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CNS-18-028

May 14, 2018

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555-0001

Subject: Duke Energy Carolinas, LLC  
Catawba Nuclear Station, Units 1 and 2  
Docket Nos. 50-413 and 50-414  
2017 Annual Radiological Environmental Operating Report

Pursuant to Catawba Nuclear Station Technical Specification 5.6.2 and Selected Licensee Commitment 16.11-16, please find enclosed the 2017 Annual Radiological Environmental Operating Report. This report covers operation of Catawba Units 1 and 2 during the 2017 calendar year.

Any questions concerning this report should be directed to Cecil A. Fletcher II, Nuclear Regulatory Affairs Manager, at (803) 701-3622.

Sincerely,

A handwritten signature in black ink that reads "Tom Simril".

Tom Simril  
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Enclosure:

1. Duke Energy Corporation, Catawba Nuclear Station, Units 1 and 2, Annual Radiological Environmental Operating Report, 2017

U.S. Nuclear Regulatory Commission  
2015 Annual Radiological Environmental Operating Report  
May 14, 2018  
Page 2

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# ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

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**DUKE ENERGY CORPORATION  
CATAWBA NUCLEAR STATION  
Units 1 and 2**

**2017**



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**LIST OF ACRONYMS USED IN THIS TEXT** *(in alphabetical order)*

AREOR	Annual Radiological Environmental Operating Report
ARERR	Annual Radiological Effluent Release Report
BW	BiWeekly
C	Control
CNS	Catawba Nuclear Station
CR	Condition Report (analogous to Nuclear Condition Report (NCR))
ERA	Environmental Resource Associates
EZA	Eckert & Ziegler Analytics
GEL	General Engineering Laboratory
GI-LLI	Gastrointestinal – Lower Large Intestine
GPS	Global Positioning System
I	Indicator
IR	Inner Ring
ISFSI	Independent Spent Fuel Storage Installation
LLD	Lower Limit of Detection
LLI	Low Level Iodine
M	Monthly
MDA	Minimum Detectable Activity
mrem	Millirem
MWe	Megawatt (electrical)
NIST	National Institute of Standards and Technology
NCR	Nuclear Condition Report (analogous to Condition Report (CR))
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OR	Outer Ring
pCi/kg	picocurie per kilogram
pCi/l	picocurie per liter
pCi/m <sup>3</sup>	picocurie per cubic meter
Q	Quarterly
REMP	Radiological Environmental Monitoring Program
SA	Semiannually
SI	Special Interest
SLCs	Selected Licensee Commitments
SM	Semimonthly
T. Body	Total Body
TECH SPECS	Technical Specifications
TLD	Thermoluminescent Dosimeter
μCi/ml	microcurie per milliliter
UFSAR	Updated Final Safety Analysis Report
W	Weekly

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# 1.0 EXECUTIVE SUMMARY

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This Annual Radiological Environmental Operating Report describes the Catawba Nuclear Station Radiological Environmental Monitoring Program (REMP), and the program results for the calendar year 2017.

Included are the identification of sampling locations, descriptions of environmental sampling and analysis procedures, comparisons of present environmental radioactivity levels and pre-operational environmental data, comparisons of doses calculated from environmental measurements and effluent data, analysis of trends in environmental radiological data as potentially affected by station operations, and a summary of environmental radiological sampling results. Quality assurance practices, sampling deviations, unavailable samples, and program changes are also discussed.

Sampling activities were conducted as prescribed by Selected Licensee Commitments (SLCs). One-thousand sixty-four samples were analyzed comprising 1,092 test results in order to compile data for the 2017 report. Based on the annual land use census, the current number of sampling sites for Catawba Nuclear Station is sufficient.

Concentrations observed in the environment in 2017 for station related radionuclides were generally within the ranges of concentrations observed in the past. Inspection of data showed that radioactivity concentrations in drinking water, surface water, and fish are higher than the activities reported for samples collected prior to the operation of the station. Measured concentrations were not higher than expected and all positively identified measurements attributable to station operation were within limits as specified in SLCs.

Additionally, environmental radiological monitoring data is consistent with effluents introduced into the environment by plant operations. The total body dose estimated to the maximum exposed member of the public as calculated by environmental sampling data, excluding TLD results, was 1.08E-1 mrem for 2017. Background radiation dose in the United States is approximately 620 mrem per year (approximately half from naturally occurring sources such as radon and half from man-made sources such as medical processes).<sup>1</sup> It is therefore concluded that station operations has had no significant radiological impact on the health and safety of the public or the environment.

<sup>1</sup>NCRP (2009). National Council on Radiation Protection and Measurements. *Ionizing Radiation Exposure of the Population of the United States*, NCRP Report No. 160 (National Council on Radiation Protection and Measurements, Bethesda, Maryland).

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## 2.0 INTRODUCTION

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### 2.1 SITE DESCRIPTION AND SAMPLE LOCATIONS

Duke Energy Corporation's Catawba Nuclear Station is a two-unit facility located on the shore of Lake Wylie in York County, South Carolina. Each of the two essentially identical units employs a pressurized water reactor nuclear steam supply system furnished by Westinghouse Electric Corporation. Each generating unit is designed to produce a net electrical output of approximately 1145 MWe. Units 1 and 2 achieved initial criticality on January 7, 1985, and May 8, 1986, respectively.

Condenser cooling is accomplished utilizing a closed system incorporating cooling towers, instead of using lake water directly. Liquid effluents are released into Lake Wylie via the station discharge canal and are not accompanied by the large additional dilution water flow associated with "once-through" condenser cooling. This design results in greater radionuclide concentrations in the discharge canal given comparable liquid effluent source terms.

Figures 2.1-1 and 2.1-2 are maps depicting the Thermoluminescent Dosimeter (TLD) monitoring locations and the sampling locations. The location numbers shown on these maps correspond to those listed in Tables 2.1-A and 2.1-B. Figure 2.1-1 comprises all sample locations within a one mile radius of CNS. Figure 2.1-2 comprises all sample locations within a 10 mile radius of CNS.

### 2.2 SCOPE AND REQUIREMENTS OF THE REMP

An environmental monitoring program has been in effect at Catawba Nuclear Station since 1981, four years prior to operation of Unit 1 in 1985. The preoperational program provides data on the existing environmental radioactivity levels for the site and vicinity which may be used to determine whether increases in environmental levels are attributable to the station. The operational program provides surveillance and backup support of detailed effluent monitoring which is necessary to evaluate the significance, if any, of the contributions to the existing environmental radioactivity levels that result from station operation.

This monitoring program is based on NRC guidance as reflected in the Selected Licensee Commitments Manual, with regard to sample media, sampling locations, sampling frequency and analytical sensitivity requirements. Indicator and control locations were established for comparison purposes to distinguish radioactivity of station origin from natural or other "man-made" environmental radioactivity. The environmental monitoring program also verifies projected and anticipated radionuclide concentrations in the environment and related exposures from releases of radionuclides from Catawba Nuclear Station. This program satisfies the requirements of Section IV.B.2 of Appendix I to 10CFR50 and provides surveillance of all appropriate critical exposure pathways to man and protects vital interests of the company, public and state and federal agencies concerned with the environment. Reporting levels for activity found in environmental samples are listed in Table 2.2-A. Table 2.2-B lists the REMP analysis and frequency schedule.



The Annual Land Use Census, required by Selected Licensee Commitments, is performed to ensure that changes in the use of areas at or beyond the site boundary are identified and that modifications to the REMP are made if required by changes in land use. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10CFR50. Results are shown in Table 3.10.

Participation in an interlaboratory comparison program as required by Selected Licensee Commitments provides for independent checks on the precision and accuracy of measurements of radioactive material in REMP sample matrices. Such checks are performed as part of the quality assurance program for environmental monitoring in order to demonstrate that the results are valid for the purposes of Section IV.B.2 of Appendix I to 10CFR50. A summary of the results obtained as part of this comparison program are in Section 5 of this annual report.

## **2.3 STATISTICAL AND CALCULATIONAL METHODOLOGY**

### **2.3.1 ESTIMATION OF THE MEAN VALUE**

There was one (1) basic statistical calculation performed on the raw data resulting from the environmental sample analysis program. The calculation involved the determination of the mean value for the indicator and the control samples for each sample medium. The mean is a widely used statistic. This value was used in the reduction of the data generated by the sampling and analysis of the various media in the Radiological Environmental Monitoring Program. "Net activity (or concentration)" is the activity (or concentration) determined to be present in the sample. No "Minimum Detectable Activity", "Lower Limit of Detection", "Less Than Level", or negative activities or concentrations are included in the calculation of the mean. The following equation was used to estimate the mean:

$$\bar{x} = \frac{\sum_{i=1}^N x_i}{N}$$

Where:

$\bar{x}$  = estimate of the mean,

i = individual sample,

N = total number of samples with a net activity (or concentration),

$x_i$  = net activity (or concentration) for sample i.

### **2.3.2 LOWER LIMIT OF DETECTION AND MINIMUM DETECTABLE ACTIVITY**

The Lower Limit of Detection (LLD), and Minimum Detectable Activity (MDA) are used throughout the REMP.

**LLD** - The LLD, as defined in the Selected Licensee Commitments Manual is the smallest concentration of radioactive material in a sample that will yield a net count, above the system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD is an *a priori* lower limit of detection. The actual LLD is dependent upon the standard deviation of the background counting rate, the counting efficiency, the sample size (mass or volume), the radiochemical yield and the radioactive decay of the sample between sample collection and counting. The "required" LLDs for each sample medium and selected radionuclides are given in the Selected Licensee Commitments and are listed in Table 2.2-C.

**MDA** - The MDA is the net counting rate (sample after subtraction of background) that must be surpassed before a sample is considered to contain a scientifically measurable amount of a radioactive material exceeding background amounts. The MDA is calculated using a sample background and may be thought of as an "actual" LLD for a particular sample measurement. Certain gross counting measurements display a calculated negative value, indicating background is greater than sample activity.

### **2.3.3 TREND IDENTIFICATION**

One of the purposes of an environmental monitoring program is to determine if there is a buildup of radionuclides in the environment due to the operation of the nuclear station. Visual inspection of tabular or graphical presentations of data (including preoperational) is used to determine if a trend exists. A decrease in a particular radionuclide's concentration in an environmental medium does not indicate that reactor operations are removing radioactivity from the environment but that reactor operations are not adding that radionuclide to the environment in quantities exceeding the preoperational level and that the normal removal processes (radioactive decay, deposition, resuspension, etc.) are influencing the concentration.

Substantial increases or decreases in the amount of a particular radionuclide's release from the nuclear plant will greatly affect the resulting environmental levels; therefore, a knowledge of the release of a radionuclide from the nuclear plant is necessary to completely interpret the trends, or lack of trends, determined from the environmental data. Factors that may affect environmental levels of radionuclides include prevailing weather conditions (periods of drought, solar cycles or heavier than normal precipitation), construction in or around either the nuclear plant or the sampling location, and addition or deletion of other sources of radioactive materials (such as the Chernobyl accident). Some of these factors may be obvious while others are sometimes unknown. Therefore, how trends are identified will include some judgment by plant personnel.

