

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNIT NOS. 1 AND 2
INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

In accordance with North Anna Units 1 and 2 Technical Specification 5.6.2 and the North Anna Independent Spent Fuel Storage Installation Technical Specification 5.5.2c, enclosed is the 2013 Annual Radiological Environmental Operating Report. The Radiological Environmental Operating Report provides the details associated with the Radiological Environmental Monitoring Program.

If you have any questions or require additional information, please contact Page Kemp at (540) 894-2295.

Very truly yours,


Gerald T. Bischof
Site Vice President

Enclosure

Commitments made in this letter: None

IE48
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Serial No. 14-129
NAPS Annual Radiological
Environmental Operating Report

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Dominion
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Radiological Environmental Monitoring Program
January 1, 2013 to December 31, 2013

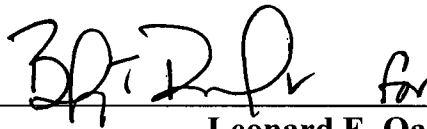
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Annual Radiological Environmental Operating Report

North Anna Power Station

January 1, 2013 to December 31, 2013

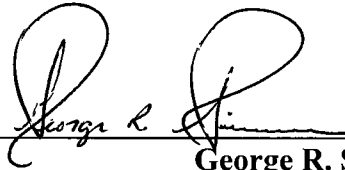
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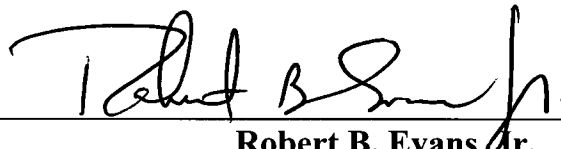
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1. EXECUTIVE SUMMARY

This document is a detailed report of the 2013 North Anna Nuclear Power Station Radiological Environmental Monitoring Program (REMP). It is submitted in accordance with North Anna Unit 1 and 2 Technical Specification 5.6.2 and North Anna Independent Spent Fuel Storage Installation (ISFSI) Technical Specification 5.5.2. Radioactivity levels from January 1 through December 31, 2013, in water, silt, shoreline sediment, milk, aquatic biota, food products, vegetation, and direct exposure pathways have been analyzed, evaluated and summarized. The REMP is designed to confirm that radiological effluent releases are As Low As Reasonably Achievable (ALARA), no undue environmental effects occur and the health and safety of the public are protected. The program also detects any unexpected environmental processes that could allow radiation accumulations in the environment or food pathway chains.

Radiation and radioactivity in the environment is monitored within a 25-mile radius of the station. North Anna Power Station personnel collect a variety of samples within this area. A number of sampling locations for each medium are selected using available meteorological, land use, and water use data. Two types of samples are obtained. Control samples are collected from areas that are beyond the measurable influence of North Anna Power Station or any other nuclear facility. These samples are used as reference data. Normal background radiation levels, or radiation present due to causes other than North Anna Power Station, can be compared to the environment surrounding the station. Indicator samples are the second sample type obtained. These samples show how much radiation is contributed to the environment by the station. Indicator samples are taken from areas close to the station where any station contribution will be at the highest concentration.

Prior to station operation, samples were collected and analyzed to determine the amount of radioactivity present in the area. The resulting values are used as a "pre-operational baseline." Analysis results from the indicator samples are compared to both current control sample values and the pre-operational baseline to determine if changes in radioactivity levels are attributable to station operations, or causes such as the Chernobyl accident, Fukushima Daiichi or natural variation.

Global Dosimetry Solutions provided thermoluminescent dosimetry (TLD) services and Teledyne Brown Engineering Environmental Services provided radioanalytical services. Participation in an Interlaboratory Comparison Program provides an independent check of sample measurement precision and accuracy. Typically, radioactivity levels in the environment are so low that analysis values frequently fall below the minimum detection limits of state-of-the-art measurement methods.

Because of this, the Nuclear Regulatory Commission (NRC) requires that equipment used for radiological environmental monitoring must be able to detect specified minimum Lower Limits of Detection (LLDs). This ensures that analyses are as accurate as possible. The NRC also mandates a reporting level for certain radionuclides. Licensed nuclear facilities must report the radionuclide activities in those environmental samples that are equal to or greater than the specified reporting level. Environmental radiation levels are sometimes referred to as a percent of the reporting level.

Analytical results are reported for all possible radiation exposure pathways to man. These pathways include airborne, water, aquatic, terrestrial, and direct radiation exposure. The airborne exposure pathway includes radioactive airborne iodine and particulates, and precipitation. The 2013 airborne results were similar to previous years. Fallout or natural radioactivity levels remained at levels consistent with past years' results.

Water and aquatic exposure pathway samples include precipitation, surface, river and well water, silt and shoreline sediments, and fish. The average tritium activity in surface water for 2013 was 4080 pCi/liter. No other plant related isotopes were reported in any surface or river water. River water collected from the North Anna River, 5.8 miles downstream of the site had an average tritium level of 4010 pCi/liter. No plant related isotopes were detected in quarterly precipitation samples. Silt samples indicated the presence of naturally occurring potassium-40 and thorium and uranium decay daughters at levels consistent with the natural background. No plant related isotope was identified in any sample. Shoreline soil, which may provide a direct exposure pathway, indicated the presence of potassium-40 and thorium and uranium decay daughters also at levels consistent with natural levels. No plant related isotope was detected in the indicator or control locations in shoreline soil. No plant related isotope was detected in fish samples from either Lake Anna or the control location, Lake Orange.

Soil samples, which are collected every three years from twelve stations, were collected in 2013. Cs-137 was identified in 10 of 11 indicator samples and the control sample. For the indicator stations the average was 208.9 pCi/Kg while for the control station the average was 329 pCi/Kg. During the preoperational phase Cs-137 was routinely detected and was attributed to fallout. Levels during this phase varied by location and date and ranged from 88 to 1390 pCi/Kg. The average was 645 pCi/kg. The current levels are also varied significantly by location and date. The decrease in the average, and the fact that the averages for the control location and the indicator locations are similar is indicative of fallout. No other plant related isotope was identified in soil samples during 2013.

The terrestrial exposure pathway includes milk and food/vegetation products. No plant related radioisotope was detected in any milk samples. Naturally occurring beryllium-7, potassium-40 and radionuclides associated with the uranium and thorium series were detected at environmental levels consistent with historical data. No plant related isotope was detected in any vegetation sample. Low levels of Cs-137 have been detected intermittently in past years.

The direct exposure pathway measures environmental radiation doses by use of thermoluminescent dosimeters (TLDs). TLD results have remained essentially constant over the years.

During 2013, as in previous years, operation of the North Anna Power Station and the Independent Spent Fuel Storage Installation (ISFSI) created no adverse environmental effects or health hazards. The maximum total body dose calculated for a hypothetical individual at the station site boundary due to liquid and gaseous effluents released from the station during 2013 was 0.45 millirem. For reference, this dose may be compared to the 625 millirem average annual exposure to every person in the United States from natural and man-made sources. Natural sources in the environment provide approximately 82% of radiation exposure to man, while nuclear power contributes less than 0.1%. These results demonstrate not only compliance with federal and state regulations but also demonstrate the adequacy of radioactive effluent control at North Anna Power Station.

2. PROGRAM DESCRIPTION

2.1 Introduction

This report documents the 2013 North Anna Power Station operational Radiological Environmental Monitoring Program (REMP).

The North Anna Power Station of Virginia Electric and Power Company (Dominion) is located on Lake Anna in Mineral, Virginia, approximately 35 miles southwest of Fredericksburg, Virginia. The site consists of two units, each with a pressurized water reactor (PWR) nuclear steam supply system and turbine generator furnished by Westinghouse Electric Corporation. Each unit has a gross electrical output of 1029 megawatts electric (MWe). Unit 1 achieved commercial operation on June 6, 1978 and Unit 2 on December 14, 1980. An independent spent fuel storage facility was licensed for dry cask storage of spent fuel in 1998.

The United States Nuclear Regulatory Commission (USNRC) regulations require that nuclear power plants be designed, constructed, and operated to keep levels of radioactive material in effluents to unrestricted areas as low as reasonably achievable (ALARA). To ensure these criteria are met, the operating license for North Anna Power Station includes Technical Specifications, which address the release of radioactive effluents. In-plant monitoring is used to ensure release limits are not exceeded. As a precaution against unexpected or undefined environmental processes which might allow undue accumulation of radioactivity in the environment, a program for monitoring the plant environs is also included in the North Anna Power Station Offsite Dose Calculation Manual (ODCM).

North Anna Power Station is responsible for collecting the various indicator and control environmental samples. Global Dosimetry Solutions is utilized for processing the TLDs. Teledyne Brown Engineering Environmental Services (TBE) is utilized for sample analyses. The results of the analyses are used to determine if changes in radioactivity levels may be attributable to station operations. Measured values are compared with control levels, which vary with time due to external events, such as cosmic ray bombardment, nuclear weapons test fallout and seasonal variations of naturally occurring radioisotopes. Data collected prior to station operation is used to indicate the degree of natural variation to be expected. The pre-operational data is compared with data collected during the operational phase to assist in evaluating any radiological impact of station operation.

Occasionally samples of environmental media show the presence of man-made isotopes. As a method of referencing the measured radionuclide concentrations in the sample media to a dose consequence to man, the data is compared to the

reporting level concentrations listed in the USNRC Regulatory Guide 4.8 and North Anna's ODCM. These concentrations are based upon the annual dose commitment recommended by 10CFR50, Appendix I, to meet the criterion of "As Low As Is Reasonably Achievable".

This report documents the results of the Radiological Environmental Monitoring Program for 2013 and satisfies the following objectives of the program:

- To provide measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposure of the maximum exposed member of the public resulting from station operations.
- To supplement the radiological effluent monitoring program by verifying that radioactive effluents are within allowable limits.
- To identify changes in radioactivity in the environment.
- To verify that station operations have no detrimental effect on the health and safety of the public.

2.2 Sampling and Analysis Program

Table 2-1 summarizes the 2013 sampling program for North Anna Power Station. All samples listed in Table 2-1 are taken at indicator locations except those labeled "control." The North Anna Radiological Monitoring Locations maps denote sample locations for North Anna Power Station. The locations are color coded to designate sample types. Table 2-2 summarizes the analysis program conducted by TBE for North Anna Power Station during the year 2013.

TABLE 2-1
North Anna Power Station – 2013
RADIOLOGICAL SAMPLING STATION
DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance	Direction	Degrees	Collection	Remarks
						Frequency	
Environmental	NAPS Sewage Treatment Plant	01	0.20	NE	42°	Quarterly & Annually	
Thermoluminescent	Fredericks Hall	02	5.30	SSW	203°	Quarterly & Annually	
Dosimetry (TLD)	Mineral, Va	03	7.10	WSW	243°	Quarterly & Annually	
	Wares Crossroads	04	5.10	WNW	287°	Quarterly & Annually	
	Route 752	05	4.20	NNE	20°	Quarterly & Annually	
	Sturgeon's Creek Marina	05A	2.04	N	11°	Quarterly & Annually	
	Levy, VA	06	4.70	ESE	115°	Quarterly & Annually	
	Bumpass, VA	07	7.30	SSE	167°	Quarterly & Annually	
	End of Route 685	21	1.00	WNW	301°	Quarterly & Annually	
	Route 700	22	1.00	WSW	242°	Quarterly & Annually	
	"Aspen Hills"	23	0.93	SSE	158°	Quarterly & Annually	
	Orange, VA	24	22.00	NW	325°	Quarterly & Annually	Control
	Bearing Cooling Tower	N-1/33	0.06	N	10°	Quarterly	
	Sturgeon's Creek Marina	N-2/34	2.04	N	11°	Quarterly	
	Parking Lot "C" (on-site)	NNE-3/35	0.24	NNE	32°	Quarterly	
	Good Hope Church	NNE-4/36	3.77	NNE	25°	Quarterly	
	Parking Lot "B"	NE-5/37	0.20	NE	42°	Quarterly	
	Lake Anna Marina (Bogg's Dr)	NE-6/38	1.46	NE	34°	Quarterly	
	Weather Tower Fence	ENE-7/39	0.36	ENE	74°	Quarterly	
	Route 689	ENE-8/40	2.43	ENE	65°	Quarterly	
	Near Training Facility	E-9/41	0.30	E	91°	Quarterly	
	"Morning Glory Hill"	E-10/42	2.85	E	93°	Quarterly	
	Island Dike	ESE-11/43	0.12	ESE	103°	Quarterly	
	Route 622	ESE-12/44	4.70	ESE	115°	Quarterly	
	DVP Biology Lab	SE-13/45	0.64	SE	138°	Quarterly	
	Route 701 (Dam Entrance)	SE-14/46	5.88	SE	137°	Quarterly	
	"Aspen Hills"	SSE-15/47	0.93	SSE	158°	Quarterly	
	Elk Creek	SSE-16/48	2.33	SSE	165°	Quarterly	
	NAPS Access Rd.	S-17/49	0.36	S	173°	Quarterly	

TABLE 2-1
North Anna Power Station – 2013
RADIOLOGICAL SAMPLING STATION
DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance	Direction	Degrees	Collection Frequency	Remarks
Environmental	Elk Creek Church	S-18/50	1.55	S	178°	Quarterly	
Thermoluminescent Dosimetry (TLD)	NAPS Access Rd.	SSW-19/51	0.24	SSW	197°	Quarterly	
	Route 618	SSW-20/52	5.30	SSW	205°	Quarterly	
	500kv Tower	SW-21/53	0.60	SW	218°	Quarterly	
	Route 700	SW-22/54	3.96	SW	232°	Quarterly	
	NAPS Radio Tower	WSW-23/55	0.38	WSW	237°	Quarterly	
	Route 700 (Exclusion Boundary)	WSW-24/56	1.00	WSW	242°	Quarterly	
	South Gate Switchyard	W-25/57	0.32	W	279°	Quarterly	
	Route 685	W-26/58	1.55	W	274°	Quarterly	
	End of Route 685	WNW-27/59	1.00	WNW	301°	Quarterly	
	Route 685	WNW-28/60	1.40	WNW	303°	Quarterly	
	North Gate - Laydown Area	NW-29/61	0.52	NW	321°	Quarterly	
	Lake Anna Campground	NW-30/62	2.54	NW	319°	Quarterly	
	#1/#2 Intake	NNW-31/63	0.07	NNW	349°	Quarterly	
	Route 208	NNW-32/64	2.21	NNW	344°	Quarterly	
	Bumpass Post Office	C-1/2	7.30	SSE	167°	Quarterly	
	Orange, VA	C-3/4	22.00	NW	325°	Quarterly	Control
	Mineral, VA	C-5/6	7.10	WSW	243°	Quarterly	
	Louisa, VA	C-7/8	11.54	WSW	257°	Quarterly	Control
Airborne Particulate and Radioiodine	NAPS Sewage Treatment Plant	01	0.20	NE	42°	Weekly	
	Biology Lab	01A	0.64	SE	138°	Weekly	
	Mineral, VA	03	7.10	WSW	243°	Weekly	
	Wares Crossroads	04	5.10	WNW	287°	Weekly	
	Route 752	05	4.20	NNE	20°	Weekly	
	Sturgeon's Creek Marina	05A	2.04	N	11°	Weekly	
	Levy, VA	06	4.70	ESE	115°	Weekly	
	Bumpass, VA	07	7.30	SSE	167°	Weekly	

TABLE 2-1
North Anna Power Station – 2013
RADIOLOGICAL SAMPLING STATION
DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance	Direction	Degrees	Collection	Remarks
						Frequency	
Airborne Particulate and Radioiodine	End of Route 685	21	1.00	WNW	301°	Weekly	
	Route 700	22	1.00	WSW	242°	Weekly	
	"Aspen Hills"	23	0.93	SSE	158°	Weekly	
	Orange, VA	24	22.00	NW	325°	Weekly	Control
Surface Water	Waste Heat Treatment Facility (Second Cooling Lagoon)	08	3.37	SSE	148°	Monthly	
	Lake Anna (upstream) (Route 669 Bridge)	09A	12.90	WNW	295°	Monthly	Control
River Water	North Anna River (downstream)	11	5.80	SE	128°	Monthly	
Ground Water (Well Water)	Biology Lab	01A	0.64	SE	138°	Quarterly	
Precipitation	Biology Lab	01A	0.64	SE	138°	Monthly	
Aquatic Sediment	Waste Heat Treatment Facility (Second Cooling Lagoon)	08	3.37	SSE	148°	Semi-Annually	
	Lake Anna (upstream) (Route 669 Bridge)	09A	12.90	WNW	295°	Semi-Annually	Control
	North Anna River (downstream)	11	5.80	SE	128°	Semi-Annually	
Shoreline Soil	Waste Heat Treatment Facility (Second Cooling Lagoon)	08	3.37	SSE	148°	Semi-Annually	
Soil	NAPS Sewage Treatment Plant	01	0.20	NE	42°	Once/3 years	
	Fredericks Hall	02	5.30	SSW	203°	Once/3 years	
	Mineral, VA	03	7.10	WSW	243°	Once/3 years	
	Wares Crossroads	04	5.10	WNW	287°	Once/3 years	

TABLE 2-1
 North Anna Power Station – 2013
 RADIOLOGICAL SAMPLING STATION
 DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance	Direction	Collection		Remarks
					Degrees	Frequency	
Soil	Route 752	05	4.20	NNE	20°	Once/3 years	
	Sturgeon's Creek Marina	05A	2.04	N	11°	Once/3 years	
	Levy, VA	06	4.70	ESE	115°	Once/3 years	
	Bumpass, VA	07	7.30	SSE	167°	Once/3 years	
	End of Route 685	21	1.00	WNW	301°	Once/3 years	
	Route 700 (Exclusion Boundary)	22	1.00	WSW	242°	Once/3 years	
	"Aspen Hills"	23	0.93	SSE	158°	Once/3 years	
	Orange, VA	24	22.00	NW	325°	Once/3 years	Control
Milk	Lakeside Dairy	12A	7.50	NW	310°	Monthly	
Fish	Waste Heat Treatment Facility (Second Cooling Lagoon)	08	3.37	SSE	148°	Semi-Annually	
	Lake Orange	25	16.5	NW	312°	Semi-Annually	Control
Food Products (Vegetation)	Stagecoach Road	14B	1.22	NNE	40°	Monthly if available or at harvest	
	Route 614	15	1.37	SE	133°	Monthly if available or at harvest	
	Route 629/522	16	12.60	NW	314°	Monthly if available or at harvest	Control
	Aspen Hills	23	0.93	SSE	158°	Monthly if available or at harvest	
	"Historic Lane"	26	1.15	S	172°	Monthly if available or at harvest	

TABLE 2-2
North Anna Power Station
SAMPLE ANALYSIS PROGRAM

SAMPLE MEDIA	FREQUENCY	ANALYSIS	LLD	REPORT UNITS
Thermoluminescent Dosimetry (TLD)				
(84 TLDs)	Quarterly	Gamma Dose	2 mR±2mR	mR/std. Month
(12 TLDs)	Annually	Gamma Dose	2 mR±2mR	mR/std. Month
Airborne Radioiodine	Weekly	I-131	0.07	pCi/m ³
Airborne Particulate	Weekly	Gross Beta	0.01	pCi/m ³
	Quarterly (a)	Gamma Isotopic		pCi/m ³
		Cs-134	0.05	
	2 nd Quarter Composite	Cs-137	0.06	
Sr-89		(b)	pCi/m ³	
Surface Water	Monthly	Sr-90	(b)	
		I-131	1(c)	pCi/L
		Gamma Isotopic		pCi/L
		Mn-54	15	
		Fe-59	30	
		Co-58	15	
		Co-60	15	
		Zn-65	30	
		Zr-95	30	
		Nb-95	15	
		Cs-134	15	
		Cs-137	18	
		Ba-140	60	
		La-140	15	
		Quarterly(a)	Tritium (H-3)	2000
	2 nd Quarter	Sr-89	(b)	pCi/L
	Composite	Sr-90	(b)	
River Water	Monthly	I-131	1(c)	pCi/L
		Gamma Isotopic		pCi/L
		Mn-54	15	
		Fe-59	30	
		Co-58	15	
		Co-60	15	
		Zn-65	30	
		Zr-95	30	
		Nb-95	15	
		Cs-134	15	
		Cs-137	18	
		Ba-140	60	

*LLDs indicate those levels to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than the listed values.

(a) Quarterly composite of each location's samples are used for the required analysis

(b) There are no required LLDs for Sr-89/90

(c) LLD for non-drinking water is 10 pCi/liter

(d) LLD applied are those for water samples. However, since this is a semi-annual composite no LLD is applied for these nuclides due to their short half-lives.

TABLE 2-2
North Anna Power Station
SAMPLE ANALYSIS PROGRAM

SAMPLE MEDIA	FREQUENCY	ANALYSIS	LLD	REPORT UNITS		
River Water	Quarterly(a) 2 nd Quarter Composite	La-140	15			
		Tritium (H-3)	2000	pCi/L		
		Sr-89	(b)	pCi/L		
		Sr-90	(b)			
Ground Water (Well Water)	Quarterly	Gamma Isotopic		pCi/L		
		Mn-54	15			
		Fe-59	30			
		Co-58	15			
		Co-60	15			
		Zn-65	30			
		Zr-95	30			
		Nb-95	15			
		I-131	10(c)			
		Cs-134	15			
		Cs-137	18			
		Ba-140	60			
		La-140	15			
			Quarterly(a) 2 nd Quarter	Tritium (H-3)	2000	pCi/L
				Sr-89	(b)	pCi/L
		Sr-90	(b)			
Aquatic Sediment	Semi-Annually	Gamma Isotopic		pCi/kg (dry)		
		Cs-134	150			
		Cs-137	180			
	Annually	Sr-89	(b)	pCi/kg (dry)		
		Sr-90	(b)			
Precipitation	Monthly	Gross Beta	4	pCi/L		
	Semi-Annual Composite ⁽¹⁾	Gamma Isotopic		pCi/L		
		Mn-54	15			
		Fe-59	30			
		Co-58	15			
		Co-60	15			
		Zn-65	30			
		Zr-95	30			
		Nb-95	15			
		I-131 ^(d)				
		Cs-134	15			
		Cs-137	18			
	Ba-140 ^(d)					
La-140 ^(d)						
Shoreline Soil	Semi-Annually	Gamma Isotopic		pCi/kg (dry)		
		Cs-134	150			
		Cs-137	180			

*LLDs indicate those levels to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than the listed values.

(a) Quarterly composite of each location's samples are used for the required analysis

(b) There are no required LLDs for Sr-89/90

(c) LLD for non-drinking water is 10 pCi/liter

(d) LLD applied are those for water samples. However, since this is a semi-annual composite no LLD is applied for these nuclides due to their short half-lives.

TABLE 2-2
North Anna Power Station
SAMPLE ANALYSIS PROGRAM

SAMPLE MEDIA	FREQUENCY	ANALYSIS	LLD	REPORT UNITS
Soil	Annually	Sr-89	(b)	pCi/kg (dry)
		Sr-90	(b)	
	Once per 3 years	Gamma Isotopic		pCi/kg (dry)
		Cs-134	150	
		Cs-137	180	
Milk	Monthly	Sr-89	(b)	pCi/kg (dry)
		Sr-90	(b)	
	Monthly	I-131	1	pCi/L
		Gamma Isotopic		
	Quarterly	Cs-134	15	pCi/L
		Cs-137	18	
		Ba-140	60	
		La-140	15	
		Sr-89	(b)	
	Fish	Semi-Annually	Gamma Isotopic	
Mn-54			130	
Fe-59			260	
Co-58			130	
Co-60			130	
Zn-65			260	
Cs-134			130	
Cs-137			150	
Food Products (Broadleaf Vegetation)	Monthly, if available, or at harvest	Gamma Isotopic		pCi/kg (wet)
		Cs-134	60	
		Cs-137	80	
		I-131	60	

*LLDs indicate those levels to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than the listed values.

- (a) Quarterly composite of each location's samples are used for the required analysis
- (b) There are no required LLDs for Sr-89/90
- (c) LLD for non-drinking water is 10 pCi/liter
- (d) LLD applied are those for water samples. However, since this is a semi-annual composite no LLD is applied for these nuclides due to their short half-lives.

