Emission Unit ID: 361

300 EP-325-01-S

EP-325-01-S

This is a MAJOR, ACTIVELY ventilated emission unit.

325 Building Radiological Processing Laboratory

Emission Unit Information

Stack Height: 89.00 ft. 27.13 m. Stack Diameter 8.00 ft. 2.44 m.

Average Stack Effluent Temperature: 72 degrees Fahrenheit. 22 degrees Celsius.

Average Stack ExhaustVelocity: 47.10 ft/second. 14.36 m/second.

Abatement Technology ALARACT WAC 246-247-040(4)

state only enforceable: WAC 246-247-010(4), 040(5), 060(5)

Zone or Area	Abatement Technology	Required # of Units	Additional Description
	HEPA	2	2 in series
	Fan	3	4 in parallel (3 operational, 1 backup)

Monitoring Requirements

state enforceable: WAC 246-247-040(5), 060(5), and federally enforceable: 40 CFR 61 subpart H

Federal and State Regulatory	Monitoring and Testing Requirements	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(2)	Method 2 Appendix A; Appendix B, Method 114	Each radionuclide that could contribute greater than 10% of the potential TEDE	Particulates are continuously sampled and collected every two-weeks for gross alpha and gross beta analysis, and composited on a semi-annual basis and analyzed isotopically. Tritium samples are collected on a monthly basis for analysis.

Sampling Requirements Record Sample; tritium by silica gel

Additional Requirements

Additional monitoring or sampling requirements established by this License will be listed in the Conditions and Limitations section, if applicable.

Operational Status This 89 foot tall stack exhausts filtered building air. Emissions were sampled using a record particulate sampler and a tritium sampler. The building contains radiochemistry laboratories and hot cells used for research process development, mixed waste treatment activities, and radioanalytical services.

This Emission Unit has 1 active Notice(s) of Construction.

Project Title	Approval No	Date Approved	NOC_ID
Conducting General Laboratory Processes Research Activities in the 325 Building	AIR 06-646	7/5/2006	687

Conditions (state only enforceable)

1) The total abated emission limit for this Notice of Construction is limited to 3.19E+00 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)).

2) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.

Approved are the following laboratory activities conducted in the RPL:

- Characterizing chemical, radiochemical, and physical properties of samples (e.g., tank wastes, spent fuel,

contaminated soils and water), as well as other gaseous materials, glass, ceramic, carbonaceous, or metallic waste forms.
- Performing research using high-level and low-level mixed tank wastes and their stimulants to test radiochemical process systems such as leaching, solvent extraction, ion exchange, vitrification, fuel dissolution, decontamination, evaporation, grouting, solid waste packaging/shipment, and high-level liquid waste shipping/receiving/transportation.
- Performing research and development for processing and immobilization support including waste separation, ion exchange, sludge washing/leaching, ultrafiltration, and oxidation/precipitation. Separated species are then immobilized into vitreous and other waste forms, which are subsequently characterized for product acceptability.
- Using a full suite of analytical capabilities for radiochemical and inorganic chemical analyses in support of process development, specializing in the analysis of highly radioactive materials and very complex sample matrices.
- Pretreatment of materials in preparation for analytical processing, waste treatment, and characterization.
- Developing methods for the separation of radioisotopes.
- Developing and testing radioisotope generators.
- Conducting Non-destructive assay (NDA).
- Characterizing and testing equipment for determining chemical and physical properties of spent nuclear fuels and associated materials to support processing and disposal pathways.
- Performing reactor dosimetry and hydrogen and helium measurements to characterize radiation damage in materials.
- Using instrumentation to conduct physical property measurement for rheological and chemical characterization of radiological and hazardous materials in support of process development.
- Measuring material particle size and density, zeta potential and rheology in support of general research as well as process development.
- Providing chemical and physical separations in support of radiological and hazardous material processing and disposal requirements. These technologies include: removal and concentration of hazardous and/or radioactive components for environmental remediation; separation of hazardous and/or radioactive materials, including solid/liquid phase separations; and, recovery of specific components for recycle and reuse.
- Characterizing complex reactor environments, including neutron fluence and spectral measurements, hydrogen and helium gas measurements, and extensive computer simulations of radiation damage effects.
- Developing thermal and vitrification processes to immobilize hazardous and radioactive materials into acceptable waste forms. Waste processing technology development includes design, process development, remote operations, and numerical and computational modeling.
- Performing nuclear magnetic resonance methods designed for investigation of radioactive materials in the environment, radioactive tank waste, plutonium bearing materials, and other DOE mission active areas as well as fundamental studies of actinide metal salts.
- Designing, installing, and testing radiochemical process systems (leaching, solvent extraction, ion exchange, vitrification, fuel dissolution, decontamination, evaporation, grouting, solid waste packaging and shipment, and high-level liquid waste shipping, receiving, and transportation).
- Using thermoanalytical instrumentation to measure reaction enthalpies, reaction kinetics and mass changes resulting from reactions, and determining the thermal sensitivity of the reaction.
- Perform analysis of reaction off-gases on a real-time or end-of-reaction basis to identify and quantify the gaseous reaction products, and investigate the thermal stabilities of candidate radioisotope waste forms, volatile radioisotope trapping materials and the potentially hazardous reactions between radioactive waste constituents.
- Separations and analyses of radionuclides for environmental measurements.
- Performing research with supercritical fluids to understand chemistry mechanisms and processes.
- Conducting wet chemistry techniques and the operation of specialized analytical instrumentation such as mass spectrometers, organic mass spectrometers, and the Inductively Coupled Plasma Spectrometers.
- Studies to decontaminate radioactive materials where metals may be hydrided or tritated and decontaminated in small electric furnaces in gloveboxes or fumehoods resulting in products (e.g., oxide materials) submitted for disposal.
- Research and development in processing and method to harden radioactive sources.
- Development of standards and testing methodologies for hardened radioactive sources.
- Analysis of samples for impurities and analysis of samples for purity.

