1 of the ER.

There are fourteen (14) stacks involving contributing sources in the airborne effluent discharge locations. Two sources contribute to the effluent from the FEP Dust Collector Stack (number 03) -- one each from the SiF_4 and BF_3 process systems. The process off-gas from the DUF_4, SiF_4 and BF_3 are all scrubbed in the three-stage (in series) equipment of the Plant KOH Scrubbing System. The treated gas from the last stage of the scrubbers exits the Plant KOH Scrubbing System Stack (number 01).

~~The IIFP ER Chapter 6 (IIFP, 2009) addresses the estimated locations of the airborne effluent discharges and monitoring estimated locations for the site.~~ Liquid plant effluents are maintained on the IIFP site and there is no discharge of process wastewater. Liquid effluent monitoring is described in ER Section 6.1.1.2.

Official Responses to Environmental Protection RAIs

EP-11. Section 9.2.2.1, Continuous Sampling Airborne Effluents – Briefly summarize relevant portions of ER Chapter 6 that are referenced. Please define (quantify) what is meant by "significant" regarding increases in radiation levels that would trigger additional analyses. Also, please summarize (briefly) the purpose of the Effluent Monitoring Program (EMP), and provide a more specific reference to subchapters within ER Chapter 6 where the EMP is discussed.

Section 9.4.3.2.2(1)(d) of the SRP, NUREG-1520, addresses Continuous Sampling Airborne Effluents for effluent monitoring under the Radiation Protection Program under 10 CFR 20. 1101.

RESPONSE: A 25% increase in radiation levels would be indicative of a significant increase in radiation levels to trigger additional analysis. The purpose of the effluent monitoring program will be briefly described and a reference to the location of the REMP discussion in Section 6.1.1 of the ER will be added to the subject paragraph. .

License Documentation Impact: Section 9.2.2.1, "Continuous Sampling Airborne Effluents" will be revised as follows:

The IIFP ER Chapter 6 addresses the Effluent Monitoring Program (EMP) (IIFP, 2009c). The purpose of the Effluent Monitoring Program (EMP) is to ensure that surveys are performed as necessary to demonstrate compliance with regulations and to demonstrate that the amount of radioactive material present in the facility effluent remains ALARA. The REMP is discussed in Section 6.1.1 of the IIFP FEP/DUP ER.

The effluent stacks, where licensed materials are involved, are sampled continuously and ~~is~~ routinely analyzed to measure radioactivity of the exhaust air. The collection filters in the sample systems are removed periodically and analyzed for gross alpha and beta activity. The filters are composited periodically and an isotopic analysis is performed. Radiological analyses are performed on ventilation air filters if there is a ~~significant~~ 25% increase in gross radioactivity, or when a process change or other circumstances cause significant changes in radioactivity concentrations.

Official Responses to Environmental Protection RAIs

EP-12. Section 9.2.2.1, Sample Collection and Analysis – Please clarify what is meant by the term "appropriate" sample collection and analysis methods and frequencies for the effluent medium and indicate the radionuclides sampled. Provide a brief summary of the EMP that addresses sample collection and analysis and frequencies.

Section 9.4.3.2.2(1)(e) of the SRP, NUREG-1520, addresses Sample Collection and Analysis for effluent monitoring.

RESPONSE: Sample collection and analysis methods and frequencies for the effluent medium will be performed in accordance with Regulatory Guide 4.15 "Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment" and Regulatory Guide 4.16, "Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluent from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants."

Section 6.1.1 of the FEP/DUP ER describes the Effluent Monitoring Program. Section 6.1 of the IIFP FEP/DUP ER (IIFP, 2009a) describes the proposed sampling and monitoring locations for gases effluents and liquid effluents. The subject subsection will be modified to include a summary.

License Documentation Impact: LA Revision A Section 9.2.2.1, subheading "Sample Collection and Analysis" will be revised as follows:

The EMP establishes ~~appropriate~~ sample collection and analysis methods and frequencies for the effluent medium and the radionuclide(s) sampled. Sample collection and analysis methods and frequencies for the effluent medium will be performed in accordance with Regulatory Guide 4.15 "Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment" and Regulatory Guide 4.16, "Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluent from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants." Sampling methods ensure that representative samples are obtained using appropriate sampling equipment and sample collection and storage procedures. Monitoring instruments are calibrated at least annually or more frequently if suggested by the manufacturer. IIFP ensures that sampling equipment (pumps, pressure gages, and air flow calibrators) are calibrated by qualified individuals. Sampling equipment and lines are inspected for defects, obstructions, and cleanliness as part of the plant preventive maintenance procedures.

