

Appendix A

Summary of Environmental Surveillance Networks

Table A-1
Summary of the Foundation's Environmental Surveillance Program

Sample Type Analysis	Collection Frequency	Locations		
		Distant	Boundary	INEEL
Air				
Gross Alpha	weekly	Blackfoot, Craters of the Moon, Idaho Falls, Rexburg	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Reno Ranch	Main Gate, EFS, Van Buren
Gross Beta ¹³¹ I	weekly	Blackfoot, Craters of the Moon, Idaho Falls, Rexburg	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Reno Ranch	Main Gate, EFS, Van Buren
Gamma Spec Particulate Mass	quarterly	Blackfoot, Craters of the Moon, Idaho Falls, Rexburg	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Reno Ranch	Main Gate, EFS, Van Buren
⁹⁰ Sr Transuranics	quarterly	Rotating schedule	Rotating schedule	Rotating schedule
PM-10	every sixth day	Rexburg, Blackfoot	Atomic City	None
Air Moisture				
Tritium	4 to 13 weeks	Blackfoot, Idaho Falls, Rexburg	Atomic City	None
Precipitation				
Tritium	monthly	Idaho Falls	None	CFA
Tritium	weekly	None	None	EFS
Surface H₂O				
Gross Alpha, Gross Beta, ³ H	semiannually	Twin Falls, Buhl, Hagerman Idaho Falls, Bliss	None	None
Drinking H₂O				
Gross Alpha Gross Beta, ³ H	semiannually	Aberdeen, Blackfoot, Carey, Idaho Falls, Fort Hall, Minidoka, Roberts, Shoshone	Arco, Atomic City, Howe, Monteview, Mud Lake, Reno Ranch	None
Milk				
¹³¹ I	weekly	Idaho Falls	None	None
¹³¹ I	monthly	Blackfoot, Carey, Dietrich, Minidoka, Roberts	Howe, Terreton, Arco	None
Tritium ⁹⁰ Sr	annually	Blackfoot, Carey, Dietrich, Idaho Falls, Minidoka, Roberts	Howe, Terreton, Arco	None
Potatoes				
Gamma Spec ⁹⁰ Sr	annually	Blackfoot, Idaho Falls, Rupert	Arco, Mud Lake	None
Wheat				
Gamma Spec ⁹⁰ Sr	annually	American Falls, Blackfoot, Dietrich, Idaho Falls, Minidoka, Carey	Arco, Monteview, Mud Lake, Tabor, Terreton	None
Lettuce				
Gamma Spec ⁹⁰ Sr	annually	Blackfoot, Carey, Idaho Falls, Pocatello	Arco, Atomic City, Howe, Mud Lake	None
Fish				
Gamma Spec	annually	None	None	Big Lost River
Sheep				
Gamma Spec	annually	Blackfoot	None	INEEL grazing areas
Waterfowl				
Gamma Spec ⁹⁰ Sr Transuranics	annually	Fort Hall	None	Waste disposal ponds
Game				
Gamma Spec	varies	None	None	INEEL roads
Soil				
Gamma Spec ⁹⁰ Sr Transuranics	biennially	Carey, Crystal Ice Caves, Blackfoot, St. Anthony	Butte City, Monteview, Atomic City, FAA Tower, Howe, Mud Lake (2), Reno Ranch	None
TLDs				
Gamma Radiation	semiannual	Aberdeen, Blackfoot, Craters of the Moon, Idaho Falls, Minidoka, Rexburg, Roberts	Arco, Atomic City, Howe, Monteview, Mud Lake, Reno Ranch	None

Table A-2
Summary of Approximate Minimum Detectable Concentrations for Radiological Analyses

<u>Sample Type</u>	<u>Analysis</u>	<u>Approximate Minimum Detectable Concentration^a (MDC)</u>	<u>Derived Concentration Guide^b (DCG)</u>	<u>Drinking Water Detection Limits^c</u>
Air (particulate filter) ^d	Gross alpha	1 x 10 ⁻¹⁵ μCi/ml	2 x 10 ⁻¹⁴ μCi/ml	--
	Gross beta	3 x 10 ⁻¹⁵ μCi/ml	3 x 10 ⁻¹² μCi/ml	--
	Specific gamma (¹³⁷ Cs)	3 x 10 ⁻¹⁶ μCi/ml	4 x 10 ⁻¹⁰ μCi/ml	
	²³⁸ Pu	2 x 10 ⁻¹⁸ μCi/ml	3 x 10 ⁻¹⁴ μCi/ml	
	^{239/240} Pu	3 x 10 ⁻¹⁸ μCi/ml	2 x 10 ⁻¹⁴ μCi/ml	
	²⁴¹ Am	2 x 10 ⁻¹⁸ μCi/ml	2 x 10 ⁻¹⁴ μCi/ml	--
Air (charcoal cartridge) ^d	⁹⁰ Sr	3 x 10 ⁻¹⁷ μCi/ml	9 x 10 ⁻¹² μCi/ml	--
	¹³¹ I	4 x 10 ⁻¹⁵ μCi/ml	4 x 10 ⁻¹⁰ μCi/ml	--
Air (atmospheric moisture) ^e	³ H	4 x 10 ⁻¹² μCi/ml	1 x 10 ⁻⁷ μCi/ml	--
Air (precipitation)	³ H	1 x 10 ⁻⁷ μCi/ml	2 x 10 ⁻³ μCi/ml	--
Water (drinking & surface)	Gross alpha	3 pCi/l	30 pCi/l	3 pCi/l
	Gross beta	2 pCi/l	100 pCi/l	4 pCi/l
	³ H	100 pCi/l	2 x 10 ⁶ pCi/l	1000 pCi/l
Milk	¹³¹ I	3 x 10 ⁻⁹ μCi/ml	--	--
Wheat	Specific gamma (¹³⁷ Cs)	4 x 10 ⁻⁹ μCi/g	--	--
	⁹⁰ Sr	5 x 10 ⁻⁹ μCi/g	--	--
Lettuce	Specific gamma (¹³⁷ Cs)	1 x 10 ⁻⁷ μCi/g	--	--
	⁹⁰ Sr	2 x 10 ⁻⁷ μCi/g	--	--

- a. The MDC is an estimate of the concentration of radioactivity in a given sample type that can be identified with a 95% level of confidence and a precision of plus or minus 100% under a specified set of typical laboratory measurement conditions.
- b. DCGs, set by the DOE, represent reference values for radiation exposure. They are based on a radiation dose of 100 mrem/yr for exposure through a particular exposure mode such as direct exposure, inhalation, or ingestion of water.
- c. These limits are required by the National Primary Drinking Water Regulations (40 CFR 141). The "detection limit" is the terminology used by the EPA and means the same as the MDC defined above.
- d. The approximate MDC is based on an average filtered air volume (pressure corrected) of 570 m³/week.
- e. The approximate MDC is expressed for tritium (as tritiated water) in air, and is based on an average filtered air volume of 25 m³, assuming an average sampling period of eight weeks.