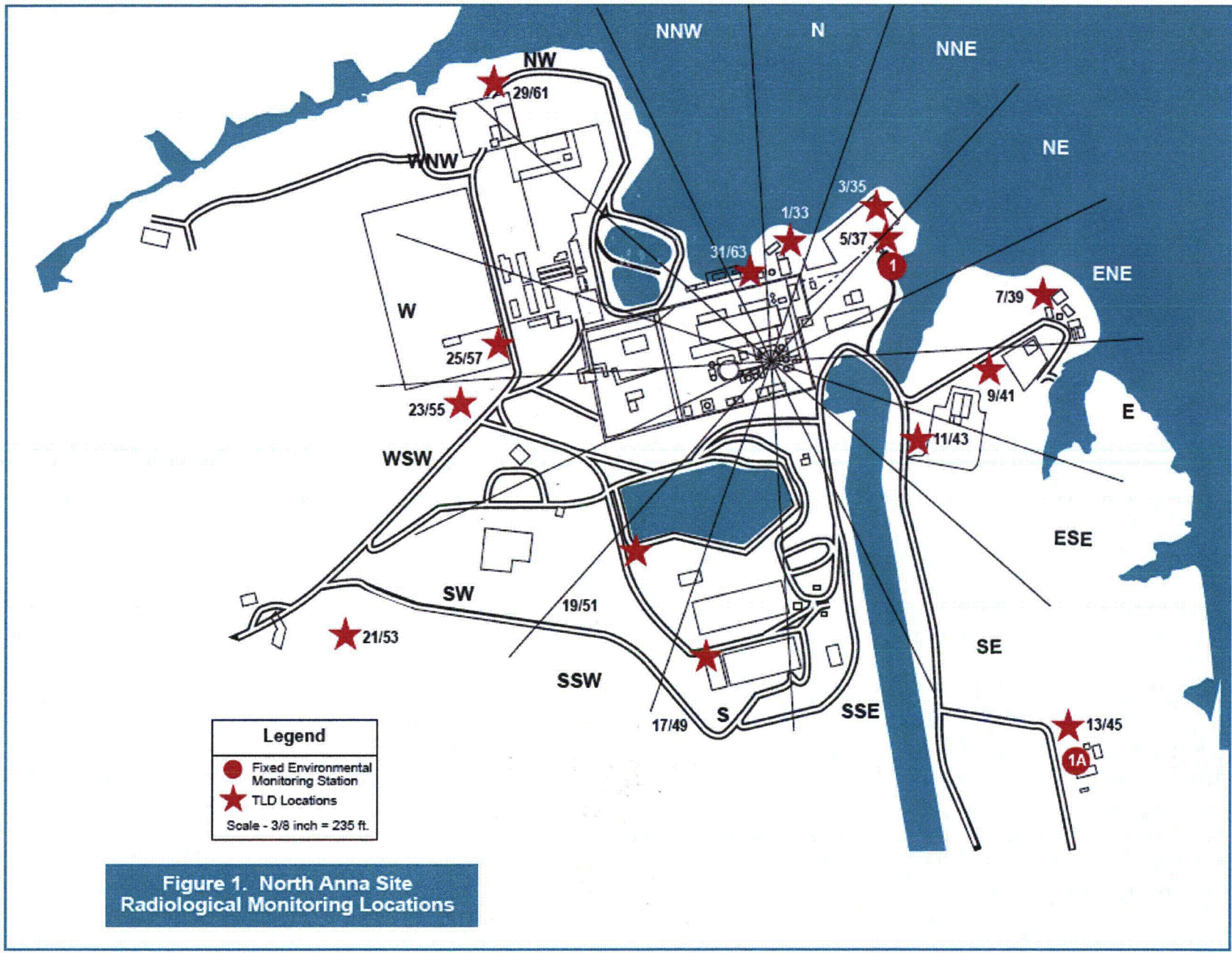
**Legend For The North Anna Power Station
Environmental Monitoring Stations Overview Maps**

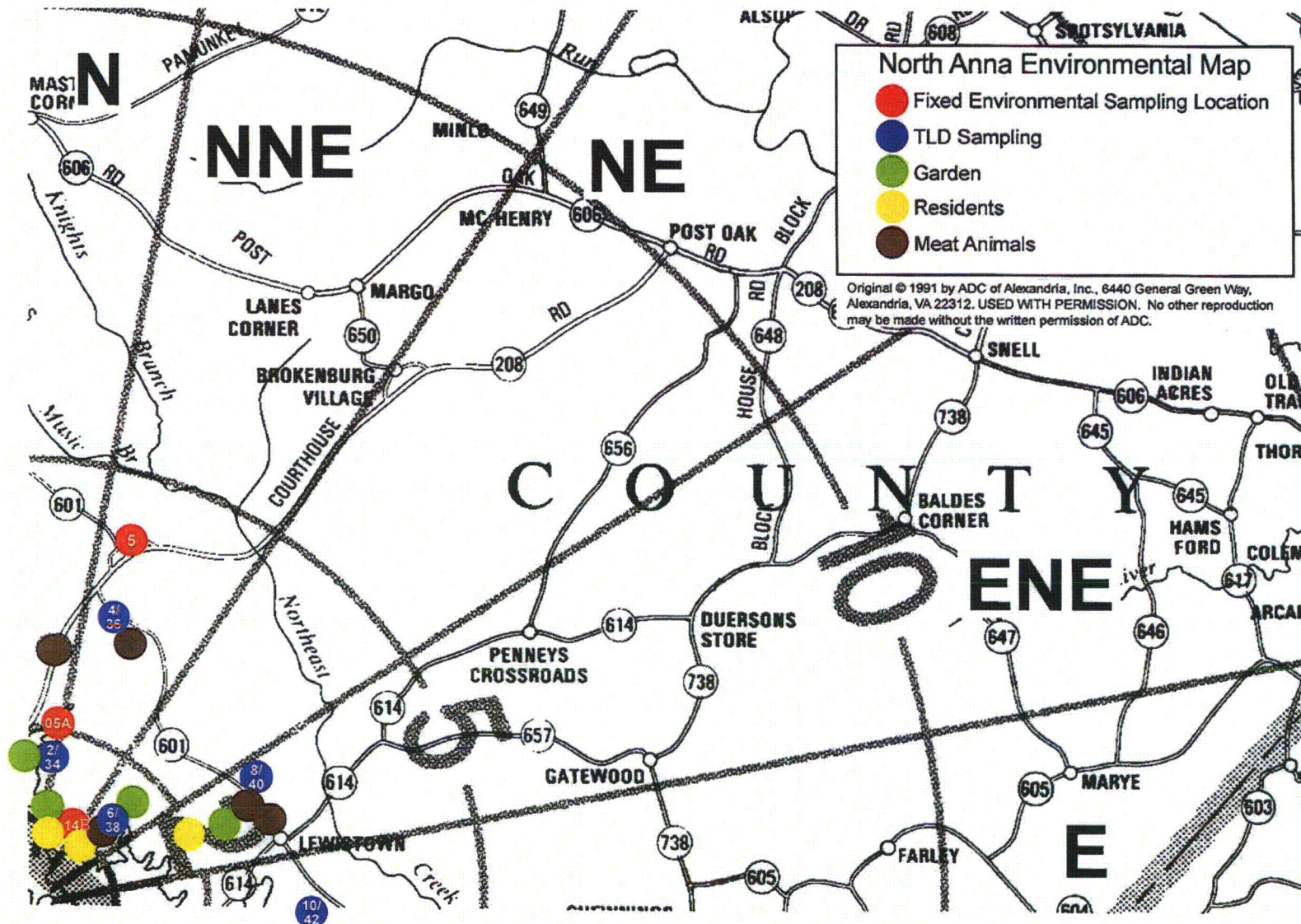
Map Designation	Environmental Station Identification	Map Designation	Environmental Station Identification
1 (a)	01,NE-5/37	7/8	C-7/8
1A	01A,SE-13/45	1/33	N-1/33
2 (a)	02,SSW-20/52	31/63	NNW-31/63
3 (a)	03,C-5/6	29/61	NW-29/61
4 (a)	04	3/35	NNE-3/35
5 (a)	05	7/39	ENE-7/39
5A (a)	05A,N-2/34	9/41	E-9/41
6 (a)	06,ESE-12/44	11/43	ESE-11/43
7 (a)	07, C-1/2	17/49	S-17/49
8	08-Water, Fish, Sediment, Shoreline Soil	19/51 21/53	SSW-19/51 SW-21/53
9A	09A-Water sample, Sediment	23/55	WSW-23/55
11	11-River Water, Sediment		
12A	12A-Milk	25/57	W-25/57
14B	14B-Vegetation	16/48	SSE-16/48
15	15-Vegetation	14/46	SE-14/46
16	16-Vegetation	22/54	SW-22/54
21 (a)	21,WNW-27/59	26/58	W-26/58
22 (a)	22,WSW-24/56	28/60	WNW-28/60
23 (a)	23-SSE-15/47,Vegetation	32/64	NNW-32/64
24 (a)(b)	24,C-3/4	8/40	ENE-8/40
25 (c)	25-Fish	4/36	NNE-4/36
26	26-Vegetation	10/42	E-10/42

(a) Indicates air sample station, annual and quarterly TLD, Triennial soil.

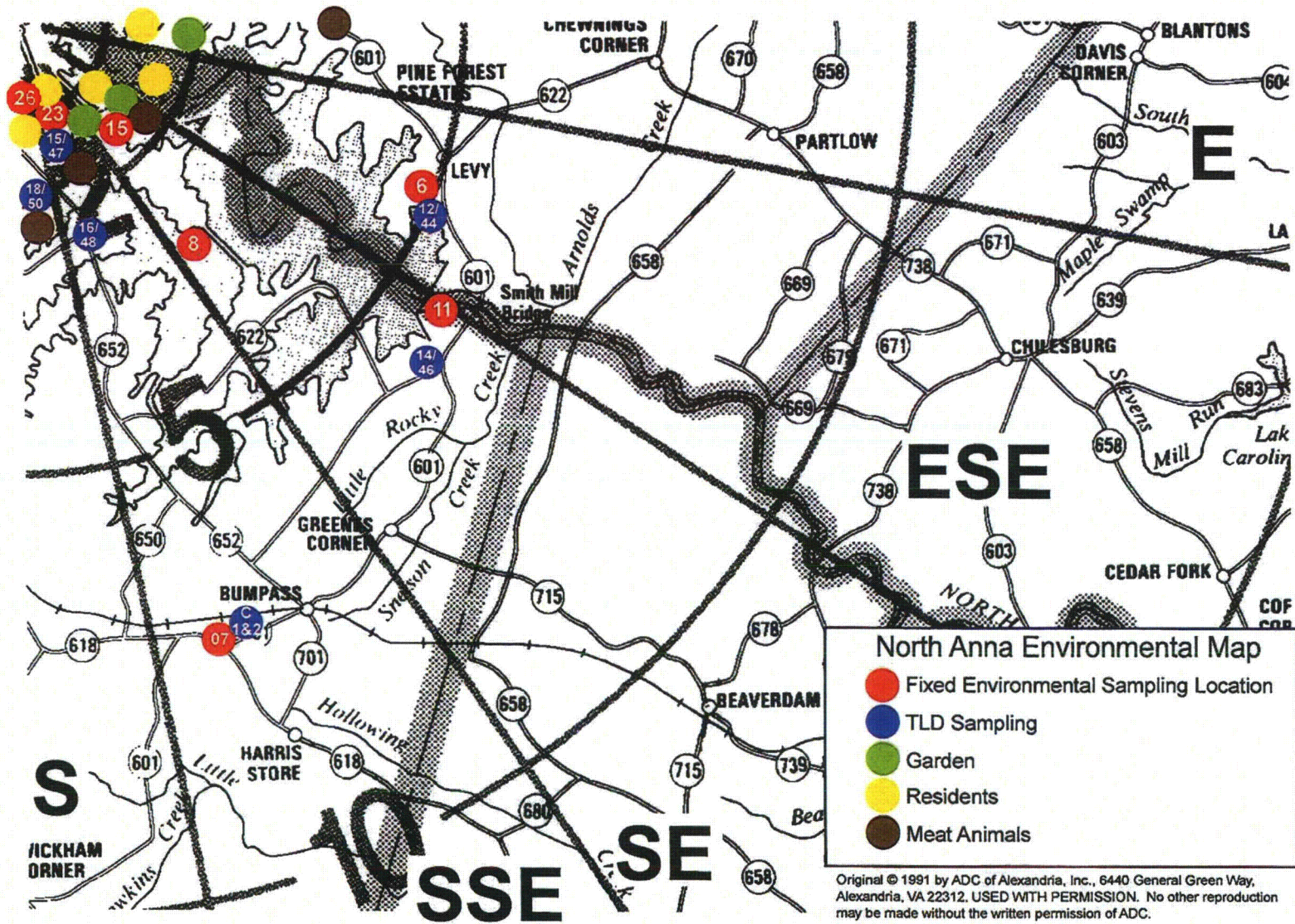
(b) In Orange

(c) In Lake Orange

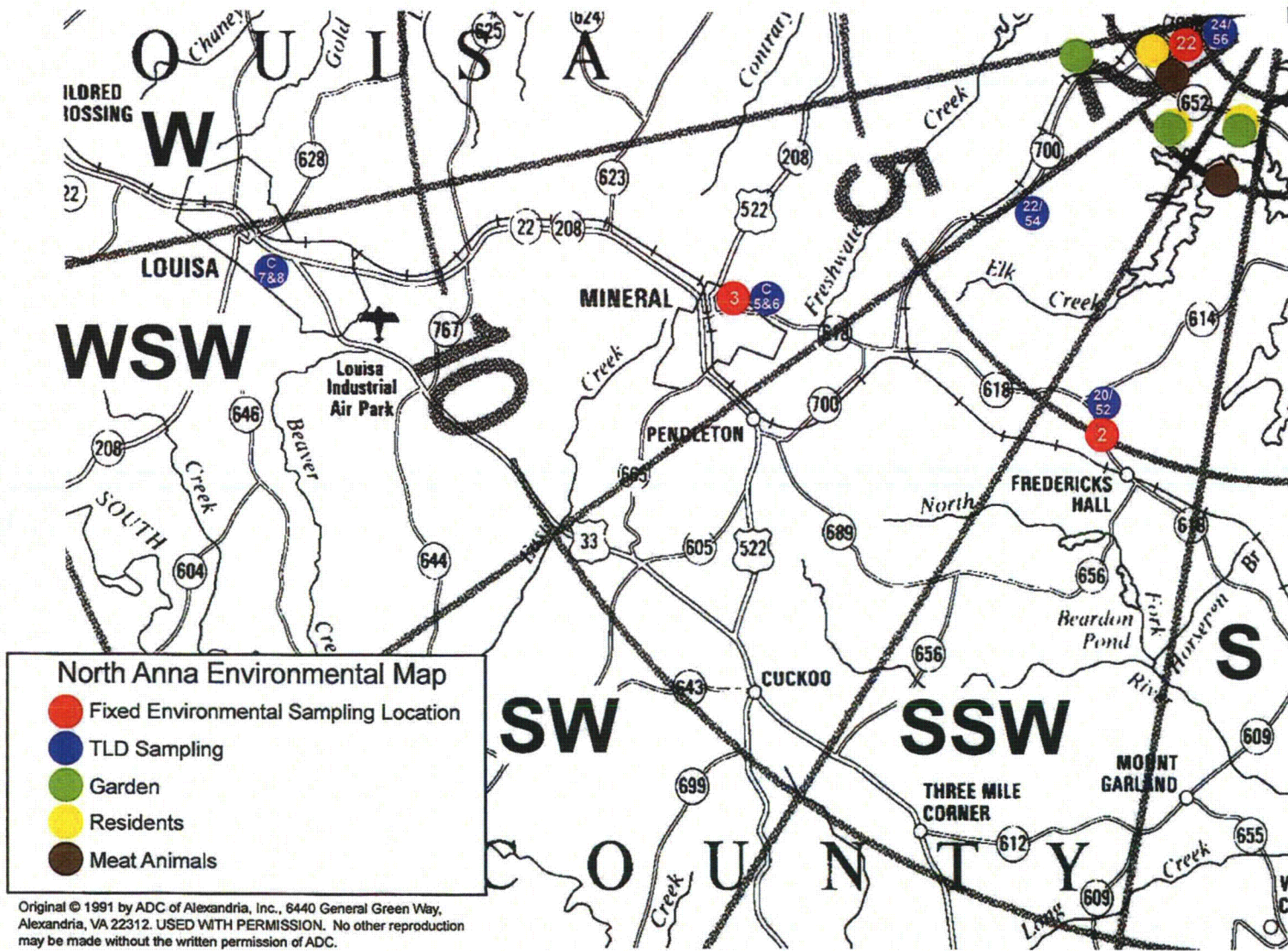




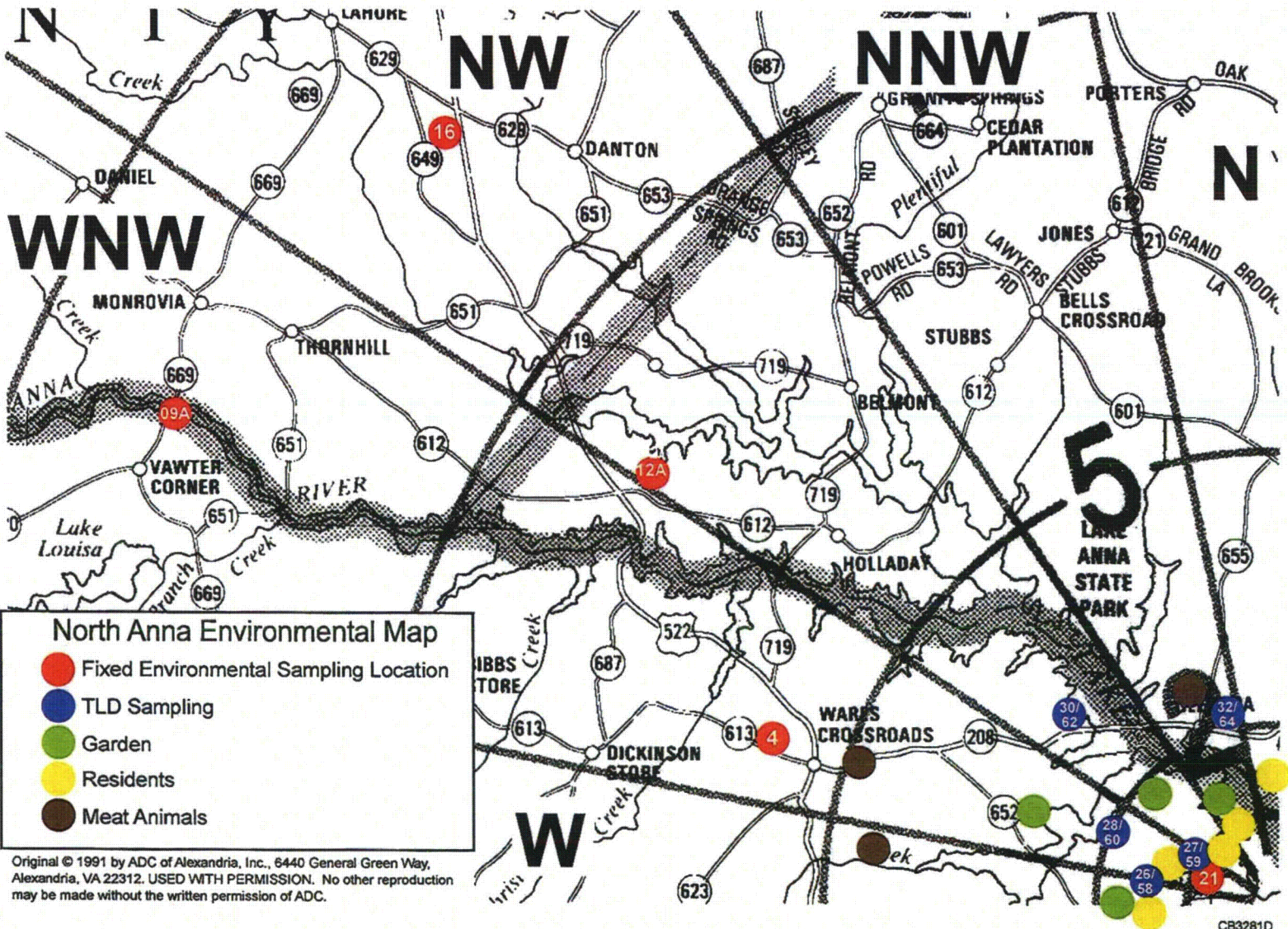
CB3280C



CB3282E



CB3283D



3. ANALYTICAL RESULTS

3.1 Summary of Results

In accordance with the North Anna Offsite Dose Calculation Manual (ODCM), a summary table of the analytical results has been prepared and is presented in Table 3-1. This data is presented in accordance with the format of the USNRC Branch Technical Position, "Acceptable Radiological Environmental Monitoring Program", Rev. 1, November 1979. The LLD listed value is taken from the ODCM. For radioanalytic analyses, the values listed in the columns indicated as "Mean/Range" include any results above the Minimum Detectable Concentration, MDC. Results are considered true positives when the measured value exceeds both the MDC and the 2σ error. For TLDs the mean and range include all values.

A more detailed analysis of the data is given in Section 4 where a discussion of the variations in the data explains many aspects that are not evident in the Summary Table because of the basic limitation of data summaries.

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD ⁽¹⁾ (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non-routine Reported Measurements
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	
Direct Radiation (mR/std. Month) (Sector TLDs)	Gamma Dose	256	2	4.6(256/256) (1.6-9.2)	29/61	0.52 mi. NW	7.7(8/8) (5.9-9.2)	3.9(16/16)* (3.3-4.4)	0
Direct Radiation (mR/std. Month) (Pre-operational TLDs)	Gamma Dose	32	2	2.5(16/16) (1.1-3.7)	C-7/8	11.54 mi. WSW	3.8 (8/8) (3.3-4.4)	3.6(16/16)* (2.7-4.4)	0
Direct Radiation (mR/std. Month) (Emergency Sector TLDs)	Gamma Dose	40	2	5.4(40/40) (3.5-9.9)	EPSP-09/10	0.37 mi. ENE	7.8(8/8) (6.0-9.9)	3.5(16/16)* (2.7-4.4)	0
Direct Radiation (mR/std. month) (Environmental TLDs)	Gamma Dose	48	2	3.8(44/44) (1.9-6.3)	23	0.93 mi. SSE	5.4(4/4) (4.8-6.3)	3.4(4/4) (2.9-3.9)	0
Direct Radiation (mR/std. Month) (Annual TLDs)	Gamma Dose	12	2	3.4(11/11) (2.3-4.8)	23	0.93 mi. SSE	4.8(1/1) (4.8)	3.4(1/1) (3.4)	0
Airborne Particulates (1E-03 pCi/m ³)	Gross Beta	676	0.01	15.4(620/624) (3.03-36.8)	05	0.2 mi. NNE	17.7(48/52) (7.84-37.8)	14.8(52/52) (5.90-35.7)	0
Air Iodine (pCi/m ³)	I-131	676	0.07	(0/624)	N/A	N/A.	N/A	N/A	0
Airborne Particulates (1E-03 pCi/m ³)	Gamma	52							
	Be-7	52	-	126(48/48) (102-161)	04	1.0 mi. WNW	132.8(4/4) (102-161)	117(4/4) (101-140)	0
	Cs-134	52	0.05	(0/48)	N/A	N/A	N/A	(0/4)	0

(1) mR/std month for TLDs

* C-3/4, -7/8 used as control locations

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations Mean Range	Indicator Location with Highest Mean			Control Location Mean Range	Non-routine Reported Measurements
	Type	Total No.			Name	Distance Direction	Mean Range		
Airborne	Cs-137	52	0.06	(0/48)	N/A	N/A	N/A	(0/4)	0
Particulates (1E-03 pCi/m ³)	Sr-89	13	-	(0/12)	N/A	N/A	N/A	(0/1)	0
	Sr-90	13	-	(0/12)	N/A	N/A	N/A	(0/1)	0
Soil* (pCi/Kg) (dry)	Triennial Gamma	12							
	K-40	12	-	15255 (11/11) (6320-29000)	23	N/A	29000 (1/1) (29000)	4660 (1/1) (4660)	0
	Cs-134	12	150	N/A	N/A	N/A	N/A	N/A	0
	Cs-137	12	180	208.9 (10/11) (93.1-539)	02	5.30 mi. SSW	539(1/1) (539)	329(1/1) (329)	0
	Ra-226	12	-	2461 (10/11) (1570-3600)	22	1.00 mi WSW	3600 (1/1) 3600	3390 (1/1) 3390	0
	Th-228	12	-	1314 (11/11) (504-2270)	06	4.70 mi ESE	2270(1/1) (2270)	1710 (1/1) (1710)	0
	Th-232	12	-	1191 (11/11) (530-2200)	06	4.70 mi ESE	2200 (1/1) (2200)	1340 (1/1) (1340)	0
	Sr-89	12	-	N/A	N/A	N/A	N/A	N/A	0
	Sr-90	12	-	N/A	N/A	N/A	N/A	N/A	0
Precipitation (pCi/liter)	Monthly Gross	12	4	6.42(9/12)	01A	0.64 mi.	6.42(9/12)	N/A	0
	Beta			(2.27-19.6)		SE	(2.27-19.6)		
	H-3	2	2000	(0/2)	N/A	N/A	N/A	N/A	0
	Semiannual Gamma	2							
	Be-7	2	-	66 (1/2) (66)	01A	0.64 mi. SE	66 (1/2) (66)	N/A	0
	Mn-54	2	15	(0/2)	N/A	N/A	N/A	N/A	0
	Fe-59	2	30	(0/2)	N/A	N/A	N/A	N/A	0
	Co-58	2	15	(0/2)	N/A	N/A	N/A	N/A	0

* Soil Samples required triennially. Samples obtained in 2013.

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non-routine Reported Measurements
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	
Precipitation (pCi/liter)	Co-60	2	15	(0/2)	N/A	N/A	N/A	N/A	0
	Zn-65	2	30	(0/2)	N/A	N/A	N/A	N/A	0
	Zr-95	2	30	(0/2)	N/A	N/A	N/A	N/A	0
	Nb-95	2	15	(0/2)	N/A	N/A	N/A	N/A	0
	I-131	2	10	(0/2)	N/A	N/A	N/A	N/A	0
	Cs-134	2	15	(0/2)	N/A	N/A	N/A	N/A	0
	Cs-137	2	18	(0/2)	N/A	N/A	N/A	N/A	0
	Ba-140	2	-	(0/2)	N/A	N/A	N/A	N/A	0
	La-140	2	-	(0/2)	N/A	N/A	N/A	N/A	0
	Th-228	2	-	(0/2)	N/A	N/A	N/A	N/A	0

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non-routine Reported Measurements
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	
Milk (pCi/liter)	Gamma	12							
	K-40	12	-	1350(12/12) (1220-1710)	12A	7.50 mi. NW	1350(12/12) (1220-1710)	N/A	0
	I-131	12	1	(0/12)	12A	N/A.	N/A	N/A	0
	Cs-137	12	18	(0/12)	N/A	N/A	N/A	N/A	0
	Ba-140	12	60	(0/12)	N/A	N/A	N/A	N/A	0
	La-140	12	15	(0/12)	N/A	N/A	N/A	N/A	0
	Sr-89 (Quarterly)	4	-	(0/4)	N/A	N/A	N/A	N/A	0
	Sr-90 (Quarterly)	4	-	(0/4)	N/A	N/A	N/A	N/A	0

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non-routine Reported Measurements
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	
Food Vegetation (pCi/kg) (wet)	Gamma	35							
	Be-7	35	-	1500(28/28) (368-3160)	26	1.15mi S	1740(7/7) (1210-2930)	1130(7/7) (681-1670)	0
	K-40	35	-	5755(28/28) (2680-10400)	14B	1.22mi NNE	6110(7/7) (4910-8300)	6110(7/7) (3970-10400)	0
	I-131	35	60	(0/28)	N/A	N/A	N/A	(0/7)	0
	Cs-134	35	60	(0/28)	N/A	N/A	N/A	(0/7)	0
	Cs-137	35	80	(0/28)	23	0.93	(0/28)	(0/7)	0
Ground Well Water (pCi/liter)	Tritium	4	2000	(0/4)	N/A	N/A	N/A	N/A	0
	Gamma	4							
	Mn-54	4	15	(0/4)	N/A	N/A	N/A	N/A	0
	Fe-59	4	30	(0/4)	N/A	N/A	N/A	N/A	0
	Co-58	4	15	(0/4)	N/A	N/A	N/A	N/A	0
	Co-60	4	15	(0/4)	N/A	N/A	N/A	N/A	0
	Zn-65	4	30	(0/4)	N/A	N/A	N/A	N/A	0
	Zr-95	4	30	(0/4)	N/A	N/A	N/A	N/A	0
	Nb-95	4	15	(0/4)	N/A	N/A	N/A	N/A	0
I-131	4	10	(0/4)	N/A	N/A	N/A	N/A	0	

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non-routine
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	Reported Measurements
Ground Well Water (pCi/liter)	Cs-134	4	15	(0/4)	N/A	N/A	N/A	N/A	0
	Cs-137	4	18	(0/4)	N/A	N/A	N/A	N/A	0
	Ba-140	4	60	(0/4)	N/A	N/A	N/A	N/A	0
	La-140	4	15	(0/4)	N/A	N/A	N/A	N/A	0
	Sr-89	1	-	(0/1)	N/A	N/A	N/A	N/A	0
	Sr-90	1	-	(0/1)	N/A	N/A	N/A	N/A	0
River Water (pCi/liter)	Tritium	4	2000	4010(4/4) (3750-4330)	11	5.80 mi. SE	4010(4/4) (3750-4330)	(0/4)*	0
	Gamma	12							
	Mn-54	12	15	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Fe-59	12	30	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Co-58	12	15	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Co-60	12	15	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Zn-65	12	30	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Zr-95	12	30	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Nb-95	12	15	(0/12)	N/A	N/A	N/A	(0/12)*	0
	I-131	12	1	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Cs-134	12	15	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Cs-137	12	18	(0/12)	N/A	N/A	N/A	(0/12)*	0

*Results of surface water taken at Location 09A used as control value for river water