Section 6.1.1 of the FEP/DUP ER describes the Effluent Monitoring Program. Section 6.1 of the IIFP FEP/DUP ER (IIFP, 2009a) describes the proposed sampling and monitoring locations for gases effluents and liquid effluents. Figure 6-1 of the IIFP FEP/DUP ER (IIFP, 2009a), "Modified Site Features with Sampling Stations and Monitoring Locations," indicates the locations of the environmental sampling stations and monitoring locations. Further, Section 6.1.1 of the ER describes the sampling media, frequency, and analysis types to be performed.

Official Responses to Environmental Protection RAIs

EP-13. Section 9.2.2.1, Radionuclide-Specific Analysis – Specify that plant preventive maintenance procedures will be maintained onsite and implemented. Specify where monitoring reports are discussed. Alternatively, briefly summarize what is meant by the term, summary reports. Also, in the second paragraph, clarify what is meant by "a significant increase" in gross radioactivity. Briefly summarize relevant portions of ER Chapter 6.1.1.

Section 9.4.3.2.2(1)(f) of the SRP, NUREG-1520, addresses Radionuclide-Specific Analysis for effluent monitoring.

RESPONSE: Facility preventive maintenance procedures will be specified to be maintained onsite and implemented. Section 9.2.2.1, "Radionuclide-Specific Analysis" will be revised as indicated in the License Documentation Impact below.

Monitoring reports are discussed in Section 9.2.2.1, "Reporting Procedures."

A 50% increase in gross radioactivity will indicate "a significant increase" in gross radioactivity Section 9.2.2.1, "Radionuclide-Specific Analysis" will be revised to add this clarification and to briefly summarize gaseous effluents.

A brief summary of relevant ER Chapter 6, Section 6.1.1 will be added to subsection "Radionuclide Specific Analysis."

License Documentation Impact: License Application, Section 9.2.2.1, "Radionuclide-Specific Analysis" will be revised as indicated below:

Radionuclide-Specific Analysis

Radionuclide-specific analyses are performed on selected composited samples as indicated in Chapter 6.1.1 of the IIFP ER (IIFP, 2009a). Because uranium in gaseous effluent may exist in a variety of compounds (e.g., UF_6, uranium oxide, UF_4, and UO_2F_2), effluent data is maintained, reviewed, and assessed by the facility's Radiation Protection Manager to assure that gaseous effluent discharges comply with regulatory release criteria for uranium. The Effluent Monitoring Program falls under the oversight of the IIFP Radiation Safety Program. Section 6.1.1 addresses the Effluent Monitoring Program. As a matter of compliance with regulatory requirements, potentially radioactive effluent from the facility is discharged only through monitored pathways. The effluent sampling program for the IIFP facility is designed to determine the quantities and concentrations of radionuclides discharged to the environment. Uranium isotopes and daughter products are expected to be the prominent radionuclides in the gaseous effluent. Process stacks and air vents are (1) sampled continuously through the use of air filters and analyzed for gross alpha/beta and isotopic and (2) analyzed weekly with additional quarterly composite analysis.

Facility preventive maintenance procedures will be specified to be maintained onsite and implemented. These preventive maintenance procedures, and the associated configuration management for these procedures, are described in LA subsection 11.2.2.

Monitoring reports, which include the quantities of individual radionuclide(s) estimated on the basis of methods other than direct measurement, include an explanation and justification of how the results were obtained. Monitoring reports are discussed in Section 9.2.2.1, "Reporting Procedures."

Official Responses to Environmental Protection RAIs

Radionuclide analysis may be performed more frequently at the beginning of the monitoring program until a predictable and consistent composition is established. Likewise, the analysis frequency may be increased when there is a ~~significant~~ 50% increase in gross radioactivity in effluents or a process change or other circumstance that might cause a significant variation in the radionuclide composition.