Figure 2.1-1

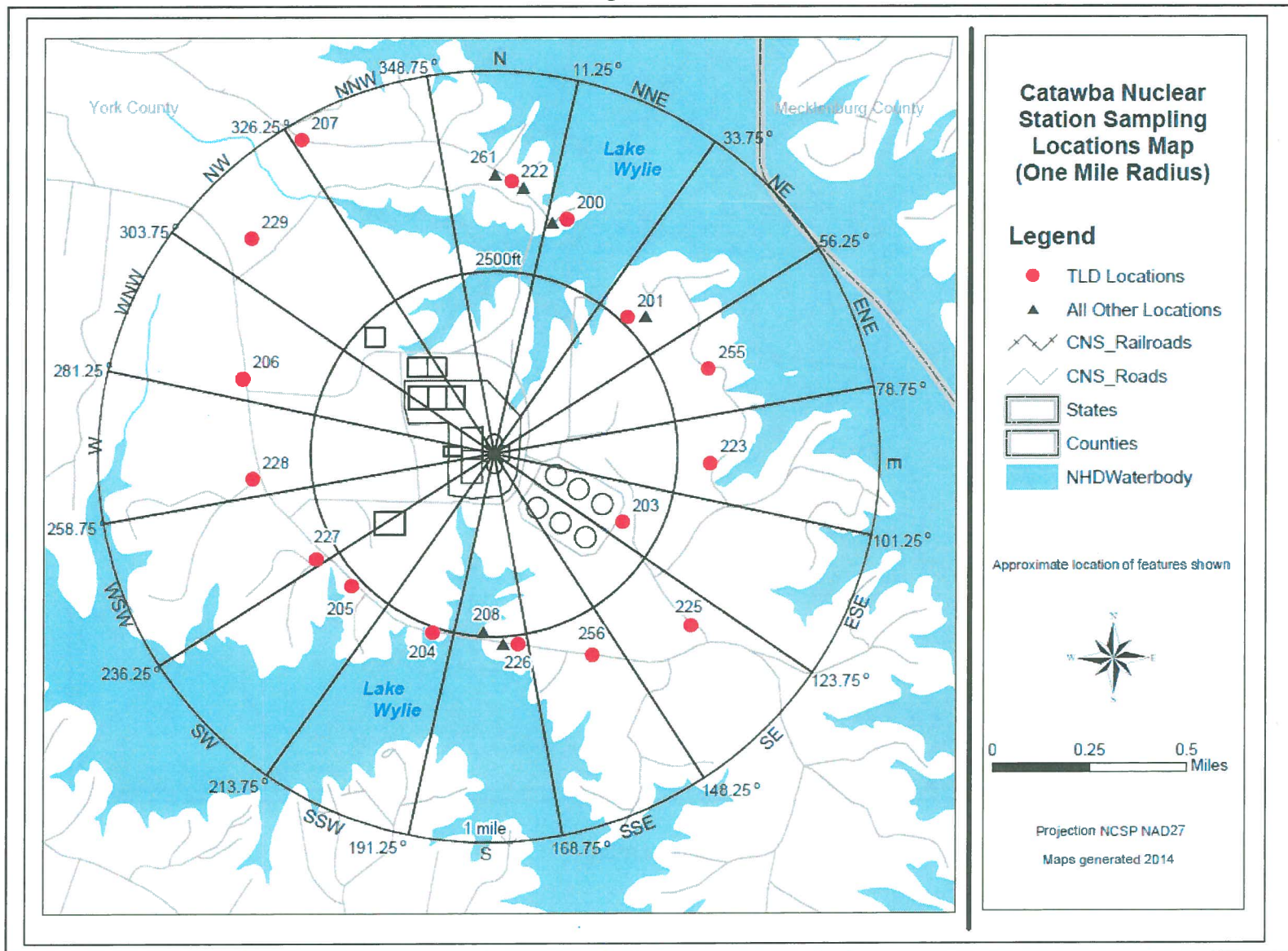
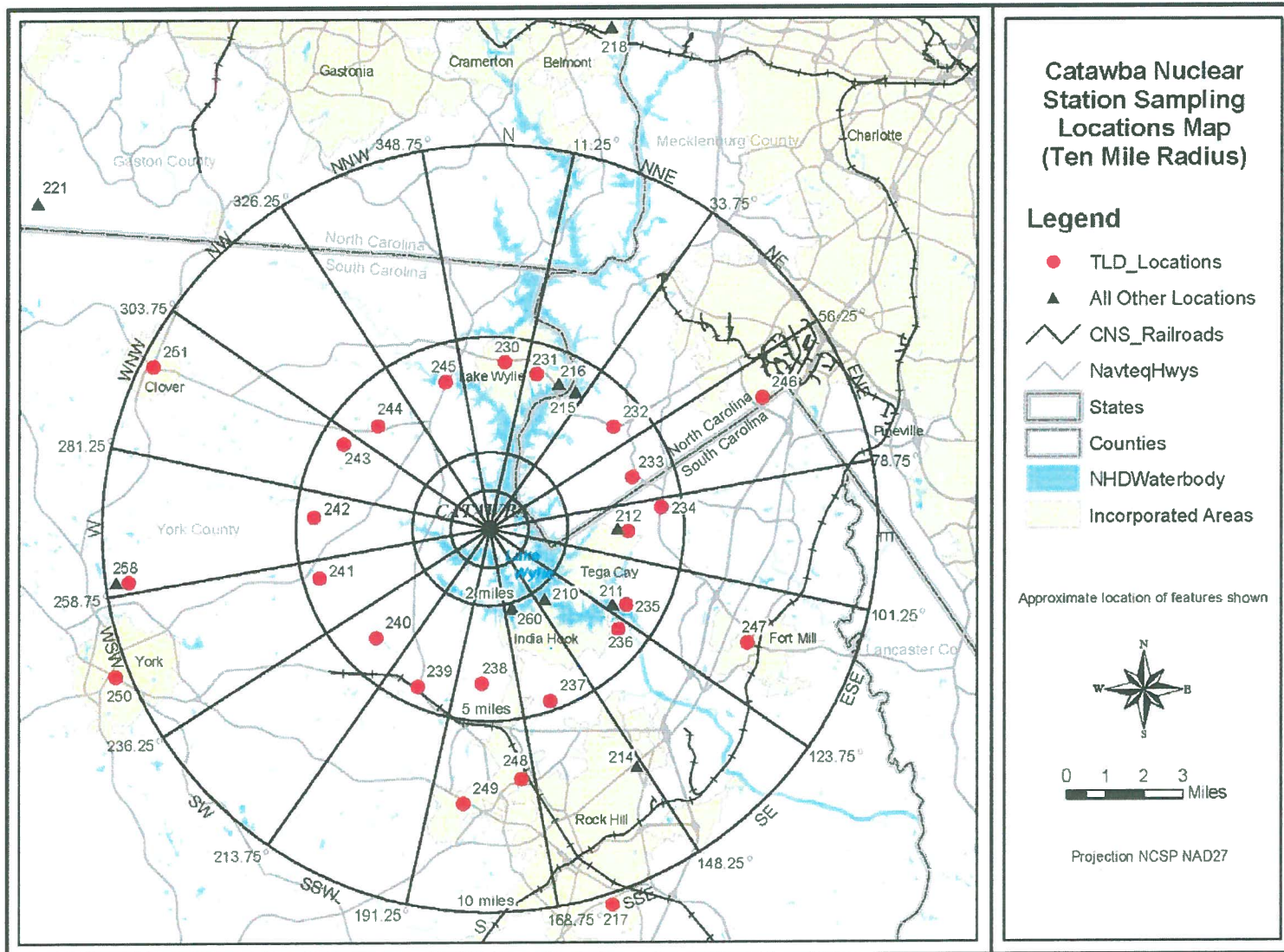


Figure 2.1-2



**TABLE 2.1-A**

**CATAWBA RADIOLOGICAL MONITORING PROGRAM  
SAMPLING LOCATIONS**

Table 2.1-A Codes			
W	Weekly	SM	Semimonthly
BW	BiWeekly	Q	Quarterly
M	Monthly	SA	Semiannually
C	Control	I	Indicator

Site #	Measure Type	Location Description*	Air Rad. & Part.	Surface Water	Drinking Water	Shoreline Sediment	Food Products (a)	Fish	Milk	Broad Leaf Veg. (b)
200	I	Site Boundary (0.63 mi NNE)	W							M
201	I	Site Boundary (0.53 mi NE)	W							M
208	I	Discharge Canal (0.45 mi S)	W	M		SA		SA		
210	I	Ebenezer Access (2.31 mi SE)				SA				
211	I	Wylie Dam (4.06 mi ESE)		M						
212	I	Tega Cay (3.32 mi E)	W							
214	I	Rock Hill Water Supply (7.30 mi SSE)			M					
215	C	River Pointe - Hwy 49 (4.21 mi NNE)		M		SA				
216	C	Hwy 49 Bridge (4.19 mi NNE)						SA		
218	C	Belmont Water Supply (13.5 mi NNE)			M					
221	C	Dairy (14.5 mi NW)							SM	
222	I	Site Boundary (0.70 mi N)								M
226	I	Site Boundary (0.48 mi S)								M
258	C	Fairhope Road (9.84 mi W)	W							M
260	I	Irrigated Gardens (2.00 mi SSE)					M(a)			
261	I	Firing Range-Site Boundary (0.72 mi N)	W							

(a) During Harvest Season

(b) When Available

\* GPS data reflect approximate accuracy to within 2-5 meters. GPS field measurements were taken as close as possible to the item of interest.

**TABLE 2.1-B**

**CATAWBA RADIOLOGICAL MONITORING PROGRAM  
SAMPLING LOCATIONS (TLD SITES)**

Table 2.1-B Codes			
IR	Inner Ring	OR	Outer Ring
C	Control	SI	Special Interest

Site #	Measure Type	Location*	Distance (miles)	Sector	Site #	Measure Type	Location*	Distance (miles)	Sector
200	IR	SITE BOUNDARY	0.63	NNE	234	OR	WELLS FARGO BANK	4.50	E
201	IR	SITE BOUNDARY	0.53	NE	235	OR	LAKE WYLIE DAM	4.07	ESE
203	IR	SITE BOUNDARY	0.38	ESE	236	OR	SC WILDLIFE FEDERATION OFFICE	4.25	SE
204	IR	SITE BOUNDARY	0.48	SSW	237	OR	TWIN LAKES ROAD AND HOMESTEAD ROAD	4.75	SSE
205	IR	SITE BOUNDARY	0.25	SW	238	OR	PENNINGTON ROAD AND WEST OAK ROAD	4.02	S
206	IR	SITE BOUNDARY	0.67	WNW	239	OR	CARTER LUMBER COMPANY	4.49	SSW
207	IR	SITE BOUNDARY	0.95	NNW	240	OR	PARAHAM ROAD	4.07	SW
212	SI	TEGA CAY AIR SITE	3.32	E	241	OR	CAMPBELL ROAD	4.58	WSW
217	C	BLACKMON ROAD	10.3	SSE	242	OR	TRANSMISSION TOWER ON PARAHAM ROAD	4.56	W
222	IR	SITE BOUNDARY	0.71	N	243	OR	KINGSBURY ROAD	4.39	WNW
223	IR	SITE BOUNDARY	0.57	E	244	OR	BETHEL ELEMENTARY SCHOOL	4.02	NW
225	IR	SITE BOUNDARY	0.68	SE	245	OR	CROWDERS CREEK BOAT LANDING	4.01	NNW
226	IR	SITE BOUNDARY	0.48	S	246	SI	CAROWINDS GUARD HOUSE	7.87	ENE
227	IR	SITE BOUNDARY	0.52	WSW	247	C	FORT MILL	7.33	ESE
228	IR	SITE BOUNDARY	0.61	W	248	SI	PIEDMONT MEDICAL CENTER	6.54	S
229	IR	SITE BOUNDARY	0.84	NW	249	SI	YORK COUNTY OPERATIONS CENTER	7.17	S
230	OR	RIVER HILLS CHURCH	4.37	N	250	SI	YORK DUKE ENERGY OFFICE	10.4	WSW
231	OR	RIVER HILLS FRONT ENTRANCE	4.21	NNE	251	C	CLOVER	9.72	WNW
232	OR	PLEASANT HILL ROAD	4.18	NE	255	IR	SITE BOUNDARY	0.61	ENE
233	OR	ZOAR ROAD AND THOMAS DRIVE	3.95	ENE	256	IR	SITE BOUNDARY	0.58	SSE
					258	SI	FAIRHOPE ROAD	9.84	W

\* GPS data reflect approximate accuracy to within 2-5 meters. GPS field measurements were taken as close as possible to the item of interest.

**TABLE 2.2-A**

**REPORTING LEVELS FOR RADIOACTIVITY  
CONCENTRATIONS IN ENVIRONMENTAL SAMPLES**

Analysis	Water (pCi/liter)	Air Particulates or Gases (pCi/m <sup>3</sup> )	Fish (pCi/kg-wet)	Milk (pCi/liter)	Food Products (pCi/kg-wet)
H-3	20,000 <sup>(a),(b)</sup>	---	---	---	---
Mn-54	1,000	---	30,000	---	---
Fe-59	400	---	10,000	---	---
Co-58	1,000	---	30,000	---	---
Co-60	300	---	10,000	---	---
Zn-65	300	---	20,000	---	---
Zr-Nb-95	400	---	---	---	---
I-131	2	0.9	---	3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200	---	---	300	---

- (a) If no drinking water pathway exists, a value of 30,000 pCi/liter may be used.  
 (b) H-3 Reporting level not applicable to surface water

**TABLE 2.2-B**

**REMP ANALYSIS FREQUENCY**

Sample Medium	Analysis Schedule	Gamma Isotopic	Tritium	Low Level I-131	Gross Beta	TLD
Air Radioiodine	Weekly	X	---	---	---	---
Air Particulate	Weekly	X	---	---	X	---
	Quarterly Composite	X	---	---	---	---
Direct Radiation	Quarterly	---	---	---	---	X
Surface Water	Monthly Composite	X	---	---	---	---
	Quarterly Composite	---	X	---	---	---
Drinking Water	Monthly Composite	X	---	(a)	X	---
	Quarterly Composite	---	X	---	---	---
Ground Water	Quarterly	X	X	---	---	---
Shoreline Sediment	Semiannually	X	---	---	---	---
Milk	Semimonthly	X	---	X	---	---
Fish	Semiannually	X	---	---	---	---
Broadleaf Vegetation	Monthly <sup>(b)</sup>	X	---	---	---	---
Food Products	Monthly <sup>(b)</sup>	X	---	---	---	---

- (a) Low-level I-131 analysis will be performed if the dose calculated for the consumption of drinking water is > 1 mrem per year. An LLD of 1 pCi/liter will be required for this analysis.  
 (b) When Available

**TABLE 2.2-C**

**MAXIMUM VALUES FOR THE *A PRIORI* LOWER LIMIT OF DETECTION**

Analysis	Water (pCi/liter)	Air Particulates or Gases (pCi/m <sup>3</sup> )	Fish (pCi/kg-wet)	Milk (pCi/liter)	Food Products (pCi/kg-wet)	Sediment (pCi/kg-dry)
Gross Beta	4	0.01	---	---	---	---
H-3	2000 <sup>(a)</sup>	---	---	---	---	---
Mn-54	15	---	130	---	---	---
Fe-59	30	---	260	---	---	---
Co-58, 60	15	---	130	---	---	---
Zn-65	30	---	260	---	---	---
Zr-Nb-95	15	---	---	---	---	---
I-131	1 <sup>(b)</sup>	0.07	---	1	60	---
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-La-140	15	---	---	15	---	---

(a) If no drinking water pathway exists, a value of 3,000 pCi/liter may be used.