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non-routine
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	Reported Measurements
River Water (pCi/liter)	Ba-140	12	60	(0/12)	N/A	N/A	N/A	(0/12)*	0
	La-140	12	15	(0/12)	N/A	N/A	N/A	(0/12)*	0
	Sr-89	1	-	(0/1)	N/A	N/A	N/A	(0/1)*	0
	Sr-90	1	-	(0/1)	N/A	N/A	N/A	(0/1)*	0
Surface Water (pCi/L)	Tritium	8	2000	4080(4/4) (3850-4370)	08	3.37 mi. SSE	4080(4/4) (3850-4370)	(0/4)	0
	Gamma	24							
	Mn-54	24	15	(0/12)	N/A	N/A	N/A	(0/12)	0
	Fe-59	24	30	(0/12)	N/A	N/A	N/A	(0/12)	0
	Co-58	24	15	(0/12)	N/A	N/A	N/A	(0/12)	0
	Co-60	24	15	(0/12)	N/A	N/A	N/A	(0/12)	0
	Zn-65	24	30	(0/12)	N/A	N/A	N/A	(0/12)	0
	Zr-95	24	30	(0/12)	N/A	N/A	N/A	(0/12)	0
	Nb-95	24	30	(0/12)	N/A	N/A	N/A	(0/12)	0
	I-131	24	1	(0/12)	N/A	N/A	N/A	(0/12)	0
	Cs-134	24	15	(0/12)	N/A	N/A	N/A	(0/12)	0
	Cs-137	24	18	(0/12)	N/A	N/A	N/A	(0/12)	0
	Ba-140	24	60	(0/12)	N/A	N/A	N/A	(0/12)	0
	La-140	24	15	(0/12)	N/A	N/A	N/A	(0/12)	0

*Results of surface water taken at Location 09A used as control value for river water

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non- routine
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	Reported Measure- ments
Surface Water (pCi/liter)	Sr-89	1	-	(0/1)	N/A	N/A	N/A	(0/1)	0
	Sr-90	1	-	(0/1)	N/A	N/A	N/A	(0/1)	0
Sediment Silt (pCi/kg)	Gamma	6	-	10990 (4/4)	11	5.80 mi.	15900 (2/2)	12250(2/2)	0
	K-40	6	-	(2340-16000)		SE	(15800 - 16000)	(12000-12500)	
	Cs-134	6	150	(0/4)	N/A	N/A	N/A	(0/2) (176)	0
	Cs-137	6	180	(0/4)	N/A	N/A	N/A	112(1/2) (112)	0
	Ra-226	6	-	2132.5(4/4)	11	5.80 mi.	2345(2/2)	2220(2/2)	0
				(1820-2540)		SE	(2150-2540)	(2090-2350)	
	Th-228	6	-	1214(4/4)	1	5.80 mi.	1565(2/2)	561(2/2)	0
				(548-1760)		SE	(1370-1760)	(548-574)	
	Th-232	6	-	1014.5 (4/4)	11	5.80 mi.	1265(2/2)	618.5(2/2)	0
				(506-1310)		SE	(1220-1310)	(506-731)	
(Annually)	Sr-89	3	-	(0/2)	N/A	N/A	N/A	(0/1)	0
	Sr-90	3	-	(0/2)	N/A	N/A	N/A	(0/1)	0
Shoreline Soil (pCi/kg) (dry)	Gamma	2	-	2650(2/2)	08	3.37 mi.	2650(2/2)	N/A	0
	K-40	2	-	(1360-3940)		SSE	(1360-3940)		
	Cs-134	2	150	(0/2)	N/A	NA	(0/2)	N/A	0
	Cs-137	2	180	(0/2)	N/A	NA	(0/2)	N/A	0
	Ra-226	2	-	1520(1/2)	08	3.37 mi.	1520(1/2)	N/A	0
			(1520)		SSE	(1520)			

Table 3-1

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Medium or Pathway Sampled (Unit)	Analysis		LLD (pCi/unit)	All Indicator Locations	Indicator Location with Highest Mean			Control Location	Non- routine
	Type	Total No.		Mean Range	Name	Distance Direction	Mean Range	Mean Range	Reported Measure- ments
Shoreline Soil									
(pCi/kg) (dry)									
	Th-228	2	-	819(2/2) (809-829)	08	3.37 mi. SSE	819(2/2) (809-829)	N/A	0
	Th-232	2	-	725.5 (2/2) (705-746)	08	3.37 mi. SSE	725.5(2/2) (705-746)	N/A	0
	(Annually)								
	Sr-89	1	-	(0/1)	N/A	NA	N/A	N/A	0
	Sr-90	1	-	(0/1)	N/A	NA	N/A	N/A	0
	Gamma	8							
Fish									
(pCi/kg) (wet)									
	K-40	8	-	2450(4/4) (2240-2650)	8	3.37 mi. SSE	2450(4/4) (2240-2650)	2447.5(4/4) (1370-2850)	0
	Mn-54	8	130	(0/4)	N/A	NA	N/A	(0/4)	0
	Fe-59	8	260	(0/4)	N/A	NA	N/A	(0/4)	0
	Co-58	8	130	(0/4)	N/A	NA	N/A	(0/4)	0
	Co-60	8	130	(0/4)	N/A	NA	N/A	(0/4)	0
	Zn-65	8	260	(0/4)	N/A	NA	N/A	(0/4)	0
	Cs-134	8	130	(0/4)	N/A	NA	N/A	(0/4)	0
	Cs-137	8	150	(0/4)	N/A	NA	N/A	(0/4)	0

3.2 Analytical Results of 2013 REMP Samples

Radiological analyses of environmental media characteristically approach and frequently fall below the detection limits of state-of-the-art measurement methods. The data reported in the following tables are strictly counting statistics. The reported error is two times the standard deviation (2σ) of the net activity. Unless otherwise noted, the overall error (counting, sample size, chemistry, errors, etc.) is estimated to be 2 to 5 times that listed. Results are considered true positives when the measured value exceeds both the MDC and the 2σ error.

Because of counting statistics, negative values, zeros and numbers below the Minimum Detectable Level (MDL) are statistically valid pieces of data¹. For clarity of this report only detectable results are presented. TBE's analytical methods meet the Lower Limit of Detection (LLD) requirements given in Table 2 of the USNRC Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program", (November 1979, Revision 1) and the North Anna ODCM.

Data are given according to sample type as indicated below.

1. Gamma Exposure Rate
2. Air Particulates, Gross Beta Radioactivity
3. Air Particulates, Weekly I-131
4. Air Particulates, Quantitative Gamma Spectra
5. Air Particulate Strontium
6. Soil
7. Precipitation
8. Cow Milk
9. Food Products and Vegetation
10. Well Water
11. River Water
12. Surface Water
13. Bottom Sediment/Silt
14. Shoreline Soil
15. Fish

¹ Analytical results are handled as recommended by HASL ("*Reporting of Analytical Results from HASL*," letter by Leo B. Higginbotham) and NUREG/CR-4007 (Sept. 1984).

TABLE 3-2

DIRECT RADIATION MEASUREMENTS - SECTOR QUARTERLY TLD RESULTS
 mR/Std. Month (30.4 days) ± 2 Sigma

Page
 1 of 4

Station	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Quarterly* Average +/- 2 s.d.
N-1	5.3	4.4	5.5	5.7	5.4 +/- 1.3
N-33	6.2	4.7	5.4	6.2	
N-2	3.8	2.5	2.8	4.4	3.3 +/- 1.3
N-34	3.3	2.5	3.6	3.3	
NNE-3	7.7	5.6	6.9	7.4	6.8 +/- 1.5
NNE-35	7.1	5.9	6.4	7.3	
NNE-4	4.6	3.6	4.6	4.2	4.4 +/- 0.9
NNE-36	4.5	3.9	5.0	4.8	
NE-5	5.2	4.4	3.6	4.2	4.7 +/- 1.6
NE-37	5.5	4.5	4.1	6.0	
NE-6	3.3	2.6	3.3	4.3	3.4 +/- 1.2
NE-38	3.5	2.7	3.6	4.2	
ENE-7	6.0	4.7	4.3	5.4	5.3 +/- 1.6
ENE-39	6.6	4.5	6.0	5.2	
ENE-8	2.8	2.2	2.3	3.5	2.7 +/- 1.0
ENE-40	2.7	2.4	2.4	3.4	
E-9	6.1	3.9	5.4	4.9	5.2 +/- 1.7
E-41	6.1	4.1	5.4	5.9	
E-10	5.5	3.9	4.7	5.1	4.9 +/- 1.4
E-42	5.7	3.9	4.8	5.5	
ESE-11	4.3	4.6	4.5	5.3	4.6 +/- 1.0
ESE-43	4.6	3.7	4.8	5.0	
ESE-12	5.8	4.9	5.0	5.0	5.0 +/- 1.0
ESE-44	5.4	4.1	4.5	5.1	
SE-13	5.8	3.8	5.0	5.3	4.8 +/- 1.6
SE-45	4.6	4.4	3.7	5.8	
SE-14	8.0	5.1	5.9	7.6	6.7 +/- 2.0
SE-46	7.1	6.5	6.1	7.6	
SSE-15	6.3	5.0	5.2	5.0	5.2 +/- 1.3
SSE-47	5.1	4.1	5.4	5.7	
SSE-16	4.3	2.1	3.0	3.6	3.0 +/- 1.5
SSE-48	3.1	2.5	2.3	3.3	

*Average of collocated TLDs.

TABLE 3-2

DIRECT RADIATION MEASUREMENTS - SECTOR QUARTERLY TLD RESULTS
 mR/Std. Month (30.4 days) \pm 2 Sigma

Station	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Quarterly* Average +/- 2 s.d.		
S-17	5.7	3.9	4.8	6.2	5.1	+/-	1.4
S-49	4.9	5.3	4.6	5.0			
S-18	3.1	1.7	2.6	2.9	2.7	+/-	1.1
S-50	2.8	2.1	2.6	3.4			
SSW-19	7.4	5.7	5.3	5.8	6.2	+/-	1.6
SSW-51	7.0	5.3	6.9	6.2			
SSW-20	2.8	2.0	2.8	3.1	2.7	+/-	1.0
SSW-52	2.5	2.1	3.1	3.5			
SW-21	4.6	4.1	4.8	5.4	4.7	+/-	1.1
SW-53	5.3	3.7	4.8	4.7			
SW-22	5.7	3.6	4.7	5.3	4.6	+/-	1.5
SW-54	4.2	3.6	4.8	4.5			
WSW-23	5.3	4.8	5.5	6.2	5.5	+/-	1.5
WSW-55	6.8	4.5	5.4	5.6			
WSW-24	5.5	3.9	4.4	4.9	4.6	+/-	1.4
WSW-56	5.5	3.6	4.3	4.7			
W-25	8.6	7.6	5.8	8.0	7.4	+/-	2.3
W-57	8.5	5.8	6.9	8.3			
W-26	3.7	2.8	3.1	3.8	3.3	+/-	1.0
W-58	3.7	2.5	3.6	3.0			
WNW-27	4.1	3.0	2.8	4.2	3.4	+/-	1.1
WNW-59	3.8	2.8	3.3	3.1			
WNW-28	3.3	2.7	2.3	3.6	3.0	+/-	0.9
WNW-60	3.3	2.6	2.6	3.3			
NW-29	7.4	7.7	7.5	8.6	7.7	+/-	2.3
NW-61	8.6	5.9	6.3	9.2			
NW-30	2.5	1.7	2.0	3.0	2.2	+/-	1.1
NW-62	2.3	1.9	1.6	2.9			
NNW-31	4.5	2.8	2.8	4.7	3.8	+/-	1.5
NNW-63	4.1	3.1	4.0	4.2			
NNW-32	3.5	3.3	3.8	5.0	3.8	+/-	1.2
NNW-64	3.7	3.1	4.3	3.9			
Mean					4.6	+/-	1.5

*Average of collocated TLDs.

TABLE 3-2

DIRECT RADIATION MEASUREMENTS - SECTOR QUARTERLY TLD RESULTS
 mR/Std. Month (30.4 days) ± 2 Sigma

Station	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Quarterly* Average +/- 2 s.d.
C-1	4.1	2.7	2.8	3.4	3.3 +/- 1.1
C-2	4.0	2.7	2.9	3.5	
C-3**	3.4	2.8	2.9	4.2	3.3 +/- 1.0
C-4**	3.3	2.7	3.1	3.8	
C-5	2.4	2.1	2.4	3.4	2.5 +/- 1.0
C-6	2.9	2.0	1.9	2.9	
C-7**	3.9	4.4	3.8	4.3	3.8 +/- 0.8
C-8**	4.0	3.3	3.3	3.5	
					2.9 +/- 1.3
					3.5 +/- 1.1
EP5A-01***	5.3	4.9	3.7	5.2	4.9 +/- 1.3
EP5A-02***	5.2	4.1	5.3	5.5	
EP5F-03***	4.5	4.2	4.4	5.2	4.5 +/- 1.2
EP5F-04***	5.5	4.0	3.7	4.6	
EP5R-05***	4.9	5.4	4.4	7.0	5.3 +/- 1.7
EP5R-06***	5.2	4.5	5.3	5.8	
EP5J-07***	6.0	3.7	4.0	3.8	4.4 +/- 1.7
EP5J-08***	4.5	3.5	4.3	5.3	
EP5P-09***	9.9	8.5	6.0	7.9	7.8 +/- 2.8
EP5P-10***	9.1	6.5	6.5	8.2	
Mean					5.4 +/- 3.1

*Average of collocated TLDs.

** Control Station

*** Emergency Plan TLDs.

**TABLE 3-2
DIRECT RADIATION MEASUREMENTS - SECTOR QUARTERLY TLD RESULTS
mR/Std. Month (30.4 days) ± 2 Sigma**

Station	First Quarter 12/26/2012 3/26/2013	Second Quarter 3/26/2013 6/25/2013	Third Quarter 6/25/2013 9/24/2013	Fourth Quarter 9/24/2013 12/31/2013	Quarterly Average +/- 2 s.d.	Annual TLD
STA-01	5.1	4.9	4.2	5.8	5.0 +/- 1.3	4.4
STA-02	3.0	2.8	2.7	3.2	2.9 +/- 0.4	2.5
STA-03	2.3	2.0	2.1	3.4	2.5 +/- 1.3	2.5
STA-04	3.7	1.9	2.4	2.5	2.6 +/- 1.5	2.8
STA-05	**	2.7	2.8	3.0	2.8 +/- 0.3	2.3
STA-05A	4.2	2.4	2.6	3.9	3.3 +/- 1.8	2.5
STA-06	5.4	4.6	4.4	5.4	5.0 +/- 1.1	4.2
STA-07	4.1	2.5	3.4	3.9	3.5 +/- 1.4	3.3
STA-21	3.2	3.2	3.9	3.3	3.4 +/- 0.7	3.3
STA-22	5.4	4.5	4.4	4.9	4.8 +/- 0.9	4.4
STA-23	6.3	5.5	4.8	5.1	5.4 +/- 1.3	4.8
STA-24*	3.7	2.9	3.0	3.9	3.4 +/- 0.5	3.6
			Mean - Indicator Locations		3.8 +/- 1.2	3.4 +/- 1.9

*Control

** TLD lost when power pole was replaced following storm

Table 3-3
Air Particulate
Gross Beta Radioactivity
 $[10^{-3} \text{ pCi/m}^3]$

Period	Station		Station		Station		Station		Station		Station		Station		Station						
Ending	01		02		03		04		05		06		07								
01/02/13	1.08E+01	+/-	2.70E+00	1.48E+01	+/-	2.92E+00	1.26E+01	+/-	2.86E+00	1.09E+01	+/-	2.74E+00	1.55E+01	+/-	2.96E+00	1.36E+01	+/-	2.86E+00	1.17E+01	+/-	2.77E+00
01/08/13	3.08E+01	+/-	3.90E+00	2.14E+01	+/-	3.44E+00	3.23E+01	+/-	3.96E+00	3.26E+01	+/-	3.97E+00	3.78E+01	+/-	4.19E+00	3.06E+01	+/-	3.88E+00	3.39E+01	+/-	4.03E+00
01/16/13	1.92E+01	+/-	2.76E+00	2.05E+01	+/-	2.82E+00	1.83E+01	+/-	2.72E+00	2.28E+01	+/-	2.92E+00	2.40E+01	+/-	2.98E+00	2.33E+01	+/-	2.95E+00	1.77E+01	+/-	2.69E+00
01/22/13	1.59E+01	+/-	3.15E+00	1.65E+01	+/-	3.20E+00	1.61E+01	+/-	3.18E+00	1.76E+01	+/-	3.26E+00	2.30E+01	+/-	3.53E+00	1.93E+01	+/-	3.34E+00	1.82E+01	+/-	3.28E+00
01/29/13	2.24E+01	+/-	3.18E+00	2.33E+01	+/-	3.22E+00	2.68E+01	+/-	3.38E+00	2.66E+01	+/-	3.37E+00	2.73E+01	+/-	3.40E+00	2.49E+01	+/-	3.29E+00	2.53E+01	+/-	3.31E+00
02/05/13	2.52E+01	+/-	3.47E+00	2.28E+01	+/-	3.36E+00	1.96E+01	+/-	3.22E+00	2.54E+01	+/-	3.48E+00	2.36E+01	+/-	3.40E+00	2.05E+01	+/-	3.26E+00	2.22E+01	+/-	3.33E+00
02/13/13	1.43E+01	+/-	2.53E+00	1.20E+01	+/-	2.41E+00	1.49E+01	+/-	2.56E+00	1.89E+01	+/-	2.76E+00	1.78E+01	+/-	2.70E+00	1.80E+01	+/-	2.72E+00	1.38E+01	+/-	2.51E+00
02/20/13	1.10E+01	+/-	2.65E+00	1.42E+01	+/-	2.88E+00	1.17E+01	+/-	2.74E+00	1.28E+01	+/-	2.79E+00	1.41E+01	+/-	2.86E+00	1.45E+01	+/-	2.87E+00	1.20E+01	+/-	2.77E+00
02/27/13	6.27E+00	+/-	2.47E+00	6.93E+00	+/-	2.49E+00	8.59E+00	+/-	2.46E+00	8.69E+00	+/-	2.61E+00	1.20E+01	+/-	2.80E+00	1.15E+01	+/-	2.78E+00	7.51E+00	+/-	2.52E+00
03/05/13	7.84E+00	+/-	2.79E+00	5.93E+00	+/-	2.62E+00	5.35E+00	+/-	2.52E+00	1.01E+01	+/-	2.86E+00	8.40E+00	+/-	2.76E+00	7.38E+00	+/-	2.70E+00	7.59E+00	+/-	2.72E+00
03/12/13	7.88E+00	+/-	2.34E+00	6.77E+00	+/-	2.66E+00	9.60E+00	+/-	2.66E+00	7.99E+00	+/-	2.39E+00	*	<	*	1.06E+01	+/-	2.85E+00	6.45E+00	+/-	2.24E+00
03/19/13	1.35E+01	+/-	2.94E+00	1.46E+01	+/-	2.99E+00	1.04E+01	+/-	2.77E+00	1.25E+01	+/-	2.88E+00	*	<	*	1.59E+01	+/-	3.06E+00	1.09E+01	+/-	2.81E+00
03/26/13	1.28E+01	+/-	2.67E+00	1.13E+01	+/-	2.58E+00	1.08E+01	+/-	2.49E+00	1.41E+01	+/-	2.69E+00	*	<	*	1.27E+01	+/-	2.64E+00	1.41E+01	+/-	2.72E+00
04/02/13	9.78E+00	+/-	2.68E+00	9.93E+00	+/-	2.69E+00	1.02E+01	+/-	2.63E+00	9.91E+00	+/-	2.64E+00	*	<	*	9.16E+00	+/-	2.63E+00	7.26E+00	+/-	2.52E+00
04/09/13	1.04E+01	+/-	2.63E+00	1.61E+01	+/-	3.21E+00	1.60E+01	+/-	2.98E+00	2.03E+01	+/-	3.18E+00	1.86E+01	+/-	3.58E+00	1.69E+01	+/-	3.00E+00	2.03E+01	+/-	3.20E+00
04/17/13	1.16E+01	+/-	2.28E+00	1.74E+01	+/-	2.58E+00	1.15E+01	+/-	2.25E+00	1.34E+01	+/-	2.39E+00	1.33E+01	+/-	2.39E+00	1.47E+01	+/-	2.47E+00	1.25E+01	+/-	2.32E+00
04/23/13	1.23E+01	+/-	3.10E+00	1.67E+01	+/-	3.34E+00	1.23E+01	+/-	3.16E+00	1.26E+01	+/-	3.16E+00	1.57E+01	+/-	3.28E+00	1.61E+01	+/-	3.34E+00	1.35E+01	+/-	3.29E+00
04/30/13	1.27E+01	+/-	2.95E+00	1.34E+01	+/-	2.87E+00	1.16E+01	+/-	2.82E+00	1.14E+01	+/-	2.82E+00	1.20E+01	+/-	2.84E+00	1.12E+01	+/-	2.80E+00	8.74E+00	+/-	2.62E+00
05/08/13	7.49E+00	+/-	2.03E+00	1.16E+01	+/-	2.34E+00	8.38E+00	+/-	2.12E+00	8.81E+00	+/-	2.16E+00	1.21E+01	+/-	2.34E+00	1.20E+01	+/-	2.34E+00	8.97E+00	+/-	2.18E+00
05/14/13	1.11E+01	+/-	2.83E+00	1.54E+01	+/-	3.06E+00	1.25E+01	+/-	2.96E+00	1.47E+01	+/-	3.05E+00	1.24E+01	+/-	2.94E+00	1.37E+01	+/-	3.01E+00	1.22E+01	+/-	2.87E+00
05/21/13	1.30E+01	+/-	2.74E+00	1.94E+01	+/-	3.06E+00	1.69E+01	+/-	2.93E+00	1.65E+01	+/-	2.91E+00	1.97E+01	+/-	3.07E+00	2.03E+01	+/-	3.11E+00	1.31E+01	+/-	2.74E+00
05/28/13	1.40E+01	+/-	2.65E+00	1.42E+01	+/-	2.67E+00	1.22E+01	+/-	2.55E+00	1.17E+01	+/-	2.52E+00	1.44E+01	+/-	2.68E+00	1.50E+01	+/-	2.71E+00	1.41E+01	+/-	2.66E+00
06/04/13	1.46E+01	+/-	2.62E+00	1.59E+01	+/-	2.70E+00	1.23E+01	+/-	2.48E+00	1.32E+01	+/-	2.54E+00	1.60E+01	+/-	2.70E+00	1.41E+01	+/-	2.59E+00	1.51E+01	+/-	2.65E+00
06/11/13	8.08E+00	+/-	2.33E+00	1.13E+01	+/-	2.53E+00	1.21E+01	+/-	2.58E+00	9.64E+00	+/-	2.43E+00	1.09E+01	+/-	2.51E+00	1.21E+01	+/-	2.58E+00	6.18E+00	+/-	2.21E+00
06/18/13	1.57E+01	+/-	2.81E+00	1.43E+01	+/-	2.73E+00	1.84E+01	+/-	2.94E+00	1.35E+01	+/-	2.68E+00	1.80E+01	+/-	2.92E+00	1.50E+01	+/-	2.76E+00	1.34E+01	+/-	2.68E+00
06/25/13	1.01E+01	+/-	2.63E+00	1.02E+01	+/-	2.59E+00	1.31E+01	+/-	2.67E+00	1.37E+01	+/-	2.76E+00	1.07E+01	+/-	2.60E+00	8.58E+00	+/-	2.48E+00	8.42E+00	+/-	2.49E+00

* Sample not obtained due to sampler not operating.

Table 3-3
Air Particulate
Gross Beta Radioactivity
 $[10^{-3} \text{ pCi/m}^3]$

Period	Station		Station		Station		Station		Station		Station		Station					
Ending	21		22		23		24*		01A		05A							
01/02/13	9.27E+00	+/-	2.62E+00	9.95E+00	+/-	2.66E+00	1.05E+01	+/-	2.69E+00	1.35E+01	+/-	2.86E+00	1.02E+01	+/-	2.67E+00	1.52E+01	+/-	2.95E+00
01/08/13	3.34E+01	+/-	4.01E+00	3.33E+01	+/-	4.00E+00	3.20E+01	+/-	3.95E+00	3.57E+01	+/-	4.11E+00	2.99E+01	+/-	3.85E+00	3.42E+01	+/-	4.04E+00
01/16/13	2.19E+01	+/-	2.89E+00	1.82E+01	+/-	2.71E+00	2.06E+01	+/-	2.83E+00	2.18E+01	+/-	2.88E+00	1.83E+01	+/-	2.72E+00	2.13E+01	+/-	2.86E+00
01/22/13	1.46E+01	+/-	3.08E+00	1.82E+01	+/-	3.28E+00	1.47E+01	+/-	3.09E+00	1.52E+01	+/-	3.12E+00	1.39E+01	+/-	3.05E+00	1.30E+01	+/-	3.01E+00
01/29/13	2.67E+01	+/-	3.37E+00	2.07E+01	+/-	3.09E+00	2.78E+01	+/-	3.42E+00	2.52E+01	+/-	3.31E+00	2.19E+01	+/-	3.15E+00	2.33E+01	+/-	3.22E+00
02/05/13	1.80E+01	+/-	3.14E+00	1.90E+01	+/-	3.19E+00	2.22E+01	+/-	3.33E+00	2.12E+01	+/-	3.29E+00	1.29E+01	+/-	2.89E+00	2.00E+01	+/-	3.23E+00
02/13/13	1.74E+01	+/-	2.69E+00	1.42E+01	+/-	2.53E+00	1.57E+01	+/-	2.60E+00	1.38E+01	+/-	2.51E+00	1.33E+01	+/-	2.48E+00	1.69E+01	+/-	2.66E+00
02/20/13	1.27E+01	+/-	2.80E+00	9.43E+00	+/-	2.61E+00	1.22E+01	+/-	2.76E+00	1.20E+01	+/-	2.77E+00	1.04E+01	+/-	2.62E+00	1.07E+01	+/-	2.68E+00
02/27/13	7.37E+00	+/-	2.56E+00	7.52E+00	+/-	2.57E+00	8.71E+00	+/-	2.58E+00	7.47E+00	+/-	2.57E+00	8.56E+00	+/-	2.61E+00	8.61E+00	+/-	2.62E+00
03/05/13	5.85E+00	+/-	2.55E+00	8.36E+00	+/-	2.72E+00	7.68E+00	+/-	2.76E+00	5.91E+00	+/-	2.55E+00	6.64E+00	+/-	2.70E+00	8.55E+00	+/-	2.76E+00
03/12/13	6.14E+00	+/-	2.29E+00	9.31E+00	+/-	2.43E+00	7.03E+00	+/-	2.34E+00	5.90E+00	+/-	2.22E+00	8.62E+00	+/-	2.38E+00	6.95E+00	+/-	2.29E+00
03/19/13	1.33E+01	+/-	2.92E+00	1.07E+01	+/-	2.79E+00	1.55E+01	+/-	3.03E+00	<3.55E+00			1.40E+01	+/-	2.97E+00	1.30E+01	+/-	2.91E+00
03/26/13	1.15E+01	+/-	2.58E+00	1.33E+01	+/-	2.68E+00	1.27E+01	+/-	2.64E+00	1.21E+01	+/-	2.60E+00	7.97E+00	+/-	2.38E+00	8.18E+00	+/-	2.37E+00
04/02/13	8.66E+00	+/-	2.60E+00	8.21E+00	+/-	2.57E+00	1.14E+01	+/-	2.75E+00	1.26E+01	+/-	2.80E+00	1.09E+01	+/-	2.73E+00	8.25E+00	+/-	2.57E+00
04/09/13	1.34E+01	+/-	2.87E+00	2.05E+01	+/-	3.21E+00	1.73E+01	+/-	3.05E+00	1.81E+01	+/-	3.09E+00	1.68E+01	+/-	2.96E+00	1.43E+01	+/-	2.88E+00
04/17/13	1.12E+01	+/-	2.25E+00	1.24E+01	+/-	2.32E+00	1.34E+01	+/-	2.37E+00	1.42E+01	+/-	2.42E+00	9.74E+00	+/-	2.17E+00	1.23E+01	+/-	2.33E+00
04/23/13	1.07E+01	+/-	3.16E+00	1.52E+01	+/-	3.26E+00	1.45E+01	+/-	3.40E+00	1.27E+01	+/-	3.14E+00	1.22E+01	+/-	3.09E+00	1.23E+01	+/-	3.15E+00
04/30/13	1.05E+01	+/-	2.75E+00	9.25E+00	+/-	2.68E+00	1.04E+01	+/-	2.70E+00	1.01E+01	+/-	2.74E+00	9.34E+00	+/-	2.76E+00	9.97E+00	+/-	2.73E+00
05/08/13	8.99E+00	+/-	2.17E+00	8.59E+00	+/-	2.14E+00	1.06E+01	+/-	2.29E+00	7.94E+00	+/-	2.10E+00	9.09E+00	+/-	2.13E+00	8.34E+00	+/-	2.13E+00
05/14/13	1.34E+01	+/-	3.00E+00	1.16E+01	+/-	2.90E+00	1.38E+01	+/-	2.95E+00	1.11E+01	+/-	2.87E+00	1.01E+01	+/-	2.77E+00	9.53E+00	+/-	2.76E+00
05/21/13	1.50E+01	+/-	2.83E+00	1.63E+01	+/-	2.90E+00	1.53E+01	+/-	2.86E+00	1.33E+01	+/-	2.75E+00	1.47E+01	+/-	2.83E+00	1.39E+01	+/-	2.78E+00
05/28/13	8.71E+00	+/-	2.34E+00	1.06E+01	+/-	2.46E+00	1.33E+01	+/-	2.62E+00	1.47E+01	+/-	2.70E+00	1.22E+01	+/-	2.55E+00	1.27E+01	+/-	2.58E+00
06/04/13	1.39E+01	+/-	2.58E+00	1.39E+01	+/-	2.58E+00	1.16E+01	+/-	2.45E+00	1.91E+01	+/-	2.87E+00	1.29E+01	+/-	2.53E+00	1.24E+01	+/-	2.49E+00
06/11/13	7.77E+00	+/-	2.33E+00	8.21E+00	+/-	2.35E+00	8.98E+00	+/-	2.39E+00	7.82E+00	+/-	2.32E+00	6.32E+00	+/-	2.22E+00	9.13E+00	+/-	2.40E+00
06/18/13	1.20E+01	+/-	2.59E+00	1.38E+01	+/-	2.70E+00	1.60E+01	+/-	2.82E+00	1.23E+01	+/-	2.62E+00	1.14E+01	+/-	2.57E+00	1.47E+01	+/-	2.75E+00
06/25/13	6.44E+00	+/-	2.33E+00	9.15E+00	+/-	2.50E+00	7.43E+00	+/-	2.44E+00	1.07E+01	+/-	2.56E+00	8.42E+00	+/-	2.53E+00	7.49E+00	+/-	2.41E+00