Official Responses to Environmental Protection RAIs

EP-14. Section 9.2.2.1, Minimum Detectable Concentrations – Please provide a more specific reference to subchapters within ER Chapter 6. Provide a summary of relevant portions of Chapter 6 that are referenced.

Section 9.4.3.2.2(1)(g) of the SRP, NUREG-1520, addresses Minimum Detectable Concentrations for effluent monitoring for concentrations in 10 CFR 20, Appendix B.

RESPONSE: LA Section 9.2.2.1 will be revised to provide a reference to the subchapters within ER Chapter 6 which addresses minimum detectable concentrations for effluent monitoring.

License Documentation Impact: LA Section 9.2.2.1, subheading "Minimum Detectable Concentrations" will be revised as follows:

~~ER Chapter 6 (HFP, 2009) presents the required minimum detectable concentration (MDC) for gross alpha analyses performed on gaseous effluent samples.~~ER Chapter 6.1.1.1 describes the gaseous effluent monitoring requirements for the facility. A minimum detectable concentration (MDC) of at least 3.7×10^{-11} Bq/ml (1.0×10^{-15} µ-Ci/ml) will be required for all gross alpha analyses performed on gaseous effluent samples.

Official Responses to Environmental Protection RAIs

EP-15. Section 9.2.2.1, Action Levels – Please identify the specific action levels. Also, identify any steps involving effluent monitoring that would be taken before shutdown.

Section 9.4.3.2.2(1)(i) of the SRP, NUREG-1520, addresses Action Levels for effluent monitoring.

RESPONSE: Specific action levels will be set at 50% of the 10 CFR 20 Appendix B Table 2 values.

License Documentation Impact: Section 9.2.2.1, "Action Levels" will be revised as indicated below:

Administrative action levels are established for effluent samples and monitoring instrumentation as an additional step in the effluent control process. All action levels are sufficiently low so as to permit implementation of corrective actions before regulatory limits are exceeded. Action levels will be set at 50% of the 10 CFR 20 Appendix B Table 2 values. Effluent samples that exceed the action level are cause for an investigation into the source of elevated radioactivity. Processes are designed to include, when practical, provision for automatic shutdown in the event action levels are exceeded.

Official Responses to Environmental Protection RAIs

EP-16. Section 9.2.2.1, Federal and State Standards for Discharges – Please define the term, "air-contaminant source." Also, provide a specific reference to the ER subchapter that provides the status of all Federal, State, and local requirements.

Section 9.4.3.2.2(1)(j) of the SRP, NUREG-1520, addresses Federal and State Standards for Discharges for effluent monitoring.

RESPONSE: Air-contaminant source means any building, structure, or facility, or combination thereof, which emits or is capable of emitting air contaminants to the atmosphere that are regulated by Federal, State and local requirements.

License Documentation Impact: The definition of air-contaminant source and the specific reference to the ER Section that provides status of all Federal, State and local requirements will be included as a revision in the IIFP License Application Section 9.2.2.1 under "Federal and State Standards for Discharges" to read as follows:

New Mexico Statutes Annotated (NMSA), Chapter 74, "Environmental Improvement," Article 2, "Air Pollution," (NMSA, 2009a) and implementing regulations in the New Mexico Administrative Code (NMAC) Title 20, "Environmental Protection," Chapter 2, "Air Quality," (NMAC, 2009a) establishes air-quality standards and permit requirements prior to construction or modification of an air-contaminant source. IIFP defines an air-contaminant source as any building, structure, or facility, or combination thereof, which emits or is capable of emitting air contaminants to the atmosphere that are regulated by Federal, State and local requirements. These regulations also define requirements for an operating permit for major producers of air pollutants and impose emission standards for hazardous air pollutants. Accordingly, IIFP will file applications and obtain appropriate air construction and operating permits, where applicable. The IIFP Environmental Report Section 1.4 addresses applicable regulatory requirements and status.

Official Responses to Environmental Protection RAIs

EP-17. Section 9.2.2.1, Waste Management Procedures – If possible, specify the Low Level Waste disposal site that may be used. Please provide a reference, include any figures, to the plant description in the LA or ER that contains the waste management facilities, as discussed in paragraph 2 of this section.

Section 9.4.3.2.2(1)(n) of the SRP, NUREG-1520, addresses Waste Management Procedures for effluent monitoring.