(b) If no drinking water pathway exists, the LLD of gamma isotopic analysis may be used.



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## 3.0 INTERPRETATION OF RESULTS

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Review of all 2017 REMP analysis results was performed to identify changes in environmental levels as a result of station operations. The following section depicts and explains the review of these results. Sample data for 2017 was compared to preoperational and historical data. Over the years of operation, analysis and collection changes have taken place that do not allow direct comparisons for some data collected from 1984 (preoperational) through 2017. Summary tables containing 2017 information required by Technical Specification Administrative Control 5.6.2 are located in Appendix B. REMP results for 2017 are located in Appendix E.

Evaluation for significant trends was performed for radionuclides that are listed as required within Selected Licensee Commitments 16.11-13. The radionuclides include: H-3, Mn-54, Fe-59, Co-58, Co-60, Zn-65, Zr-95, Nb-95, I-131, Cs-134, Cs-137, Ba-140 and La-140. Gross beta analysis results were trended for drinking water and gross beta trending for air particulates was initiated in 1996. Other radionuclides detected that are the result of plant operation, but not required for reporting, are trended.

A comparison of annual mean concentrations of effluent-based detected radionuclides to historical results provided trending bases. Frequency of detection and concentrations related to SLC reporting levels (Table 2.2-A) were used as criteria for trending conclusions. All 2017 maximum percentages of reporting levels attributed to CNS operation were well below the 100% action level.

Selected Licensee Commitment section 16.11-13 addresses actions to be taken if radionuclides other than those required are detected in samples collected. The occurrences of these radionuclides are the result of CNS liquid effluents which contained the radionuclides.

During 1984-1986, all net activity results (sample minus background), both positive and negative were included in calculation of sample mean. A change in the EnRad gamma spectroscopy system on September 1, 1987, decreased the number of measurements yielding detectable low-level activity for indicator and control location samples. It was thought that the method used by the previous system was vulnerable to false-positive results.

All 2017 sample analysis results were reviewed to detect and identify any significant trends. Tables and graphs are used throughout this section to display data from effluent-based radionuclides identified since the system change in late 1987. All negative concentration values were replaced with zero for calculation purposes. Any zero concentrations used in tables or graphs represent activity measurements less than detectable levels.

Review of all 2017 data presented in this section supports the conclusion that there were no significant changes in environmental sample radionuclide concentrations of samples collected and analyzed from CNS site and surrounding areas that were attributable to plant operations.

### 3.1 AIRBORNE RADIOIODINE AND PARTICULATES

In 2017, 318 radioiodine and particulate samples were analyzed, 265 from five indicator locations and 53 at the control location. Particulate samples were analyzed weekly for gross beta. A quarterly gamma analysis was performed on the quarterly filter composite (by location). An additional gamma analysis was performed on the final 2017 air particulate sample set for calendar reconciliation purposes (NCR # 02174799). Radioiodine samples received a weekly gamma analysis.

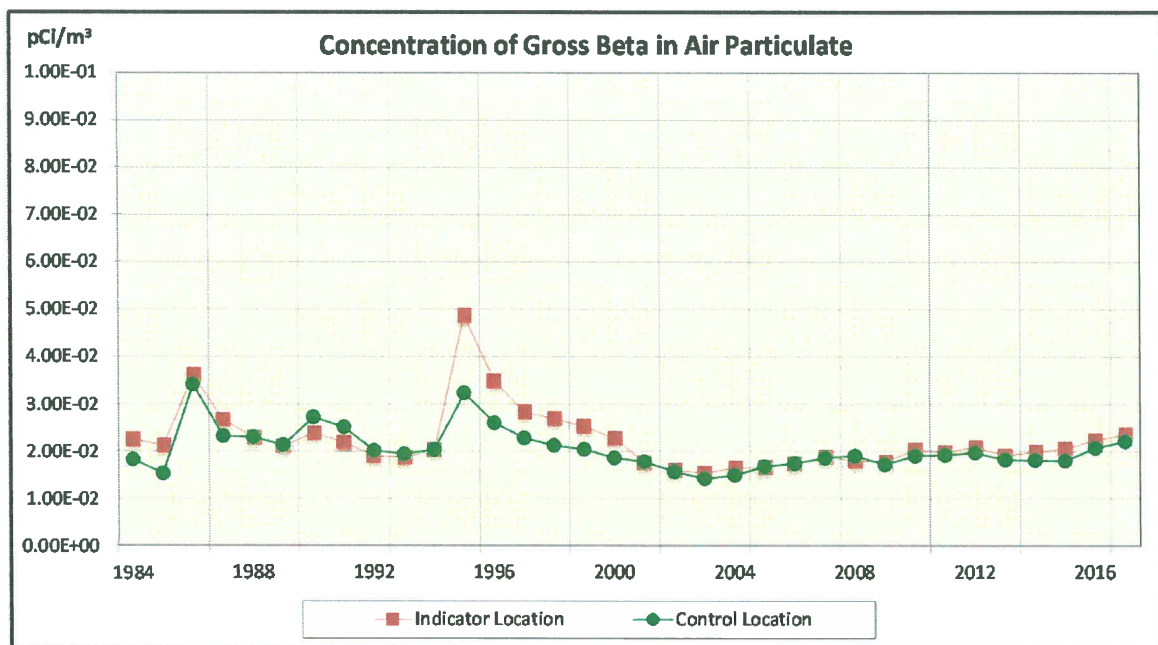
Figure 3.1 shows individual sample gross beta results for the indicator location with highest annual mean and the control location samples during 2017. The two sample locations' results are similar in concentration and have varied negligibly since preoperational periods.

There were no detectable gamma emitters attributable to plant operations identified for particulate filters analyzed during 2017. Table 3.1-A shows the highest indicator annual mean and control location annual mean for gross beta in air particulate.

There was no detectable I-131 in air radioiodine samples analyzed in 2017. Table 3.1-B shows the highest indicator annual mean and control location annual mean for I-131 since 1984 (preoperational period). The table shows similar concentrations for both the indicator and control locations and the activities decreasing from early in the operational history of the plant. No I-131 activity due to CNS plant operations has been detected since 1987.

K-40 and Be-7 that occur naturally were routinely detected in charcoal cartridges collected during the year.

Figure 3.1



*There is no reporting level for gross beta in air particulate*

**Table 3.1-A Mean Concentration of Gross Beta in Air Particulate**

<b>Year</b>	<b>Indicator Location (pCi/m<sup>3</sup>)</b>	<b>Control Location (pCi/m<sup>3</sup>)</b>
1984	2.25E-2	1.82E-2
1985	2.12E-2	1.53E-2
1986	3.62E-2	3.41E-2
1987	2.67E-2	2.32E-2
1988	2.29E-2	2.30E-2
1989	2.11E-2	2.13E-2
1990	2.39E-2	2.72E-2
1991	2.19E-2	2.51E-2
1992	1.90E-2	2.01E-2
1993	1.87E-2	1.94E-2
1994	2.03E-2	2.03E-2
1995	4.88E-2	3.23E-2
1996	3.49E-2	2.60E-2
1997	2.83E-2	2.28E-2
1998	2.69E-2	2.12E-2
1999	2.53E-2	2.04E-2
2000	2.28E-2	1.86E-2
2001	1.76E-2	1.78E-2
2002	1.60E-2	1.57E-2
2003	1.54E-2	1.42E-2
2004	1.65E-2	1.49E-2
2005	1.66E-2	1.68E-2
2006	1.74E-2	1.74E-2
2007	1.88E-2	1.86E-2
2008	1.80E-2	1.90E-2
2009	1.78E-2	1.72E-2
2010	2.03E-2	1.90E-2
2011	1.98E-2	1.92E-2
2012	2.09E-2	1.97E-2
2013	1.92E-2	1.82E-2
2014	1.99E-2	1.81E-2
2015	2.06E-2	1.80E-2
2016	2.24E-2	2.07E-2
2017	2.35E-2	2.21E-2

**Table 3.1-B Mean Concentration of Air Radioiodine (I-131)**

Year	Indicator Location (pCi/m <sup>3</sup> )	Control Location (pCi/m <sup>3</sup> )
1984	1.30E-3	1.46E-2
1985	4.75E-3	2.38E-2
1986	1.43E-2	1.02E-2
1987	1.38E-2	0.00E0
1988	0.00E0	0.00E0
1989	0.00E0	0.00E0
1990	0.00E0	0.00E0
1991	0.00E0	0.00E0
1992	0.00E0	0.00E0
1993	0.00E0	0.00E0
1994	0.00E0	0.00E0
1995	0.00E0	0.00E0
1996	0.00E0	0.00E0
1997	0.00E0	0.00E0
1998	0.00E0	0.00E0
1999	0.00E0	0.00E0
2000	0.00E0	0.00E0
2001	0.00E0	0.00E0
2002	0.00E0	0.00E0
2003	0.00E0	0.00E0
2004	0.00E0	0.00E0
2005	0.00E0	0.00E0
2006	0.00E0	0.00E0
2007	0.00E0	0.00E0
2008	0.00E0	0.00E0
2009	0.00E0	0.00E0
2010	0.00E0	0.00E0
2011 <sup>(1)</sup>	5.53E-2	5.65E-2
2012	0.00E0	0.00E0
2013	0.00E0	0.00E0
2014 <sup>(2)</sup>	0.00E0	0.00E0
2015	0.00E0	0.00E0
2016	0.00E0	0.00E0
2017	0.00E0	0.00E0

0.00E0 indicates no detectable measurements

(1) 2011 concentration affected by Fukushima Daiichi

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

## **3.2 DRINKING WATER**

Gross beta analysis and gamma spectroscopy were performed on 28 drinking water samples. These samples were composited to create 8 quarterly composite period samples for tritium analysis with additional tritium analyses performed on the final 2017 monthly composites for calendar reconciliation purposes (NCR # 02174927). One indicator location was sampled, along with one control location.

No gamma emitting radionuclides attributable to plant operations were identified in 2017 drinking water samples. There have been no gamma emitting radionuclides identified in drinking water samples since 1988.

Figure 3.2-1 and Table 3.2 shows highest annual mean gross beta concentrations for the indicator location and control location since preoperation. The indicator location (downstream of the plant effluent release point) average concentration was 2.20 pCi/l in 2017 and the control location concentration was 1.76 pCi/l. The table shows that current gross beta levels are not statistically different from preoperational concentrations.

Tritium was detected in the five indicator samples and in the five control samples during 2017. The mean indicator tritium concentration for 2017 was 916 pCi/l, 4.58% of reporting level. The mean control tritium concentration for 2017 was 583 pCi/l, 2.92% of reporting level. Figure 3.2-2 and Table 3.2 display the highest indicator and control location annual mean concentrations for tritium since 1984.

The concentration of tritium in drinking water is affected by releases from the Catawba plant and the McGuire Nuclear Station, located approximately 40 miles upstream of the Catawba plant on the Catawba River.

The dose for consumption of water was less than one mrem per year, historically and for 2017; therefore low-level iodine analysis is not required.

