NRC RA18-026

2017 Annual Radioactive Effluent Release Report

Part 9

6.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The Radiological Environmental Monitoring Program for the environs around LaSalle Station is given in Table 6-1.

Figure 6-1 through Figure 6-3 show sampling and monitoring locations.

Table 6-1 (Page 1 of 8)
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
1. Airborne a. Radioiodine and Particulates	1). Indicators-Near Field L-01, Nearsite No. 1, 1.5 mi (2.4 km) NNW (N 41° 16.016', W 88° 40.920') L-03, Onsite No. 3, 1.0 mi (1.6 km) ENE (N 41° 15.145', W 88° 39.174') L-05, Onsite No. 5, 0.3 mi (0.5 km) ESE (N 41° 14.520', W 88° 39.355') L-06, Nearsite No. 6, 0.4 mi (0.6 km) W (N 41° 14.602', W 88° 41.056') 2. Indicators-Far Field L-04, Rte 170, 3.2 mi (5.1 km) E (N 41° 15.243', W 88° 36.451') L-07, Seneca, 5.2 mi (8.4 km) NNE (N 41° 19.093', W 88° 36.473') L-08, Marseilles, 6.0 mi (9.7 km) NNW (N 41° 19.645', W 88° 42.925') L-11A, Ransom, 6.0 mi (9.7 km) S (N 41° 09.405', W 88° 39.565') 3. Controls L-10, Streator, 13.5 mi (21.7 km) SW (N 41° 06.642', W 88° 49.481')	Continuous sampler operation with particulate sample collection weekly, or more frequently if required by dust loading, and radioiodine canister collection weekly.	Radioiodine Canisters: I-131 analysis weekly on near field and control samples[1]. Particulate Sampler: Gross beta analysis following weekly filter change[2] and gamma isotopic analysis[3] quarterly on composite filters by location on near field and control samples.[1]

Table 6-1 (Page 2 of 8)
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
2. Direct Radiation a. Field Dosimeter	1) Indicators-Inner Ring L-101-1, 0.5 mi (0.8 km) N (N 41° 15.084', W 88°40.087') L-101-2, 0.5 mi (0.8 km) N (N 41° 15.084', W 88°40.087') L-102-1, 0.6 mi (1.0 km) NNE (N 41° 15.226', W 88°39.915' L-102-2, 0.6 mi (1.0 km) NNE (N 41° 15.226', W 88°39.915' L-103-1, 0.7 mi (1.1 km) NE (N 41° 15.168', W 88°39.492') L-103-2, 0.7 mi (1.1 km) NE (N 41° 15.168', W 88°39.492') L-104-1, 0.8 mi (1.3 km) ENE (N 41° 15.138', W 88°39.185') L-104-2, 0.8 mi (1.3 km) ENE (N 41° 15.138', W 88°39.185') L-105-1, 0.7 mi (1.1 km) E (N 41° 14.724', W 88°39.425') L-105-2, 0.7 mi (1.1 km) E (N 41° 14.724', W 88°39.425') L-106-1, 1.4 mi (2.2 km) ESE (N 41° 14.328', W 88°38.751') L-106-2, 1.4 mi (2.2 km) ESE (N 41° 14.328', W 88°38.751') L-107-1, 0.8 mi (1.3 km) SE (N 41° 14.308', W 88°39.502') L-107-2, 0.8 mi (1.3 km) SE (N 41° 14.308', W 88°39.502') L-108-1, 0.5 mi (0.8 km) SSE (N 41° 14.305', W 88°39.825') L-108-2, 0.5 mi (0.8 km) SSE (N 41° 14.305', W 88°39.825') L-109-1, 0.6 mi (1.0 km) S (N 41° 14.299', W 88°40.106') L-109-2, 0.6 mi (1.0 km) S (N 41° 14.299', W 88°40.106') L-110-1, 0.6 mi (1.0 km) SSW (N 41° 14.290', W 88°40.388') L-110-2, 0.6 mi (1.0 km) SSW (N 41° 14.290', W 88°40.388') L-111b-1, 0.8 mi (1.3 km) SW (N 41° 14.277', W 88°40.878') L-111b-2, 0.8 mi (1.3 km) SW (N 41° 14.277', W 88°40.878') L-112-1, 0.9 mi (1.4 km) WSW (N 41° 14.403', W 88°41.050') L-112-2, 0.9 mi (1.4 km) WSW (N 41° 14.403', W 88°41.050') L-113a-1, 0.8 mi (1.3 km) W (N 41° 14.658', W 88°41.055') L-113a-2, 0.8 mi (1.3 km) W (N 41° 14.658', W 88°41.055') L-114-1, 0.9 mi (1.4 km) WNW (N 41° 14.991', W 88°41.070') L-114-2, 0.9 mi (1.4 km) WNW (N 41° 14.991', W 88°41.070') L-115-1, 0.7 mi (1.1 km) NW (N 41° 15.054', W 88°40.529') L-115-2, 0.7 mi (1.1 km) NW (N 41° 15.054', W 88°40.529') L-116-1, 0.6 mi (1.0 km) NNW (N 41° 15.210', W 88°40.366') L-116-2, 0.6 mi (1.0 km) NNW (N 41° 15.210', W 88°40.366')	Quarterly	Gamma dose on each Field Dosimeter quarterly.