RESPONSE: Final selection of a low level waste (LLW) disposal site has not been made.; however, Table 4-4 of the IIFP FEP/DUP ER (IIFP, 2009a) identifies transportation radiological data for three possible licensed LLW disposal destinations (1) Energy Solutions in Clive, Utah, (2) WCS, a Texas facility just inside the Texas border near Eunice, New Mexico, and (3) GTS Duratek in Oak Ridge, Tennessee. Discussions have been conducted with Energy Solutions relative to disposal and acceptance criteria of the uranium oxide waste that is a byproduct of the IIFP Fluorine Extraction Process (FEP). Currently, the Energy Solutions disposal facility at Clive, Utah is a licensed and acceptable facility for disposal of the uranium oxide and other LLW waste. The WCS Texas facility is expected to also be available to accept LLW and uranium oxide by the time the IIFP Facility becomes operational.

Additional information about the waste management facilities and descriptions is provided below as amendments to the Section 9.2.2.1, "Waste Management Procedures." Some of the building descriptions being added to Section 9.2.2.1 are also being revised in response to the Request for Additional Information (RAI) General Information (GI)-6.B. In addition, Table 1-2 in the License Application, "Building IIFP FEP/DUP Facility Building Sizes" referenced in Section 9.2.2.1, "Waste Management Procedures" was revised in response to RAI GI-6B to include updated building sizes.

Table 1-3 in the License Application, "Estimated Annual Quantities of Waste Generated at the IIFP Facility" as referenced in Section 9.2.2.1, "Waste Management Procedures" will be revised to include updated information.

License Documentation Impact: Subsection 9.2.2.1, Waste Management Procedures," paragraph two will be revised, the section will be expanded and paragraph three will be deleted. The subsection will read as follows:

Waste Management Procedures

Solid waste management facilities with sufficient capability to enable preparation, packaging, storage, and transfers to licensed disposal sites in accordance with the regulations, are incorporated into the IIFP Facility design and are maintained in proper operating condition as required to support the operation of the facility. Waste management procedures and processes are performed in various buildings and areas of the IIFP Facility depending on the locations and characteristics of the waste stream. The main buildings involved are the FEP Process Building, FEP Oxide Staging Building, Decontamination Building, Environmental Protection Process (EPP) Building and the Material Warehouse. These major buildings and areas are either described below or references to other Sections of the IIFP License Application are provided for more specific descriptions.

The locations of the buildings and areas discussed below are shown in the IIFP License Application, General Information, Figure 1-5. A larger and more legible site drawing showing the subject buildings and locations is provided as Drawing 100-C-0001, Revision E, and is part of the engineering drawing package provided to the NRC as separate document files of the IIFP License

Application. The subject building sizes are provided in Table 1-2. Chapter 1 General Information of the License Application

Table 1-3, Chapter 1, General Information of the License Application shows the estimated annual quantity of waste generated at the IIFP Facility. The largest amount of solid waste generated is the depleted uranium oxide that is a byproduct of the FEP process. This waste is managed using the equipment and facilities of the FEP Process Building and the FEP Oxide Staging Building. The depleted uranium oxide from the FEP process is collected in the oxide storage hopper for temporary storage until it is packaged for shipment. The depleted uranium oxide byproduct is filled into Department of Transportation approved drums (or other approved transport containers). The depleted oxide is filled into the packaging container using an enclosed filling (drum off) station located in the FEP Process Building. The oxide hoppers and the drum-off stations are located on the first level of the building. The filling station enclosure is connected to the FEP oxide dust collection system to provide negative pressure in the enclosed filling station to contain and capture dust during the filling process. After filling, the uranium oxide shipping containers are then checked, labeled and staged temporarily in the FEP Oxide Staging Building for scheduled loading and shipment by trailer truck to a licensed disposal site. The FEP Oxide Staging Building is adjacent to, and on the east-side of the FEP Process Building. The wall between the FEP Oxide Staging Building and the FEP Process Building is a fire barrier. This building is a two level building with a reinforced concrete floor on the first level with containment-type curbing. It is used for staging of oxide waste containers for loading into truck trailers and transporting to an off-site licensed waste disposal facility. Equipment in the building consists of weighing equipment, electrical and instrumentation monitoring and alarm panels and controls, exhaust hood systems, piping and ductwork connections to the primary dust collector system.