The RPL also is approved to maintain two hot cell complexes for conducting work with highly radioactive

materials. The High Level Radiochemistry Facility (HLRF) and Shielded Analytical Laboratory (SAL) hot cell complexes, and the stand alone mini-cells, provide unique, complimentary capabilities for conducting bench-scale to pilot-scale work with wide varieties and forms of radioactive materials. These capabilities include: radiochemical separation and purification; irradiated fuel/target sectioning and processing; metallography and ceramography; activated metals physical properties testing; thermal processing; materials physical properties testing (solid/liquid separation, centrifugation, settling behavior); radioanalytical and preparatory chemistry operations (acid dissolution, aqueous/solvent extraction or leaching, distillation, ion exchange, caustic fusion).

Additional approval of the process for this activity is contained in the following Conditions/Limitations.

3) The PTE for this project as determined under WAC 246-247-030(21)(a-e) [as specified in the application] is 2.09E+04 mrem/year. Approved are the associated potential release rates (Curies/year) of:

Ac - 225		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ac - 227		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ac - 228		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 108		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 108 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 109 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 110		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 110 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Ag - 111		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Al - 26		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Al - 28		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Am - 241	3.50E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Am - 242		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Am - 242 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			
Am - 243	5.40E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Am - 245		Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.			

Ar - 37			Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ar - 39			Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ar - 41			Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ar - 42			Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

As - 74			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

As - 76			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

At - 217			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Au - 195			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Au - 198			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 131			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 133			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 133	m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 137	m	4.60E+04	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Ba - 139			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 140			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 141			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ba - 142			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Be - 10			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Be - 7			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bi - 207			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bi - 210			Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bi - 211 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bi - 212 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bi - 213 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bi - 214 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bk - 249 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Bk - 250 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Br - 82 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Br - 83 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Br - 84 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Br - 85 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

C - 11 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

C - 14 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

C - 14 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

C - 15 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ca - 41 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ca - 45 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ca - 47 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cd - 109 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cd - 113 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cd - 113 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cd - 115		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cd - 115 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ce - 139		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ce - 141		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ce - 142		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ce - 143		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ce - 144		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cf - 249		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cf - 250		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cf - 251		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cf - 252	1.20E-01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Cl - 36		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 241		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 242		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 243		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 244	1.00E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Cm - 245		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 246		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 247		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cm - 248		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Co - 56		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Co - 57		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Co - 58		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Co - 60	1.60E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Cr - 51		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cr - 55		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 131		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 134		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 134 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 135		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 136		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 137	1.70E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Cs - 138		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cs - 139		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Cu - 64		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Es - 254		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Eu - 150		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Eu - 152		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Eu - 152 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Eu - 154	2.00E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Eu - 155	4.90E+03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Eu - 156		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Eu - 157		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