* Control Station

Table 3-3
Air Particulate
Gross Beta Radioactivity
 $[10^{-3} \text{ pCi/m}^3]$

Period	Station		Station		Station		Station		Station		Station		Station	
Ending	01	02	03	04	05	06	07							
07/03/13	1.41E+01 +/-	2.35E+00	1.43E+01 +/-	2.38E+00	1.25E+01 +/-	2.28E+00	1.23E+01 +/-	2.27E+00	1.37E+01 +/-	2.34E+00	1.13E+01 +/-	2.21E+00	1.49E+01 +/-	2.40E+00
07/09/13	7.47E+00 +/-	2.47E+00	9.32E+00 +/-	2.62E+00	9.46E+00 +/-	2.73E+00	8.30E+00 +/-	2.59E+00	7.84E+00 +/-	2.55E+00	6.19E+00 +/-	2.43E+00	6.93E+00 +/-	2.47E+00
07/16/13	1.14E+01 +/-	2.64E+00	1.24E+01 +/-	2.71E+00	1.15E+01 +/-	2.62E+00	9.71E+00 +/-	2.58E+00	1.28E+01 +/-	2.71E+00	8.95E+00 +/-	2.51E+00	1.04E+01 +/-	2.60E+00
07/24/13	1.61E+01 +/-	2.62E+00	1.71E+01 +/-	2.67E+00	1.64E+01 +/-	2.63E+00	1.80E+01 +/-	2.71E+00	1.70E+01 +/-	2.66E+00	1.58E+01 +/-	2.60E+00	1.55E+01 +/-	2.59E+00
07/31/13	1.30E+01 +/-	2.63E+00	1.74E+01 +/-	2.87E+00	1.39E+01 +/-	2.71E+00	1.42E+01 +/-	2.67E+00	1.61E+01 +/-	2.82E+00	1.44E+01 +/-	2.72E+00	1.56E+01 +/-	2.78E+00
08/06/13	1.25E+01 +/-	3.04E+00	1.59E+01 +/-	3.22E+00	1.80E+01 +/-	3.33E+00	1.76E+01 +/-	3.31E+00	1.53E+01 +/-	3.19E+00	1.81E+01 +/-	3.34E+00	1.43E+01 +/-	3.14E+00
08/14/13	1.75E+01 +/-	2.67E+00	1.75E+01 +/-	2.67E+00	2.26E+01 +/-	2.91E+00	1.79E+01 +/-	2.69E+00	2.34E+01 +/-	2.94E+00	2.11E+01 +/-	2.84E+00	2.02E+01 +/-	2.80E+00
08/20/13	5.32E+00 +/-	2.58E+00	9.07E+00 +/-	2.82E+00	1.05E+01 +/-	2.90E+00	8.64E+00 +/-	2.80E+00	1.13E+01 +/-	2.96E+00	8.81E+00 +/-	2.81E+00	9.07E+00 +/-	2.82E+00
08/27/13	1.48E+01 +/-	2.72E+00	1.42E+01 +/-	2.66E+00	1.40E+01 +/-	2.61E+00	1.46E+01 +/-	2.67E+00	1.23E+01 +/-	2.54E+00	1.65E+01 +/-	2.78E+00	1.61E+01 +/-	2.76E+00
09/03/13	2.22E+01 +/-	3.10E+00	2.94E+01 +/-	3.46E+00	2.52E+01 +/-	3.31E+00	2.70E+01 +/-	3.36E+00	2.65E+01 +/-	3.35E+00	2.76E+01 +/-	3.39E+00	2.86E+01 +/-	3.43E+00
09/10/13	1.69E+01 +/-	2.82E+00	2.16E+01 +/-	3.07E+00	1.92E+01 +/-	2.96E+00	1.86E+01 +/-	2.92E+00	2.00E+01 +/-	2.99E+00	1.80E+01 +/-	2.89E+00	2.31E+01 +/-	3.15E+00
09/17/13	1.46E+01 +/-	2.90E+00	2.49E+01 +/-	3.37E+00	2.40E+01 +/-	3.28E+00	2.36E+01 +/-	3.30E+00	2.93E+01 +/-	3.54E+00	2.46E+01 +/-	3.35E+00	2.42E+01 +/-	3.33E+00
09/24/13	1.47E+01 +/-	2.73E+00	1.84E+01 +/-	2.91E+00	1.17E+01 +/-	2.51E+00	1.59E+01 +/-	2.76E+00	1.39E+01 +/-	2.66E+00	1.85E+01 +/-	2.91E+00	1.52E+01 +/-	2.74E+00
10/02/13	1.37E+01 +/-	2.50E+00	1.56E+01 +/-	2.55E+00	1.74E+01 +/-	2.74E+00	1.75E+01 +/-	2.72E+00	1.80E+01 +/-	2.73E+00	1.65E+01 +/-	2.65E+00	1.40E+01 +/-	2.53E+00
10/08/13	2.26E+01 +/-	3.35E+00	3.29E+01 +/-	3.87E+00	2.44E+01 +/-	3.53E+00	3.08E+01 +/-	3.79E+00	3.33E+01 +/-	3.91E+00	2.85E+01 +/-	3.68E+00	3.30E+01 +/-	3.88E+00
10/16/13	1.07E+01 +/-	2.20E+00	1.33E+01 +/-	2.33E+00	1.39E+01 +/-	2.33E+00	1.04E+01 +/-	2.15E+00	1.43E+01 +/-	2.37E+00	1.16E+01 +/-	2.22E+00	1.21E+01 +/-	2.25E+00
10/22/13	1.54E+01 +/-	3.13E+00	2.25E+01 +/-	3.56E+00	1.76E+01 +/-	3.34E+00	1.96E+01 +/-	3.42E+00	2.36E+01 +/-	3.63E+00	1.65E+01 +/-	3.26E+00	2.10E+01 +/-	3.48E+00
10/30/13	1.94E+01 +/-	2.75E+00	2.52E+01 +/-	3.00E+00	2.46E+01 +/-	2.94E+00	2.64E+01 +/-	3.04E+00	2.47E+01 +/-	2.96E+00	2.57E+01 +/-	3.01E+00	2.17E+01 +/-	2.84E+00
11/05/13	2.92E+01 +/-	3.75E+00	2.38E+01 +/-	3.52E+00	2.16E+01 +/-	3.47E+00	2.74E+01 +/-	3.71E+00	2.49E+01 +/-	3.61E+00	2.84E+01 +/-	3.77E+00	1.71E+01 +/-	3.18E+00
11/13/13	1.00E+01 +/-	2.26E+00	1.31E+01 +/-	2.43E+00	1.64E+01 +/-	2.61E+00	1.54E+01 +/-	2.56E+00	1.54E+01 +/-	2.56E+00	1.94E+01 +/-	2.76E+00	1.67E+01 +/-	2.62E+00
11/20/13	1.48E+01 +/-	2.71E+00	1.47E+01 +/-	2.71E+00	1.04E+01 +/-	2.46E+00	1.66E+01 +/-	2.81E+00	1.41E+01 +/-	2.67E+00	1.26E+01 +/-	2.59E+00	1.55E+01 +/-	2.75E+00
11/26/13	1.82E+01 +/-	3.24E+00	1.53E+01 +/-	3.07E+00	1.33E+01 +/-	2.95E+00	1.61E+01 +/-	3.12E+00	1.37E+01 +/-	2.98E+00	1.48E+01 +/-	3.04E+00	1.48E+01 +/-	3.04E+00
12/03/13	1.91E+01 +/-	2.99E+00	2.40E+01 +/-	3.24E+00	2.05E+01 +/-	3.07E+00	2.07E+01 +/-	3.08E+00	2.34E+01 +/-	3.21E+00	2.43E+01 +/-	3.25E+00	2.38E+01 +/-	3.22E+00
12/11/13	2.20E+01 +/-	2.86E+00	1.80E+01 +/-	2.68E+00	1.26E+01 +/-	2.41E+00	2.22E+01 +/-	2.87E+00	1.68E+01 +/-	2.62E+00	2.00E+01 +/-	2.77E+00	1.36E+01 +/-	2.46E+00
12/17/13	2.82E+01 +/-	3.98E+00	1.67E+01 +/-	3.45E+00	1.78E+01 +/-	3.46E+00	2.23E+01 +/-	3.76E+00	1.70E+01 +/-	3.43E+00	2.36E+01 +/-	3.78E+00	2.12E+01 +/-	3.67E+00
12/23/13	1.58E+01 +/-	3.22E+00	1.44E+01 +/-	3.13E+00	1.46E+01 +/-	3.14E+00	1.80E+01 +/-	3.32E+00	1.56E+01 +/-	3.20E+00	1.79E+01 +/-	3.33E+00	1.62E+01 +/-	3.23E+00
MEAN	1.491E+01 +/-	2.81E+00	1.63E+01 +/-	2.90E+00	1.54E+01 +/-	2.84E+00	1.65E+01 +/-	2.90E+00	1.77E+01 +/-	2.97E+00	1.68E+01 +/-	2.92E+00	1.56E+01 +/-	2.85E+00

Table 3-3
Air Particulate
Gross Beta Radioactivity
[10⁻³ pCi/m³]

Period Ending	Station 21		Station 22		Station 23		Station 24*		Station 01A		Station 05A							
07/03/13	1.03E+01	+/-	2.14E+00	1.44E+01	+/-	2.38E+00	1.35E+01	+/-	2.33E+00	1.43E+01	+/-	2.38E+00	1.13E+01	+/-	2.25E+00	1.06E+01	+/-	2.17E+00
07/09/13	5.70E+00	+/-	2.40E+00	6.91E+00	+/-	2.52E+00	7.11E+00	+/-	2.46E+00	6.25E+00	+/-	2.48E+00	<3.15E+00			4.86E+00	+/-	2.35E+00
07/16/13	1.16E+01	+/-	2.65E+00	9.56E+00	+/-	2.54E+00	1.21E+01	+/-	2.68E+00	1.04E+01	+/-	2.59E+00	9.63E+00	+/-	2.54E+00	9.52E+00	+/-	2.53E+00
07/24/13	1.55E+01	+/-	2.59E+00	1.21E+01	+/-	2.42E+00	1.57E+01	+/-	2.60E+00	1.04E+01	+/-	2.33E+00	1.37E+01	+/-	2.50E+00	1.38E+01	+/-	2.50E+00
07/31/13	1.62E+01	+/-	2.84E+00	9.41E+00	+/-	2.39E+00	1.36E+01	+/-	2.67E+00	1.20E+01	+/-	2.57E+00	1.43E+01	+/-	2.71E+00	1.01E+01	+/-	2.47E+00
08/06/13	1.51E+01	+/-	3.18E+00	1.56E+01	+/-	3.21E+00	1.69E+01	+/-	3.27E+00	1.09E+01	+/-	2.94E+00	1.03E+01	+/-	2.91E+00	1.23E+01	+/-	3.02E+00
08/14/13	2.18E+01	+/-	2.88E+00	1.71E+01	+/-	2.66E+00	2.01E+01	+/-	2.79E+00	1.89E+01	+/-	2.74E+00	1.60E+01	+/-	2.60E+00	1.94E+01	+/-	2.76E+00
08/20/13	6.60E+00	+/-	2.66E+00	8.43E+00	+/-	2.77E+00	5.85E+00	+/-	2.62E+00	8.46E+00	+/-	2.79E+00	5.41E+00	+/-	2.59E+00	8.64E+00	+/-	2.80E+00
08/27/13	1.54E+01	+/-	2.69E+00	1.36E+01	+/-	2.60E+00	1.34E+01	+/-	2.63E+00	1.64E+01	+/-	2.74E+00	1.19E+01	+/-	2.55E+00	1.34E+01	+/-	2.60E+00
09/03/13	2.67E+01	+/-	3.38E+00	2.13E+01	+/-	3.12E+00	2.50E+01	+/-	3.25E+00	2.49E+01	+/-	3.31E+00	2.31E+01	+/-	3.16E+00	2.06E+01	+/-	3.08E+00
09/10/13	1.71E+01	+/-	2.85E+00	1.89E+01	+/-	2.95E+00	1.81E+01	+/-	2.89E+00	1.72E+01	+/-	2.85E+00	1.58E+01	+/-	2.76E+00	1.65E+01	+/-	2.81E+00
09/17/13	2.70E+01	+/-	3.40E+00	1.86E+01	+/-	3.18E+00	2.08E+01	+/-	3.19E+00	2.12E+01	+/-	3.14E+00	2.13E+01	+/-	3.23E+00	1.95E+01	+/-	3.09E+00
09/24/13	1.34E+01	+/-	2.64E+00	1.41E+01	+/-	2.73E+00	1.92E+01	+/-	2.94E+00	1.48E+01	+/-	2.71E+00	1.10E+01	+/-	2.51E+00	1.69E+01	+/-	2.85E+00
10/02/13	1.01E+01	+/-	2.32E+00	1.20E+01	+/-	2.43E+00	1.48E+01	+/-	2.58E+00	1.21E+01	+/-	2.43E+00	1.24E+01	+/-	2.44E+00	1.28E+01	+/-	2.47E+00
10/08/13	1.62E+01	+/-	3.13E+00	2.74E+01	+/-	3.67E+00	2.35E+01	+/-	3.43E+00	1.74E+01	+/-	3.17E+00	1.97E+01	+/-	3.20E+00	2.98E+01	+/-	3.76E+00
10/16/13	7.78E+00	+/-	1.97E+00	1.02E+01	+/-	2.12E+00	1.02E+01	+/-	2.16E+00	1.10E+01	+/-	2.16E+00	8.85E+00	+/-	2.09E+00	1.31E+01	+/-	2.30E+00
10/22/13	1.13E+01	+/-	2.98E+00	1.56E+01	+/-	3.23E+00	1.79E+01	+/-	3.30E+00	1.55E+01	+/-	3.25E+00	1.77E+01	+/-	3.26E+00	2.04E+01	+/-	3.48E+00
10/30/13	1.33E+01	+/-	2.40E+00	2.02E+01	+/-	2.75E+00	1.79E+01	+/-	2.67E+00	1.58E+01	+/-	2.52E+00	1.85E+01	+/-	2.71E+00	2.09E+01	+/-	2.78E+00
11/05/13	2.29E+01	+/-	3.53E+00	2.07E+01	+/-	3.41E+00	2.58E+01	+/-	3.60E+00	2.09E+01	+/-	3.45E+00	1.90E+01	+/-	3.25E+00	2.44E+01	+/-	3.59E+00
11/13/13	1.38E+01	+/-	2.48E+00	1.68E+01	+/-	2.63E+00	1.64E+01	+/-	2.61E+00	1.63E+01	+/-	2.59E+00	1.54E+01	+/-	2.56E+00	1.63E+01	+/-	2.60E+00
11/20/13	1.19E+01	+/-	2.55E+00	1.66E+01	+/-	2.81E+00	1.26E+01	+/-	2.59E+00	1.86E+01	+/-	2.92E+00	1.17E+01	+/-	2.53E+00	1.30E+01	+/-	2.61E+00
11/26/13	1.32E+01	+/-	2.94E+00	1.02E+01	+/-	2.75E+00	1.33E+01	+/-	2.95E+00	1.09E+01	+/-	2.80E+00	1.26E+01	+/-	2.91E+00	1.54E+01	+/-	3.08E+00
12/03/13	1.60E+01	+/-	2.84E+00	2.43E+01	+/-	3.25E+00	2.47E+01	+/-	3.27E+00	2.32E+01	+/-	3.20E+00	2.00E+01	+/-	3.04E+00	2.22E+01	+/-	3.15E+00
12/11/13	1.45E+01	+/-	2.56E+00	1.80E+01	+/-	2.74E+00	1.76E+01	+/-	3.37E+00	1.98E+01	+/-	2.76E+00	1.62E+01	+/-	2.59E+00	1.36E+01	+/-	2.46E+00
12/17/13	1.79E+01	+/-	3.50E+00	2.11E+01	+/-	3.66E+00	2.65E+01	+/-	3.92E+00	1.61E+01	+/-	3.41E+00	2.16E+01	+/-	3.67E+00	1.77E+01	+/-	3.46E+00
12/23/13	1.25E+01	+/-	3.03E+00	1.98E+01	+/-	3.42E+00	1.59E+01	+/-	3.22E+00	1.88E+01	+/-	3.36E+00	1.24E+01	+/-	3.03E+00	1.26E+01	+/-	3.03E+00
MEAN	1.39E+01	+/-	2.77E+00	1.47E+01	+/-	2.81E+00	1.56E+01	+/-	2.87E+00	1.48E+01	+/-	2.83E+00	1.35E+01	+/-	2.75E+00	1.45E+01	+/-	2.80E+00
													Mean - All Indicator Locations		1.54E+01	+/-	2.85E+00	

* Control Station

Table 3-4
Airborne Iodine
I-131
[10⁻³ pCi/m³]

Period	Station	Station	Station	Station	Station	Station	Station	Station	Station
Ending	01	02	03	04	05	06	07		
01/02/13	< 1.24E+01	< 3.21E+01	< 3.29E+01	< 3.25E+01	< 3.22E+01	< 2.49E+01	< 2.49E+01		
01/08/13	< 6.62E+01	< 6.61E+01	< 6.62E+01	< 6.62E+01	< 3.54E+01	< 3.54E+01	< 3.54E+01		
01/16/13	< 2.73E+01	< 6.15E+01	< 6.15E+01	< 6.15E+01	< 6.15E+01	< 2.37E+01	< 2.37E+01		
01/22/13	< 4.59E+01	< 4.61E+01	< 4.61E+01	< 4.61E+01	< 4.01E+01	< 4.01E+01	< 4.01E+01		
01/29/13	< 1.91E+01	< 4.30E+01	< 4.30E+01	< 4.30E+01	< 4.30E+01	< 3.87E+01	< 3.87E+01		
02/05/13	< 3.37E+01	< 3.37E+01	< 3.37E+01	< 3.37E+01	< 1.98E+01	< 1.98E+01	< 1.98E+01		
02/13/13	< 1.19E+01	< 3.07E+01	< 3.07E+01	< 3.07E+01	< 3.07E+01	< 2.72E+01	< 2.72E+01		
02/20/13	< 2.18E+01	< 2.23E+01	< 2.22E+01	< 2.22E+01	< 1.66E+01	< 1.65E+01	< 1.67E+01		
02/27/13	< 1.85E+01	< 3.55E+01	< 3.63E+01	< 3.58E+01	< 3.60E+01	< 2.43E+01	< 2.39E+01		
03/05/13	< 2.87E+01	< 2.82E+01	< 2.75E+01	< 2.78E+01	< 2.27E+01	< 2.28E+01	< 2.29E+01		
03/12/13	< 3.74E+01	< 4.56E+01	< 4.16E+01	< 3.83E+01	< *	< 4.53E+01	< 3.83E+01		
03/19/13	< 3.44E+01	< 3.44E+01	< 3.44E+01	< 3.44E+01	< *	< 2.42E+01	< 2.42E+01		
03/26/13	< 2.52E+01	< 2.52E+01	< 2.44E+01	< 2.46E+01	< *	< 2.77E+01	< 2.77E+01		
04/02/13	< 1.35E+01	< 3.48E+01	< 3.37E+01	< 3.40E+01	< *	< 2.73E+01	< 2.73E+01		
04/09/13	< 8.67E+00	< 2.53E+01	< 2.29E+01	< 2.29E+01	< 2.79E+01	< 2.29E+01	< 2.33E+01		
04/17/13	< 2.24E+01	< 8.71E+00	< 2.21E+01	< 2.26E+01	< 2.26E+01	< 2.53E+01	< 2.49E+01		
04/23/13	< 1.34E+01	< 3.46E+01	< 3.54E+01	< 3.53E+01	< 3.45E+01	< 2.13E+01	< 2.21E+01		
04/30/13	< 2.55E+01	< 2.42E+01	< 9.59E+00	< 2.48E+01	< 2.47E+01	< 2.81E+01	< 2.75E+01		
05/08/13	< 1.44E+01	< 2.72E+01	< 2.67E+01	< 2.68E+01	< 2.67E+01	< 3.22E+01	< 3.25E+01		
05/14/13	< 2.27E+01	< 2.24E+01	< 2.32E+01	< 8.39E+00	< 2.30E+01	< 2.62E+01	< 2.56E+01		
05/21/13	< 1.68E+01	< 4.31E+01	< 4.29E+01	< 4.31E+01	< 4.31E+01	< 3.43E+01	< 3.43E+01		
05/28/13	< 4.60E+01	< 4.61E+01	< 4.61E+01	< 4.61E+01	< 1.89E+01	< 3.18E+01	< 3.18E+01		
06/04/13	< 8.10E+00	< 2.09E+01	< 2.08E+01	< 2.09E+01	< 2.09E+01	< 1.96E+01	< 1.96E+01		
06/11/13	< 2.98E+01	< 2.98E+01	< 3.00E+01	< 2.98E+01	< 3.07E+01	< 1.29E+01	< 3.07E+01		
06/18/13	< 1.73E+01	< 4.43E+01	< 4.42E+01	< 4.43E+01	< 4.43E+01	< 4.05E+01	< 4.05E+01		
06/25/13	< 2.32E+01	< 2.27E+01	< 2.17E+01	< 2.24E+01	< 2.91E+01	< 2.92E+01	< 1.23E+01		

* Sample not obtained due to sampler not operating

Table 3-4
Airborne Iodine
I-131
[10⁻³ pCi/m³]

Period Ending	Station 21	Station 22	Station 23	Station 24*	Station 01A	Station 05A
01/02/13	< 2.49E+01	< 2.49E+01	< 3.28E+01	< 3.29E+01	< 3.28E+01	< 3.29E+01
01/08/13	< 1.49E+01	< 3.54E+01	< 2.70E+01	< 2.70E+01	< 2.70E+01	< 2.70E+01
01/16/13	< 2.37E+01	< 2.37E+01	< 4.00E+01	< 3.99E+01	< 3.99E+01	< 3.99E+01
01/22/13	< 3.99E+01	< 2.35E+01	< 5.60E+01	< 5.62E+01	< 5.60E+01	< 5.62E+01
01/29/13	< 3.87E+01	< 3.87E+01	< 4.00E+01	< 4.00E+01	< 4.00E+01	< 4.00E+01
02/05/13	< 1.98E+01	< 2.62E+01	< 1.10E+01	< 2.62E+01	< 2.62E+01	< 2.62E+01
02/13/13	< 2.72E+01	< 2.72E+01	< 2.80E+01	< 2.80E+01	< 2.80E+01	< 2.80E+01
02/20/13	< 1.67E+01	< 2.10E+01	< 2.10E+01	< 8.84E+00	< 2.05E+01	< 2.09E+01
02/27/13	< 2.44E+01	< 2.44E+01	< 2.44E+01	< 2.51E+01	< 2.48E+01	< 2.49E+01
03/05/13	< 2.24E+01	< 2.89E+01	< 3.00E+01	< 2.88E+01	< 1.06E+01	< 2.93E+01
03/12/13	< 3.97E+01	< 3.84E+01	< 2.69E+01	< 2.64E+01	< 2.61E+01	< 2.63E+01
03/19/13	< 2.42E+01	< 2.42E+01	< 3.05E+01	< 3.05E+01	< 3.05E+01	< 1.58E+01
03/26/13	< 2.77E+01	< 2.77E+01	< 2.49E+01	< 2.48E+01	< 2.51E+01	< 2.48E+01
04/02/13	< 2.74E+01	< 2.73E+01	< 2.33E+01	< 2.32E+01	< 2.35E+01	< 2.32E+01
04/09/13	< 2.33E+01	< 2.33E+01	< 1.83E+01	< 1.82E+01	< 1.77E+01	< 1.81E+01
04/17/13	< 2.49E+01	< 2.49E+01	< 1.98E+01	< 1.98E+01	< 1.98E+01	< 2.00E+01
04/23/13	< 2.24E+01	< 2.10E+01	< 2.08E+01	< 1.95E+01	< 1.94E+01	< 1.98E+01
04/30/13	< 2.79E+01	< 2.79E+01	< 2.10E+01	< 2.16E+01	< 2.22E+01	< 2.16E+01
05/08/13	< 3.21E+01	< 3.21E+01	< 3.28E+01	< 3.21E+01	< 3.14E+01	< 3.22E+01
05/14/13	< 2.63E+01	< 2.63E+01	< 2.71E+01	< 2.81E+01	< 2.77E+01	< 2.80E+01
05/21/13	< 3.42E+01	< 3.42E+01	< 5.15E+01	< 5.13E+01	< 5.15E+01	< 5.13E+01
05/28/13	< 3.18E+01	< 3.18E+01	< 4.41E+01	< 4.41E+01	< 4.41E+01	< 4.41E+01
06/04/13	< 1.96E+01	< 1.96E+01	< 1.77E+01	< 1.77E+01	< 1.77E+01	< 1.77E+01
06/11/13	< 3.09E+01	< 3.09E+01	< 1.78E+01	< 3.28E+01	< 3.27E+01	< 3.28E+01
06/18/13	< 4.03E+01	< 4.03E+01	< 3.55E+01	< 3.55E+01	< 3.56E+01	< 3.54E+01
06/25/13	< 2.89E+01	< 2.89E+01	< 3.16E+01	< 3.04E+01	< 3.19E+01	< 3.09E+01