The Decontamination Building serves as a facility with equipment to manage Low-Level Contaminated Waste (LLW) other than the depleted uranium oxide waste. The Decontamination Building is located adjacent to, and on the north side of the DUF_4 Process Building. The construction provides for a fire barrier between the Decontamination Building and the DUF_4 Process Building. This building is used for decontamination of equipment for maintenance and for handling and preparing LLW for shipments. The Decontamination Building contains an equipment cleaning booth and hood system, equipment for sorting and packaging LLW and mixed dry solid waste, loading station, weighing scales, drying equipment, primary and secondary dust collector system in series, contaminated-water holding tanks, primary and polishing filters, associated pumps, piping, field equipment instrumentation panels, ion exchange columns and associated controls and backwash systems.

Radioactive waste, including dust collector bags, ion exchange resin, crushed-contaminated drums, contaminated trash, contaminated and carbon-bed trap material are collected in labeled containers in each Restricted Area and transferred to a temporary radioactive waste storage area located in the Decontamination Building. In this area LLW is sorted, if needed, prepared, packaged, and surveyed. Suitable waste is volume-reduced using compaction equipment, if feasible. The LLW is loaded and transported for disposal at an off-site licensed LLW disposal facility.

Also in the Decontamination Building, relatively small volumes of miscellaneous waste liquors, that have potential to contain depleted uranium, are concentrated, filtered and treated to remove the depleted uranium from liquid steams. Depleted uranium removed from liquid streams is collected, dried for volume reduction and to meet acceptance criteria and sent to an off-site

licensed low-level-waste disposal site along with the waste depleted uranium oxides produced by the de-conversion processes.

The EPP Building and adjacent area is used to treat and manage fluoride-bearing waste liquors. The design of the IIFP Facility includes equipment to regenerate spent potassium hydroxide (KOH) solutions that can be reused and recycled in the Plant KOH Scrubbing System. This design and operation eliminates the need to otherwise discharge the flow as treated wastewater and also conserves the use of the treating agent and saves cost. Also, aqueous waste solutions that are not licensed material but contain fluoride or trace metals are treated in the EPP.

The treatment of fluoride-bearing liquors results in a solid particulate calcium fluoride (CaF_2) which may be sold as a raw material for use in the fluorine chemical industry. Converting the fluoride in the subject liquors to a solid is the means by which fluoride wastes are managed with potential use as a resource in other industrial markets. The treatment process, preparation and packaging procedures for the CaF_2 are conducted in the Environmental Protection Process (EPP) Building. In this area, the CaF_2 is filtered from the process and dried for shipment to customers, where there is a demand, or shipped to an off-site Resource Conservation and Recovery Act (RCRA) permitted disposal site if there is no feasible market demand. The EPP Building and equipment is described in the IIFP License Application Section 1.1.2.1 and in the Integrated Safety Analysis (ISA) Summary Section.3.1.8.

The Material Warehouse is located just northeast of the Process Offices and Laboratory Building. This warehouse is used to receive and store such items as piping components, electrical conduit, wiring, equipment for capital construction projects and spare parts. Small quantities of chemicals such as paints, oils, and cleaning agents may be stored in the warehouse. No licensed materials are stored in this building.

Part of the Material Warehouse is used for managing non-radioactive waste. Designated areas inside the Material Warehouse and some collection containers on the adjacent outside curbed concrete pads are used to collect, sort, package, if necessary, and load non-radioactive waste. This waste has been segregated and surveyed to be determined as non-radioactive prior to moving to the Material Warehouse area. Waste sent to this area must be approved for release to licensed commercial disposal or recycling. This waste includes industrial sanitary wastes, such as cardboard, paper, wood, scrap metal, etc. Some of these wastes, such as cardboard, paper, and metal may be shipped to off-site facilities for recycle or minimization, and, then sent, if required, to an off-site licensed waste disposal facility.

One area in the warehouse is designated for these type wastes. Another area in the warehouse is set aside to manage small quantities of Resource Conservation and Recovery Act (RCRA) waste that is not otherwise handled at the EPP. The RCRA waste is packaged, labeled, manifest and loaded for shipment. A permitted transport contractor is used to transport the waste to a permitted RCRA facility for disposal.