Figure 3.2-1

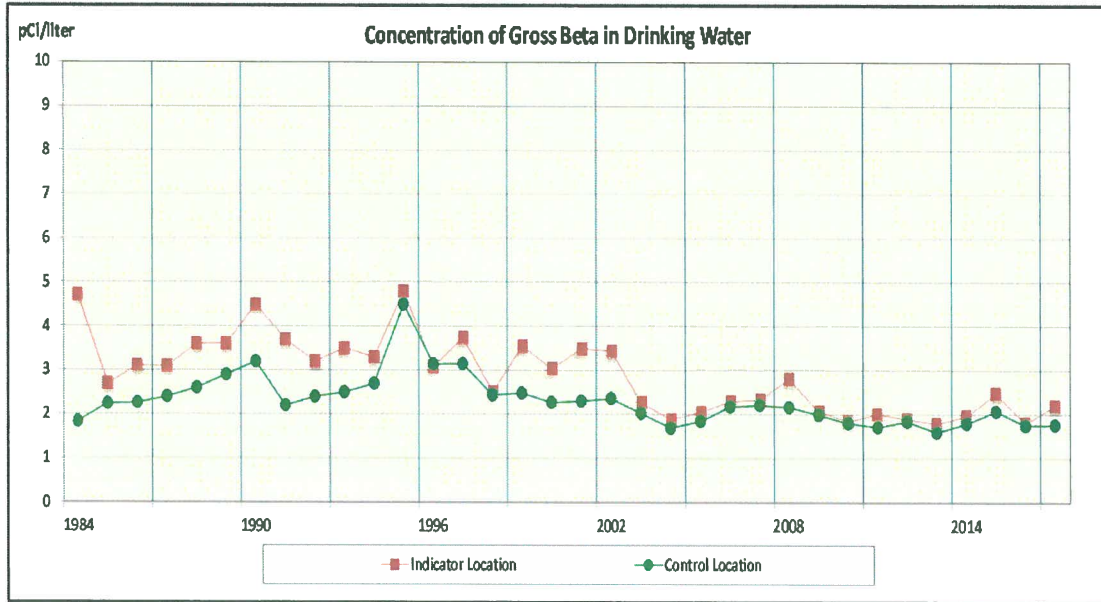
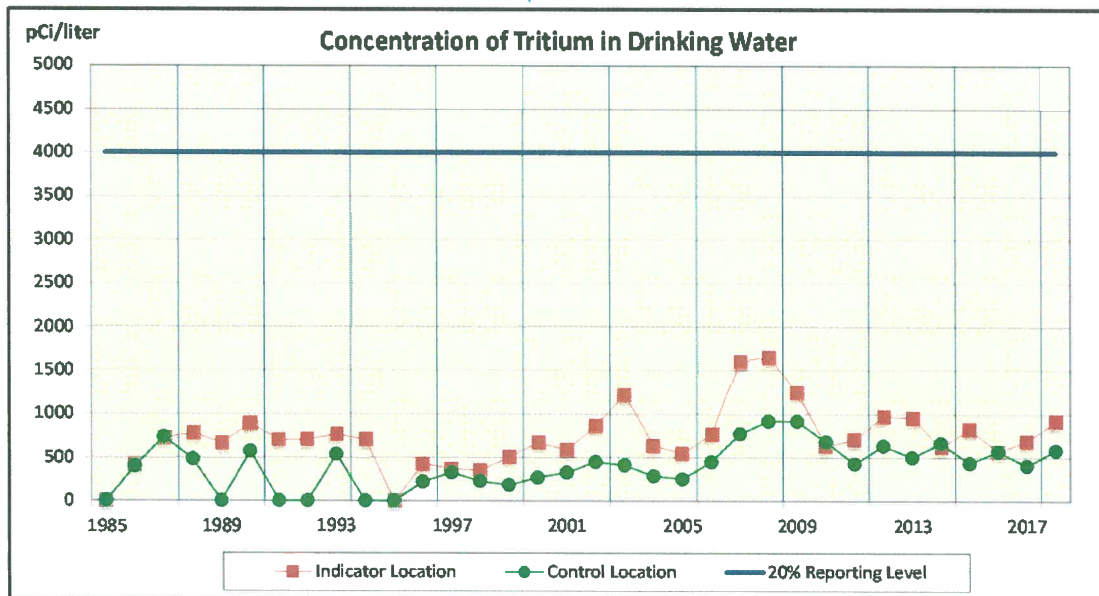


Figure 3.2-2



**Table 3.2 Mean Concentration of Radionuclides in Drinking Water**

YEAR	Gross Beta (pCi/l)		Tritium (pCi/l)	
	Indicator Location	Control Location	Indicator Location	Control Location
1984	4.72	1.83	3.10E-2	3.10E-2
1985	2.70	2.24	4.13E2	4.00E2
1986	3.11	2.26	7.23E2	7.33E2
1987	3.10	2.40	7.80E2	4.80E2
1988	3.60	2.60	6.64E2	0.00E0
1989	3.60	2.90	8.91E2	5.72E2
1990	4.50	3.20	7.03E2	0.00E0
1991	3.70	2.20	7.04E2	0.00E0
1992	3.20	2.40	7.65E2	5.38E2
1993	3.50	2.50	7.06E2	0.00E0
1994	3.30	2.70	0.00E0	0.00E0
1995	4.80	4.50	4.28E2	2.21E2
1996	3.08	3.14	3.71E2	3.27E2
1997	3.74	3.15	3.54E2	2.28E2
1998	2.51	2.44	5.07E2	1.83E2
1999	3.55	2.48	6.71E2	2.70E2
2000	3.04	2.27	5.87E2	3.26E2
2001	3.49	2.30	8.66E2	4.50E2
2002	3.44	2.36	1.22E3	4.11E2
2003	2.27	2.02	6.36E2	2.88E2
2004	1.88	1.69	5.47E2	2.54E2
2005	2.05	1.84	7.69E2	4.50E2
2006	2.30	2.17	1.59E3	7.70E2
2007	2.34	2.21	1.65E3	9.18E2
2008	2.81	2.16	1.25E3	9.16E2
2009	2.07	1.99	6.34E2	6.81E2
2010	1.84	1.80	7.05E2	4.27E2
2011	2.01	1.71	9.73E2	6.36E2
2012	1.89	1.84	9.54E2	5.02E2
2013	1.79	1.59	6.22E2	6.64E2
2014	1.96	1.79	8.21E2	4.37E2
2015	2.48	2.07	5.70E2	5.70E2
2016	1.80	1.75	6.88E2	4.06E2
2017	2.20	1.76	9.16E2	5.83E2

0.00E0 indicates detectable measurements  
 1984 - 1986 mean based on all net activity

### **3.3 SURFACE WATER**

A total of 42 monthly surface water samples were analyzed for gamma emitting radionuclides. The samples were composited to create 12 quarterly composite period samples for tritium analysis with additional tritium analyses performed on the final 2017 monthly composites for calendar reconciliation purposes (NCR # 02174927). Two indicator locations and one control location were sampled. One indicator location (208) is located near the liquid effluent discharge point.

All 2017 indicator location samples contained tritium with an average concentration of 3,854 pCi/l. Indicator location 208 (Discharge Canal) showed a range of activities from 4,500 to 8,350 pCi/l which had the highest mean concentration of 6,804 pCi/l. Tritium was detected in all five control samples during 2017 with an average concentration of 524 pCi/l.

No gamma emitting radionuclides attributable to plant operations were identified in 2017 surface water samples. During 2015, Co-58 and Co-60 were detected in one indicator surface water sample at location 208 (NCR # 01934713). Table 3.3 summarizes the indicator annual means of radionuclides detected since 1984. Visual inspection of the tabular data did not reveal any increasing trends.

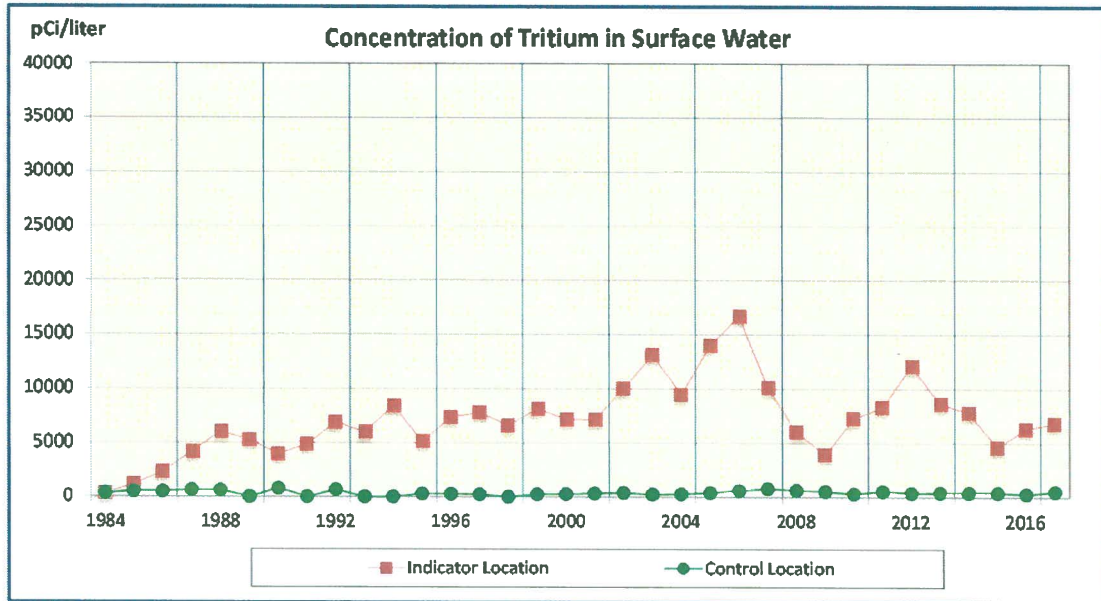
During the third quarter of 2014, Catawba experienced higher than normal levels of mixed fission and activation products in the liquid radioactive waste processing system due to process influent stream chemical changes and larger than normal volumes of non-contaminated water introduced into the system. As system tanks reached storage capacity, liquid radioactive waste was discharged with higher than normal concentrations of mixed fission and activation products. Other radionuclides, such as tritium, were not impacted by this operational occurrence (NCR # 01897053).

Figure 3.3 displays the highest indicator and control annual means for tritium since 1984. Table 3.3 lists the highest indicator annual means.

The concentration of tritium in surface water is affected by releases from the Catawba plant and the McGuire Nuclear Station, located approximately 40 miles upstream of the Catawba plant on the Catawba River.



Figure 3.3



*There is no reporting level for tritium in surface water, however, if no drinking water pathway exists, a value of 30,000 pCi/l may be used. A drinking water pathway exists for Catawba Nuclear Station, so this limit does not apply for surface water. See section 3.2 for drinking water results.*

**Table 3.3 Mean Concentrations of Radionuclides in Surface Water (pCi/l)**

YEAR	Co-58	Co-60	Nb-95	Cs-137	H-3 Indicator	H-3 Control
1984	4.59E-1	5.71E-1	6.48E-1	9.08E-1	3.35E2	3.18E2
1985	3.46E0	4.83E-2	2.70E0	8.19E-1	1.19E3	5.05E2
1986	3.10E-1	-4.12E-2	2.05E0	4.85E-1	2.34E3	5.05E2
1987 <sup>(1)</sup>	0.00E0	3.10E0	4.30E0	9.90E0	4.17E3	6.20E2
1988	9.20E0	0.00E0	0.00E0	0.00E0	6.03E3	6.07E2
1989	0.00E0	0.00E0	0.00E0	0.00E0	5.27E3	0.00E0
1990	6.50E0	0.00E0	0.00E0	0.00E0	3.98E3	7.73E2
1991	0.00E0	0.00E0	0.00E0	0.00E0	4.87E3	0.00E0
1992	0.00E0	0.00E0	0.00E0	0.00E0	6.91E3	6.64E2
1993	4.70E0	1.80E0	0.00E0	0.00E0	5.98E3	0.00E0
1994	0.00E0	0.00E0	0.00E0	0.00E0	8.42E3	0.00E0
1995	0.00E0	0.00E0	0.00E0	0.00E0	5.13E3	2.89E2
1996	0.00E0	0.00E0	0.00E0	0.00E0	7.36E3	2.61E2
1997	0.00E0	0.00E0	0.00E0	0.00E0	7.77E3	2.20E2
1998	0.00E0	0.00E0	0.00E0	0.00E0	6.61E3	0.00E0
1999	0.00E0	0.00E0	0.00E0	0.00E0	8.13E3	2.41E2
2000	0.00E0	0.00E0	0.00E0	0.00E0	7.19E3	2.56E2
2001	0.00E0	0.00E0	0.00E0	0.00E0	7.13E3	3.28E2
2002	0.00E0	0.00E0	0.00E0	0.00E0	1.00E4	3.80E2
2003	0.00E0	0.00E0	0.00E0	0.00E0	1.31E4	2.37E2
2004	0.00E0	0.00E0	0.00E0	0.00E0	9.43E3	2.60E2
2005	0.00E0	0.00E0	0.00E0	0.00E0	1.40E4	3.78E2
2006	0.00E0	0.00E0	0.00E0	0.00E0	1.67E4	5.83E2
2007	0.00E0	0.00E0	0.00E0	0.00E0	1.01E4	7.82E2
2008	6.80E0	1.16E1	0.00E0	0.00E0	6.02E3	6.31E2
2009	9.40E0	1.06E1	0.00E0	0.00E0	3.93E3	5.29E2
2010	0.00E0	0.00E0	0.00E0	0.00E0	7.26E3	2.94E2
2011	8.75E0	1.96E1	0.00E0	0.00E0	8.29E3	5.41E2
2012	0.00E0	0.00E0	0.00E0	0.00E0	1.21E4	3.71E2
2013	0.00E0	0.00E0	0.00E0	0.00E0	8.62E3	4.02E2
2014 <sup>(2)</sup>	7.23E0	4.69E0	0.00E0	0.00E0	7.79E3	4.18E2
2015	1.15E1	1.07E0	0.00E0	0.00E0	4.61E3	4.14E2
2016	0.00E0	0.00E0	0.00E0	0.00E0	6.34E3	2.81E2
2017	0.00E0	0.00E0	0.00E0	0.00E0	6.80E3	5.24E2

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

### 3.4 MILK

A total of 26 milk samples was analyzed by gamma spectroscopy and low level iodine during 2017. There was one control location sampled. No indicator dairies were identified by the 2017 land use census.

There were no gamma emitting radionuclides attributable to plant operations identified in milk samples in 2017. Cs-137 is the only radionuclide, other than naturally occurring, reported in milk samples since 1996. Cs-137 in milk is not unusual. It is a constituent of nuclear weapons test fallout and nuclear plant accidents and has been observed periodically in samples from indicator and control locations since the preoperational period. Airborne Cs-137 has not been released from the plant since 1992.

Table 3.4 lists highest indicator location annual mean and control location annual mean for Cs-137 since the preoperational period. K-40 is a naturally occurring radionuclide observed in milk samples in 2017.