* Control Station

Table 3-4
Airborne Iodine
I-131
[10⁻³ pCi/m³]

Period	Station	Station	Station	Station	Station	Station	Station	Station
Ending	01	02	03	04	05	06	07	
07/03/13	< 2.69E+01	< 2.71E+01	< 2.72E+01	< 2.72E+01	< 1.61E+01	< 3.82E+01	< 3.81E+01	
07/09/13	< 2.88E+01	< 2.92E+01	< 3.07E+01	< 2.97E+01	< 3.75E+01	< 3.73E+01	< 3.72E+01	
07/16/13	< 1.35E+01	< 3.50E+01	< 3.42E+01	< 3.53E+01	< 3.46E+01	< 2.64E+01	< 2.64E+01	
07/24/13	< 4.26E+01	< 4.26E+01	< 4.26E+01	< 4.27E+01	< 2.94E+01	< 2.95E+01	< 2.95E+01	
07/31/13	< 3.13E+01	< 5.23E+01	< 5.32E+01	< 5.16E+01	< 5.29E+01	< 6.69E+01	< 6.67E+01	
08/06/13	< 4.10E+01	< 4.10E+01	< 4.10E+01	< 4.10E+01	< 3.55E+01	< 3.55E+01	< 3.55E+01	
08/14/13	< 1.08E+01	< 2.79E+01	< 2.80E+01	< 2.79E+01	< 2.79E+01	< 3.35E+01	< 3.35E+01	
08/20/13	< 3.31E+01	< 3.31E+01	< 3.29E+01	< 3.31E+01	< 3.03E+01	< 3.03E+01	< 3.03E+01	
08/27/13	< 9.39E+00	< 1.56E+01	< 1.53E+01	< 1.56E+01	< 1.55E+01	< 3.78E+01	< 3.79E+01	
09/03/13	< 4.85E+01	< 4.91E+01	< 5.00E+01	< 4.94E+01	< 4.37E+01	< 4.36E+01	< 4.34E+01	
09/10/13	< 3.15E+01	< 3.16E+01	< 3.17E+01	< 3.16E+01	< 3.25E+01	< 3.25E+01	< 3.25E+01	
09/17/13	< 4.06E+01	< 3.99E+01	< 3.89E+01	< 3.96E+01	< 4.16E+01	< 4.18E+01	< 4.19E+01	
09/24/13	< 2.65E+01	< 6.77E+01	< 6.66E+01	< 6.70E+01	< 6.76E+01	< 4.60E+01	< 4.60E+01	
10/02/13	< 2.01E+01	< 5.04E+01	< 5.30E+01	< 5.25E+01	< 5.21E+01	< 3.66E+01	< 3.66E+01	
10/08/13	< 1.30E+01	< 3.40E+01	< 3.49E+01	< 3.42E+01	< 3.44E+01	< 2.96E+01	< 2.96E+01	
10/16/13	< 6.00E+01	< 2.29E+01	< 5.77E+01	< 5.87E+01	< 5.84E+01	< 4.30E+01	< 4.30E+01	
10/22/13	< 2.28E+01	< 5.99E+01	< 6.10E+01	< 6.02E+01	< 6.04E+01	< 6.39E+01	< 6.36E+01	
10/30/13	< 3.22E+01	< 3.19E+01	< 1.22E+01	< 3.18E+01	< 3.16E+01	< 2.56E+01	< 2.57E+01	
11/05/13	< 1.83E+01	< 4.79E+01	< 4.90E+01	< 4.81E+01	< 4.86E+01	< 3.65E+01	< 3.64E+01	
11/13/13	< 5.61E+01	< 5.61E+01	< 5.61E+01	< 2.18E+01	< 5.61E+01	< 4.40E+01	< 4.40E+01	
11/20/13	< 1.97E+01	< 5.07E+01	< 5.07E+01	< 5.07E+01	< 5.07E+01	< 5.02E+01	< 5.02E+01	
11/26/13	< 5.05E+01	< 5.05E+01	< 5.04E+01	< 5.05E+01	< 2.12E+01	< 4.73E+01	< 4.73E+01	
12/03/13	< 1.82E+01	< 4.70E+01	< 4.71E+01	< 4.70E+01	< 4.70E+01	< 4.67E+01	< 4.67E+01	
12/11/13	< 1.31E+01	< 3.13E+01	< 3.13E+01	< 3.13E+01	< 3.13E+01	< 3.19E+01	< 3.19E+01	
12/17/13	< 6.28E+01	< 6.36E+01	< 6.23E+01	< 6.42E+01	< 6.67E+01	< 6.71E+01	< 6.74E+01	
12/23/13	< 6.62E+01	< 6.59E+01	< 6.58E+01	< 6.58E+01	< 3.05E+01	< 3.05E+01	< 1.81E+01	

Table 3-4
Airborne Iodine
I-131
[10⁻³ pCi/m³]

Period Ending	Station 21	Station 22	Station 23	Station 24*	Station 01A	Station 05A
07/03/13	< 3.81E+01	< 3.81E+01	< 3.21E+01	< 3.22E+01	< 3.31E+01	< 3.22E+01
07/09/13	< 1.57E+01	< 3.80E+01	< 3.00E+01	< 3.11E+01	< 2.98E+01	< 3.06E+01
07/16/13	< 2.62E+01	< 2.62E+01	< 3.94E+01	< 3.94E+01	< 3.94E+01	< 3.93E+01
07/24/13	< 2.96E+01	< 1.24E+01	< 2.63E+01	< 2.64E+01	< 2.63E+01	< 2.63E+01
07/31/13	< 6.64E+01	< 6.64E+01	< 5.34E+01	< 5.33E+01	< 5.34E+01	< 5.39E+01
08/06/13	< 3.55E+01	< 3.60E+01	< 1.51E+01	< 3.60E+01	< 3.60E+01	< 3.60E+01
08/14/13	< 3.37E+01	< 3.37E+01	< 2.90E+01	< 2.90E+01	< 2.90E+01	< 2.90E+01
08/20/13	< 3.02E+01	< 2.73E+01	< 2.74E+01	< 1.15E+01	< 2.74E+01	< 2.74E+01
08/27/13	< 3.73E+01	< 3.73E+01	< 3.72E+01	< 3.60E+01	< 3.73E+01	< 3.65E+01
09/03/13	< 4.40E+01	< 4.09E+01	< 4.01E+01	< 4.12E+01	< 1.67E+01	< 4.07E+01
09/10/13	< 3.27E+01	< 3.41E+01	< 3.39E+01	< 3.40E+01	< 3.38E+01	< 1.42E+01
09/17/13	< 4.09E+01	< 4.35E+01	< 4.15E+01	< 4.02E+01	< 4.18E+01	< 1.71E+01
09/24/13	< 4.60E+01	< 4.72E+01	< 5.25E+01	< 5.26E+01	< 5.29E+01	< 5.33E+01
10/02/13	< 3.67E+01	< 3.66E+01	< 4.30E+01	< 4.29E+01	< 4.27E+01	< 4.29E+01
10/08/13	< 3.06E+01	< 3.02E+01	< 3.15E+01	< 3.23E+01	< 3.10E+01	< 3.19E+01
10/16/13	< 4.23E+01	< 4.23E+01	< 4.87E+01	< 4.73E+01	< 4.92E+01	< 4.79E+01
10/22/13	< 6.46E+01	< 6.46E+01	< 5.08E+01	< 5.26E+01	< 5.02E+01	< 5.18E+01
10/30/13	< 2.55E+01	< 2.55E+01	< 3.20E+01	< 3.11E+01	< 3.21E+01	< 3.15E+01
11/05/13	< 3.70E+01	< 3.70E+01	< 4.50E+01	< 4.69E+01	< 4.48E+01	< 4.61E+01
11/13/13	< 4.40E+01	< 4.40E+01	< 5.65E+01	< 5.63E+01	< 5.65E+01	< 5.65E+01
11/20/13	< 5.02E+01	< 5.02E+01	< 4.62E+01	< 4.62E+01	< 4.62E+01	< 4.62E+01
11/26/13	< 4.72E+01	< 4.72E+01	< 6.71E+01	< 6.69E+01	< 6.71E+01	< 6.71E+01
12/03/13	< 4.68E+01	< 4.68E+01	< 4.34E+01	< 4.35E+01	< 4.34E+01	< 4.34E+01
12/11/13	< 3.30E+01	< 3.30E+01	< 5.37E+01	< 3.83E+01	< 3.83E+01	< 3.83E+01
12/17/13	< 6.73E+01	< 6.54E+01	< 6.55E+01	< 6.55E+01	< 6.50E+01	< 2.72E+01
12/23/13	< 3.04E+01	< 3.04E+01	< 6.91E+01	< 6.87E+01	< 6.91E+01	< 6.90E+01

* Control Station

Table 3-5
Airborne Particulate
Gamma Spectra
 $[10^{-3} \text{ pCi/m}^3]$

Sampling Location	Be-7		Cs-134*		Cs-137*	
01	1.12E+02	+/- 2.95E+01	< 1.50E+00	< 1.41E+00		
01A	1.45E+02	+/- 3.35E+01	< 1.60E+00	< 1.15E+00		
02	9.96E+01	+/- 2.53E+01	< 1.38E+00	< 1.05E+00		
03	9.16E+01	+/- 3.83E+01	< 2.08E+00	< 1.86E+00		
04	1.02E+02	+/- 3.86E+01	< 1.56E+00	< 1.64E+00		
05	9.02E+01	+/- 3.47E+01	< 1.63E+00	< 1.43E+00		
05A	1.07E+02	+/- 4.40E+01	< 2.24E+00	< 1.93E+00		
06	1.24E+02	+/- 3.77E+01	< 2.31E+00	< 1.94E+00		
07	1.11E+02	+/- 3.49E+01	< 1.70E+00	< 1.12E+00		
21	1.11E+02	+/- 3.10E+01	< 1.44E+00	< 1.02E+00		
22	1.31E+02	+/- 2.84E+01	< 1.35E+00	< 1.32E+00		
23	1.38E+02	+/- 2.82E+01	< 1.62E+00	< 1.36E+00		
24**	1.01E+02	+/- 2.75E+01	< 1.35E+00	< 8.39E-01		

Quarter 1

Sampling Location	Be-7		Cs-134*		Cs-137*		Sr-89	Sr-90
01	1.15E+02	+/- 2.73E+01	< 1.21E+00	< 8.69E-01	< 5.39E+00	< 1.71E+00		
01A	1.46E+02	+/- 2.97E+01	< 1.57E+00	< 1.54E+00	< 5.31E+00	< 2.11E+00		
02	1.52E+02	+/- 4.08E+01	< 1.61E+00	< 1.41E+00	< 6.25E+00	< 2.13E+00		
03	1.80E+02	+/- 3.43E+01	< 1.39E+00	< 1.13E+00	< 6.48E+00	< 2.23E+00		
04	1.61E+02	+/- 3.51E+01	< 1.49E+00	< 1.45E+00	< 6.39E+00	< 2.15E+00		
05	1.77E+02	+/- 4.22E+01	< 2.06E+00	< 2.06E+00	< 6.69E+00	< 2.17E+00		
05A	1.41E+02	+/- 2.66E+01	< 1.38E+00	< 1.42E+00	< 5.96E+00	< 1.69E+00		
06	1.61E+02	+/- 2.39E+01	< 1.14E+00	< 1.13E+00	< 5.69E+00	< 1.73E+00		
07	1.35E+02	+/- 3.78E+01	< 1.33E+00	< 9.74E-01	< 5.82E+00	< 1.97E+00		
21	1.16E+02	+/- 3.35E+01	< 1.43E+00	< 1.02E+00	< 6.00E+00	< 2.19E+00		
22	1.39E+02	+/- 2.96E+01	< 1.38E+00	< 1.21E+00	< 5.56E+00	< 2.22E+00		
23	1.47E+02	+/- 3.26E+01	< 1.03E+00	< 1.04E+00	< 5.55E+00	< 2.15E+00		
24**	1.40E+02	+/- 3.31E+01	< 1.79E+00	< 1.47E+00	< 6.62E+00	< 2.25E+00		

Quarter 2

* LLD identified in the ODCM
 ** Control Station

Table 3-5
Airborne Particulate
Gamma Spectra
 $[10^{-3} \text{ pCi/m}^3]$

page
2 of 2

Quarter 3

Sampling Location	Be-7		Cs-134*		Cs-137*		
01	1.05E+02	+/-	2.40E+01	<	1.22E+00	<	1.22E+00
01A	1.04E+02	+/-	2.09E+01	<	1.06E+00	<	1.09E+00
02	1.52E+02	+/-	2.43E+01	<	1.67E+00	<	1.39E+00
03	1.43E+02	+/-	3.38E+01	<	1.58E+00	<	1.38E+00
04	1.32E+02	+/-	3.07E+01	<	1.24E+00	<	9.80E-01
05	1.36E+02	+/-	2.88E+01	<	1.14E+00	<	1.17E+00
05A	1.11E+02	+/-	2.65E+01	<	1.25E+00	<	8.87E-01
06	1.09E+02	+/-	3.31E+01	<	1.70E+00	<	1.86E+00
07	1.63E+02	+/-	3.45E+01	<	1.39E+00	<	1.20E+00
21	1.67E+02	+/-	3.18E+01	<	1.73E+00	<	1.65E+00
22	1.22E+02	+/-	2.98E+01	<	2.06E+00	<	1.44E+00
23	1.14E+02	+/-	2.57E+01	<	1.06E+00	<	1.25E+00
24**	1.09E+02	+/-	2.61E+01	<	9.69E-01	<	1.12E+00
MEAN							

Sampling Location	Be-7		Cs-134*		Cs-137*		MEAN Be-7			
01	1.11E+02	+/-	1.99E+01	<	1.05E+00	<	8.45E-01	1.11E+02	+/-	2.52E+01
01A	1.03E+02	+/-	2.39E+01	<	1.52E+00	<	1.12E+00	1.25E+02	+/-	2.70E+01
02	1.26E+02	+/-	3.04E+01	<	1.35E+00	<	1.38E+00	1.32E+02	+/-	3.02E+01
03	1.01E+02	+/-	2.20E+01	<	1.33E+00	<	1.24E+00	1.29E+02	+/-	3.21E+01
04	1.36E+02	+/-	3.78E+01	<	1.77E+00	<	1.57E+00	1.33E+02	+/-	3.56E+01
05	1.09E+02	+/-	2.15E+01	<	1.44E+00	<	1.08E+00	1.28E+02	+/-	3.18E+01
05A	1.13E+02	+/-	3.18E+01	<	1.66E+00	<	1.34E+00	1.18E+02	+/-	3.22E+01
06	1.20E+02	+/-	2.83E+01	<	1.52E+00	<	1.46E+00	1.29E+02	+/-	3.08E+01
07	1.15E+02	+/-	2.53E+01	<	1.24E+00	<	8.56E-01	1.31E+02	+/-	3.31E+01
21	1.04E+02	+/-	2.65E+01	<	1.81E+00	<	1.40E+00	1.25E+02	+/-	3.07E+01
22	1.02E+02	+/-	2.11E+01	<	1.08E+00	<	9.81E-01	1.24E+02	+/-	2.72E+01
23	1.30E+02	+/-	2.89E+01	<	1.54E+00	<	1.80E+00	1.32E+02	+/-	2.89E+01
24**	1.18E+02	+/-	2.69E+01	<	1.51E+00	<	1.28E+00	1.17E+02	+/-	2.84E+01
Mean of All Indicator Location:								1.26E+02	+/-	3.04E+01

Quarter 4

* LLD Identified in ODCM

** Control Station

Table 3-6
Soil
[pCi/kg]

Sample Date	Station	Sr-89			Sr-90			K-40			Cs-134		
		Activity Conc	2 Sigma	MDC	Activity Conc	2 Sigma	MDC	Activity Conc	2 Sigma	MDC	Activity Conc	2 Sigma	MDC
7/16/13	01	6.58E+01	2.420E+02	4.59E+02	-8.21E-01	1.59E+01	2.62E+01	2.60E+04	1.18E+03	3.09E+02	-2.20E+01	2.69E+01	3.64E+01
7/16/13	02	2.32E+01	2.71E+02	5.42E+02	1.93E+01	1.67E+01	2.63E+01	1.10E+04	1.41E+03	5.90E+02	-2.36E+01	4.65E+01	6.30E+01
7/16/13	03	2.76E+02	3.35E+02	5.56E+02	2.14E+01	2.29E+01	3.64E+01	6.57E+03	1.11E+03	6.59E+02	-9.23E+00	5.21E+01	7.04E+01
7/16/13	04	-6.50E+01	2.27E+02	5.02E+02	-1.04E+01	2.09E+01	3.51E+01	6.32E+03	7.58E+02	3.81E+02	-1.57E+01	3.19E+01	4.29E+01
7/16/13	05	-1.75E+01	2.54E+02	5.28E+02	1.68E+01	1.65E+01	2.62E+01	1.76E+04	1.56E+03	4.90E+02	9.16E+00	4.36E+01	6.39E+01
7/16/13	05A	-2.77E+01	2.87E+01	5.99E+02	-1.24E+01	1.91E+01	3.21E+01	1.07E+04	1.05E+03	3.96E+02	-8.81E-01	3.03E+01	4.38E+01
7/16/13	06	2.93E+02	3.23E+02	5.26E+02	6.08E+00	1.99E+01	3.24E+01	1.03E+04	1.15E+03	4.25E+02	-5.22E+01	5.17E+01	6.71E+01
7/16/13	07	1.05E+02	3.00E+02	5.60E+02	-9.92E+00	1.91E+01	3.20E+01	7.31E+03	1.09E+03	4.96E+02	-2.35E+01	4.20E+01	5.59E+01
7/16/13	21	9.02E+01	2.89E+02	5.46E+02	2.84E+01	2.03E+01	3.19E+01	2.16E+04	1.61E+03	4.24E+02	-1.82E+01	3.63E+01	4.87E+01
7/16/13	22	-1.39E+02	2.21E+02	5.28E+02	1.83E+00	1.85E+01	3.03E+01	2.14E+04	1.62E+03	5.35E+02	5.01E+00	4.55E+01	6.57E+01
7/16/13	23	-9.98E+00	2.63E+02	5.44E+02	2.16E+01	1.64E+01	2.58E+01	2.90E+04	1.62E+03	5.01E+02	3.00E+01	4.03E+01	5.99E+01
7/16/13	24*	1.22E+02	2.97E+02	5.52E+02	1.14E+01	1.78E+01	2.87E+01	4.66E+03	1.12E+03	7.67E+02	-5.25E+01	5.73E+01	7.51E+01

MEAN Indicator 1.53E+04
 Control 4.66E+03

*Control Station

Sample Date	Station	Cs-137			Ra-226			Th-228			Th-232		
		Activity Conc	2 Sigma	MDC	Activity Conc	2 Sigma	MDC	Activity Conc	2 Sigma	MDC	Activity Conc	2 Sigma	MDC
7/16/13	01	2.78E+01	2.89E+01	5.06E+01	1.99E+03	8.58E+02	9.03E+02	1.13E+03	7.39E+01	7.35E+01	1.17E+03	1.10E+02	1.60E+02
7/16/13	02	5.39E+02	9.62E+01	6.75E+01	9.14E+02	1.27E+03	1.24E+03	5.04E+02	8.73E+01	1.07E+02	5.30E+02	2.34E+02	4.33E+02
7/16/13	03	2.65E+02	9.78E+01	7.28E+01	1.79E+03	1.57E+03	1.52E+03	8.03E+02	1.22E+02	1.24E+02	8.78E+02	1.98E+02	2.48E+02
7/16/13	04	2.79E+02	5.93E+01	4.78E+01	2.32E+03	1.26E+03	9.56E+02	8.16E+02	7.72E+01	7.25E+01	7.44E+02	1.32E+02	1.62E+02
7/16/13	05	1.70E+02	6.46E+01	7.50E+01	3.06E+03	1.44E+03	1.41E+03	1.66E+03	1.21E+02	1.08E+02	1.41E+03	2.11E+02	5.90E+02
7/16/13	05A	1.35E+02	7.04E+01	4.78E+01	2.18E+03	8.82E+02	8.57E+02	8.24E+02	7.70E+01	7.09E+01	7.34E+02	1.19E+02	1.57E+02
7/16/13	06	1.67E+02	9.33E+01	7.08E+01	3.26E+03	1.41E+03	1.80E+03	2.27E+03	1.30E+02	1.33E+02	2.20E+03	1.79E+02	2.09E+02
7/16/13	07	2.13E+02	6.18E+01	6.73E+01	2.08E+03	1.50E+03	1.62E+03	1.42E+03	1.08E+02	1.18E+02	1.24E+03	2.03E+02	4.63E+02
7/16/13	21	9.31E+01	5.65E+01	4.83E+01	1.57E+03	9.64E+02	1.11E+03	1.09E+03	9.41E+01	8.88E+01	1.03E+03	1.56E+02	1.94E+02
7/16/13	22	1.07E+02	5.35E+01	8.09E+01	3.60E+03	1.19E+03	1.47E+03	2.23E+03	1.43E+02	1.11E+02	1.82E+03	2.54E+02	6.16E+02
7/16/13	23	1.21E+02	5.11E+01	7.68E+01	2.76E+03	1.43E+03	1.30E+03	1.71E+03	1.14E+02	9.77E+01	1.35E+03	1.92E+02	4.73E+02
7/16/13	24*	3.29E+02	1.02E+02	8.19E+01	3.39E+03	2.06E+03	1.72E+03	1.71E+03	1.57E+02	1.37E+02	1.34E+03	2.02E+02	2.91E+02

MEAN Indicator 2.09E+02 2.46E+03 1.31E+03 1.19E+03
 Control 3.29E+02 3.39E+03 1.71E+03 1.34E+03

*Control Station

Table 3-7
Precipitation
Gross Beta
[pCi/L]

Sampling Date	Gross Beta			H-3	Rainfall (inches)
01/29/13	3.25E+00	+/-	1.42E+00	<8.65E+01	3.42
02/27/13	5.79E+00	+/-	1.50E+00	<7.21E+02	2.48
03/26/13	< 1.74E+00			<8.75E+02	3.00
04/30/13	2.27E+00	+/-	1.17E+00	<8.54E+02	3.50
05/28/13	6.43E+00	+/-	1.39E+00	<6.84E+02	2.20
06/25/13	2.73E+00	+/-	1.48E+00	<7.26E+02	7.08
07/31/13	1.96E+01	+/-	2.11E+00	<8.09E+02	4.23
08/27/13	2.63E+00	+/-	1.37E+00	<7.91E+02	5.21
09/24/13	9.63E+00	+/-	1.70E+00	<9.35E+02	1.72
10/30/13	<1.99E+00			<7.96E+02	3.05
11/26/13	5.41E+00	+/-	1.60E+00	<8.54E+02	1.03
12/31/13	<1.57E+00			<8.31E+02	0.00
Mean	6.42E+00	+/-	1.58E+00		Total 36.92

Table 3-7
Precipitation
Gamma Spectra
[pCi/L]

Sampling Location	Be-7		Mn-54		Fe-59		Co-58		Co-60	
01A										
06/25/13	<	3.57E+01	<	9.50E-01	<	9.76E+00	<	2.37E+00	<	7.96E-01
12/31/13	6.60E+01	+/- 3.68E+01	<	1.94E+00	<	1.79E+01	<	4.80E+00	<	1.51E+00
	Zn-65		Zr-95		Nb-95		Cs-134		Cs-137	
01A										
06/25/13	<	2.25E+00	<	4.92E+00	<	3.19E+00	<	8.46E-01	<	8.22E-01
12/31/13	<	3.94E+00	<	8.84E+00	<	5.37E+00	<	1.67E+00	<	1.75E+00
	Ba-140		La-140		I-131		Th-228			
01A										
06/25/13	<	2.30E+03	<	7.89E+02	<	4.07E+04	<	1.60E+00		
12/31/13	<	2.92E+03	<	9.15E+02	<	3.71E+04	<	3.87E+00		

Table 3-8
Milk
Gamma Spectra & Strontium
[pCi/L]

Sampling Date	K-40		Sr-89	Sr-90	I-131*	Cs-134*	Cs-137*	Ba-140*	Station 12A	
									La-140*	
01/16/13	1.23E+03	+/- 1.45E+02	[a]	[a]	< 9.22E-01	< 6.33E+00	< 6.83E+00	< 4.42E+01	< 1.27E+01	
02/19/13	1.39E+03	+/- 8.80E+01	[a]	[a]	< 6.60E-01	< 3.52E+00	< 4.40E+00	< 1.96E+01	< 5.52E+00	
03/19/13	1.27E+03	+/- 1.11E+02	< 3.51E+00	< 1.84E+00	< 4.84E-01	< 4.42E+00	< 5.56E+00	< 2.34E+01	< 7.43E+00	
04/17/13	1.22E+03	+/- 1.42E+02	[a]	[a]	< 9.76E-01	< 6.06E+00	< 7.27E+00	< 4.52E+01	< 1.13E+01	
05/21/13	1.32E+03	+/- 1.33E+02	[a]	[a]	< 8.42E-01	< 6.11E+00	< 7.14E+00	< 5.06E+01	< 1.36E+01	
06/18/13	1.71E+03	+/- 1.86E+02	< 3.95E+00	< 1.63E+00	< 8.57E-01	< 6.53E+00	< 8.11E+00	< 3.96E+01	< 1.44E+01	
07/16/13	1.27E+03	+/- 1.41E+02	[a]	[a]	< 6.07E-01	< 5.66E+00	< 5.77E+00	< 3.05E+01	< 1.03E+01	
08/20/13	1.39E+03	+/- 1.08E+02	[a]	[a]	< 8.93E-01	< 3.72E+00	< 4.24E+00	< 3.15E+01	< 8.34E+00	
09/17/13	1.32E+03	+/- 1.62E+02	< 2.97E+00	< 8.30E-01	< 5.71E-01	< 5.96E+00	< 6.44E+00	< 3.23E+01	< 1.05E+01	
10/16/13	1.48E+03	+/- 1.09E+02	[a]	[a]	< 7.53E-01	< 3.68E+00	< 4.09E+00	< 3.54E+01	< 8.13E+00	
11/20/13	1.36E+03	+/- 1.60E+02	[a]	[a]	< 7.15E-01	< 6.46E+00	< 7.42E+00	< 5.26E+01	< 1.32E+01	
12/17/13	1.29E+03	+/- 1.49E+02	< 3.77E+00	< 1.03E+00	< 5.38E-01	< 4.20E+00	< 5.70E+00	< 5.00E+01	< 1.42E+01	
Sta. Mean	1.35E+03	+/- 1.36E+02								

* LLD identified in ODCM

[a] Sr-89/90 analyses performed on the last monthly sample of each quarter.