F - 18		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Fe - 55		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Fe - 59		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Fr - 221		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Fr - 223		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ga - 67		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ga - 72		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Gd - 148		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Gd - 149		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Gd - 151		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Gd - 152		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Gd - 153		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ge - 68		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

H - 3	3.00E+03	Gas	WAC 246-247-030(21)(a)
H - 3	1.30E+05	Gas	WAC 246-247-030(21)(a)
H - 3		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Hf - 175		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Hf - 178		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Hf - 178 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Hf - 181		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Hf - 182 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Hg - 203 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ho - 166 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ho - 166 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 122 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 123 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 125 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 129 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 130 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 131 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 132 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 133 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 134 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

I - 135 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

In - 106 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

In - 113 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

In - 114 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

In - 114 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

In - 115 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

In - 115 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ir - 192 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

K - 40 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

K - 42 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 81 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 83 m Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 85 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 85 m Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 87 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 88 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 89 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Kr - 90 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

La - 138 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

La - 140 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

La - 141 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

La - 142 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Lu - 177 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Mg - 27 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Mn - 52 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Mn - 54 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Mn - 56 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Mo - 93 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Mo - 99 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

N - 13 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Na - 22 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Na - 24 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 91 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 91 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 92 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 93 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 94 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 95 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 95 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 97 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nb - 97 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nd - 144 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Nd - 147 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ni - 56 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ni - 59 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ni - 63 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ni - 65 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Np - 235 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Np - 236 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Np - 237 3.60E+00 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Np - 238 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Np - 239 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Np - 240 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Np - 240 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

O - 15 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

P - 32 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

P - 33 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pa - 231 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pa - 233 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pa - 234 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pa - 234 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pb - 209 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pb - 210 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pb - 211 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pb - 212 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pb - 214 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pd - 107 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pd - 109 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 145 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 146 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 147 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 148 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 148 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 149 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pm - 151 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 208 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 209 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 210 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 211 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 212 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 213 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 214 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 215 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 216 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Po - 218 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pr - 143 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pr - 144 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pr - 144 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pu - 234		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pu - 236		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pu - 237		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pu - 238	5.70E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 239	5.50E+01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 240	3.40E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 241	3.20E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 242	5.20E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Pu - 243		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Pu - 244		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ra - 223		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ra - 224		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ra - 225		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ra - 226		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ra - 228		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rb - 86		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rb - 87		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rb - 88		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rb - 89		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rb - 90		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rb - 90 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Re - 186		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Re - 187 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Re - 188 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rh - 102 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rh - 103 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rh - 105 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rh - 105 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rh - 106 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rn - 219 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rn - 220 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Rn - 222 Gas WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ru - 103 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ru - 105 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ru - 106 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ru - 97 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

S - 35 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sb - 124 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sb - 125 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sb - 126 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sb - 126 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sb - 127 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sc - 46		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sc - 47		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Se - 75		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Se - 79		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Si - 31		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sm - 145		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sm - 146		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sm - 147		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sm - 151	5.40E+04	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Sm - 153		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sm - 157		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 113		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 117 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 119 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 121 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 123		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 125		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sn - 126		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sr - 85		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sr - 89		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sr - 90	3.60E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Sr - 91		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Sr - 92		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ta - 179		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ta - 182		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ta - 183	1.70E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Tb - 160		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tc - 101		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tc - 95 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tc - 97		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tc - 97 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tc - 98		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tc - 99	1.80E+00	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Tc - 99 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 121		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 121 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 123		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 123 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 125 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 127		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 127 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 129		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 129 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 131 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 131 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 132 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 133 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 133 m Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Te - 134 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Th - 227 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Th - 228 7.40E-03 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Th - 229 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Th - 230 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Th - 231 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Th - 232 4.40E+00 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Th - 233 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Th - 234 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ti - 44 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Ti - 51 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tl - 204 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tl - 207 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tl - 208 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tl - 209 Liquid/Particulate Solid WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tm - 170		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Tm - 171		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

U - 232	5.50E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U - 233	1.30E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U - 234	1.40E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U - 235	3.10E+01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U - 236	1.40E-02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U - 237		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

U - 238	6.10E+01	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
U - 239		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

U - 240		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

V - 48		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

V - 49		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

W - 181		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

W - 185		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

W - 187		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

W - 188	1.70E+02	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Xe - 122		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 123		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 125		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 127		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 131 m		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 133		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 133 m		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 135		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 135 m		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 137		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Xe - 138		Gas	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Y - 88		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Y - 90	1.20E+05	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Y - 90 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Y - 91		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Y - 91 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Y - 92		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Y - 93		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Yb - 164		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Yb - 175		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Yb - 177		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zn - 65		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zn - 69		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zn - 69 m		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zr - 88		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zr - 89		Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zr - 93	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

Zr - 95	Liquid/Particulate Solid	WAC 246-247-030(21)(a)

Contributes less than 0.1 mrem/yr to the MEI, and represents less than 10% of the unabated PTE and represents less than 25% of the abated dose.