~~Descriptions of the proposed IIFP waste management systems are provided in the IIFP Chapter 3.~~

License Documentation Impact: Table 1-3 in Section 1.1.6.1 of the License Application, "Estimated Annual Quantities of Waste Generated at the IIFP Facility" as referenced in Section 9.2.2.1, "Waste Management Procedures" above will be revised to include updated quantities.

Official Responses to Environmental Protection RAIs

Table 1-3 Estimated Annual Quantities of Waste Generated at the IIFP Facility

Material	Estimated Annual Amount (lb)
Depleted uranium oxide	2,800,000-~~6,000,000~~6,200,000
Other process LLW	~~42,000-68,000~~ 85,650-137,300
~~Misc., LLW~~	~~35,000-55,000~~
RCRA	~~32,300-361,500*~~ 203,200-308,400*
Industrial waste including sanitary waste	~~71,000-108,500~~ 60,650-91,300

*Includes Calcium Fluoride which may not be RCRA Waste if sold.

Official Responses to Environmental Protection RAIs

EP-18. Section 9.2.2.2, Environmental Monitoring - Environmental Monitoring is mislabeled as merely being one of several topics under Section 9.2.2.1, Effluent Monitoring. Instead, Environmental Monitoring should be identified separately as the second subsection under Section 9.2.2, Effluent and Environmental Controls and Monitoring. Because Environmental Monitoring is the second part of Section 9.2.2, it should be numbered separately as Subsection 9.2.2.2.

Section 9.4.3.2.2(2) of the SRP, NUREG-1520, addresses Environmental Monitoring.

RESPONSE: The referenced subsection will be removed from Section 9.2.2.1, Effluent Monitoring as described below.

License Documentation Impact: The following subsection "Environmental Monitoring" will be renumbered and moved from Section 9.2.2.1, "Effluent Monitoring" to a new section 9.2.2.2 Environmental Monitoring. This impact is described in response to RAI EP-19.

Official Responses to Environmental Protection RAIs

EP-19. Section 9.2.2.2, Environmental Monitoring – As noted above, Section 9.2.2.2 should have been the location within the LA to describe Environmental Monitoring. LA Section 9.2.2.1, Effluent Monitoring, identifies 14 topics related to the effluent monitoring acceptance criteria. The acceptance criteria closely track the topic headings identified in Section 9.4.3.2.2(1) of the SRP, (NUREG-1520). However, Environmental Monitoring, which should have been numbered as LA Section 9.2.2.2, did not identify the 9 SRP topics related to the environmental monitoring acceptance criteria. LA Section 9.2.2.2 only identified two SRP topics in a very brief and conclusory manner. These two topics only touch lightly on a few of the remaining (missing) topics. Provide additional discussion to address all of the nine SRP topics and provide additional specific cross-referencing.

Environmental Monitoring acceptance criteria in Section 9.4.3.2.2(2) of the SRP (NUREG-1520), which are labeled as being (a) through (i), address the specific information needed in the Effluent Monitoring section of the LA, as discussed above. Provide a brief summary for each of these, as well as a cross-reference to the appropriate LA or ER subsections or subchapters that provide the needed additional detail. Note that it appears that some criteria are not addressed at all (e.g., (d) analytical methods and instrumentation, maintenance and calibration program, (e) action levels and actions to be taken, (f) identify MDCs for Environmental Monitoring that are at least as low as those for Effluent Monitoring for air and water (g) data analysis methods and criteria, and (i) adequacy of environmental data to assess impacts from any releases identified in the ISA). Please provide this missing information.
Section 9.4.3.2.2(2) of the SRP, NUREG-1520, addresses Environmental Monitoring under 10 CFR 20.

RESPONSE: A new section 9.2.2.2, "Environmental Monitoring" will be added to include the information moved from the previous section, 9.2.2.1, Effluent Monitoring subheading "Environmental Monitoring". This section will be revised and expanded to address all 9 SRP topics identified in Section 9.4.3.2.2(2) of the SRP (NUREG-1520).

License Documentation Impact: The following License Application, Section 9.2.2.2, "Environmental Monitoring," will be renumbered, revised and expanded as described below.

~~**Environmental Monitoring**~~

9.2.2.2 Environmental Monitoring

The following sections address the acceptance criteria related to environmental monitoring.