Table 3-9
Food and Vegetation
Gamma Spectra
[pCi/kg]

Sampling Location	Sampling Date	Be-7		K-40		I-131*		Cs-134*		Cs-137*			
14B	04/09/13	1.12E+03	+/-	1.91E+01	7.87E+03	+/-	4.68E+02	<	2.87E+01	<	1.71E+01	<	1.90E+01
	05/14/13	5.79E+02	+/-	2.53E+02	5.33E+03	+/-	4.90E+02	<	4.10E+01	<	1.86E+01	<	2.01E+01
	06/11/13	1.56E+03	+/-	2.32E+02	5.22E+03	+/-	4.27E+02	<	1.98E+01	<	1.47E+01	<	1.95E+01
	07/09/13	1.62E+03	+/-	2.89E+02	4.93E+03	+/-	5.17E+02	<	5.74E+01	<	2.44E+01	<	2.73E+01
	08/14/13	5.64E+02	+/-	2.18E+02	8.30E+03	+/-	5.60E+02	<	2.49E+01	<	2.34E+01	<	2.46E+01
	09/10/13	1.79E+03	+/-	6.51E+02	4.91E+03	+/-	9.24E+02	<	4.53E+01	<	5.89E+01	<	5.96E+01
	10/08/13	1.89E+03	+/-	5.02E+02	6.23E+03	+/-	8.41E+02	<	3.49E+01	<	4.24E+01	<	4.57E+01
	Mean	1.30E+03	+/-	3.09E+02	6.11E+03	+/-	6.04E+02	+/-		+/-		+/-	
Sampling Location	Sampling Date	Be-7		K-40		I-131*		Cs-134*		Cs-137*			
15	04/09/13	1.45E+03	+/-	2.81E+02	7.11E+03	+/-	6.15E+02	<	3.51E+01	<	2.39E+01	<	2.90E+01
	05/14/13	3.68E+02	+/-	2.15E+02	5.34E+03	+/-	6.79E+02	<	3.63E+01	<	3.19E+01	<	3.19E+01
	06/11/13	1.54E+03	+/-	3.26E+02	6.13E+03	+/-	7.40E+02	<	1.96E+01	<	2.84E+01	<	3.53E+01
	07/09/13	1.25E+03	+/-	2.97E+02	4.92E+03	+/-	6.46E+02	<	4.72E+01	<	2.39E+01	<	2.69E+01
	08/14/13	1.47E+03	+/-	4.11E+02	6.74E+03	+/-	9.14E+02	<	2.81E+01	<	4.16E+01	<	4.69E+01
	09/10/13	3.16E+03	+/-	4.77E+02	5.75E+03	+/-	7.63E+02	<	5.78E+01	<	4.74E+01	<	5.12E+01
	10/08/13	1.30E+03	+/-	4.65E+02	6.45E+03	+/-	1.01E+03	<	3.75E+01	<	5.26E+01	<	4.69E+01
	Mean	1.51E+03	+/-	3.53E+02	6.06E+03	+/-	7.67E+02	+/-		+/-		+/-	
Sampling Location	Sampling Date	Be-7		K-40		I-131*		Cs-134*		Cs-137*			
16**	04/09/13	1.43E+03	+/-	1.74E+02	6.30E+03	+/-	4.41E+02	<	2.38E+01	<	1.71E+01	<	1.83E+01
	05/14/13	6.87E+02	+/-	2.06E+02	4.06E+03	+/-	4.22E+02	<	4.21E+01	<	2.00E+01	<	2.05E+01
	06/11/13	1.47E+03	+/-	2.42E+02	5.62E+03	+/-	5.30E+02	<	2.21E+01	<	2.00E+01	<	2.37E+01
	07/09/13	1.67E+03	+/-	2.94E+02	4.70E+03	+/-	5.70E+02	<	3.57E+01	<	2.40E+01	<	2.91E+01
	08/14/13	6.81E+02	+/-	3.06E+02	1.04E+04	+/-	1.10E+03	<	2.95E+01	<	4.65E+01	<	4.98E+01
	09/10/13	<	<	5.28E+02	7.69E+03	+/-	1.11E+03	<	5.86E+01	<	5.69E+01	<	5.95E+01
	10/08/13	8.66E+02	+/-	6.15E+02	3.97E+03	+/-	8.22E+02	<	3.20E+01	<	3.55E+01	<	3.85E+01
	Mean	1.13E+03	+/-	3.38E+02	6.11E+03	+/-	7.14E+02	+/-		+/-		+/-	

* LLD identified in ODCM

** Control Station

Table 3-9
Food and Vegetation
Gamma Spectra
 [pCi/kg]

Sampling Location	Sampling Date	Be-7		K-40		I-131*	Cs-134*	Cs-137*					
23	04/09/13	1.57E+03	+/-	3.73E+02	6.77E+03	+/-	8.02E+02	<	2.70E+01	<	3.57E+01	<	4.03E+01
	05/14/13	5.47E+02	+/-	2.75E+02	4.54E+03	+/-	6.24E+02	<	4.16E+01	<	2.77E+01	<	3.09E+01
	06/11/13	9.45E+02	+/-	2.52E+02	5.25E+03	+/-	5.80E+02	<	1.87E+01	<	2.19E+01	<	2.72E+01
	07/09/13	1.48E+03	+/-	1.12E+02	4.98E+03	+/-	2.18E+02	<	5.57E+01	<	9.73E+00	<	1.06E+01
	08/14/13	2.22E+03	+/-	3.83E+02	8.80E+03	+/-	8.90E+02	<	2.67E+01	<	4.24E+01	<	4.86E+01
	09/10/13	2.03E+03	+/-	4.35E+02	2.68E+03	+/-	7.42E+02	<	5.84E+01	<	4.27E+01	<	4.37E+01
	10/08/13	1.26E+03	+/-	5.95E+02	5.75E+03	+/-	1.03E+03	<	3.72E+01	<	5.85E+01	<	6.91E+01
	Mean	1.44E+03	+/-	3.46E+02	5.54E+03	+/-	6.98E+02	+/-		+/-		+/-	
Sampling Location	Sampling Date	Be-7		K-40		I-131*	Cs-134*	Cs-137*					
26	04/09/13	2.23E+03	+/-	4.19E+02	8.93E+03	+/-	7.60E+02	<	2.62E+01	<	4.67E+01	<	4.92E+01
	05/14/13	1.49E+03	+/-	2.95E+02	6.63E+03	+/-	7.30E+02	<	3.51E+01	<	3.15E+01	<	3.37E+01
	06/11/13	1.43E+03	+/-	3.38E+02	5.23E+03	+/-	6.63E+02	<	2.11E+01	<	3.19E+01	<	3.57E+01
	07/09/13	1.60E+03	+/-	2.60E+02	4.30E+03	+/-	5.72E+02	<	4.16E+01	<	2.09E+01	<	2.49E+01
	08/14/13	1.21E+03	+/-	2.64E+02	4.41E+03	+/-	5.20E+02	<	2.57E+01	<	2.76E+01	<	3.00E+01
	09/10/13	1.30E+03	+/-	5.25E+02	2.84E+03	+/-	7.90E+02	<	4.01E+01	<	5.38E+01	<	5.84E+01
	10/08/13	2.93E+03	+/-	6.69E+02	4.83E+03	+/-	8.80E+02	<	3.34E+01	<	5.76E+01	<	5.96E+01
	Mean	1.74E+03	+/-	3.96E+02	5.31E+03	+/-	7.02E+02	+/-		+/-		+/-	
Indicator locations		1.50E+03	+/-	3.51E+02	5.76E+03	+/-	6.93E+02	+/-		+/-		+/-	

* LLD identified in ODCM

Table 3-10
Well Water
Gamma Spectra, Strontium, and Tritium
[pCi/L]

Sampling Date	Station 01A								
	H-3	Sr-89	Sr-90	Mn-54	Fe-59	Co-58	Co-60	Zn-65	
03/26/13	< 8.75E+02	[a]	[a]	< 5.15E+00	< 1.12E+01	< 4.54E+00	< 5.17E+00	< 8.77E+00	
06/25/13	< 7.25E+02	< 4.11E+00	< 7.72E-01	< 2.91E+00	< 6.20E+00	< 3.40E+00	< 2.62E+00	< 4.99E+00	
09/24/13	< 9.45E+02	[a]	[a]	< 4.48E+00	< 1.13E+01	< 5.40E+00	< 4.51E+00	< 9.30E+00	
12/31/13	< 8.30E+02	[a]	[a]	< 6.60E-01	< 1.30E+00	< 6.26E-01	< 5.87E-01	< 1.29E+00	

Sampling Date								
	Zr-95	Nb-95	I-131	Cs-134	Cs-137	Ba-140	La-140	
03/26/13	< 8.99E+00	< 7.07E+00	< 9.20E-01	< 4.40E+00	< 5.53E+00	< 2.63E+01	< 7.90E+00	
06/25/13	< 5.27E+00	< 3.23E+00	< 6.92E-01	< 2.79E+00	< 3.03E+00	< 1.99E+01	< 5.69E+00	
09/24/13	< 8.64E+00	< 5.73E+00	< 6.00E-01	< 4.47E+00	< 5.45E+00	< 2.68E+01	< 7.74E+00	
12/31/13	< 9.82E-01	< 6.58E-01	< 1.39E+00	< 6.04E-01	< 7.04E-01	< 4.03E+00	< 1.15E+00	

[a] Sr-89/90 analyses performed on the second quarter sample.

Table 3-11
River Water
Gamma Spectra, Strontium, and Tritium
[pCi/L]

Sampling Date	H-3	Sr-89	Sr-90	Mn-54*	Fe-59*	Co-58*	Co-60*	Station 11 Zn-65*
01/15/13	[a]	[b]	[b]	< 2.25E+00	< 6.16E+00	< 2.58E+00	< 2.19E+00	< 4.93E+00
02/12/13	[a]	[b]	[b]	< 4.39E+00	< 9.52E+00	< 4.54E+00	< 4.05E+00	< 8.50E+00
03/11/13	3.87E+03 +/-	7.92E+02	[b]	< 1.49E+00	< 3.29E+00	< 1.56E+00	< 1.58E+00	< 2.89E+00
04/16/13	[a]	[b]	[b]	< 4.96E+00	< 1.07E+01	< 5.28E+00	< 4.91E+00	< 1.07E+00
05/13/13	[a]	[b]	[b]	< 5.70E+00	< 1.31E+01	< 4.95E+00	< 3.96E+00	< 1.00E+00
06/10/13	4.33E+03 +/-	7.54E+02	< 4.76E+00	< 8.34E-01	< 4.09E+00	< 7.68E+00	< 3.93E+00	< 6.12E+00
07/14/13	[a]	[b]	[b]	< 4.46E+00	< 7.24E+00	< 4.01E+00	< 3.70E+00	< 8.97E+00
08/12/13	[a]	[b]	[b]	< 6.18E+00	< 1.42E+01	< 5.36E+00	< 5.68E+00	< 1.14E+00
09/16/13	3.75E+03 +/-	7.44E+02	[b]	< 1.64E+00	< 4.04E+00	< 1.62E+00	< 1.61E+00	< 3.47E+00
10/14/13	[a]	[b]	[b]	< 1.93E+00	< 4.90E+00	< 2.08E+00	< 1.96E+00	< 3.98E+00
11/12/13	[a]	[b]	[b]	< 1.65E+00	< 4.36E+00	< 2.04E+00	< 1.66E+00	< 3.18E+00
12/17/13	4.09E+03 +/-	7.84E+02	[b]	< 1.46E+00	< 3.81E+00	< 1.72E+00	< 1.59E+00	< 3.16E+00
MEAN	4.01E+03 +/-	7.69E+02 +/-	+/-	+/-	+/-	+/-	+/-	+/-

Sampling Date	Nb-95*	Zr-95*	I-131*	Cs-134*	Cs-137*	Ba-140*	La-140*
01/15/13	< 4.56E+00	< 2.62E+00	< 9.31E-01	< 2.28E+00	< 2.55E+00	< 1.75E+01	< 5.97E+00
02/12/13	< 8.93E+00	< 4.28E+00	< 6.89E-01	< 4.52E+00	< 5.28E+00	< 2.74E+01	< 7.58E+00
03/11/13	< 2.82E+00	< 1.66E+00	< 7.85E-01	< 1.52E+00	< 1.62E+00	< 1.01E+01	< 2.56E+00
04/16/13	< 9.29E+00	< 5.84E+00	< 7.35E-01	< 5.32E+00	< 5.24E+00	< 4.16E+01	< 7.11E+00
05/13/13	< 8.94E+00	< 5.66E+00	< 5.31E-01	< 4.59E+00	< 5.94E+00	< 2.81E+01	< 1.14E+01
06/10/13	< 7.59E+00	< 4.48E+00	< 3.91E-01	< 3.68E+00	< 3.86E+00	< 2.07E+01	< 5.89E+00
07/14/13	< 6.36E+00	< 4.09E+00	< 6.48E-01	< 3.67E+00	< 4.51E+00	< 2.34E+01	< 6.92E+00
08/12/13	< 9.23E+00	< 6.43E+00	< 5.97E-01	< 4.66E+00	< 5.90E+00	< 4.23E+01	< 1.49E+01
09/16/13	< 3.27E+00	< 1.90E+00	< 5.81E-01	< 1.57E+00	< 1.78E+00	< 1.24E+01	< 4.09E+00
10/14/13	< 3.90E+00	< 2.22E+00	< 4.85E-01	< 1.76E+00	< 1.95E+00	< 1.78E+01	< 5.82E+00
11/12/13	< 3.14E+00	< 2.05E+00	< 5.29E-01	< 1.55E+00	< 1.78E+00	< 1.95E+01	< 6.43E+00
12/17/13	< 3.19E+00	< 1.80E+00	< 4.02E-01	< 1.43E+00	< 1.66E+00	< 1.40E+01	< 4.87E+00
MEAN	+/-	+/-	+/-	+/-	+/-	+/-	+/-

* LLD identified in ODCM

[a] Tritium analyses on quarterly composite.

[b] Sr-89/90 performed annually on 2nd quarter composite sample.

Table 3-12
Surface Water
Gamma Spectra, Strontium, Tritium
[pCi/L]

Sampling Date									Station 08					
	H-3*	Sr-89		Sr-90	Mn-54*	Fe-59*	Co-58*	Co-60*	Zn-65*					
01/15/13	[a]	[b]	[b]	<	1.19E+00	<	2.93E+00	<	1.29E+00	<	1.21E+00	<	2.61E+00	
02/12/13	[a]	[b]	[b]	<	3.53E+00	<	8.99E+00	<	3.96E+00	<	3.48E+00	<	8.07E+00	
03/11/13	4.37E+03	+/-	8.23E+02	[b]	<	1.55E+00	<	3.60E+00	<	1.57E+00	<	1.75E+00	<	3.25E+00
04/16/13	[a]	[b]	[b]	<	3.58E+00	<	8.84E+00	<	4.65E+00	<	3.87E+00	<	8.54E+00	
05/13/13	[a]	[b]	[b]	<	3.61E+00	<	7.85E+00	<	3.57E+00	<	3.68E+00	<	7.48E+00	
06/10/13	4.00E+03	+/-	7.42E+02	<	4.27E+00	<	7.19E+00	<	3.88E+00	<	3.69E+00	<	7.92E+00	
07/14/13	[a]	[b]	[b]	<	4.32E+00	<	7.84E+00	<	4.04E+00	<	4.04E+00	<	7.15E+00	
08/12/13	[a]	[b]	[b]	<	4.76E+00	<	1.32E+01	<	4.56E+00	<	4.90E+00	<	9.33E+00	
09/16/13	3.85E+03	+/-	7.54E+02	[b]	<	2.32E+00	<	5.89E+00	<	2.55E+00	<	2.50E+00	<	4.68E+00
10/14/13	[a]	[b]	[b]	<	1.56E+00	<	4.14E+00	<	1.75E+00	<	1.61E+00	<	3.27E+00	
11/12/13	[a]	[b]	[b]	<	1.87E+00	<	4.85E+00	<	2.09E+00	<	1.78E+00	<	3.79E+00	
12/17/13	4.08E+03	+/-	7.79E+02	[b]	<	1.56E+00	<	3.94E+00	<	1.69E+00	<	1.64E+00	<	3.13E+00
Mean	4.08E+03	+/-	7.75E+02	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	

Sampling Date														
	Zr-95*	Nb-95*		I-131*	Cs-134*	Cs-137*	Ba-140*	La-140*						
01/15/13	<	2.44E+00	<	1.41E+00	<	8.08E-01	<	1.14E+00	<	1.35E+00	<	9.26E+00	<	2.87E+00
02/12/13	<	7.16E+00	<	4.17E+00	<	7.10E-01	<	3.78E+00	<	4.24E+00	<	2.16E+01	<	7.40E+00
03/11/13	<	2.84E+00	<	1.70E+00	<	7.33E-01	<	1.51E+00	<	1.66E+00	<	9.06E+00	<	3.13E+00
04/16/13	<	8.18E+00	<	4.35E+00	<	5.99E-01	<	3.65E+00	<	3.90E+00	<	3.21E+01	<	7.77E+00
05/13/13	<	6.58E+00	<	3.24E+00	<	6.30E-01	<	3.39E+00	<	3.50E+00	<	1.80E+01	<	5.31E+00
06/10/13	<	6.32E+00	<	3.92E+00	<	4.59E-01	<	3.34E+00	<	3.65E+00	<	1.65E+01	<	4.49E+00
07/14/13	<	5.68E+00	<	3.31E+00	<	6.20E-01	<	3.53E+00	<	3.84E+00	<	1.79E+01	<	6.35E+00
08/12/13	<	9.79E+00	<	5.49E+00	<	7.39E-01	<	4.60E+00	<	4.97E+00	<	3.14E+01	<	1.16E+01
09/16/13	<	4.46E+00	<	2.55E+00	<	5.63E-01	<	2.13E+00	<	2.28E+00	<	1.60E+01	<	5.51E+00
10/14/13	<	3.18E+00	<	1.90E+00	<	4.48E-01	<	1.58E+00	<	1.72E+00	<	1.59E+01	<	4.59E+00
11/12/13	<	3.57E+00	<	2.07E+00	<	5.98E-01	<	1.74E+00	<	1.81E+00	<	2.10E+01	<	6.51E+00
12/17/13	<	3.17E+00	<	1.80E+00	<	4.25E-01	<	1.55E+00	<	1.73E+00	<	1.48E+01	<	4.20E+00
Mean	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-

* LLD identified in ODCM

[a] Tritium analyses on quarterly composite.

[b] Sr-89/90 performed annually on 2nd quarter composite sample.

Table 3-12
Surface Water
Gamma Spectra, Strontium, Tritium
[pCi/L]

Sampling Date	Station 09A							
	H-3*	Sr-89	Sr-90	Mn-54*	Fe-59*	Co-58*	Co-60*	Zn-65*
01/15/13	[a]	[b]	[b]	< 1.47E+00	< 3.49E+00	< 1.60E+00	< 1.60E+00	< 3.00E+00
02/12/13	[a]	[b]	[b]	< 5.67E+00	< 1.19E+01	< 6.60E+00	< 6.03E+00	< 1.10E+01
03/11/13	< 8.83E+02	[b]	[b]	< 1.39E+00	< 3.24E+00	< 1.52E+00	< 1.36E+00	< 2.75E+00
04/16/13	[a]	[b]	[b]	< 3.70E+00	< 1.05E+01	< 4.53E+00	< 4.25E+00	< 9.35E+00
05/13/13		[b]	[b]	< 3.77E+00	< 6.74E+00	< 3.34E+00	< 3.74E+00	< 7.24E+00
06/10/13	< 8.02E+02	< 3.75E+00	< 8.04E-01	< 3.57E+00	< 6.92E+00	< 4.03E+00	< 3.78E+00	< 8.33E+00
07/14/13	[a]	[b]	[b]	< 3.10E+00	< 7.30E+00	< 3.27E+00	< 3.14E+00	< 6.34E+00
08/12/13	[a]	[b]	[b]	< 4.26E+00	< 9.23E+00	< 3.80E+00	< 4.60E+00	< 8.82E+00
09/16/13	< 7.67E+02	[b]	[b]	< 1.94E+00	< 4.35E+00	< 2.05E+00	< 1.81E+00	< 3.62E+00
10/14/13	[a]	[b]	[b]	< 1.48E+00	< 3.32E+00	< 1.55E+00	< 1.43E+00	< 2.83E+00
11/12/13	[a]	[b]	[b]	< 1.76E+00	< 4.61E+00	< 2.03E+00	< 1.89E+00	< 3.59E+00
12/17/13	< 8.12E+02	[b]	[b]	< 1.91E+00	< 5.23E+00	< 2.30E+00	< 2.15E+00	< 3.93E+00
Mean	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-

Sampling Date	Station 09A							
	Zr-95*	Nb-95*	I-131*	Cs-134*	Cs-137*	Ba-140*	La-140*	
01/15/13	< 3.10E+00	< 1.67E+00	< 9.23E-01	< 1.56E+00	< 1.60E+00	< 1.19E+01	< 3.57E+00	
02/12/13	< 9.99E+00	< 5.97E+00	< 7.75E-01	< 6.07E+00	< 6.36E+00	< 3.38E+01	< 1.43E+01	
03/11/13	< 2.70E+00	< 1.66E+00	< 5.76E-01	< 1.44E+00	< 1.57E+00	< 9.21E+00	< 2.62E+00	
04/16/13	< 8.68E+00	< 4.84E+00	< 7.64E-01	< 4.50E+00	< 4.16E+00	< 3.41E+01	< 7.94E+00	
05/13/13	< 6.04E+00	< 3.70E+00	< 5.62E-01	< 3.55E+00	< 3.95E+00	< 1.80E+01	< 6.62E+00	
06/10/13	< 7.37E+00	< 3.60E+00	< 4.44E-01	< 3.84E+00	< 3.84E+00	< 1.92E+01	< 4.78E+00	
07/14/13	< 6.32E+00	< 3.55E+00	< 6.32E-01	< 3.09E+00	< 3.99E+00	< 1.88E+01	< 5.26E+00	
08/12/13	< 8.47E+00	< 4.74E+00	< 7.70E-01	< 4.00E+00	< 4.44E+00	< 3.74E+01	< 1.27E+01	
09/16/13	< 3.57E+00	< 2.12E+00	< 5.51E-01	< 1.93E+00	< 2.05E+00	< 1.51E+00	< 3.97E+00	
10/14/13	< 3.00E+00	< 1.63E+00	< 3.74E-01	< 1.39E+00	< 1.57E+00	< 1.41E+01	< 4.46E+00	
11/12/13	< 3.66E+00	< 2.20E+00	< 6.44E-01	< 1.68E+00	< 1.87E+00	< 2.07E+01	< 6.29E+00	
12/17/13	< 4.06E+00	< 2.34E+00	< 4.32E-01	< 1.79E+00	< 2.05E+00	< 1.73E+01	< 5.83E+00	
Mean	+/-	+/-	+/-	+/-	+/-	+/-	+/-	

* LLD identified in ODCM

[a] Tritium analyses on quarterly composite.

[b] Sr-89/90 performed annually on 2nd quarter composite sample.

Table 3-13
Sediment Silt
Gamma Spectra, and Strontium
[pCi/Kg]

page
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Sample Date	Sr-89	Sr-90	K-40	Cs-134*	Cs-137*
4/22/2013					
Station 08	[a]	[a]	7.30E+03 +/- 9.19E+02	< 4.07E+01	< 4.50E+01
Station 09A**	[a]	[a]	1.25E+04 +/- 1.31E+03	< 5.42E+01	< 6.49E+01
Station 11	[a]	[a]	1.58E+04 +/- 1.62E+03	< 8.85E+01	< 8.83E+01
			Ra-226	Th-228	Th-232

4/22/2013					
Station 08			1.82E+03 +/- 8.38E+02	9.44E+02 +/- 7.81E+01	8.31E+02 +/- 1.09E+02
Station 09A**			2.35E+03 +/- 8.61E+02	5.48E+02 +/- 9.39E+01	7.31E+02 +/- 1.27E+02
Station 11			2.54E+03 +/- 1.65E+03	1.76E+03 +/- 1.97E+02	1.31E+03 +/- 1.97E+02

Sample Date	Sr-89	Sr-90	K-40	Cs-134*	Cs-137*
10/14/2013					
Station 08	< 4.66E+02	< 2.79E+01	2.34E+03 +/- 7.35E+02	< 4.93E+01	< 6.05E+01
Station 09A**	< 3.25E+02	< 2.61E+01	1.20E+04 +/- 1.17E+03	< 4.68E+01	< 5.74E+01
Station 11	< 4.05E+02	< 3.67E+01	1.60E+04 +/- 1.23E+03	< 4.99E+01	< 5.17E+01
			Ra-226	Th-228	Th-232

10/14/2013					
Station 08			2.02E+03 +/- 9.69E+02	7.80E+02 +/- 8.40E+01	6.97E+02 +/- 1.19E+02
Station 09A**			2.09E+03 +/- 1.20E+03	5.74E+02 +/- 8.04E+01	5.06E+02 +/- 1.23E+02
Station 11			2.15E+03 +/- 1.07E+03	1.37E+03 +/- 8.88E+01	1.22E+03 +/- 1.59E+02

	MEAN				
	Sr-89	Sr-90	K-40	Cs-134*	Cs-137*
Indicator	+/-	+/-	1.04E+04 +/- 1.13E+03	+/-	+/-
Control	+/-	+/-	1.23E+04 +/- 1.24E+03	+/-	+/-
			Ra-226	Th-228	Th-232
Indicator			2.13E+03 +/- 1.23E+03	1.21E+03 +/- 1.12E+02	1.01E+03 +/- 1.46E+02
Control			2.22E+03 +/- 8.61E+02	5.61E+02 +/- 8.72E+01	6.19E+02 +/- 1.25E+02

* LLD identified in ODCM

** Control Station

[a] Sr-89/90 analyses performed annually.

Table 3-14
Shoreline Soil
Gamma Spectra, and Strontium
[pCi/Kg]

Sample Date	Sr-89	Sr-90	K-40		Cs-134*		Cs-137*		
4/22/2013									
Station 08	[a]	[a]	1.36E+03	+/- 7.52E+02	<	6.00E+01	<	6.83E+01	
			Ra-226		Th-228		Th-232		
			<	1.44E+03	8.09E+02	+/- 1.16E+02	7.05E+02	+/- 1.48E+02	
Sample Date	Sr-89	Sr-90	K-40		Cs-134*		Cs-137*		
10/14/2013									
Station 08	< 3.34E+02	< 2.68E+01	3.94E+03	+/- 8.46E+02	<	5.29E+01	<	5.77E+01	
			Ra-226		Th-228		Th-232		
			1.52E+03	+/- 1.12E+03	8.29E+02	+/- 9.51E+01	7.46E+02	+/- 1.45E+02	
			MEAN						
			K-40		Cs-134*		Cs-137*		
	+/-	+/-	2.65E+03	+/- 7.99E+02	+/-		+/-		
			Ra-226		Th-228		Th-232		
			1.52E+03	+/- 1.44E+03	8.19E+02	+/- 1.06E+02	7.26E+02	+/- 1.47E+02	

* LLD identified in ODCM

[a] Sr-89/90 analyses performed annually.