The radioactive isotopes identified for this emission unit are (no quantities specified):

Ac - 225	Ac - 227	Ac - 228	Ag - 108 m	Ag - 108
Ag - 109 m	Ag - 110 m	Ag - 110	Ag - 111	Al - 26
Al - 28	Am - 241	Am - 242 m	Am - 242	Am - 243
Am - 245	Ar - 37	Ar - 39	Ar - 41	Ar - 42
As - 74	As - 76	At - 217	Au - 195	Au - 198
Ba - 131	Ba - 133	Ba - 133 m	Ba - 137 m	Ba - 139
Ba - 140	Ba - 141	Ba - 142	Be - 10	Be - 7
Bi - 207	Bi - 210	Bi - 211	Bi - 212	Bi - 213
Bi - 214	Bk - 249	Bk - 250	Br - 82	Br - 83
Br - 84	Br - 85	C - 11	C - 14	C - 15
Ca - 41	Ca - 45	Ca - 47	Cd - 109	Cd - 113 m
Cd - 113	Cd - 115 m	Cd - 115	Ce - 139	Ce - 141
Ce - 142	Ce - 143	Ce - 144	Cf - 249	Cf - 250
Cf - 251	Cf - 252	Cl - 36	Cm - 241	Cm - 242
Cm - 243	Cm - 244	Cm - 245	Cm - 246	Cm - 247
Cm - 248	Co - 56	Co - 57	Co - 58	Co - 60
Cr - 51	Cr - 55	Cs - 131	Cs - 134	Cs - 134 m
Cs - 135	Cs - 136	Cs - 137	Cs - 138	Cs - 139
Cu - 64	Es - 254	Eu - 150	Eu - 152	Eu - 152 m
Eu - 154	Eu - 155	Eu - 156	Eu - 157	F - 18
Fe - 55	Fe - 59	Fr - 221	Fr - 223	Ga - 67
Ga - 72	Gd - 148	Gd - 149	Gd - 151	Gd - 152
Gd - 153	Ge - 68	H - 3	Hf - 175	Hf - 178
Hf - 178 m	Hf - 181	Hf - 182	Hg - 203	Ho - 166
Ho - 166 m	I - 122	I - 123	I - 125	I - 129
I - 130	I - 131	I - 132	I - 133	I - 134
I - 135	In - 106	In - 113 m	In - 114 m	In - 114
In - 115	In - 115 m	Ir - 192	K - 40	K - 42
Kr - 81	Kr - 83 m	Kr - 85	Kr - 85 m	Kr - 87
Kr - 88	Kr - 89	Kr - 90	La - 138	La - 140
La - 141	La - 142	Lu - 177	Mg - 27	Mn - 52
Mn - 54	Mn - 56	Mo - 93	Mo - 99	N - 13
Na - 22	Na - 24	Nb - 91	Nb - 91 m	Nb - 92
Nb - 93 m	Nb - 94	Nb - 95	Nb - 95 m	Nb - 97
Nb - 97 m	Nd - 144	Nd - 147	Ni - 56	Ni - 59
Ni - 63	Ni - 65	Np - 235	Np - 236	Np - 237
Np - 238	Np - 239	Np - 240	Np - 240 m	O - 15
P - 32	P - 33	Pa - 231	Pa - 233	Pa - 234
Pa - 234 m	Pb - 209	Pb - 210	Pb - 211	Pb - 212
Pb - 214	Pd - 107	Pd - 109	Pm - 145	Pm - 146
Pm - 147	Pm - 148 m	Pm - 148	Pm - 149	Pm - 151
Po - 208	Po - 209	Po - 210	Po - 211	Po - 212
Po - 213	Po - 214	Po - 215	Po - 216	Po - 218