Background and Baseline Measurements

The Radiological Environmental Monitoring Program (REMP) at the IIFP Facility establishes a process for collecting data for assessing radiological impacts on the environs. The REMP includes the collection of data during pre-operational years in order to establish baseline radiological information that will be used in determining and evaluating impacts from operations at the plant on the local environment. The REMP will be initiated at least 12 months prior to facility operations in order to develop a sufficient database. Prior to facility operations, ~~soil and groundwater~~ samples will be collected from the site and analyzed to determine a baseline to be used in evaluating changes in potential environmental conditions caused by facility operations. Vegetation and soil samples, both from on and off-site locations will be collected on a quarterly basis in each sector during the pre-operational REMP. The REMP is described in the IIFP ER

Section 6.1.2, "Radiological Environmental Monitoring Program". Air and water samples will be collected from remote locations in order to provide background data during operations.

Monitoring

The REMP Sampling Program is described in the IIFP ER Section 6.1.2.1. The following sections describe the types of monitoring to be performed.

~~The EMP (IIFP, 2009c) at the IIFP facility is a major part of the effluent compliance program. It provides a supplementary check of containment and effluent controls, establishes a process for collecting data for assessing radiological impacts on the environs and estimating the potential impacts on the public, and supports the demonstration of compliance with applicable radiation protection standards and guidelines. The types and frequency of sampling and analyses are summarized in the IIFP ER Chapter 6.1, Radiological Environmental Monitoring Program. Environmental media identified for sampling consist of ambient air, groundwater, soil/sediment, direct radiation, and vegetation.~~

Direct Radiation Monitoring

Direct radiation monitoring of the stored DUF_6 cylinders will be accomplished by use of environmental thermoluminescent dosimeters (TLDs) placed at the facility perimeter fence line or other location(s) close to the DUF_6 cylinders.

Air Monitoring

Air samples will be collected at locations that are close to the facility that would provide the best opportunity to detect and identify facility-related radioactivity in the ambient air. Air monitoring stations will be situated along the fence perimeter, next to the Stormwater Retention Basins, nearest resident, and "control comparative" location. The control sample location will be established beyond 5 km (5 mi) in an upwind sector. Air samplers will operate on a continuous basis.

Vegetation and Soil

Vegetation and soil samples, both from on and off-site locations will be collected in five different sectors. Vegetation samples may include vegetables and grass, depending on availability. Soil samples will be collected in the same vicinity as the vegetation samples.

Groundwater

Groundwater samples from monitoring wells will be collected. Two wells will be located down gradient to the facility of which one well will be located on the southeast side of the Full DUF_6 Cylinder Storage Pad. Up to four up gradient wells may be needed along the east and northeast side of the IIFP Facility.

Sediment

Sediment samples will be collected from the stormwater runoff retention basis on site to monitor for any buildup of uranic material being deposited.

Official Responses to Environmental Protection RAIs

Stormwater

Stormwater samples will be collected from the site Stormwater Retention Basin and the DUF_6 cylinder storage pads.

Sampling Locations and Frequencies

Table 6-2 of the IIFP ER summarizes the sampling locations, frequencies, and type of analysis to be performed for each Sample Type described previously. Section 6.1 of the IIFP ER lists the proposed sampling and monitoring locations for environmental sampling. The exact locations will be finalized with the completion of final site design.

Monitoring Procedures

Monitoring procedures will employ well-known acceptable analytical methods and instrumentation. The instrument maintenance and calibration program will be appropriate to the given instrumentation, in accordance with manufacturers' recommendations.

IIFP will ensure that the on-site laboratory and any contractor laboratory used to analyze IIFP samples participates in third-party laboratory intercomparison programs appropriate to the media and analytes being measured. IIFP will require that all radiological and non-radiological laboratory vendors are certified by the National Environmental Laboratory Accreditation Program (NELAP) or an equivalent state laboratory accreditation agency for the analytes being tested.

Action Levels

Action levels will be established to identify concentrations at which an investigation will be performed, as well as levels at which process operations would be shut down. Action Levels for vegetation, soil, groundwater, sediment, and stormwater samples will initially be set at twice background. Action levels for direct radiation monitoring samples will initially be set at 10% of the 10 CFR 20 dose limits to the public. Action levels for air monitoring will initially be set at 1% of the 10 CFR 20 Appendix B values. Action levels will be reviewed and adjusted annually as necessary.