Table 3-15
Fish
Gamma Spectra
[pCi/Kg]

												Fish [a]					
												Station 08					
Sampling Date	K-40		Mn-54*	Fe-59*	Co-58*	Co-60*	Zn-65*	Cs-134*	Cs-137*								
04/24/13	2.65E+03	+/-	9.20E+02	<	5.75E+01	<	1.28E+02	<	5.92E+01	<	4.77E+01	<	9.95E+01	<	4.30E+01	<	5.56E+01
10/15/13	2.24E+03	+/-	1.06E+03	<	7.34E+01	<	1.73E+02	<	7.51E+01	<	6.84E+01	<	1.18E+02	<	6.44E+01	<	7.22E+01
												Station 25**					
Sampling Date	K-40		Mn-54*	Fe-59*	Co-58*	Co-60*	Zn-65*	Cs-134*	Cs-137*								
04/23/13	2.75E+03	+/-	1.31E+03	<	7.19E+01	<	1.88E+02	<	1.08E+02	<	5.60E+01	<	1.63E+02	<	9.28E+01	<	8.41E+01
10/16/13	2.85E+03	+/-	8.46E+02	<	6.01E+01	<	1.49E+02	<	6.60E+01	<	6.75E+01	<	1.26E+02	<	5.40E+01	<	6.50E+01
												catfish [b]					
												Station 08					
Sampling Date	K-40		Mn-54*	Fe-59*	Co-58*	Co-60*	Zn-65*	Cs-134*	Cs-137*								
04/24/13	2.32E+03	+/-	1.03E+03	<	7.04E+01	<	1.57E+02	<	6.24E+01	<	6.04E+01	<	8.73E+01	<	5.83E+01	<	5.10E+01
10/18/13	2.59E+03	+/-	9.12E+02	<	6.70E+01	<	1.64E+02	<	6.84E+01	<	6.66E+01	<	1.46E+02	<	6.50E+01	<	7.29E+01
												Station 25**					
Sampling Date	K-40		Mn-54*	Fe-59*	Co-58*	Co-60*	Zn-65*	Cs-134*	Cs-137*								
04/23/13	2.82E+03	+/-	8.99E+02	<	5.76E+01	<	1.13E+02	<	5.22E+01	<	6.99E+01	<	1.22E+02	<	4.65E+01	<	5.06E+01
10/17/13	1.37E+03	+/-	9.71E+02	<	7.12E+01	<	1.22E+02	<	7.67E+01	<	5.76E+01	<	1.36E+02	<	6.00E+01	<	6.66E+01
Mean	2.45E+03	+/-	9.94E+02														
Indicator	2.45E+03	+/-	9.81E+02														
Control	2.45E+03	+/-	1.01E+03														

* LLD identified in ODCM

** Control Station

[a] Non-bottom dwelling species of gamefish.

[b] Bottom dwelling species of fish.

DISCUSSION OF RESULTS

Data from the radiological analyses of environmental media collected during 2013 and tabulated in Section 3, are discussed below. Except for TLDs, Teledyne Brown Engineering analyzed all samples throughout the year. The procedures and specifications followed for these analyses are as required in the TBE quality assurance manuals and laboratory procedures. In addition to internal quality control measurements performed by each laboratory, they also participate in an Interlaboratory Comparison Program. Participation in this program ensures that independent checks on the precision and accuracy of the measurements of radioactive material in environmental samples are performed. The results of the Interlaboratory Comparison Programs are provided in Appendix B.

The predominant radioactivity detected throughout 2013 was that from external sources, such as fallout from nuclear weapons tests and naturally occurring radionuclides. Naturally occurring nuclides such as Be-7, K-40, Th-228 and Th-232 were detected in numerous samples. Th-228 & Th-232 results were variable and are generally at levels higher than plant related radionuclides.

The following is a discussion and summary of the results of the environmental measurements taken during the 2013 reporting period.

4.1 Gamma Exposure Rate

A thermoluminescent dosimeter (TLD) is an inorganic crystal used to detect ambient radiation. TLDs are placed in two concentric rings around the station. The inner ring is located at the site boundary, and the outer ring is located at approximately five miles from the station. TLDs are also placed in special interest areas, such as population areas and nearby residences. Additional TLDs serve as controls. Ambient radiation comes from naturally occurring radioisotopes in the air and soil, radiation from cosmic origin, fallout from nuclear weapons testing, station effluents and direct radiation from the station.

The results of the analyses are presented in Table 3-2. Figure 4-1 shows the historical trend of TLD exposure rate measurements. Control and indicator averages indicate a steady relationship. Two dosimeters made of CaF and LiF sensitive elements are deployed at each sampling location. These TLDs replaced the previously used CaSO₄:Dy in Teflon TLDs in January 2001. The

dose with the replacement TLDs is lower than that of the previously used TLDs. This will continue to be monitored.

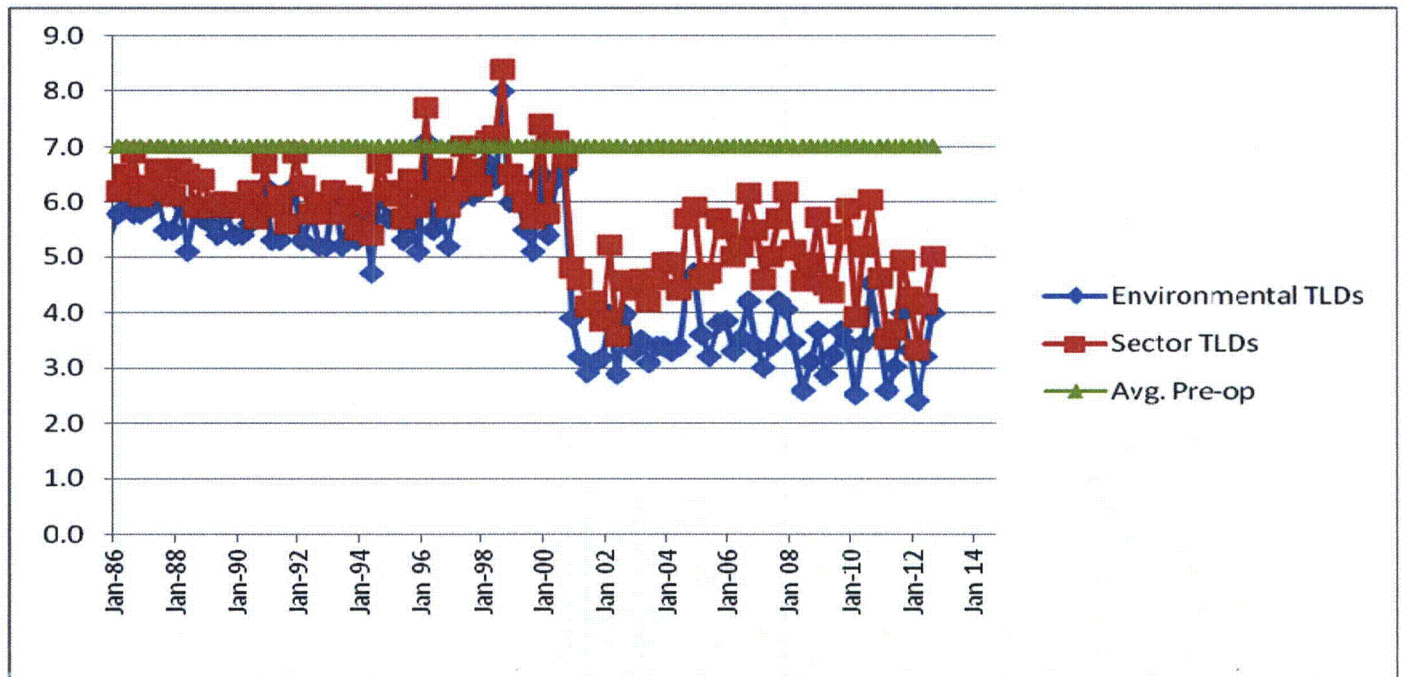


Figure 4-1 TLD (mrem/Standard Month)

Sector TLDs are deployed quarterly at thirty-two locations in the environs of the North Anna site. Two badges are placed at each location. The average level of the 32 locations (two badges at each location) was 4.6 mR/standard month with a range of 1.6 to 9.2 mR/standard month. The highest quarterly average reading for any single location was obtained at location NW-29/61. This value was 7.7 mR/standard month. This location is on site on the north gate of the construction side laydown area. Quarterly and annual TLDs are also located at twelve environmental air sampling stations. For the eleven indicator locations within 10 miles of the station the average quarterly reading was 3.8 mR/standard month with a range of 1.9 to 6.3 mR/standard month. The average annual reading for these locations was 3.4 mR/standard month with a range from 2.3 to 4.8 mR/standard month. The control location showed a quarterly average of 3.4 mR/standard month with a range of 2.9 to 3.9 mR/standard month. Its annual reading was 3.6 mR/standard month. 10 emergency sector TLDs, which are all located onsite had a quarterly average of 5.4 mR/standard month with EPSP-9/10 having the highest quarterly average of 7.8 mR/standard month. Eight other TLDs, designated C-1 thru C-8, which

were pre-operational controls, were collected quarterly from four locations. Stations C-3/4 and C-7/8 are designated controls. These had a quarterly average of 3.6, while Station C-1/2 and C-5/6 had a quarterly average of 2.5 mR/standard month with a range of 1.1 to 3.7 mR/standard month. During the pre-operational period (starting in 1977) the doses were measured between 4.3 and 8.8 mR/standard month.

4.2 Airborne Gross Beta

Results of the weekly gross beta analyses are presented in Table 3-3. A review of the historical plot in Figure 4-2, indicates gross beta activity levels have remained relatively unchanged. The drop indicated in 2009 may be a function of a return to the vendor used from 1988 until 2001. This will be monitored in the future to see if this is in fact the case. Inner and outer ring monitoring locations continue to show no significant variation in measured activities (see Figure 4-3). This indicates that any station contribution is not measurable.

Gross beta activity found during the pre-operational and early operating period of North Anna Power Station was higher because of nuclear weapons testing. During that time, nearly 740 nuclear weapons were tested worldwide. In 1985 weapons testing ceased, and with the exception of the Chernobyl accident in 1986, airborne gross beta results have remained steady. During the preoperational period of July 1, 1974 through March 31, 1978 gross beta activities ranged from a low of 0.005 pCi/m³ to a high of 0.75 pCi/m³.

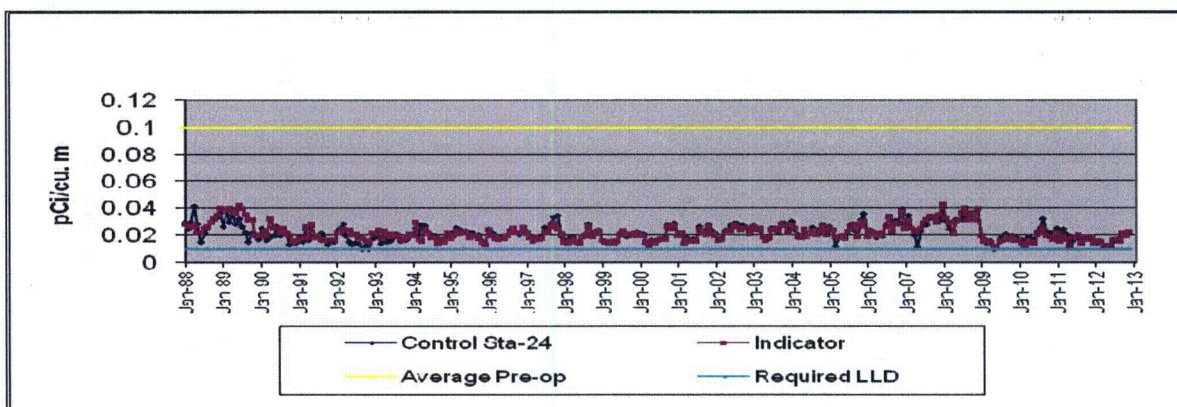


Figure 4-2 Historical Gross Beta in Air Particulates

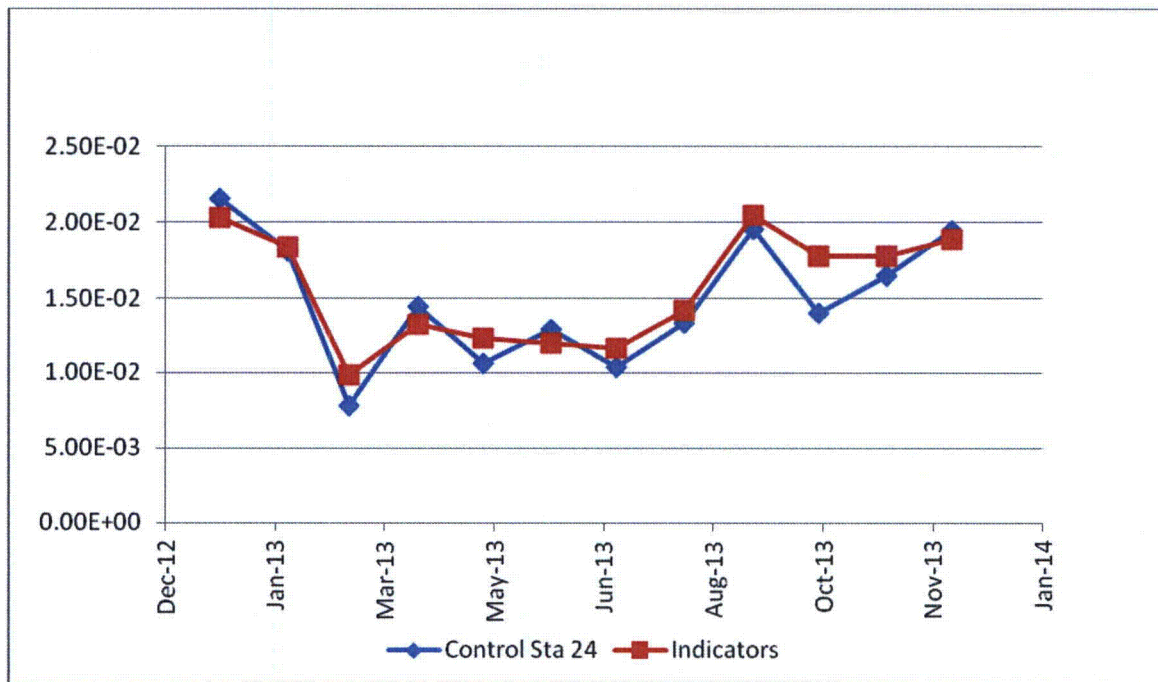


Figure 4-3 2013 Gross Beta in Air Particulates (pCi/m³)

4.3 Airborne Radioiodine

Charcoal cartridges are used to collect airborne radioiodine. Once a week the samples are collected and analyzed. The results of the analyses are presented in Table 3-4. These results are similar to pre-operational data and the results of samples taken prior to and after the 1986 accident in the Soviet Union at Chernobyl and the effect of the Fukushima Daiichi event.

4.4 Air Particulate Gamma

The air particulate filters that are utilized for the weekly gross beta analyses are composited by location and analyzed quarterly by gamma spectroscopy. The results are listed in Table 3-5. The results indicate the presence of naturally occurring Be-7, which is produced by cosmic processes. Examination of pre-operational data indicates comparable measurements of Be-7, as would be expected. The results of these analyses indicate the lack of station effects on the environment.

4.5 Air Particulate Strontium

Strontium-89 and 90 analyses are performed on the second quarter composites of air particulate filters from all monitoring stations. There has been no detection of these fission products at any of the indicator or control stations in recent years.

4.6 Soil

Soil samples, which are collected every three years from twelve stations, were collected in 2013. Cs-137 was identified in 10 of 11 indicator samples and the control sample. For the indicator stations the average was 208.9 pCi/Kg while for the control station the average was 329 pCi/Kg. During the preoperational phase Cs-137 was routinely detected and was attributed to fallout. Levels during this phase varied by location and date and ranged from 88 to 1390 pCi/Kg. The average was 645 pCi/kg. The current levels are also varied significantly by location and date. The decrease in the average, and the fact that the averages for the control location and the indicator locations are similar is indicative of fallout. No other plant related isotopes were identified in Soil samples during 2013.

4.7 Precipitation

A sample of rain water was collected monthly at on-site station 01A and analyzed for gross beta activity and H-3. The results are presented in Table 3-7. Twelve precipitation samples were obtained in 2013. Semi-annual composites are prepared and analyzed for gamma emitting isotopes in accordance with program requirements. No plant related isotopes were reported in any precipitation water sample at the indicator location. Naturally occurring gamma emitting radioisotopes were detected. No positive H-3 result was reported. During the pre-operational period gross beta activity in rain water was expressed in nCi per square meter of the collector surface, thus a direct comparison cannot be made to the 2013 period. During the pre-operational period, tritium was measured in over half of the few quarterly composites made. This tritium activity ranged from 100 to 330 pCi/liter.

4.8 Cow Milk

Analysis of milk samples is generally the most sensitive indicator of fission product existence in the terrestrial environment. This pathway also shows

measurable amounts of nuclear weapons testing fallout. Therefore, this media needs to be evaluated very carefully when trying to determine if there is any plant effect.

Analysis results for cow milk are contained in Table 3-8. No sample indicated positive results. Gamma spectroscopy did not detect the presence of any isotopes related to the operation of North Anna. In years past, Cs-137 has been detected sporadically. These occurrences were attributed to residual global fallout from past atmospheric weapons testing. Naturally occurring K-40 was detected in all samples.

Once each quarter a sample from the collection station is analyzed for strontium-89 and strontium-90. Neither Sr-89 nor Sr-90 was detected. Sr-90 has been observed in the past. Pre-operational levels of 2.2 to 5.4 pCi/liter were measured for Sr-90. There has been a long-term activity trend for Sr-90 showing a continuous decline. It should be noted that strontium-90 is not a part of station effluents. Its detection is the product of nuclear weapons testing fallout. This conclusion can be made based upon the fact that Sr-89 and Sr-90 have not been detected in gaseous effluents released from the station in many years, and the trend of consistent declining levels since the pre-operational period.

4.9 Food Products and Vegetation

Food/vegetation samples were collected from five locations and analyzed by gamma spectroscopy. The results of the analyses are presented in Table 3-9. Low levels of Cs-137, attributable to fallout, have been seen periodically in vegetation samples. As expected, naturally occurring potassium-40 and cosmogenic beryllium-7 were detected in most samples, and thorium-228 and other natural products, including Bi-214, were detected in some samples. No plant related isotopes were identified in any Vegetation sample during 2013.

4.10 Well Water

Water was sampled quarterly from the onsite well at the metrology laboratory. These samples were analyzed for gamma radiation and for tritium. The second quarter sample was analyzed by vendor for Sr-89, Sr-90, H-3, I-131, and gamma emitters. The results of these analyses are presented in Table 3-10. No plant related isotopes were detected. No gamma emitting isotopes were detected during the pre-operational period.

4.11 River Water

Samples of water from the North Anna River were collected monthly. The analyses are presented in Table 3-11. All monthly samples are analyzed by gamma spectroscopy. The monthly samples were composited quarterly and analyzed for tritium. Additionally, the second quarter samples are analyzed for strontium-89 and strontium-90 in accordance with program requirements. There has been no detection of these fission products at any of the indicator or control stations in recent years.

No gamma emitting radioisotopes were positively identified in any of the samples. There was no measured activity of strontium-89 or strontium-90. Tritium was measured in all four samples with an average annual concentration of 4010 pCi/liter and a range of 3750 to 4330 pCi/liter. These levels are comparable to those observed in previous years, see Figure 4-4. No river water samples were collected during the pre-operational period.

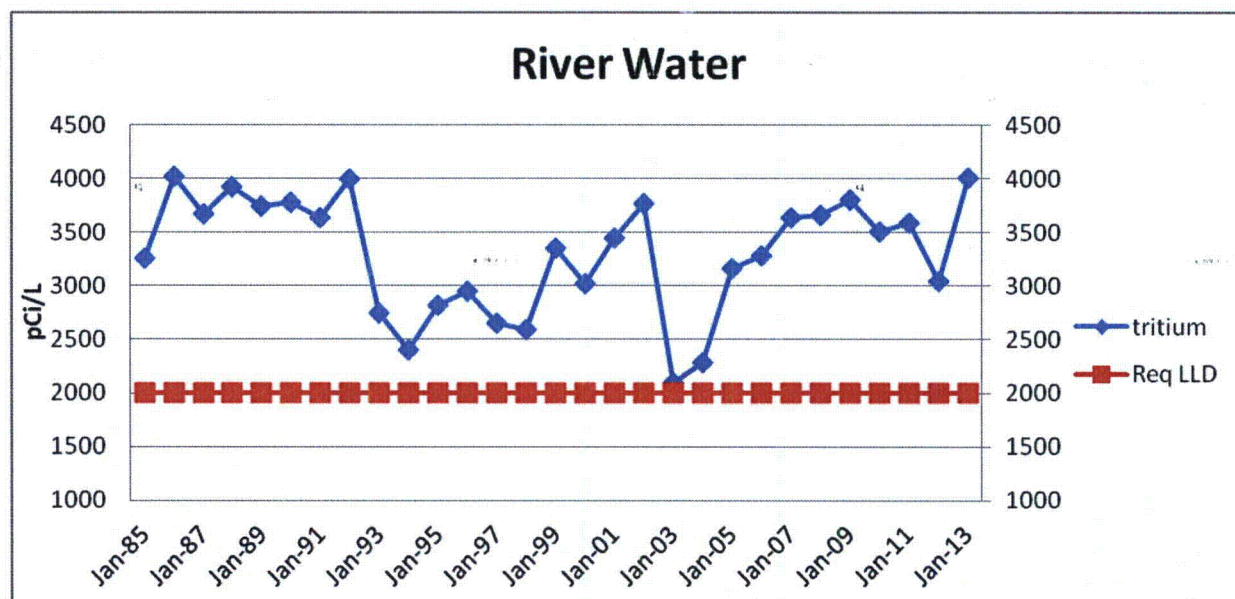


Figure 4-4 Tritium in River water

4.12 Surface Water

Samples of surface water were collected monthly from two stations, an indicator station located at the discharge lagoon and a control station located 12.9 miles WNW. The samples were analyzed by gamma spectroscopy and for iodine-131 by radiochemical separation. A quarterly composite from each station was prepared and analyzed for tritium. Additionally, the second quarter samples are analyzed for strontium-89 and strontium-90. There has been no positive indication of these fission products at any of the indicator or control stations in recent years. The results are presented in Table 3-12.

No non-naturally occurring gamma emitting radioisotopes, including iodine were detected in any of the samples. No tritium was detected at the control location. The average level of tritium activity at the indicator station was 4080 pCi/liter with a range of 3850 to 4370 pCi/liter. Levels of tritium have increased since 1978 when the average level was below 300 pCi/liter. Levels measured at the indicator location (Station 8) are comparable to those measured since 1986, see Figure 4-5. During the pre-operational period tritium was measured in several samples with concentrations between 90 and 250 pCi/liter.

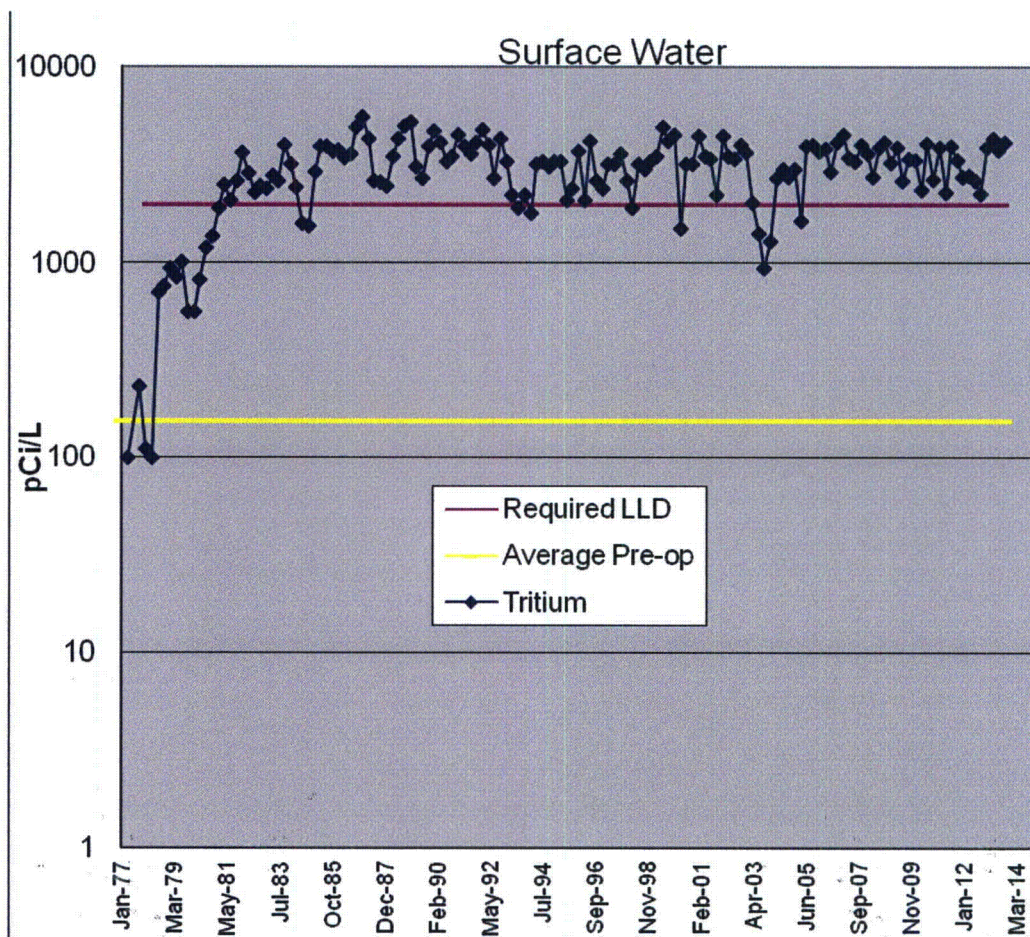


Figure 4.5 Tritium in Surface Water

4.13 Bottom Sediment

Bottom sediment or silt is sampled to evaluate any buildup of radionuclides in the environment due to the operation of the station. Buildup of radionuclides in bottom sediment could indirectly lead to increasing radioactivity levels in fish.

Sediment samples were collected during March and October from each of three locations and were analyzed by gamma spectroscopy. The October samples were analyzed for strontium-89 and strontium-90. The results are presented in Table 3-13.

No plant related isotopes were detected in 2013. The detection of Cs-137 in bottom sediment is historically common with positive indications usually apparent in both indicator and control samples. The detection of Cs-137 is the

result of accumulation and runoff into the lake of residual weapons testing fallout; its global presence has been well documented. During the pre-operational period sediment samples were also analyzed by gamma spectroscopy. Figure 4-6 shows the historical trend of Cs-137 in sediments.

Neither Strontium-89 nor Strontium-90 was detected in any samples of aquatic sediment/silt in 2013. Strontium-90 has been detected occasionally in the past at both the indicator and control locations and is attributable to fallout from past bomb tests. A number of naturally occurring radioisotopes were detected in these samples at background levels.