Pr - 143	Pr - 144	Pr - 144 m	Pu - 234	Pu - 236
Pu - 237	Pu - 238	Pu - 239	Pu - 240	Pu - 241
Pu - 242	Pu - 243	Pu - 244	Ra - 223	Ra - 224
Ra - 225	Ra - 226	Ra - 228	Rb - 86	Rb - 87
Rb - 88	Rb - 89	Rb - 90	Rb - 90 m	Re - 186
Re - 187	Re - 188	Rh - 102	Rh - 103 m	Rh - 105
Rh - 105 m	Rh - 106	Rn - 219	Rn - 220	Rn - 222
Ru - 103	Ru - 105	Ru - 106	Ru - 97	S - 35
Sb - 124	Sb - 125	Sb - 126	Sb - 126 m	Sb - 127
Sc - 46	Sc - 47	Se - 75	Se - 79	Si - 31
Sm - 145	Sm - 146	Sm - 147	Sm - 151	Sm - 153
Sm - 157	Sn - 113	Sn - 117 m	Sn - 119 m	Sn - 121 m
Sn - 123	Sn - 125	Sn - 126	Sr - 85	Sr - 89
Sr - 90	Sr - 91	Sr - 92	Ta - 179	Ta - 182
Ta - 183	Tb - 160	Tc - 101	Tc - 95 m	Tc - 97
Tc - 97 m	Tc - 98	Tc - 99	Tc - 99 m	Te - 121 m
Te - 121	Te - 123	Te - 123 m	Te - 125 m	Te - 127 m
Te - 127	Te - 129 m	Te - 129	Te - 131	Te - 131 m
Te - 132	Te - 133	Te - 133 m	Te - 134	Th - 227
Th - 228	Th - 229	Th - 230	Th - 231	Th - 232
Th - 233	Th - 234	Ti - 44	Ti - 51	Tl - 204
Tl - 207	Tl - 208	Tl - 209	Tm - 170	Tm - 171
U - 232	U - 233	U - 234	U - 235	U - 236
U - 237	U - 238	U - 239	U - 240	V - 48
V - 49	W - 181	W - 185	W - 187	W - 188
Xe - 122	Xe - 123	Xe - 125	Xe - 127	Xe - 131 m
Xe - 133	Xe - 133 m	Xe - 135	Xe - 135 m	Xe - 137
Xe - 138	Y - 88	Y - 90	Y - 90 m	Y - 91
Y - 91 m	Y - 92	Y - 93	Yb - 164	Yb - 175
Yb - 177	Zn - 65	Zn - 69	Zn - 69 m	Zr - 88
Zr - 89	Zr - 93	Zr - 95		

The potential release rates described in this Condition were used to determine control technologies and monitoring requirements for this approval. DOE must notifiy the Department of a "modification" to the emission unit, as defined in WAC 246-247-030(16). DOE must notify the Department of any changes to a NESHAP major emission unit when a specific isotope is newly identified as contributing greater than 10% of the potential TEDE to the MEI, or greater than 25% of the TEDE to the MEI after controls. (WAC 246-247-110(9)) DOE must notify the Department of any changes to potential release rates as required by state or federal regulations including changes that would constitute a significant modification to the Air Operating Permit under WAC 173-401-725(4). Notice will be provided according to the particular regulation under which notification is required. If the applicable regulation(s) does not address manner and type of notification, DOE will provide the Department with advance written notice by letter or electronic mail but not solely by copies of documents.

4) For the I-131 Medical Isotope Project

The charcoal bed shall be rated at a minimum of 1,000 cubic feet per minute (cfm) and be 2" thick.

5) For the I-131 Medical Isotope Project:

Iodine samples shall be collected using a two-stage sample collection system. The sampling system shall consist of a 47mm in-line filter holder that contains either a removable activated carbon canister or filter paper coated with activated carbon. Two samplers shall be placed in series to evaluate potential breakthrough of the first sampling stage. The iodine samplers shall be installed on the current stack sampling system for RPL, downstream of the record particulate sampler. The iodine samples shall be analyzed using EPA Method G-1 (40 CFR 61, Appendix

B).

6) For the I-131 Medical Isotope Project:

The exhaust from the hot cell shall be routed through an activated charcoal bed. A charcoal bed shall be procured and installed upstream of the HEPA filters. The filter assembly shall be a two-stage filter, containing a charcoal bed and a post-filter inside of the same outer housing. The post-filter shall be a particulate filter designed to remove any carbon particles that may dislodge from the bed from normal use, preventing these particles from reaching the primary and secondary stages of HEPA filtration downstream.