**Table 3.4 Mean Concentration of Radionuclides in Milk**

YEAR	Cs-137 Indicator (pCi/l)	Cs-137 Control (pCi/l)
1984	2.95E0	2.98E0
1985	2.11E0	2.12E0
1986	3.76E0	4.54E0
1987 <sup>(1)</sup>	5.00E0	5.50E0
1988	3.20E0	3.80E0
1989	0.00E0	0.00E0
1990	8.00E0	6.70E0
1991	0.00E0	0.00E0
1992	3.40E0	5.00E0
1993	5.00E0	0.00E0
1994	2.80E0	0.00E0
1995	8.60E0	0.00E0
1996	6.05E0	0.00E0
1997	0.00E0	0.00E0
1998	0.00E0	0.00E0
1999	0.00E0	0.00E0
2000	0.00E0	0.00E0
2001	0.00E0	0.00E0
2002	0.00E0	0.00E0
2003	0.00E0	0.00E0
2004	No Indicator Location	0.00E0
2005	No Indicator Location	0.00E0
2006	No Indicator Location	0.00E0
2007	No Indicator Location	0.00E0
2008	No Indicator Location	0.00E0
2009	No Indicator Location	0.00E0
2010	No Indicator Location	0.00E0
2011	No Indicator Location	0.00E0
2012	No Indicator Location	0.00E0
2013	No Indicator Location	0.00E0
2014 <sup>(2)</sup>	No Indicator Location	0.00E0
2015	No Indicator Location	0.00E0
2016	No Indicator Location	0.00E0
2017	No Indicator Location	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

### **3.5 BROADLEAF VEGETATION**

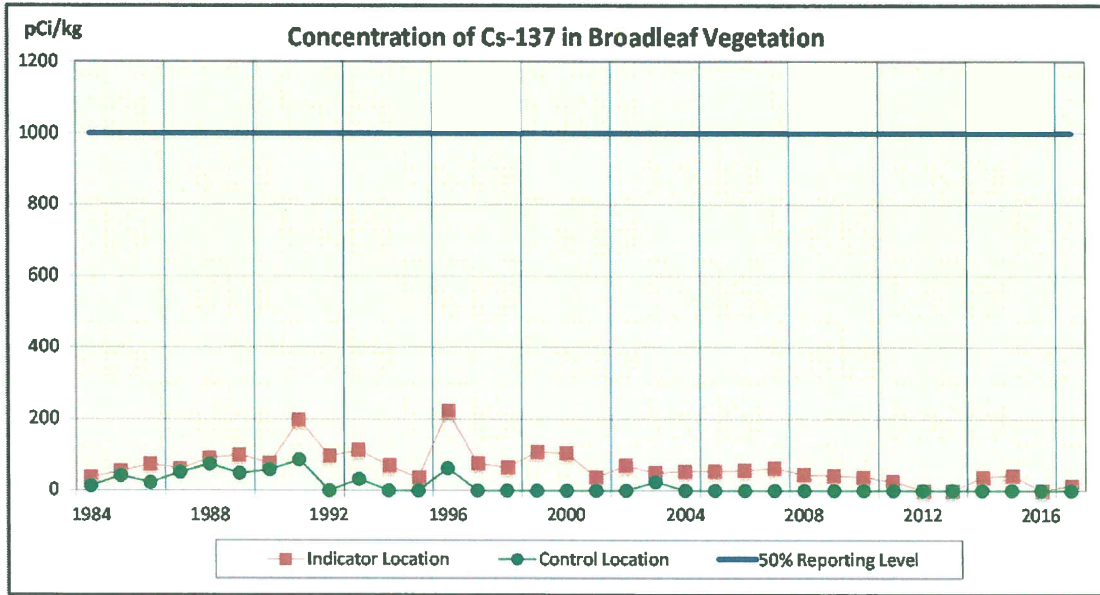
Gamma spectroscopy was performed on 60 broadleaf vegetation samples during 2017. Four indicator locations and one control location were sampled. Cs-137 was reported in one indicator sample, Location 201, at a concentration of 14.3 pCi/kg (0.72% of reporting level). Cs-137 was not detected in any of the control samples in 2017.

Cs-137 is the only gamma emitting radionuclide, other than naturally occurring, reported in vegetation samples. It is not unusual for Cs-137 to be present in vegetation. It is a constituent of nuclear weapons test fallout and nuclear plant accidents and has been observed in samples from indicator and control locations since the preoperational period. Table 3.6 lists the highest indicator location annual mean and control location annual mean for Cs-137 since early in the station's operational history. Visual inspection of the tabular data did not reveal any increasing trends.

Figure 3.5 shows indicator and control annual means for Cs-137 in vegetation since 1984. Values shown from 1984 to 2017 show a stable trend for Cs-137 in vegetation. No airborne Cs-137 has been released from the plant since 1992.

K-40 and Be-7 are naturally occurring radionuclides that were observed in broadleaf vegetation samples in 2017.

Figure 3.5



**Table 3.5 Mean Concentration of Radionuclides in Broadleaf Vegetation**

YEAR	Cs-137 Indicator (pCi/kg)	Cs-137 Control (pCi/kg)
1984	3.76E1	1.30E1
1985	5.48E1	4.16E1
1986	7.42E1	2.22E1
1987 <sup>(1)</sup>	6.10E1	5.10E1
1988	9.10E1	7.40E1
1989	1.00E2	4.80E1
1990	7.70E1	5.80E1
1991	1.98E2	8.60E1
1992	9.70E1	0.00E0
1993	1.13E2	3.20E1
1994	7.00E1	0.00E0
1995	3.60E1	0.00E0
1996	2.23E2	6.22E1
1997	7.57E1	0.00E0
1998	6.53E1	0.00E0
1999	1.08E2	0.00E0
2000	1.04E2	0.00E0
2001	3.76E1	0.00E0
2002	7.02E1	0.00E0
2003	4.96E1	2.40E1
2004	5.45E1	0.00E0
2005	5.48E1	0.00E0
2006	5.79E1	0.00E0
2007	6.31E1	0.00E0
2008	4.44E1	0.00E0
2009	4.25E1	0.00E0
2010	3.77E1	0.00E0
2011	2.62E1	0.00E0
2012	0.00E0	0.00E0
2013	0.00E0	0.00E0
2014 <sup>(2)</sup>	3.72E1	0.00E0
2015	4.29E1	0.00E0
2016	0.00E0	0.00E0
2017	1.43E1	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

2011 concentration affected by Fukushima Daiichi

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR# 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

### **3.6 FOOD PRODUCTS**

Collection of food product samples (crops) from an irrigated garden began in 1989. The irrigated garden is located on Lake Wylie downstream from CNS, Location 260. During the 2017 growing season nine samples were collected and analyzed for gamma radionuclides. There were no gamma emitting radionuclides attributable to plant operations identified in food product samples in 2017. There is no control location for this media type.

Table 3.7 shows Cs-137 indicator location highest annual mean concentrations since 1989.

K-40 and Be-7 are naturally occurring radionuclides that were observed in food product samples in 2016.



**Table 3.6 Mean Concentration of Radionuclides in Food Products**

YEAR	Cs-137 Indicator (pCi/kg)
1989	0.00E0
1990	0.00E0
1991	0.00E0
1992	0.00E0
1993	2.50E1
1994	0.00E0
1995	0.00E0
1996	0.00E0
1997	0.00E0
1998	0.00E0
1999	0.00E0
2000	0.00E0
2001	0.00E0
2002	0.00E0
2003	0.00E0
2004	0.00E0
2005	0.00E0
2006	0.00E0
2007	0.00E0
2008	0.00E0
2009	0.00E0
2010	0.00E0
2011	0.00E0
2012	0.00E0
2013	0.00E0
2014 <sup>(1)</sup>	0.00E0
2015	0.00E0
2016	0.00E0
2017	0.00E0

0.00E0 indicates no detectable measurements

There is no control location for Food Products.

(1) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

### 3.7 FISH

Gamma spectroscopy was performed on 12 fish samples collected during 2017. One downstream indicator location and one control location were sampled.

Co-58, Co-60, and Cs-137 are normally the predominant radionuclides identified in fish samples. There were no gamma emitting radionuclides attributable to plant operations identified in any fish samples in 2017.

Figures 3.7-1, 3.7-2, and 3.7-3 are graphs displaying annual mean concentrations for Co-58, Co-60, and Cs-137. Table 3.7 depicts the highest indicator location annual mean for radionuclides detected. In addition, radionuclides identified in fish samples since 1988 have been included in the table. Overall, radionuclides have not shown a significant trend or accumulation.

K-40 was observed in some fish samples collected during 2017.

Figure 3.7-1

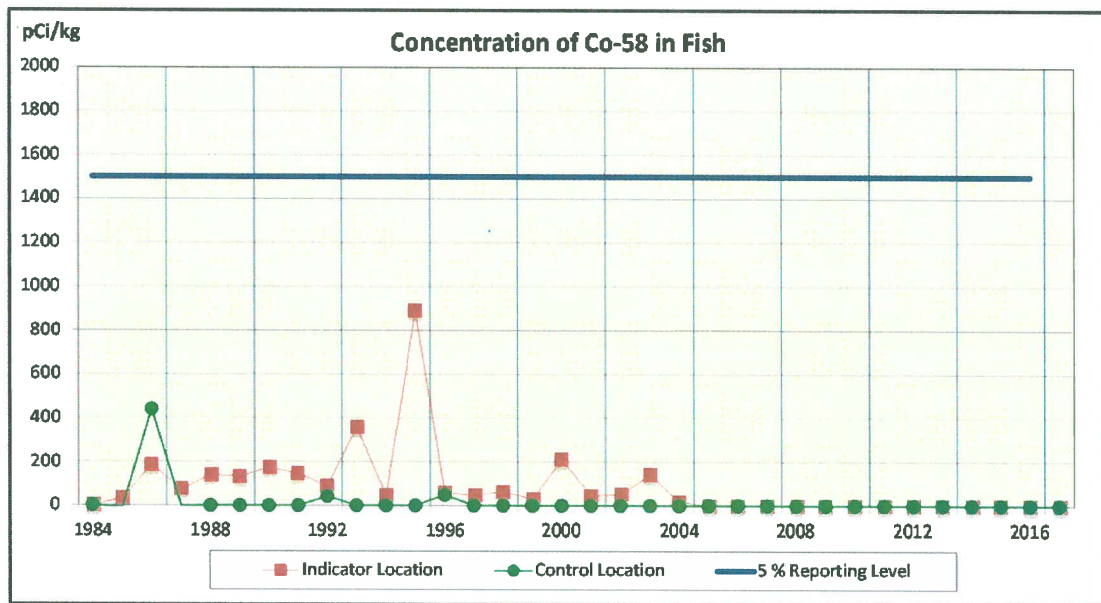


Figure 3.7-2

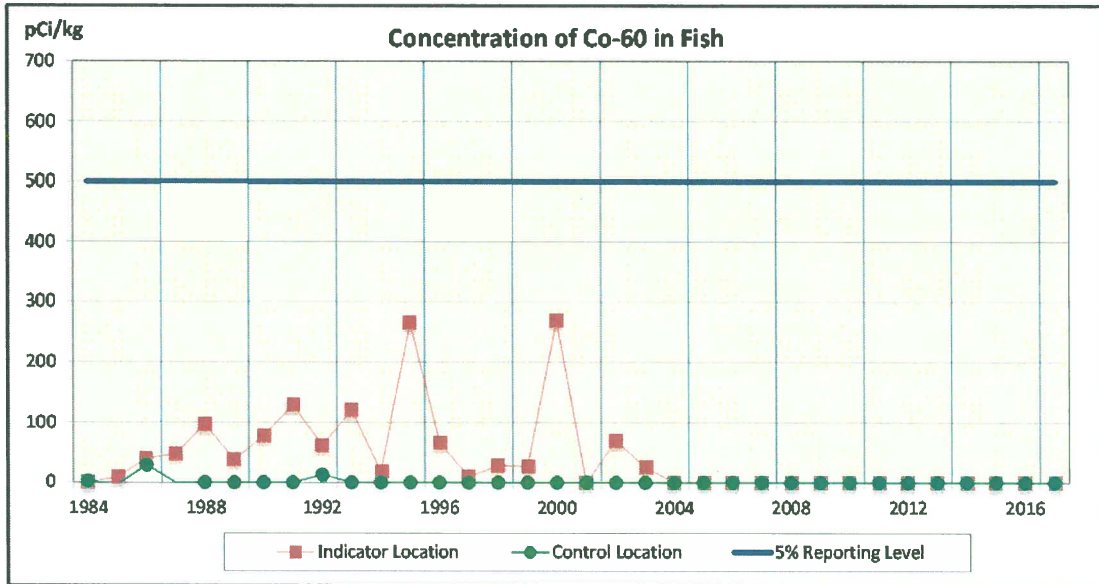
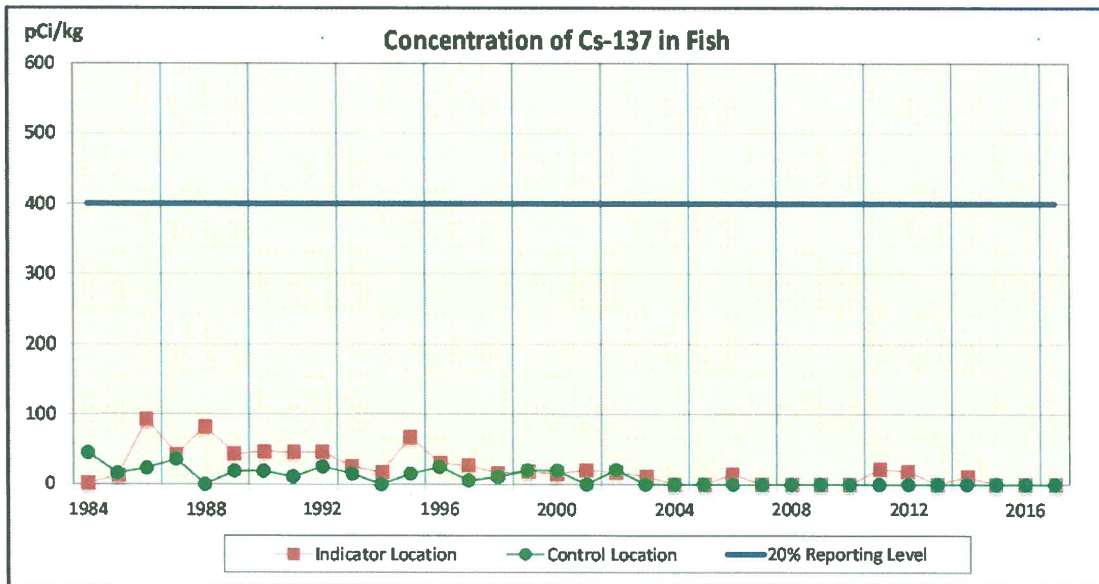