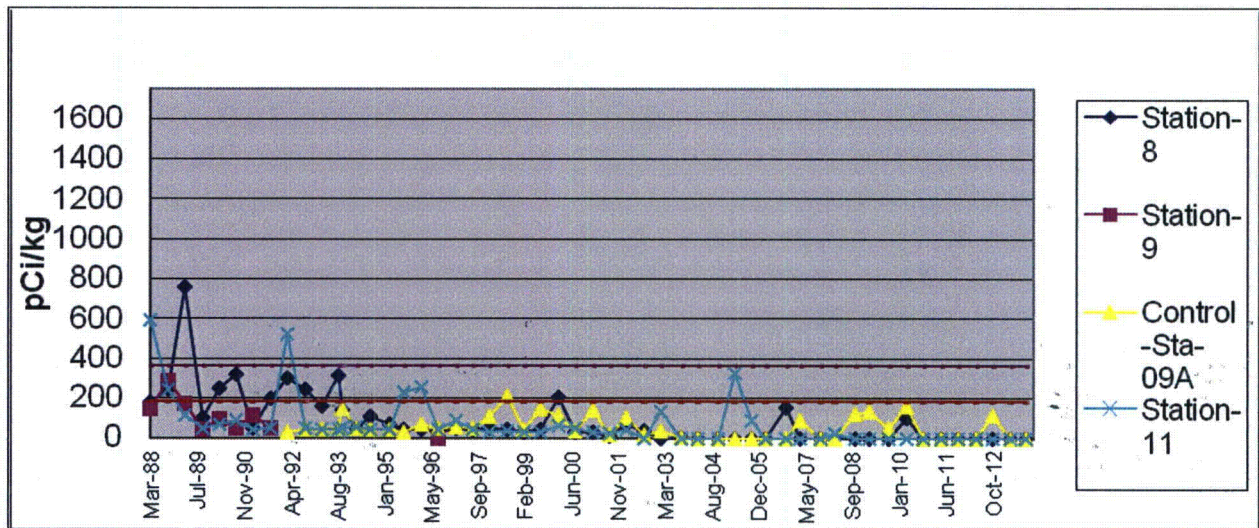


Figure 4-6 Cs-137 in Sediment/Silt

4.14 Shoreline Soil

Shoreline soil/sediment, unlike bottom sediment, may provide a direct dose to humans. Buildup of radioisotopes along the shoreline may provide a source of direct exposure for those using the area for commercial and recreational uses. Samples of shoreline soil were collected in April and October from indicator station 08. The samples were analyzed by gamma spectroscopy. The October sample was analyzed for strontium-89 and strontium-90. The results are presented in Table 3-14.

Naturally occurring radioisotopes were detected at concentrations equivalent to normal background activities. No plant related isotopes were detected in any indicator or control samples analyzed. Strontium-90 is often detected in this media, however as discussed previously, the presence of Sr-90 and Cs-137 is

attributed to accumulation of residual global fallout from past atmospheric weapons testing.

4.15 Fish

Four sample sets of fish, two from Lake Anna and two from the control station, Lake Orange, were collected during 2013 and analyzed by gamma spectroscopy. Each sample set consisted of a sample of game species and a sample of bottom-dwelling species, which were analyzed separately. The results are presented in Table 3-15. Naturally occurring K-40 was detected in all samples. No plant related isotopes were detected. Cs-137 was measured in pre-operational environmental fish samples.

5. PROGRAM EXCEPTIONS

REMP Exceptions for Scheduled Sampling and Analysis during 2013 – North Anna

Location	Description	Date of Sampling	Reason(s) for Loss/Exception
14B,15,16,23, 26	Vegetation	01/08/13	Seasonal unavailability
14B,15,16,23, 26	Vegetation	02/13/13	Seasonal unavailability
14B,15,16,23, 26	Vegetation	03/12/13	Seasonal unavailability
STA 5	AP/Char	03/12/13	Sampler not running. Power pole damaged by snow storm.
STA 5	Annual/Quarterly TLD	03/12/13	TLDs missing due to power pole damage from snow storm.
STA 2	AP/Char	04/09/13	Sampler not running/ replaced. Minimum volume not met.
14B,15,16,23, 26	Vegetation	11/ 13 /13	Seasonal unavailability
14B,15,16,23, 26	Vegetation	12/ 12 /13	Seasonal unavailability

REFERENCES

References

Dominion, North Anna Power Station Technical Specifications, Units 1 and 2.

Dominion, North Anna Power Station Independent Spent Fuel Storage Installation Technical Specifications.

Dominion, Station Administrative Procedure, VPAP-2103N, "Offsite Dose Calculation Manual".

Virginia Electric and Power Company, North Anna Technical Procedure, HP-3051.010, "Radiological Environmental Monitoring Program".

Title 10 Code of Federal Regulation, Part 50 (10CFR50), "Domestic Licensing of Production and Utilization Facilities".

United States Nuclear Regulatory Commission Regulatory Guide 1.109, Rev. 1, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I", October, 1977.

United States Nuclear Regulatory Commission, Regulatory Guide 4.8 "Environmental Technical Specifications for Nuclear Power Plants", December 1975.

USNRC Branch Technical Position, "Acceptable Radiological Environmental Monitoring Program", Rev. 1, November 1979.

NUREG 0472, "Radiological Effluent Technical Specifications for PWRs", Rev. 3, March 1982.

HASL-300, Environmental Measurements Laboratory, "EML Procedures Manual," 27th Edition, Volume 1, February 1992.

NUREG/CR-4007, "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements," September 1984.

APPENDICES

APPENDIX A: LAND USE CENSUS

Year 2013

LAND USE CENSUS
North Anna Power Station
Louisa County, Virginia

January 1 to December 31, 2013

<i>Direction</i>	<i>Distance (miles)</i>					
	<i>Nearest Site Boundary</i>	<i>Nearest Resident</i>	<i>Nearest Garden (> 50m²)</i>	<i>Nearest Meat Animal</i>	<i>Nearest Milch Cow</i>	<i>Nearest Milch Goat</i>
<i>N</i>	0.9	1.3	1.78	2.9	<i>NONE</i>	<i>NONE</i>
<i>NNE</i>	0.9	0.9	1.2	3.1	<i>NONE</i>	<i>NONE</i>
<i>NE</i>	0.8	0.9	1.6	1.6	<i>NONE</i>	<i>NONE</i>
<i>ENE</i>	0.8	2.37	2.4	2.7	<i>NONE</i>	<i>NONE</i>
<i>E</i>	0.8	1.3	2.0	3.5	<i>NONE</i>	<i>NONE</i>
<i>ESE</i>	0.9	1.7	1.7	<i>NONE</i>	<i>NONE</i>	<i>NONE</i>
<i>SE</i>	0.9	1.4	1.5	1.4	<i>NONE</i>	<i>NONE</i>
<i>SSE</i>	0.9	1.0	1.0	1.6	<i>NONE</i>	<i>NONE</i>
<i>S</i>	0.9	1.0	1.0	2.0	<i>NONE</i>	<i>NONE</i>
<i>SSW</i>	1	1.3	1.33	2.0	<i>NONE</i>	<i>NONE</i>
<i>SW</i>	1.1	1.65	1.65	<i>NONE</i>	<i>NONE</i>	<i>NONE</i>
<i>WSW</i>	1.1	1.6	2.4	1.6	<i>NONE</i>	<i>NONE</i>
<i>W</i>	1.1	1.5	1.9	4.4	<i>NONE</i>	<i>NONE</i>
<i>WNW</i>	1	1.1	2.6	5.0	<i>NONE</i>	<i>NONE</i>
<i>NW</i>	1	1.0	2.0	<i>NONE</i>	<i>NONE</i>	<i>NONE</i>
<i>NNW</i>	0.9	1.0	1.2	2.3	<i>NONE</i>	<i>NONE</i>

2012 to 2013 Land Use Census Changes			
Nearest	Direction	2012 Distance	2013 Distance
Resident	NONE		
Site Boundary	NONE		
Garden	N	1.72	1.78
	SSW	2.34	1.33
Meat Animal	NONE		
Milch Cow	NONE		
Milch Goat	NONE		

APPENDIX B: SUMMARY OF INTERLABORATORY COMPARISONS

YEAR 2013

INTRODUCTION

This appendix covers the Intercomparison Program of the Teledyne Brown Engineering – Environmental Services as required by technical specifications for the Radiological Environmental Monitoring Program (REMP). TBE uses QA/QC samples provided by Eckert & Zeigler Analytics, Inc, DOE's Mixed Analyte Performance Evaluation Program (MAPEP) and Environmental Resource Associates, (ERA) to monitor the quality of analytical processing associated with the REMP. The suite of samples is designed to be comparable with the pre-1996 US EPA Interlaboratory Cross-Check Program in terms of sample number, matrices, and nuclides. This includes:

E & Z Analytics:

Milk for gamma emitters, Iodine-131, Fe-55, Sr-89 and Sr-90 analyses once per quarter.

Air particulate for gamma emitters once per quarter

Charcoal for I-131 once per quarter

ERA

Water for tritium, gamma, Iodine-131, Sr-89, Sr-90, gross alpha and beta during the 2nd and 4th quarters.

Water for natural uranium during the 2nd quarter

DOE

Water and soil for gamma, Iodine-131, U-233/234, U-238, transuranics, tritium, Fe-55, Ni-63, Sr-90 and Tc-99 analyses during the 1st quarter.

Water for gross alpha and beta during the 1st and 3rd quarters.

Air particulates and vegetation for gamma, Iodine-131, U-233/234, U-238, transuranics, Sr-90 analyses during the 1st and 3rd quarters.

Air filter for gross alpha and beta analyses during the 1st and 3rd quarters.

RESULTS

Interlaboratory comparison program results are evaluated using TBE's criterion. Any sample analysis result that does not pass the criteria is investigated by TBE. Nonconformance Reports were generated and corrective actions taken as a result of this program.

For the TBE laboratory, 178 out of 185 analyses performed met the specified acceptance criteria. Seven analyses (Sr-89 and Sr-90 in milk, Co-57, Zn-65 and Sr-90 in soil, Cs-134 in air particulate and Sr-90 in vegetation [two low warning in a row]) did not meet the specified acceptance criteria or internal QA requirements for the following reason:

1. Teledyne Brown Engineering's Analytics September 2013 Sr-89 in milk result of 63.9 pCi/L was lower than the known value of 96.0 pCi/L. The failure was a result of analyst error and was specific to the Analytics sample. Client samples for the associated time period were evaluated and no client samples were affected by this failure. NCR 13-15
2. Teledyne Brown Engineering's Analytics September 2013 Sr-90 in milk result of 8.88 pCi/L was lower than the known value of 13.2 pCi/L. The failure was a result of analyst error and was specific to the Analytics sample. Client samples for the associated time period were evaluated and no client samples were affected by this failure. NCR 13-15
3. & 4. Teledyne Brown Engineering's MAPEP September 2013 Co-57 and Zn-65 in soil were evaluated as failing the false positive test. While MAPEP evaluated the results as failures, the gamma software listed the results as non identified

nuclides. The two nuclides would never have been reported as detected nuclides to a client. MAPEP does not allow laboratories to put in qualifiers for the submitted data nor “less than” results. MAPEP evaluates results based on the relationship between the activity and the uncertainty. MAPEP spiked the soil sample with an extremely large concentration of Eu-152, which was identified by the gamma software as an interfering nuclide, resulting in forced activity results that were evaluated by MAPEP as detected Co-57 and Zn-65. No client samples were affected by these failures. NCR 13-14

5. Teledyne Brown Engineering’s MAPEP September 2013 Sr-90 in soil result of 664 Bq/kg was higher than the known value of 460 Bq/kg, exceeding the upper control limit of 598 Bq/kg. An incorrect Sr-90 result was entered into the MAPEP database. The correct Sr-90 activity of 322 Bq/kg would have been evaluated as acceptable with warning. No client samples were affected by this failure. NCR 13-14
6. Teledyne Brown Engineering’s MAPEP September 2013 Cs-134 in air particulate activity of -0.570 Bq/sample was evaluated as a failed false positive test, based on MAPEP’s evaluation of the result as a significant negative value at 3 standard deviations. A negative number would never have been reported as a detected nuclide to a client, therefore no client samples were affected by this failure. NCR 13-14
7. Teledyne Brown Engineering’s MAPEP September 2013 Sr-90 in vegetation result was investigated due to two low warnings in a row. It appears the September sample was double

spiked with carrier, resulting in a low activity. With a recovery of around 50% lower, the Sr-90 result would have fallen within the acceptance range. No client samples were affected by this issue. NCR 13-14

A summary of TBE's results is provided in the tables on the following pages for the required sample matrix types and isotopic distribution. Delineated in the table for each of the media/analysis combinations, are: the specific radionuclide; its result; analytical date; the known values supplied by the providers; pass or fail criteria.

**ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)			
March 2013	E10477	Milk	Sr-89	pCi/L	120	99.7	1.20	A			
			Sr-90	pCi/L	9.21	11.0	0.84	A			
March 2013	E10478	Milk	I-131	pCi/L	87.1	100	0.87	A			
			Ce-141	pCi/L	186	187	0.99	A			
			Cr-51	pCi/L	463	472	0.98	A			
			Cs-134	pCi/L	201	214	0.94	A			
			Cs-137	pCi/L	262	266	0.98	A			
			Co-58	pCi/L	200	208	0.96	A			
			Mn-54	pCi/L	215	208	1.03	A			
			Fe-59	pCi/L	266	252	1.06	A			
			Zn-65	pCi/L	311	301	1.03	A			
			Co-60	pCi/L	384	400	0.96	A			
			March 2013	E10480	AP	Ce-141	pCi	95.3	95.6	1.00	A
						Cr-51	pCi	264	241	1.10	A
						Cs-134	pCi	123	109	1.13	A
						Cs-137	pCi	142	136	1.04	A
Co-58	pCi	112				106	1.06	A			
Mn-54	pCi	115				106	1.08	A			
Fe-59	pCi	139				129	1.08	A			
Zn-65	pCi	163				153	1.07	A			
Co-60	pCi	212	204	1.04	A						
March 2013	E10479	Charcoal	I-131	pCi	90.1	92.6	0.97	A			
March 2013	E10481	Water	Fe-55	pCi/L	1840	1890	0.97	A			
June 2013	E10564	Milk	Sr-89	pCi/L	110	95.0	1.16	A			
			Sr-90	pCi/L	15.8	17.0	0.93	A			
June 2013	E10545	Milk	I-131	pCi/L	92.6	95.5	0.97	A			
			Ce-141	pCi/L	83.1	90.4	0.92	A			
			Cr-51	pCi/L	253	250	1.01	A			
			Cs-134	pCi/L	118	125	0.94	A			
			Cs-137	pCi/L	143	151	0.95	A			
			Co-58	pCi/L	87.1	94.0	0.93	A			

		Mn-54	pCi/L	171	172	0.99	A
		Fe-59	pCi/L	125	120	1.04	A
		Zn-65	pCi/L	220	217	1.01	A
		Co-60	pCi/L	169	175	0.97	A
E10547	AP	Ce-141	pCi	56.8	56.7	1.00	A
		Cr-51	pCi	168	157	1.07	A
		Cs-134	pCi	85.2	78.4	1.09	A
		Cs-137	pCi	101	94.6	1.07	A
		Co-58	pCi	62.7	58.9	1.06	A
		Mn-54	pCi	125	108	1.16	A
		Fe-59	pCi	85.7	75.0	1.14	A
		Zn-65	pCi	169	136	1.24	W
		Co-60	pCi	116	110	1.05	A
E10546	Charcoal	I-131	pCi	86.5	89.7	0.96	A

**ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

Month/Year	Identification		Nuclide	Units	Reported	Known	Ratio (c)	Evaluation (d)		
	Number	Matrix			Value (a)	Value (b)	TBE/Analytics			
June 2013	E10549	Water	Fe-55	pCi/L	1610	1610	1.00	A		
September 2013	E10646	Milk	Sr-89	pCi/L	63.9	96.0	0.67	N (1)		
			Sr-90	pCi/L	8.88	13.2	0.67	N (1)		
	E10647	Milk	I-131	pCi/L	93.9	98.3	0.96	A		
			Ce-141	pCi/L				NA (2)		
			Cr-51	pCi/L	272	277	0.98	A		
			Cs-134	pCi/L	150	172	0.87	A		
			Cs-137	pCi/L	125	131	0.95	A		
			Co-58	pCi/L	105	108	0.97	A		
			Mn-54	pCi/L	138	139	0.99	A		
			Fe-59	pCi/L	125	130	0.96	A		
			Zn-65	pCi/L	264	266	0.99	A		
			Co-60	pCi/L	187	196	0.95	A		
			E10672	AP	Ce-141	pCi				NA (2)
					Cr-51	pCi	208	223	0.93	A
					Cs-134	pCi	143	139	1.03	A
					Cs-137	pCi	106	105	1.01	A
Co-58	pCi	97.0			86.5	1.12	A			
Mn-54	pCi	116			112	1.04	A			
Fe-59	pCi	98.6			105	0.94	A			
Zn-65	pCi	219			214	1.02	A			
E10648	Charcoal	I-131	pCi	76.3	71.7	1.06	A			
E10673	Water	Fe-55	pCi/L	1790	1690	1.06	A			
December 2013	E10774	Milk	Sr-89	pCi/L	97.3	93.8	1.04	A		
			Sr-90	pCi/L	13.3	12.9	1.03	A		
E10775	Milk	I-131	pCi/L	89.7	96.1	0.93	A			
		Ce-141	pCi/L	99.8	110	0.91	A			
		Cr-51	pCi/L	297	297	1.00	A			
		Cs-134	pCi/L	129	142	0.91	A			

			Cs-137	pCi/L	126	126	1.00	A
			Co-58	pCi/L	116	112	1.04	A
			Mn-54	pCi/L	167	168	0.99	A
			Fe-59	pCi/L	117	110	1.06	A
			Zn-65	pCi/L	757	741	1.02	A
			Co-60	pCi/L	141	147	0.96	A
E10777	AP		Ce-141	pCi	85.1	88.0	0.97	A
			Cr-51	pCi	278	238	1.17	A
			Cs-134	pCi	123	114	1.08	A
			Cs-137	pCi	102	101	1.01	A
			Co-58	pCi	84.4	89.9	0.94	A
			Mn-54	pCi	132	135	0.98	A
			Fe-59	pCi	101	88.3	1.14	A
			Zn-65	pCi	506	595	0.85	A
			Co-60	pCi	118	118	1.00	A

**ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2013	E10776	Charcoal	I-131	pCi	84.7	80.5	1.05	A
	E10778	Water	Fe-55	pCi/L	2010	1910	1.05	A

- (1) Milk, Sr-89/90 - The failure was due to analyst error. No client samples were affected by this failure. NCR 13-15
- (2) The sample was not spiked with Ce-141
- (a) Teledyne Brown Engineering reported result.
- (b) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
- (c) Ratio of Teledyne Brown Engineering to Analytics results.
- (d) Analytics evaluation based on TBE internal QC limits: A= Acceptable, reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning, reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable, reported result falls outside the ratio limits of < 0.70 and > 1.30.

**DOE's MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

Month/Year	Identification				Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
	Number	Media	Nuclide	Units				
March 2013	13-MaW28	Water	Cs-134	Bq/L	21.0	24.4	17.1 - 31.7	A
			Cs-137	Bq/L	0.0446		(1)	A
			Co-57	Bq/L	28.3	30.9	21.6 - 40.2	A
			Co-60	Bq/L	18.2	19.56	13.69 - 25.43	A
			H-3	Bq/L	506	507	355 - 659	A
			Mn-54	Bq/L	25.7	27.4	19.2 - 35.6	A
			K-40	Bq/L	2.09		(1)	A
			Sr-90	Bq/L	10.5	10.5	7.4 - 13.7	A
			Zn-65	Bq/L	29.2	30.4	21.3 - 39.5	A
	13-GrW28	Water	Gr-A	Bq/L	2.74	2.31	0.69 - 3.93	A
			Gr-B	Bq/L	15.6	13.0	6.5 - 19.5	A
	13-MaS28	Soil	Cs-134	Bq/kg	859	887	621 - 1153	A
			Cs-137	Bq/kg	633	587	411 - 763	A
			Co-57	Bq/kg	0.256		(1)	A
			Co-60	Bq/kg	738	691	484 - 898	A
			Mn-54	Bq/kg	0.671		(1)	A
			K-40	Bq/kg	714	625.3	437.7 - 812.9	A
			Sr-90	Bq/kg	442	628	440 - 816	W
			Zn-65	Bq/kg	1057	995	697 - 1294	A
	13-RdF28	AP	Cs-134	Bq/sample	1.73	1.78	1.25 - 2.31	A
			Cs-137	Bq/sample	2.73	2.60	1.82 - 3.38	A
			Co-57	Bq/sample	2.38	2.36	1.65 - 3.07	A
			Co-60	Bq/sample	0.0302		(1)	A
			Mn-54	Bq/sample	4.36	4.26	2.98 - 5.54	A
			Sr-90	Bq/sample	1.43	1.49	1.04 - 1.94	A
			Zn-65	Bq/sample	3.14	3.13	2.19 - 4.07	A
	13-GrF28	AP	Gr-A	Bq/sample	0.767	1.20	0.36 - 2.04	A
			Gr-B	Bq/sample	0.871	0.85	0.43 - 1.28	A
	13-RdV28	Vegetation	Cs-134	Bq/sample	-0.197		(1)	A
			Cs-137	Bq/sample	7.39	6.87	4.81 - 8.93	A
			Co-57	Bq/sample	9.87	8.68	6.08 - 11.28	A

			Co-60	Bq/sample	6.08	5.85	4.10 - 7.61	A
			Mn-54	Bq/sample	-0.0104		(1)	A
			Sr-90	Bq/sample	1.28	1.64	1.15 - 2.13	W
			Zn-65	Bq/sample	6.84	6.25	4.38 - 8.13	A
September 2013	13-MaW29	Water	Cs-134	Bq/L	29.1	30.0	21.0 - 39.0	A
			Cs-137	Bq/L	34.5	31.6	22.1 - 41.1	A
			Co-57	Bq/L	0.0358		(1)	A
			Co-60	Bq/L	24.6	23.58	16.51 - 30.65	A
			H-3	Bq/L	2.45		(1)	A
			Mn-54	Bq/L	0.0337		(1)	A
			K-40	Bq/L	0.193		(1)	A
			Sr-90	Bq/L	9.12	7.22	5.05 - 9.39	W
			Zn-65	Bq/L	38.1	34.6	24.2 - 45.0	A
	13-GrW29	Water	Gr-A	Bq/L	1.13	0.701	0.210 - 1.192	A
			Gr-B	Bq/L	7.61	5.94	2.97 - 8.91	A

**DOE's MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

Month/Year	Identification			Units	Reported	Known	Acceptance	Evaluation (c)
	Number	Media	Nuclide		Value (a)	Value (b)	Range	
September 2013	13-MaS29	Soil	Cs-134	Bq/kg	1150	1172	820 - 1524	A
			Cs-137	Bq/kg	1100	977	684 - 1270	A
			Co-57	Bq/kg	670		(1)	N (2)
			Co-60	Bq/kg	502	451	316 - 586	A
			Mn-54	Bq/kg	758	674	472 - 876	A
			K-40	Bq/kg	796	633	443 - 823	W
			Sr-90	Bq/kg	664	460	322 - 598	N (2)
			Zn-65	Bq/kg	210		(1)	N (2)
	13-RdF29	AP	Cs-134	Bq/sample	-0.570		(1)	N (2)
			Cs-137	Bq/sample	2.85	2.7	1.9 - 3.5	A
			Co-57	Bq/sample	3.30	3.4	2.4 - 4.4	A
			Co-60	Bq/sample	2.41	2.3	1.6 - 3.0	A
			Mn-54	Bq/sample	3.65	3.5	2.5 - 4.6	A
			Sr-90	Bq/sample	1.40	1.81	1.27 - 2.35	W
			Zn-65	Bq/sample	2.90	2.7	1.9 - 3.5	A
	13-GrF29	AP	Gr-A	Bq/sample	0.872	0.9	0.3 - 1.5	A
			Gr-B	Bq/sample	1.57	1.63	0.82 - 2.45	A
	13-RdV29	Vegetation	Cs-134	Bq/sample	5.29	5.20	3.64 - 6.76	A
			Cs-137	Bq/sample	7.48	6.60	4.62 - 8.58	A
			Co-57	Bq/sample	0.0129		(1)	A
			Co-60	Bq/sample	0.0523		(1)	A
			Mn-54	Bq/sample	8.78	7.88	5.52 - 10.24	A
			Sr-90	Bq/sample	1.63	2.32	1.62 - 3.02	W (2)
			Zn-65	Bq/sample	3.18	2.63	1.84 - 3.42	W

(1) False positive test.

(2) Soil, Co-57 & Zn-65 identified by gamma software as not detected, MAPEP evaluated as failing the false positive test. A large concentration of Eu-152 was spiked into the sample, causing interference in the analysis. Gamma software recognized the interference and identified them as not detected. MAPEP does not allow clients to enter non-detect designation.

Soil, Sr-90 - incorrect results were submitted to MAPEP. Should have been 332 bq/kg, which would have passed.

AP, Cs-134 - MAPEP evaluated the -0.570 as a failed false positive test. No client samples were affected by these failures. NCR 13-04
Vegetation, Sr-90 - it appears that the carrier was double spiked into the sample, resulting in the low activity for this sample. NCR 13-04

(a) Teledyne Brown Engineering reported result.

(b) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or

volumetric measurements made during standard preparation.

(c) DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.

**ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES**

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
May 2013	RAD-93	Water	Sr-89	pCi/L	48.3	41.3	31.6 - 48.4	A
			Sr-90	pCi/L	19.3	23.9	17.2 - 28.0	A
			Ba-133	pCi/L	81.9	82.1	69.0 - 90.3	A
			Cs-134	pCi/L	40.9	42.8	34.2 - 47.1	A
			Cs-137	pCi/L	44.0	41.7	37.0 - 48.8	A
			Co-60	pCi/L	61.9	65.9	59.3 - 75.0	A
			Zn-65	pCi/L	202	189	170 - 222	A
			Gr-A	pCi/L	34.2	40.8	21.1 - 51.9	A
			Gr-B	pCi/L	18.0	21.6	13.0 - 29.7	A
			I-131	pCi/L	23.8	23.8	19.7 - 28.3	A
			U-Nat	pCi/L	60.4	61.2	49.8 - 67.9	A
			H-3	pCi/L	3970	4050	3450 - 4460	A
				MRAD-18	Filter	Gr-A	pCi/filter	Lost during processing
November 2013	RAD-95	Water	Sr-89	pCi/L	25.5	21.9	14.4 - 28.2	A
			Sr-90	pCi/L	14.3	18.1	12.8 - 21.5	A
			Ba-133	pCi/L	57.2	54.2	44.7 - 59.9	A
			Cs-134	pCi/L	83.3	86.7	71.1 - 95.4	A
			Cs-137	pCi/L	201	206	185 - 228	A
			Co-60	pCi/L	104	102	91.8 - 114	A
			Zn-65	pCi/L	361	333	300 - 389	A
			Gr-A	pCi/L	29.5	42.8	22.2 - 54.3	A
			Gr-B	pCi/L	30.1	32.2	20.8 - 39.9	A
			I-131	pCi/L	23.1	23.6	19.6 - 28.0	A
			U-Nat	pCi/L	5.53	6.24	47.0 - 7.44	A
			H-3	pCi/L	17650	17700	15500 - 19500	A
				MRAD-19	Filter	Gr-A	pCi/filter	33.0

(a) Teledyne Brown Engineering reported result.

(b) The ERA known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. NA=not acceptable. Reported result falls outside of the Control Limits. CE= Check for Error. Reported result falls within the Control Limits and outside the Warning Limit.