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Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
2. Direct Radiation (Cont'd) a. Field Dosimeter	2) Indicators-Outer Ring L-201-3, 4.0 mi (6.4 km) N (N 41° 18.205', W 88°40.162') L-201-4, 4.0 mi (6.4 km) N (N 41° 18.205', W 88°40.162') L-202-3, 3.6 mi (5.8 km) NNE (N 41° 17.793', W 88°38.287') L-202-4, 3.6 mi (5.8 km) NNE (N 41° 17.793', W 88°38.287') L-203-1, 4.0 mi (6.4 km) NE (N 41° 17.291', W 88°36.311') L-203-2, 4.0 mi (6.4 km) NE (N 41° 17.291', W 88°36.311') L-204-1, 3.2 mi (5.2 km) ENE (N 41° 15.346', W 88°36.442') L-204-2, 3.2 mi (5.2 km) ENE (N 41° 15.346', W 88°36.442') L-205-1, 3.2 mi (5.2 km) ESE (N 41° 14.144', W 88°36.410') L-205-2, 3.2 mi (5.2 km) ESE (N 41° 14.144', W 88°36.410') L-205-3, 5.1 mi (8.2 km) E (N 41° 14.774', W 88°34.209') L-205-4, 5.1 mi (8.2 km) E (N 41° 14.774', W 88°34.209') L-206-1, 4.3 mi (6.9 km) SE (N 41° 12.825', W 88°36.388') L-206-2, 4.3 mi (6.9 km) SE (N 41° 12.825', W 88°36.388') L-207-1, 4.5 mi (7.2 km) SSE (N 41° 11.476', W 88°37.546') L-207-2, 4.5 mi (7.2 km) SSE (N 41° 11.476', W 88°37.546') L-208-1, 4.5 mi (7.2 km) S (N 41° 10.818', W 88°39.432') L-208-2, 4.5 mi (7.2 km) S (N 41° 10.818', W 88°39.432') L-209-1, 4.0 mi (6.4 km) SSW (N 41° 11.662', W 88°41.173') L-209-2, 4.0 mi (6.4 km) SSW (N 41° 11.662', W 88°41.173') L-210-1, 3.3 mi (5.3 km) SW (N 41° 12.519', W 88°42.364') L-210-2, 3.3 mi (5.3 km) SW (N 41° 12.519', W 88°42.364') L-211-1, 4.5 mi (7.2 km) WSW (N 41° 12.557', W 88°44.489') L-211-2, 4.5 mi (7.2 km) WSW (N 41° 12.557', W 88°44.489') L-212-1, 4.0 mi (6.4 km) W(N 41° 14.095', W 88°44.508') L-212-2, 4.0 mi (6.4 km) W (N 41° 14.095', W 88°44.508') L-213-3, 4.9 mi (7.9 km) W (N 41° 14.402', W 88°45.674') L-213-4, 4.9 mi (7.9 km) W (N 41° 14.402', W 88°45.674') L-214-3, 5.1 mi (8.2 km) WNW (N 41° 16.028', W 88°45.708') L-214-4, 5.1 mi (8.2 km) WNW (N 41° 16.028', W 88°45.708') L-215-3, 5.0 mi (8.0 km) NW (N 41° 17.760', W 88°44.133') L-215-4, 5.0 mi (8.0 km) NW (N 41° 17.760', W 88°44.133') L-216-3, 5.0 mi (8.0 km) NNW (N 41° 18.823', W 88°42.087') L-216-4, 5.0 mi (8.0 km)NNW (N 41° 18.823', W 88°42.087')	Quarterly	Gamma dose on each Field Dosimeter quarterly.