Figure 3.7-3



**Table 3.7 Mean Concentrations of Radionuclides in Fish (pCi/kg)**

Year	Mn-54	Co-58	Co-60	Cs-134	Cs-137	Nb-95	Fe-59	Sb-122	Sb-125
1984	3.07E0	3.00E0	6.11E-1	-5.32E0	1.83E0	0.00E0	0.00E0	0.00E0	0.00E0
1985	7.68E-1	3.40E1	9.11E0	3.22E0	1.28E1	5.07E0	0.00E0	0.00E0	0.00E0
1986	2.01E1	1.86E2	4.01E1	3.51E1	9.29E1	0.00E0	7.30E0	0.00E0	0.00E0
1987 <sup>(1)</sup>	7.24E0	7.57E1	4.81E1	3.83E0	4.27E1	5.40E0	0.00E0	0.00E0	0.00E0
1988	2.85E1	1.40E2	9.70E1	1.67E1	8.24E1	0.00E0	0.00E0	0.00E0	0.00E0
1989	8.28E0	1.33E2	3.83E1	1.47E1	4.37E1	8.58E-1	0.00E0	0.00E0	0.00E0
1990	2.51E1	1.75E2	7.77E1	1.32E1	4.66E1	3.33E0	0.00E0	7.00E0	9.25E0
1991	3.15E1	1.46E2	1.29E2	1.03E1	4.60E1	7.90E-1	2.30E0	0.00E0	7.45E0
1992	1.34E1	9.02E1	6.20E1	1.27E1	4.61E1	0.00E0	0.00E0	0.00E0	0.00E0
1993	2.14E1	3.58E2	1.21E2	2.73E0	2.56E1	0.00E0	0.00E0	0.00E0	0.00E0
1994	1.91E0	4.75E1	1.81E1	0.00E0	1.75E1	0.00E0	0.00E0	0.00E0	1.45E1
1995	5.65E1	8.90E2	2.66E2	0.00E0	6.77E1	1.38E1	0.00E0	0.00E0	0.00E0
1996	0.00E0	5.95E1	6.68E1	0.00E0	3.02E1	0.00E0	0.00E0	0.00E0	0.00E0
1997	0.00E0	4.93E1	9.88E0	0.00E0	2.74E1	0.00E0	0.00E0	0.00E0	0.00E0
1998	0.00E0	6.44E1	2.86E1	0.00E0	1.58E1	0.00E0	0.00E0	0.00E0	0.00E0
1999	0.00E0	3.12E1	2.71E1	0.00E0	1.87E1	0.00E0	0.00E0	0.00E0	0.00E0
2000	0.00E0	2.13E2	2.69E2	0.00E0	1.52E1	0.00E0	0.00E0	0.00E0	0.00E0
2001	0.00E0	4.66E1	0.00E0	0.00E0	2.08E1	0.00E0	0.00E0	0.00E0	0.00E0
2002	0.00E0	5.23E1	7.00E1	0.00E0	1.73E1	0.00E0	0.00E0	0.00E0	0.00E0
2003	0.00E0	1.43E2	2.61E1	0.00E0	1.19E1	0.00E0	0.00E0	0.00E0	0.00E0
2004	4.92E1	1.81E1	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2005	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2006	0.00E0	0.00E0	0.00E0	0.00E0	1.44E1	0.00E0	0.00E0	0.00E0	0.00E0
2007	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2008	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2009	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2010	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2011	0.00E0	0.00E0	0.00E0	0.00E0	2.16E1	0.00E0	0.00E0	0.00E0	0.00E0
2012	0.00E0	0.00E0	0.00E0	0.00E0	1.84E1	0.00E0	0.00E0	0.00E0	0.00E0
2013	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2014 <sup>(2)</sup>	0.00E0	0.00E0	0.00E0	0.00E0	1.10E1	0.00E0	0.00E0	0.00E0	0.00E0
2015	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2016	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2017	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change

### 3.8 SHORELINE SEDIMENT

During 2017, a total of 6 shoreline sediment samples was analyzed, four from two indicator locations and two from the control location.

Co-58, Co-60, and Cs-137 are normally the predominant radionuclides identified in shoreline sediment samples. There were no gamma emitting radionuclides attributable to plant operations identified in samples from the indicator locations or the control location.

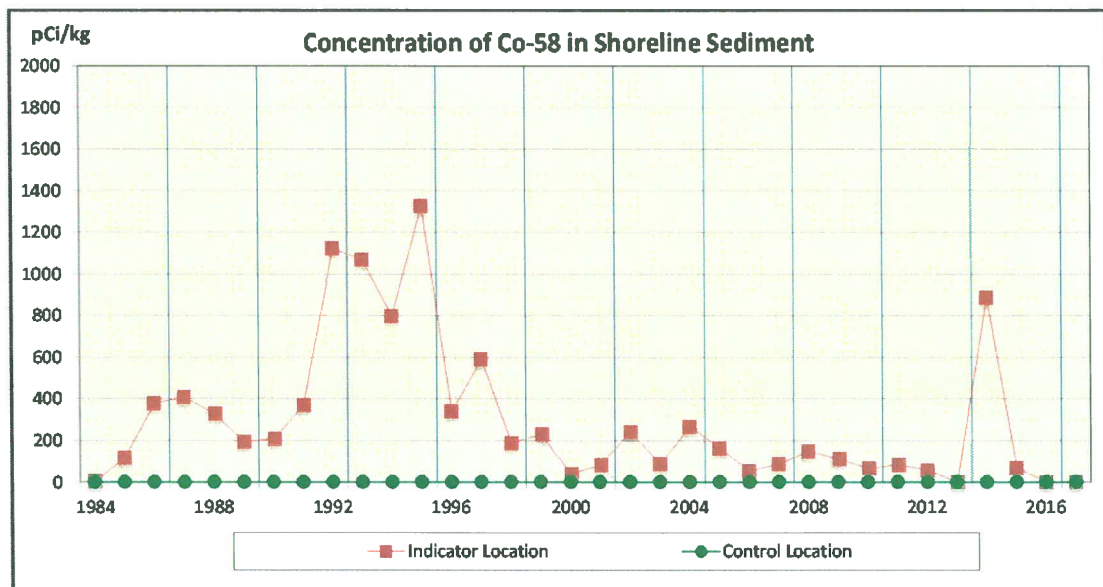
During the third quarter of 2014, Catawba experienced higher than normal levels of mixed fission and activation products in the liquid radioactive waste processing system due to process influent stream chemical changes and larger than normal volumes of non-contaminated water introduced into the system. As system tanks reached storage capacity, liquid radioactive waste was discharged with higher than normal concentrations of mixed fission and activation products (NCR # 01897053).

Table 3.9 lists highest indicator location annual mean since 1984. Included in the table are radionuclides that have been identified in shoreline sediment samples since 1988.

Figures 3.8-1, 3.8-2, and 3.8-3 are graphs displaying annual mean concentrations for Co-58, Co-60, and Cs-137.

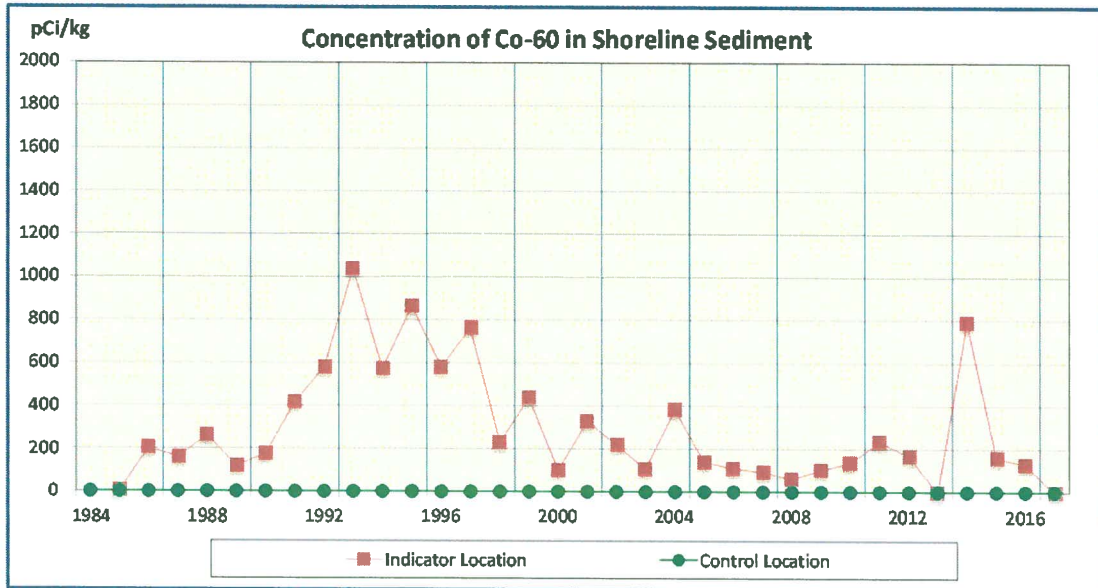
Naturally occurring K-40 was observed in some shoreline sediment samples collected during 2017.

Figure 3.8-1



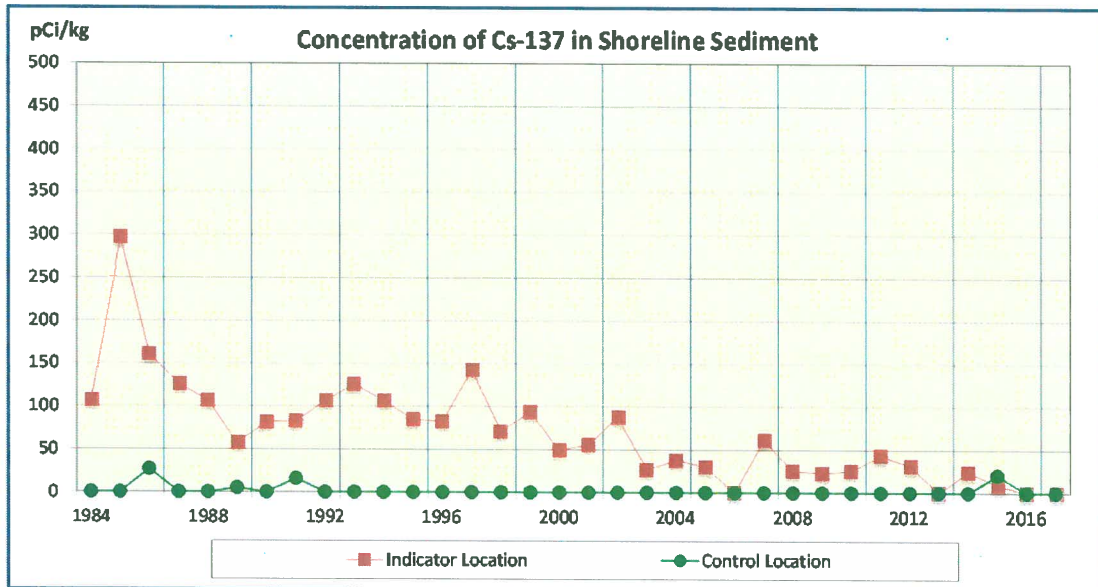
*There is no reporting level for Co-58 in Shoreline Sediment*