Minimum Detectable Concentration

Minimum Detectable Concentrations (MDCs) will be specified for sample analysis on the basis of the action levels. The MDCs will at least as low as those selected for effluent monitoring in air, 3.7×10^{-11} Bq/ml (1.0×10^{-15} µ Ci/ml).

Data Analysis

As specified in approved written procedures, data analysis methods and criteria used in evaluating and reporting the environmental sampling results will be appropriate and indicate when an action level is being approached in time to take corrective actions.

Status of Licenses, Permits and Approvals

Official Responses to Environmental Protection RAIs

The federal, state, and local requirements for environmental monitoring are followed in accordance with the licenses and permits described in LA Section 9.2.2.1, "Federal and State Standards for Discharges."

Monitoring for "High" and "Intermediate" Consequence Accidents

The ISA did not identify any accidents that resulted in "High" or "Intermediate" consequences with respect to environmental impact. However, the environmental monitoring will be adequate for assessing impacts to the environment from potential radioactive and non-radioactive releases.

Official Responses to Environmental Protection RAIs

EP-20. Section 9.2.3, Integrated Safety Analysis (ISA) – Clarify whether the IROFS also address the consequences of accidental releases on the environment outside the site boundary. Briefly summarize accidents that could impact the members of the public located outside the facility boundary and any associated IROFS; provide appropriate specific references to the ISA.

Section 9.4.3.2.3 of the SRP (NUREG-1520) addresses environmental protection in the ISA.

RESPONSE: Accident sequences that could result in radiological or non-radiological releases to the environment are described in ISA Section 3, "Processes, Hazards, and Accident Sequences. Demonstration of compliance is provided in Section 4 of the ISA Summary. Section 5 of the ISA Summary details the Process Hazard Analysis Methodology.

Table 5-10, "Risk Matrix and Risk Index Values" in the ISA Summary depicts the matrix for the Severity of Consequences and Likelihood of Occurrences. Consequence categories are determined for environmental exposure by comparison of the 24-hour averaged release of radioactive materials outside the restricted area to 5000 times the values in Table 2 of Appendix B to CFR Part 20. If an accidental release results in concentrations exceeding this metric, the accident is assigned a consequence category of intermediate. If the likelihood category of the accident is greater than 2 (not unlikely), then IROFS would be assigned to lower the Risk Index to 4 or less.

There were no accident sequences identified which resulted in concentrations exceeding the environmental performance metric therefore, no IROFS were designated for accidental releases on the environment outside the site boundary.

ISA Summary Section 9.2.3 will be revised as shown below.

License Documentation Impact: Section 9.2.3 of the IIFP License Application, Revision A will be revised to read as follows.

IIFP has prepared an ISA (IIFP, 2009d) in accordance with 10 CFR 70.62, "Safety Program and Integrated Safety Analysis" (CFR, 2009f), which includes the evaluation of high and intermediate consequence events involving releases of radioactive material to the environment. ~~The ISA process is described in detail in LA Chapter 3, Integrated Safety Analysis, and the ISA details and results are provided as the IIFP ISA Summary.~~ Accident sequences that could result in radiological or non-radiological releases to the environment are described in ISA Section 3, "Processes, Hazards, and Accident Sequences. Demonstration of compliance provided in Section 4 of the ISA Summary. Section 5 of the ISA Summary details the Process Hazard Analysis Methodology.

Table 5-10, "Risk Matrix and Risk Index Values" in the ISA Summary depicts the matrix for the Severity of Consequences and Likelihood of Occurrences. IROFS are established for any accident for which the Risk Index is greater than 4. Consequence categories are determined for environmental exposure by comparison of the 24-hour averaged release of radioactive materials outside the restricted area to 5000 times the values in Table 2 of Appendix B to CFR Part 20. If an accidental release results in concentrations exceeding this metric, the accident is assigned a consequence category of intermediate. If the likelihood category of the accident is greater than 2 (not unlikely), then IROFS would be assigned to lower the Risk Index to 4 or less.

Official Responses to Environmental Protection RAIs

There were no accident sequences identified which resulted in concentrations exceeding the environmental performance metric therefore, no IROFS were designated for accidental releases on the environment outside the site boundary.