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Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
2. Direct Radiation (Cont'd) a. Field Dosimeter	3) Indicators - Other One at each of the airborne location given in part 1.a.1 and 1.a.2 4). Controls One at each airborne control location given in part 1.a.3	Quarterly	Gamma dose on each Field Dosimeter quarterly.

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Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
3. Waterborne			
a. Ground/Well	1) Indicators L-27, LSCS Onsite Well at Station (N 41° 14.665', W 88° 40.127') L-28 #6, Marseilles Well, 4.1 mi (11.3 km) N (N 41° 18.215', W 88° 39.430')	Quarterly	Gamma isotopic[3] and tritium analysis quarterly.
	2) Control L-28 #4, Marseilles Well, 7.0 mi (10.9 km) NNW (N 41° 20.367', W 88° 42.054') L-28 #5, Marseilles Well, 6.7 mi (10.km) NNW (N 41° 20.142', W 88° 42.563')		Alternate based on availability
b. Drinking Water	There is no drinking water pathway within 6.2 mi (10 km) downstream of station.		
c. Surface Water	1) Indicator L-40, Illinois River downstream, 5.2 mi (8.4 km) NNW (N 41° 19.230', W 88° 42.048')	Weekly grab sample	Gross beta and gamma isotopic analysis[3] on monthly composite; tritium analysis on quarterly composite.
	2) Control L-21, Illinois River at Seneca, 4.0 mi (6.4 km) NE (N 41°17.892', W 88° 36.308')		
d. Sediments	1) Indicators L-40, Illinois River downstream, 5.2 mi (8.4 km) NNW (N 41° 19.230', W 88° 42.048') L-41, Illinois River downstream 4.6 mi (7.4 km) N (N 41° 18.678', W 88° 40.368')	Semiannually	Gamma isotopic analysis[3] semiannually.
	2) Control L-21, Illinois River at Seneca 4.0 mi (6.4 km) NE (N 41° 17.892', W 88° 36.308')		

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Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
4. Ingestion	1) Indicators		
a. Milk	At the time of this revision, there are no dairies within 6.2 miles which consistently produce milk. 2) Controls L-42, Biros Dairy, 14.2 mi (22.9 km)E (N 41° 15.379', W 88° 23.823')	Biweekly: May through October; monthly: November through April	Gamma isotopic[3] and I-131 analysis[4] biweekly May through October, monthly November through April.
b. Fish	1) Indicator L-35, Marseilles Pool of Illinois River, 6.5 mi (10.5 km)NNW (N 41° 19.386', W 88° 42.492') L-34, LaSalle Lake 2 mi (3.2 km) E 2) Control L-36, Illinois River upstream of discharge, 4.3 mi (6.9 km) NE (N 41° 17.892', W 88° 36.308')	Two times annually	Gamma isotopic analysis[3] on edible portions of each
c. Food Products	a. Indicators Two samples from each of the four major quadrants within 6.2 miles (10 km) of the station, if available. Sample locations for food products may vary based on availability and therefore are not required to be identified here but shall be taken. Refer to most recent Land Use Census for specific garden locations. b. Controls Two samples within 9.3 to 18.6 miles (15 to 30 km) of the station, if available. Refer to most recent Land Use Census for specific garden locations.	Annually	Gamma isotopic analysis[3] and I-131 analysis each sample.

Table 6-1 (Page 7 of 8)
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample	Sample or Monitoring Location	Sampling or Collection Frequency	Type and Frequency of Analysis
4. Ingestion (cont'd) d. Vegetation	----------NOTE---------- These vegetation samples are only required if milk sampling is not performed. ---------- a. <u>Indicator</u> Samples of 3 different types of broadleaf vegetation within 10km (6.2 miles) at 2 different offsite locations in the highest D/Q sector of the station, if available Sample locations for vegetation may vary based on availability and therefore are not required to be identified here but shall be taken. Refer to most recent Land Use Census for specific vegetation locations. b. <u>Control</u> Samples of 3 different types of broadleaf vegetation within 15 to 30km (9.3 to 18.6 miles) in the lowest D/Q sector of the station, if available. Refer to most recent Land Use Census for specific vegetation loacations.	Monthly during the growing season (May through October)	Gamma isotopic analysis[3] and I-131 analysis on each sample.