Figure 3.8-2



*There is no reporting level for Co-60 in Shoreline Sediment*

Figure 3.8-3



*There is no reporting level for Cs-137 in Shoreline Sediment*

**Table 3.8 Mean Concentrations of Radionuclides in Shoreline Sediment (pCi/kg)**

Year	Mn-54	Co-58	Co-60	Nb-95	Zr-95	Cs-134	Cs-137	Co-57	Sb-125
1984	1.03E0	4.40E0	-2.34E0	0.00E0	0.00E0	3.19E1	1.07E2	0.00E0	0.00E0
1985	-3.12E0	1.16E2	5.18E0	0.00E0	0.00E0	2.11E2	2.97E2	0.00E0	0.00E0
1986	1.09E2	3.79E2	2.05E2	0.00E0	3.96E1	6.50E1	1.61E2	0.00E0	0.00E0
1987 <sup>(1)</sup>	8.83E1	4.08E2	1.61E2	4.22E1	0.00E0	6.08E1	1.26E2	0.00E0	0.00E0
1988	1.07E2	3.29E2	2.63E2	2.28E1	7.54E0	2.59E1	1.07E2	7.65E-1	3.68E0
1989	4.58E1	1.94E2	1.21E2	5.02E0	0.00E0	1.65E1	5.77E1	0.00E0	1.57E1
1990	5.39E1	2.08E2	1.77E2	0.00E0	0.00E0	1.66E1	8.18E1	0.00E0	7.15E0
1991	8.50E1	3.70E2	4.19E2	5.30E0	0.00E0	1.82E1	8.33E1	1.20E0	1.50E1
1992	1.17E2	1.13E3	5.80E2	3.50E0	0.00E0	1.69E1	1.07E2	3.00E0	2.70E1
1993	1.33E2	1.07E3	1.04E3	0.00E0	0.00E0	2.80E1	1.26E2	2.47E1	2.16E2
1994	4.93E1	7.98E2	5.73E2	0.00E0	0.00E0	5.67E0	1.07E2	4.38E0	4.60E1
1995	1.02E2	1.33E3	8.65E2	1.13E2	0.00E0	0.00E0	8.50E1	3.69E1	1.49E2
1996	8.73E1	3.39E2	5.81E2	0.00E0	0.00E0	0.00E0	8.30E1	0.00E0	1.96E2
1997	6.96E1	5.90E2	7.64E2	0.00E0	0.00E0	0.00E0	1.43E2	0.00E0	1.76E2
1998	3.07E1	1.88E2	2.30E2	0.00E0	0.00E0	0.00E0	7.11E1	0.00E0	0.00E0
1999	7.28E1	2.29E2	4.39E2	0.00E0	0.00E0	0.00E0	9.42E1	0.00E0	1.40E2
2000	0.00E0	3.90E1	1.03E2	0.00E0	0.00E0	0.00E0	4.96E1	0.00E0	0.00E0
2001	3.86E1	8.27E1	3.29E2	0.00E0	0.00E0	0.00E0	5.58E1	0.00E0	0.00E0
2002	3.51E1	2.41E2	2.22E2	0.00E0	0.00E0	0.00E0	8.83E1	0.00E0	0.00E0
2003	2.17E1	8.75E1	1.08E2	0.00E0	0.00E0	0.00E0	2.69E1	0.00E0	0.00E0
2004	6.60E1	2.67E2	3.83E2	0.00E0	0.00E0	0.00E0	3.79E1	0.00E0	0.00E0
2005	0.00E0	1.61E2	1.41E2	0.00E0	0.00E0	0.00E0	3.04E1	0.00E0	0.00E0
2006	0.00E0	5.40E1	1.11E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2007	0.00E0	8.77E1	9.46E1	0.00E0	0.00E0	0.00E0	6.13E1	0.00E0	0.00E0
2008	0.00E0	1.48E2	6.24E1	0.00E0	0.00E0	0.00E0	2.57E1	0.00E0	0.00E0
2009	0.00E0	1.10E2	1.04E2	0.00E0	0.00E0	0.00E0	2.27E1	0.00E0	0.00E0
2010	0.00E0	6.56E1	1.37E2	0.00E0	0.00E0	0.00E0	2.56E1	0.00E0	0.00E0
2011	0.00E0	8.36E1	2.36E2	0.00E0	0.00E0	3.62E1	4.33E1	1.05E1	0.00E0
2012	0.00E0	5.59E1	1.70E2	0.00E0	0.00E0	0.00E0	3.15E1	0.00E0	0.00E0
2013	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2014 <sup>(2)</sup>	6.84E1	8.87E2	7.90E2	0.00E0	0.00E0	0.00E0	2.46E1	0.00E0	0.00E0
2015	0.00E0	6.73E1	1.61E2	0.00E0	0.00E0	0.00E0	8.75E0	0.00E0	0.00E0
2016	0.00E0	0.00E0	1.31E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2017	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

## **3.9 DIRECT GAMMA RADIATION**

### **3.9.1 ENVIRONMENTAL TLD**

Catawba is licensed with an exclusion area boundary defined by UFSAR Section 2.1.1.2 as a 2500 foot radius from station center. This is the same boundary established for determining radioactive effluent release limits. No permanent public access is permitted within the exclusion area. TLD locations designated as "inner ring" are within a 1 mile radius from station center and all are used as indicators. TLD locations designated as "outer ring" are outside the 1 mile "inner ring" but within a 5 mile radius of station center. All outer ring TLD locations are used as indicators. A subset of TLD locations within a 7 to 11 mile radius from station center are designated as "special interest." The three "control" locations are greater than 7 miles from station center. These locations were chosen to reduce the probability of influence from Catawba operation on data. The control locations are not used as background subtraction in the TLD analysis. Their purpose is to provide a comparison to indicator locations.

In 2017, 164 total TLDs were analyzed, 152 at indicator locations and 12 at control locations. TLDs are collected and analyzed quarterly. Transit and laboratory background dose is determined and subtracted from gross field readings as required by ANSI N545-1975. Based on Appendix B TLD data, the highest annual total dose was 85.6 mrem at indicator location 229, 0.84 miles NW of station center. Figure 3.9 and Table 3.9-A show TLD inner ring, outer ring, and control location annual averages in mrem per year. Data is provided from 1984 when TLD locations were added and arranged in an inner ring and outer ring configuration. Preoperational data is also provided in the table. As shown in the graph, doses measured by environmental TLDs show little or no change since the current TLD system was implemented. Comparing data from the 2017 Catawba Annual Radiological Effluent Release Report (ARERR), dose to a member of the public resulting from gaseous effluent releases at Catawba is a small fraction of measured TLD dose. Therefore, it can be concluded that gaseous effluents from Catawba had negligible impact on measured TLD values.

Starting in 2014, enhanced analytical methods were implemented. Quarterly and annual baseline dose was determined using appropriate statistical methods considering data from 2000 through 2012. Quarterly and annual dose for 2017 was compared to baseline values to determine if an Investigation Level had been exceeded for evaluation of potential dose to a member of the public. No TLD location exceeded the Quarterly or Annual Investigation Level in 2017, therefore no evaluation of dose to a member of the public from direct or scattered radiation was performed. Table 3.9-B summarizes the data.

A TLD intercomparison program is conducted as part of the quality assurance program. Results of this program are included in section 5.7.

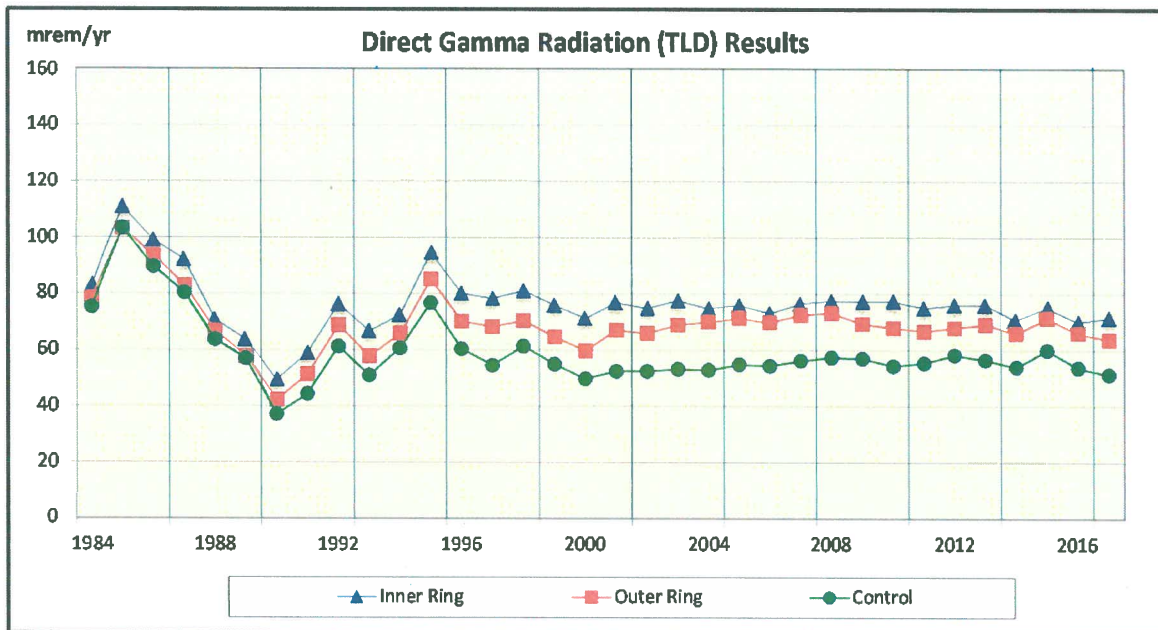


### 3.9.2 ISFSI

The Catawba ISFSI began operation in 2007. It is located approximately 0.2 miles north of station center in a secured area specifically constructed to provide dry storage for spent nuclear fuel. The ISFSI employs the NAC-UMS® and MAGNASTOR® vertical storage designs. Irradiated fuel assemblies are confined, protected, and shielded by a reinforced concrete modules. Both systems are completely passive and designed to provide radiation shielding and safe confinement for a range of accident conditions and natural events. Both systems use a passive natural circulation ventilation system to remove decay heat from the modules. No radiological liquid or gaseous effluents are expected from the passive storage provided by the ISFSI. Therefore any dose to offsite locations would be from direct and scattered gamma radiation.

Environmental TLD results described in 3.9.1 above are reviewed quarterly to identify trends and demonstrate compliance with dose and dose rate limits at the 2500 foot exclusion area boundary. Additional TLD locations not associated with REMP are presently located on the Catawba protected area fence near the ISFSI and on the ISFSI boundary. These are used to demonstrate compliance with occupational exposure controls and augment REMP TLD results. Doses measured by environmental TLDs show little or no change since the ISFSI began operation.

Figure 3.9



*There is no reporting level for Direct Radiation (TLD)*

**Table 3.9-A Direct Gamma Radiation (TLD) Results<sup>(1)</sup>**

Year	Inner Ring Average (mrem/yr)	Outer Ring Average (mrem/yr)	Control Average (mrem/yr)
1984*	8.31E1	7.85E1	7.53E1
1985	1.11E2	1.03E2	1.03E2
1986	9.91E1	9.36E1	8.97E1
1987	9.22E1	8.30E1	8.05E1
1988	7.09E1	6.68E1	6.37E1
1989	6.37E1	5.78E1	5.70E1
1990	4.94E1	4.23E1	3.71E1
1991	5.89E1	5.14E1	4.44E1
1992	7.64E1	6.89E1	6.13E1
1993	6.68E1	5.79E1	5.09E1
1994	7.25E1	6.58E1	6.07E1
1995	9.46E1	8.52E1	7.68E1
1996	8.01E1	7.02E1	6.04E1
1997	7.83E1	6.83E1	5.45E1
1998	8.10E1	7.05E1	6.14E1
1999	7.60E1	6.47E1	5.49E1
2000	7.13E1	5.98E1	4.98E1
2001	7.69E1	6.72E1	5.24E1
2002	7.49E1	6.60E1	5.24E1
2003	7.76E1	6.90E1	5.32E1
2004	7.47E1	7.01E1	5.28E1
2005	7.58E1	7.15E1	5.48E1
2006	7.31E1	6.99E1	5.43E1
2007	7.65E1	7.26E1	5.62E1
2008	7.74E1	7.32E1	5.74E1
2009	7.73E1	6.94E1	5.70E1
2010	7.74E1	6.80E1	5.43E1
2011	7.50E1	6.67E1	5.54E1
2012	7.61E1	6.80E1	5.83E1
2013	7.60E1	6.92E1	5.65E1
2014	7.07E1	6.60E1	5.40E1
2015	7.51E1	7.14E1	6.00E1
2016	7.00E1	6.61E1	5.37E1
2017	7.15E1	6.38E1	5.13E1

\* Preoperational Data

(1) 2014 AREOR, tabular results converted from mR/yr to mrem/yr (n \* 0.95)



**Table 3.9-B definition of terms**

- $MDD_Q$  = minimum differential dose, quarterly, 3 times 90<sup>th</sup> percentile  $s_Q$  determined from analysis in mrem
- $MDD_A$  = minimum differential dose, annual, 3 times 90<sup>th</sup> percentile  $s_A$  determined from analysis in mrem
- $B_Q$  = Quarterly baseline (mrem)
- $M_Q$  = location's 91 day standard quarter normalized dose (mrem per standard quarter)
- $L_Q$  = quarterly investigation level dose (mrem)
- $B_A$  = baseline background dose (mrem) (annual)
- $M_A$  = annual monitoring data -  $M_a$  determined by normalizing available quarterly data to 4 full quarters
- $L_A$  = annual investigation level dose (mrem)
- ND = not detected

### **3.10 LAND USE CENSUS**

The 2017 Annual Land Use Census was conducted July 12- 13, 2017 as required by SLC 16.11-14. Table 3.10 summarizes census results. A map indicating identified locations is shown in Figure 3.10.