7) For the I-131 Medical Isotope Project:

The iodine sampling system shall be in continuous operation when the I-131 material for this project enters the RPL facility through completion of the project (when all iodine has been processed and shipped for offsite use).

8) For the I-131 Medical Isotope Project:

The removal efficiency for radio-iodine of the charcoal bed filter unit shall be a minimum of 90% and shall be installed and tested per ANSI 510. These procedures shall be developed in accordance with the guidance provided in ANSI N510. These procedures shall be provided to the department for review prior to starting the I-131 project.

9) For the Th-232 medical isotope project:

Before initiation of processing, the Rn-220 monitor shall be operational. The exhaust sample will be measured by a Rn-220 monitor collected using the same isokinetic probe that is used to collect the record particulate sample. The radon monitor shall be installed downstream of the record particulate sample, measuring the sample stream that has already been pre-filtered by the record particulate sample.

10) For the Th-232 Medical Isotope Project:

Procedures for Rn-220 monitoring shall be forwarded to the department for review.

11) For the Th-232 Medical Isotope:

The Rn-220 gas that is generated during the process will be routed through a recovery system that is located inside of a hood in Room 510. As the Rn-220 (gaseous form) decays (55 second half-life), the resulting daughter products shall be collected in the recovery system. The recovery system shall be capable of collecting in excess of 80% of the Rn-220 that is generated.

12) For the Tritium Target Qualification Project (TTQP)

Sectioning of the TPBAR rods shall be performed in the hot cells in HLRF. Sectioning must be done inside Plexiglas containment.

13) For the Tritium Target Qualification Project (TTQP):

Project activities are limited to High Level Radiochemical Facility (HLRF), Shielded Analytical Laboratory (SAL), and Rooms 420, 418, and Room 48 in the basement.

14) For the Tritium Target Qualification Project (TTQP):

The "Mandatory Use Procedures" require that each step be read prior to performing the activity.

These procedures are those that involve the following:

* Operation of the furnace and gas clean-up system used to extract tritium from the Tritium Producing Burnable Absorber Rods
and;
* The transfer of the extracted tritium to hydride transport vessels.

15) For the Tritium Target Qualification Project (TTQP):

The tritium permeation testing shall be conducted in Room 48 of the basement in the laboratory hood or glovebox.

16) For the Waste Sludge Solidification Demonstration:

The objective is to demonstrate methods of solidification of waste sludge from the 105 K East Basin. The purpose for rendering the sludge as a solid is to allow for permanent storage at the Waste Isolation Pilot Plant (WIPP).

Core samples are taken from sludge found in the K East Basin (up to 4 liters of solids) and transported to the 325 Building (RPL) for initial study. The samples are collected in 4-liter poly bottles and shipped to RPL in PAS-1 containers accompanied by a chain-of-custody. All containers shall be visually inspected upon receipt and dose measurements taken. After receipt, the sample bottles are placed into a glove box or hot cell and combined into one composite. The sludge is allowed to settle from the mixture, and the water is decanted. The decanted water and a sample of the settle sludge are characterized for major constituents (e.g. nucleotides, organics). The remaining sludge is split into different test samples and each processed with a different solidification method (grout, absorbent, drying, etc). Characterization of each test sample will occur at RPL, with the exception of one long term grout-solidified monolith prepared for long term and WIPP-specific testing at the Central Waste Center (CWC). Once testing is completed, a recommendation is made for the most effective solidification process.

Once the initial study is complete, large scale testing begins and will nominally include up to 6.3 m^3 (the Spent Nuclear Fuel (SNF) project bounding volume is 7.5 m^3) of sludge material. Material from the K East Basin is to be transported to the 325 Building using a Sludge Transport Systems (STS).

The STS consists of:

- Large Diameter Container (LDC). A vertical stainless steel cylindrical tank designed to contain material from K East Basin. The container is approximately 5 feet in diameter and 10 feet high.
- Sludge transportation cask. The LDC is placed into a cylindrical stainless steel and lead shell which is to provide shielding and to seal the LDC from the outside.
- Transportation trailer. The sludge transportation cask is anchored onto a trailer. The sludge transportation trailer complies with federal regulations and state standards.

Note: The following information is for completeness. Radioactive air emissions from these activities are covered by other permits/processes.