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[1] Far field samples are analyzed when near field results are inconsistent with previous measurements and radioactivity is confirmed as having its origin in airborne effluents released from the station, or at the discretion of the ODCM Specialist.

[2] Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thorium daughter decay. If gross beta activity in air particulate samples is greater than 10 times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

[3] Gamma isotopic analysis means the identification and quantification of gamma emitting radionuclides that may be attributable to the effluents from the station.

[4] I-131 analysis means the analytical separation and counting procedure are specific for this radionuclide.

Figure 6-1
Fixed Air Sampling Sites and Outer Ring Field Dosimeter Locations

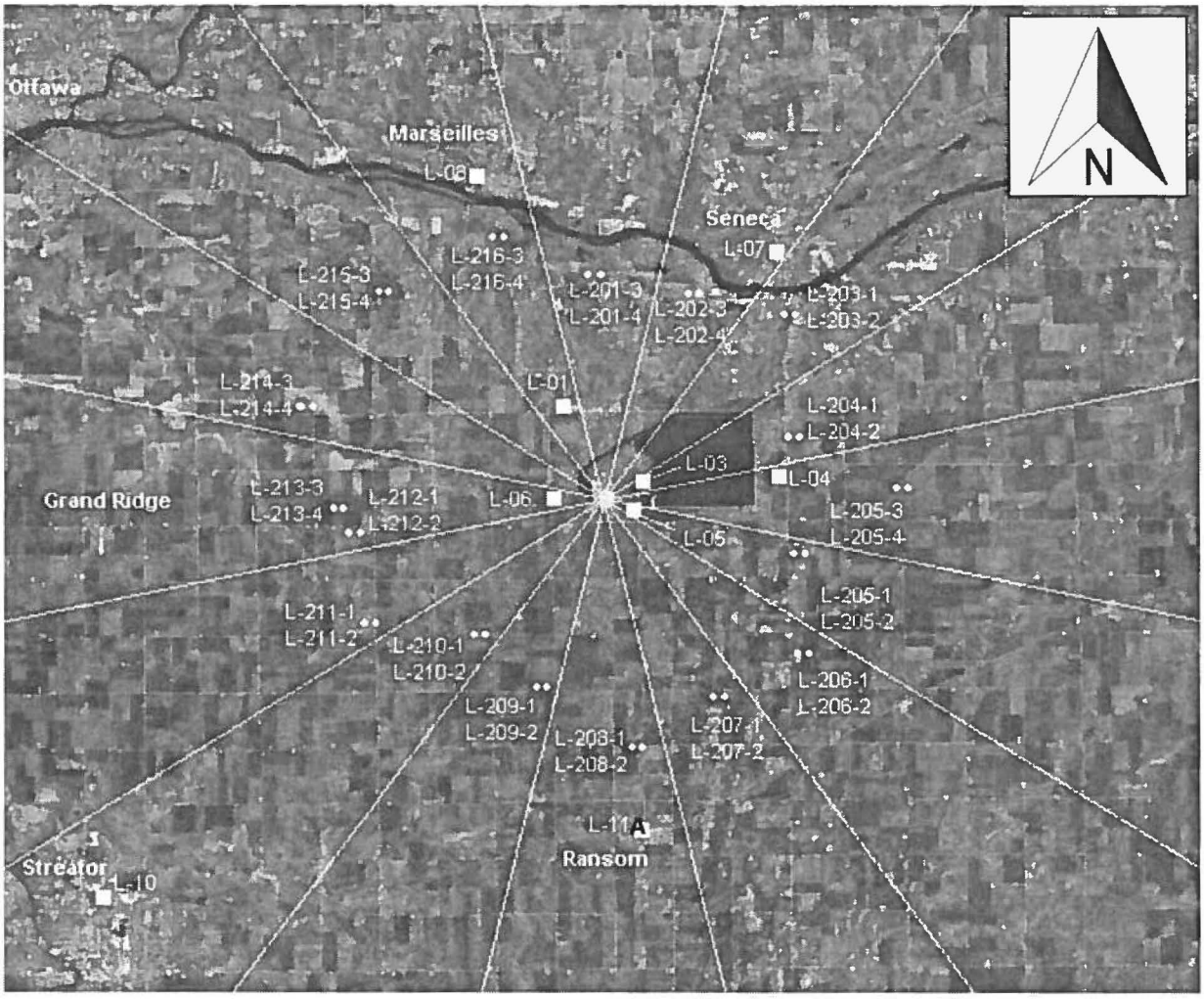

Figure 6-2
Inner Ring Field Dosimeters Locations

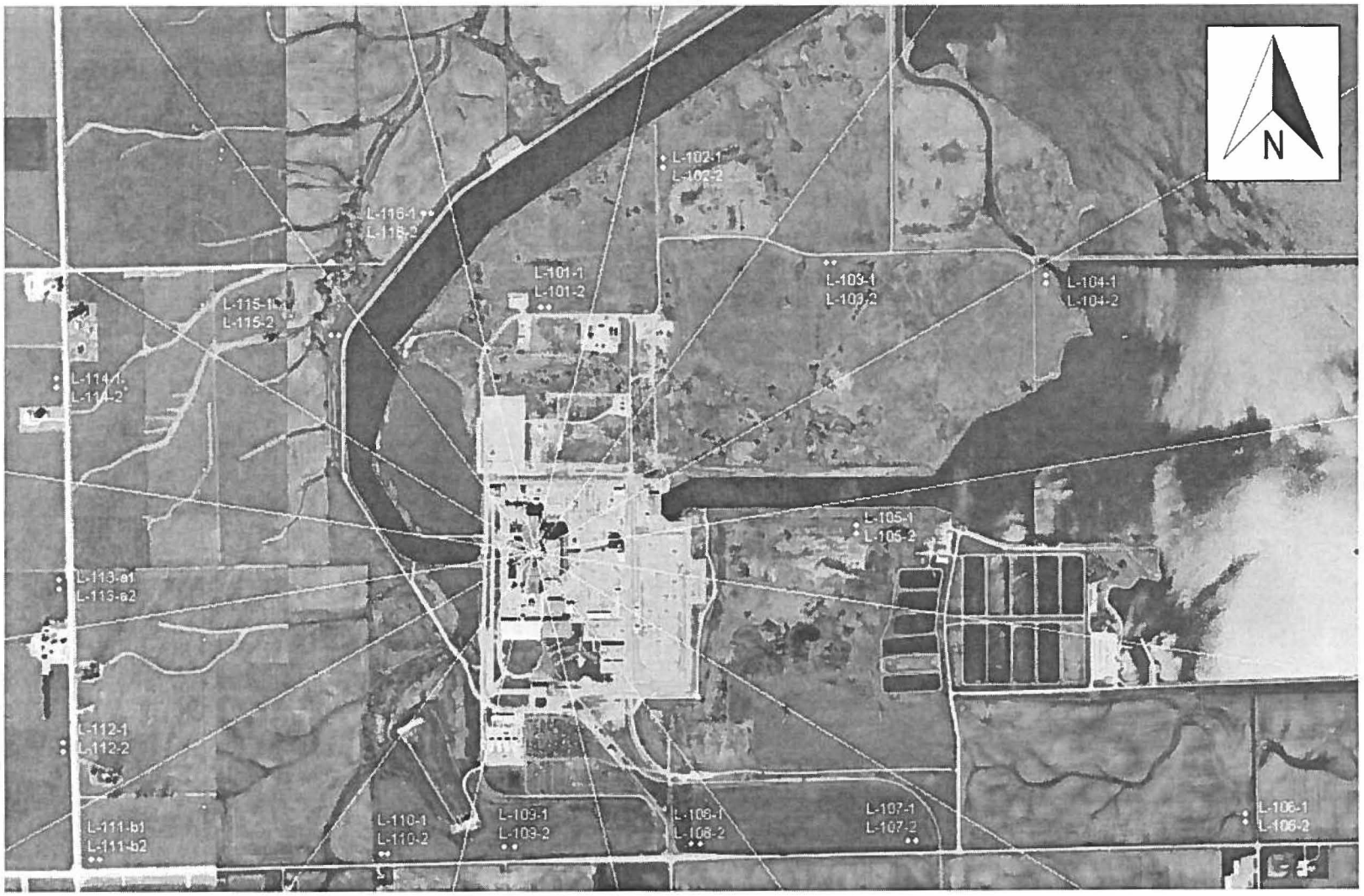

Figure 6-3
Ingestion and Waterborne Exposure Pathway Sample Locations