The STS is staged in the north transfer bay near the K East North Loading Operation Pit (NLOP). The LDC is connected to the K East Basin's Sludge Retrieval System (SRS), and is filled with material. Once a sufficient volume of sludge is contained in the LDC, the excess water cover level is lowered so the tank holds approximately 2.5 m^3 of material. An inert gas (e.g., helium or argon) blanket is placed over the material inside the LDC and the tank's outlet and inlet ports are closed. A NucFil HEPA-type filter and rupture disk are placed on the tank's vent ports. The cask lid is then installed, sealing the LDC inside. Once the cask is sealed and secured, the STS is transported to the 325 Building loading dock by the High-Level Radiochemistry Facility (HLRF). Once the STS is staged in the desired location, the transportation cask is unsealed in an approved area.

Note: The following activities describe actions to be taken within the RPL.

Inside the building, the LDC inlet and outlet are opened and the material is sampled for analysis. After determining the acceptability of the material, it is pumped from the LDC into several shielded vessels. The materials in the vessels are then processed with the solidification method designated from the initial testing. Each vessel is covered with a lid vented with a NucFil HEPA-type filter. Each shield vessel is placed in an overpack container and stored inside the RPL until the material is ready for shipped to CWC. Once the LDC is emptied, it is rinsed. It is then placed back onto the STS in preparation for resealing in the transportation cask and for transport back to K Basin. Overall, three shipments of K East Basin sludge in the STS are planned at this time.

17) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

MEDICAL ISOTOPE RESEARCH (I-131 Project)

I-131 solution will be procured from an offsite vendor and shipped to the Pacific Northwest National Laboratory (PNNL). It is expected that multiple shipments of I-131 will be required throughout the project, due to storage concerns that are the result of the short half-life of I-131 (approximately eight days). The objective of these

experiments is to combine the I-131 solution with an antibody solution (supplied by the customer). The test apparatus is a closed system that shall be set up inside of a hot cell located in Room 203 of the RPL.

One containment vessel (medical grade - intravenous type bag) shall be used for the I-131 solution, and the second vessel shall be used to contain the vendor-supplied antibody solution. Both solutions shall be transported to the mixing vessel by means of a peristaltic pump. The mixed solution will then be routed through an in-line purification system and dispensed into a medical grade product bag. Once processing is complete, the I-131 antibody shall be transferred from the product bag into small glass vials (inside the hot cell). The final product can then be shipped to the customer or a destination designated by the customer. Shipment from RPL must occur fairly quickly, due to the short half-life of I-131.

Processing will be performed using variable amounts of I-131 and will be conducted as separate batches. Current project is allowed to conduct multiple processing runs, with each run using from four to 100 curies (Ci) of I-131. The processing of the material will not alter the physical form of the I-131 liquid. No more than 300 Ci of I-131 per year is allowed.

18) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

MEDICAL ISOTOPE RESEARCH (Th-232 Project)

Th-232 parent material is approved to be present in the facility as either an oxide [ThO2] or a nitrate [Th(NO3)4]. The parent material shall be maintained in shipping containers, with sub-samples being periodically removed for performing laboratory testing. During the tests, the parent material may be subjected to processes (e.g., grinding or suspension in solution) to maximize the recovery of the desired isotopes. The preparation of the parent material and the capture process shall be performed in Room 510. The amount of parent material allowed to be processed annually under this NOC is estimated to be 30,000 kilograms. Parent material may be transported to RPL from off-site suppliers in multiple shipments throughout the year. The parent material shall be in the form of a granular oxide or nitrate (powder) that will be stored inside shipping containers at RPL until it is to be used. The shipping containers will be opened periodically to retrieve parent material for processing.

The prepared materials will then be loaded into a containment vessel and the vessel sealed. A transport line has been tapped into the lid of the containment vessel. The Rn-220 gas that is generated during batch processing exits the vessel through this transport line to a radon recovery system that is located inside of a laboratory hood in Room 510. The daughter products that result from the decay of Rn-220 are captured by the recovery system, and this system exhausts to a laboratory fume hood that is part of the RPL radiological exhaust system. The exhaust exits the facility through the RPL main stack (EP-325-01-S).

The radionuclides associated with this project are the Th-232 in the parent material, and the daughter products resulting from the decay of Th-232 (in order): Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Po-212, Tl-208, and Pb-208 (stable isotope).

19) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

Tritium Target Qualification Project (TTQP)

Tritium Target Qualification Project (TTQP) it is approved to perform the analysis of ten tritium-producing, burnable absorber rods (target rods) that were shipped to the RPL from the Idaho National Engineering Laboratory and eight additional target rods shipped from the Argonne National Laboratory West (ANL-W) to the RPL.

The processes approved under this activity includes the following:

Target Rod Sectioning (Activity 1) - Sections are cut from the tritium target rods for quantitative analysis using a diamond saw within a Plexiglas containment. Each section is disassembled, and the components are analyzed to determine gas-species concentrations. Selected sections are further analyzed for lithium burn-up, as well as tritium and helium content. The rods are then subjected to protium, metallography, and microprobe studies. During the

sectioning of the rods, emissions from the hot cells of the High-Level Radiochemistry Facility (HLRF) are vented to the existing radiological exhaust system and eventually to the main exhaust stack.

Tritium Extraction and Analysis (Activity 2) - Tritium is extracted by heating either a 4-foot target rod, or components from the target rod sections. Following tritium extraction, the 4-foot target rod is sectioned and analyzed as described in Activity 1. Tritium extraction and analysis is performed at two separate locations within the Radiochemical Processing Laboratory (RPL). Small-scale tritium extraction tests are performed in Room 416, while full tritium-rod extraction tests are conducted in the hot cells of the HLRF. Radionuclide emissions not captured during the tritium extraction tests pass through a laboratory hood or glovebox to the existing ventilation system, and eventually through the main exhaust stack.

Ex-reactor Tritium Permeation Tests (Activity 3) - Measurements are taken to determine the cladding material permeability used in the target rods. The test is conducted in an enclosed test loop, of which a section is constructed from TARGET ROD cladding material. Tritium absorption/release kinetics validation, correlation development and hydrogen ingress characterization, safety testing, and mechanical testing are then conducted. The tritium permeation tests are performed in Laboratory 48 in the RPL basement. Preparation of lithium aluminate (LiAlO2) samples for lithium isotopic ratio analysis is conducted in Laboratory 419. Radionculide emissions not captured during the permeation tests are allowed to pass through a laboratory hood or glovebox, to the existing ventilation system, and eventually through the main exhaust stack.

Other activities that will continue with the "ramp down" of the TTQP include clean-up of the furnace and other portions of the extraction system and subsequent waste disposal. During these activities, minor tritium releases are expected from hold-up within the system.

20) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in (WAC 246-247-030(16)), may be conducted.

WASTE OPERATIONS

The approved activities in the Radiochemical Processing Laboratory (RPL) include waste treatment operations that occur in various areas of the facility. In the HWTU, hazardous materials and radioactive mixed waste shall be stored, dispensed, used, handled, packaged in drums, and treated using various small bench-scale treatment processes. Treatment processes used at the HWTU is limited to include pH adjustment, ion exchange, venting of gas cylinders, carbon absorption using polymer beads or mineral absorbents such as clays, chemical oxidation, chemical precipitation, chemical reduction, waste concentration by evaporation, neutralization, filtration, solvent extraction, solids washing, catalytic destruction, and grout encapsulation (cementation).

The compaction unit is allowed to reduce volumes of low-level radioactive and radioactive-mixed dry materials (such as gloves, wipes, and step-off pad waste). During each compaction event, radiological smear samples shall be collected to verify containment of radiological contamination.

Radioactive waste boxes and drums are allowed to be stored in a controlled, fenced area (outside of the RPL) at the northeast corner of the facility. If any intrusive work (i.e., sampling, etc.) is required that may have the potential to emit radionuclides, the container shall be moved inside the facility.

21) TTQP Project Specific Emission Control Systems

Molecular Sieve

A molecular sieve will be used to control emissions during the full-rod tritium extraction process to be performed in the HRLF.

The molecular sieve will be used until the exhaust gas concentration, as measured with an ion chamber, indicates that the sieve is approaching the point of breakthrough. At this point, a fresh molecular sieve bed will replace the spent bed.

Two-Stage Bubbler Trap

The tritium emission control system for the small-scale extraction activities in Laboratory 416 consists of a two-stage bubbler-type trapping system. The bubbler-type trapping system includes a glass tube that contains either water or oil. An inert sweep gas carries the tritium from the heated tritium target rod components to the bubbler where tritium is removed from the gas stream.

Uranium Getter

Cladding material permeability measurements during Activity 3 will use a uranium getter material as a part of the commercial tritium storage system.