During the 2017 census no irrigated gardens (superior to existing gardens) or milk locations were identified. The nearest residence is located in the NE sector at 0.56 miles. No environmental program changes were required as a result of the 2017 land use census.

**Table 3.10 Catawba 2017 Land Use Census Results**

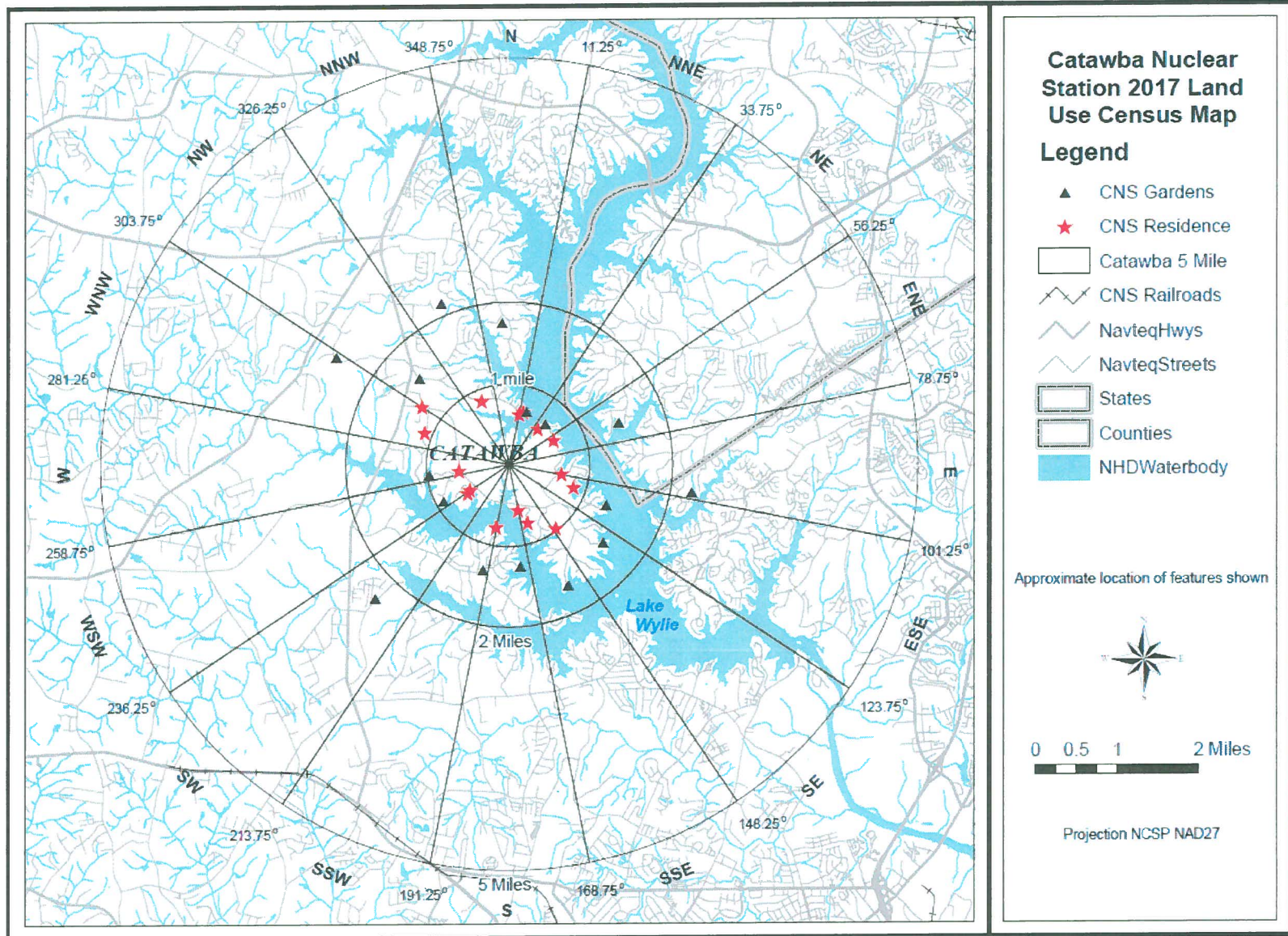
Performed 7/12/2017 - 7/13/2017  
Nearest Pathways (Miles)

SECTOR	RESIDENCE		GARDEN		MILK ANIMAL	
	2016	2017	2016	2017	2016	2017
North	0.63	0.63	1.55	1.74*	---	---
North-Northeast	0.66	0.66	0.69	0.69	---	---
Northeast	0.56	0.56	0.67	0.67	---	---
East-Northeast	0.61	0.61	1.44	1.44	---	---
East	0.65	0.65	2.26	2.26	---	---
East-Southeast	0.84	0.84	1.29	1.29	---	---
Southeast	0.97	0.97	1.50	1.50	---	---
South-Southeast	0.74	0.74	1.64	1.64	---	---
South	0.63	0.63	1.25	1.25	---	---
South-Southwest	0.83	0.78*	1.33	1.33	---	---
Southwest	0.63	0.63	2.02	2.32*	---	---
West-Southwest	0.57	0.57	0.91	0.91	---	---
West	0.68	0.62*	0.96	0.96	---	---
West-Northwest	1.10	1.10	2.53	2.53	---	---
Northwest	1.27	1.27	1.54	1.54	---	---
North-Northwest	0.86	0.86	2.13	2.13	---	---

**NOTE:** Sector and distances were determined by Global Positioning System

\* Represents a change from the previous year

Figure 3.10



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## 4.0 EVALUATION OF DOSE

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### 4.1 DOSE FROM ENVIRONMENTAL MEASUREMENTS

Annual doses to maximum exposed individuals were estimated based on measured concentrations of radionuclides in 2017 CNS REMP samples. The primary purpose of estimating doses based on sample results is to allow comparison to effluent program dose estimates.

Doses based on REMP sample results were calculated using the methodology and data presented in NRC Regulatory Guide 1.109. Measured radionuclide concentrations, averaged over the entire year for a specific radionuclide, indicator location, and sample type, were used to calculate REMP-based doses, after subtracting the applicable average background concentration (as measured at the corresponding control location). Regulatory Guide 1.109 consumption rates for the maximum exposed individual were used in the calculations. A dose factor of zero was assumed when the guide listed “NO DATA” as the dose factor for a given radionuclide and organ.

Maximum dose estimates (Highest Annual Mean Concentration) based on drinking water, fish, and vegetation sample results are reported in Table 4.1-A. The individual critical population and pathway dose calculations are reported in Table 4.1-B.

REMP-based dose estimates are not reported for airborne radioiodine, airborne particulate, milk, or ground water sample types because no radionuclides attributable to CNS operations were detected. Naturally occurring K-40 and Be-7 were detected in some samples but were not included in any REMP-based dose estimates. Dose estimates are not reported for surface water because sampled surface water is not considered to be a potable drinking water source although surface water tritium concentrations are used in calculating doses from fish. Exposure estimates based upon REMP TLD results are discussed in Section 3.9.

The maximum environmental organ dose estimate for any single sample type (excluding TLD results) collected during 2017 was 1.22E-01 mrem to the child bone from the consumption of vegetation.

### 4.2 ESTIMATED DOSE FROM RELEASES

Throughout the year, dose estimates were calculated based on actual 2017 liquid and gaseous effluent release data. Effluent-based dose estimates were calculated using the RETDAS computer program which employs methodology and data presented in NRC Regulatory Guide 1.109. These doses are shown in Table 4.1-A along with the corresponding REMP-based dose estimates. Summaries of RETDAS dose calculations are reported in the Annual Radioactive Effluent Release Report.



The effluent-based liquid release doses are summations of the dose contributions from the drinking water, fish, and shoreline pathways. For iodine, particulate, and tritium exposure the effluent-based gaseous release doses are summations of the dose contributors from ground/plane, inhalation, milk and vegetation pathways.

### **4.3 COMPARISON OF DOSES**

The environmental and effluent dose estimates given in Table 4.1-A agree reasonably well. The similarity of the doses indicate that the radioactivity levels in the environment do not differ significantly from those expected based on effluent measurements and modeling of the environmental exposure pathways. This indicates that effluent program dose estimates are both valid and reasonably conservative.

There are some differences in how effluent and environmental doses are calculated that affect the comparison. Doses calculated from environmental data are conservative because they are based on a mean that includes only samples with a net positive activity versus a mean that includes all sample results (i.e. zero results are not included in the mean). Also, airborne tritium is not measured in environmental samples but is used to calculate effluent doses.

Additionally, in 2010 Catawba began reporting estimated dose from effluent Carbon 14 (C-14). This change came about with the issuing of Regulatory Guide 1.21, Revision 2, Measuring, Evaluating and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste. A description of this change is found in the 2010 Annual Radiological Effluent Release Report. C-14 is not easily measured in the environment and therefore, environmental and effluent doses from C-14 cannot be compared directly.

In calculations based on environmental data, the liquid release pathways of drinking water and fish were the predominant dose pathways. Liquid effluent release data indicated drinking water, fish, and shoreline sediment as the predominant dose pathways. The maximum total organ dose based on 2017 environmental sample results was 4.24E-2 mrem to the child liver, total body, thyroid, kidney, lung, and GI-LLI. The maximum total organ dose of 8.41E-2 mrem for liquid effluent-based estimates was to the child liver.

In calculations based on gaseous release pathways, vegetation was the predominant dose pathway based on effluent data. The maximum total organ dose based on 2017 gaseous effluent estimates was 5.95E0 mrem to the child bone, with C-14 being the primary dose contributor. Vegetation was the only gaseous release pathway media that contained detectable activity. The maximum total organ dose for gaseous environmental estimates was 1.22E-1 mrem to the child bone.

The doses calculated do not exceed 40CFR190 or 10CFR50 dose commitment limits for members of the public. Doses to members of the public attributable to the operation of CNS are being maintained well within regulatory limits and are described in the Annual Radiological Effluent Release Report (ARERR).

**TABLE 4.1-A**

**CATAWBA NUCLEAR STATION  
2017 ENVIRONMENTAL AND EFFLUENT DOSE COMPARISON**

**LIQUID RELEASE PATHWAY**

<b>Organ</b>	<b>Environmental or Effluent Data</b>	<b>Critical Age <sup>(1)</sup></b>	<b>Critical Pathway <sup>(2)</sup></b>	<b>Location</b>	<b>Maximum Dose <sup>(3)</sup> (mrem)</b>
Skin	Environmental	-	-	-	-
Skin	Effluent	Teen	Shoreline Sediment	Discharge Pt.	3.31E-03
Bone	Environmental	-	-	-	-
Bone	Effluent	Child	Fresh Water Fish	Discharge Pt.	2.04E-02
Liver	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	4.24E-02
Liver	Effluent	Child	Drinking Water	7.30 mi SSE	8.41E-02
T. Body	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	4.24E-02
T. Body	Effluent	Child	Drinking Water	7.30 mi SSE	8.26E-02
Thyroid	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	4.24E-02
Thyroid	Effluent	Child	Drinking Water	7.30 mi SSE	8.14E-02
Kidney	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	4.24E-02
Kidney	Effluent	Child	Drinking Water	7.30 mi SSE	8.19E-02
Lung	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	4.24E-02
Lung	Effluent	Child	Drinking Water	7.30 mi SSE	8.16E-02
GI-LLI	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	4.24E-02
GI-LLI	Effluent	Child	Drinking Water	7.30 mi SSE	8.21E-02

- (1) Critical Age is the highest total dose (all pathways) to an age group.
- (2) Critical Pathway is the highest individual dose within the identified Critical Age group.
- (3) Maximum dose is a summation of the fish, drinking water and shoreline sediment pathways.

GASEOUS RELEASE PATHWAY**IODINE, PARTICULATE, and TRITIUM**

<b>Organ</b>	<b>Environmental or Effluent Data</b>	<b>Critical Age <sup>(1)</sup></b>	<b>Critical Pathway <sup>(2)</sup></b>	<b>Location</b>	<b>Maximum Dose <sup>(3)</sup> (mrem)</b>
Skin	Environmental	-	-	-	-
Skin	Effluent	All	Ground Plane	0.5 mi NNE	0.00E+00
Bone	Environmental	Child	Vegetation	201 (0.53 mi NE)	1.22E-01
Bone	Effluent	Child	Vegetation	0.5 mi NNE	5.95E+00
Liver	Environmental	Child	Vegetation	201 (0.53 mi NE)	1.16E-01
Liver	Effluent	Child	Vegetation	0.5 mi NNE	2.26E+00
T. Body	Environmental	Adult	Vegetation	201 (0.53 mi NE)	6.53E-02
T. Body	Effluent	Child	Vegetation	0.5 mi NNE	2.26E+00
Thyroid	Environmental	-	-	-	-
Thyroid	Effluent	Child	Vegetation	0.5 mi NNE	2.26E+00
Kidney	Environmental	Child	Vegetation	201 (0.53 mi NE)	3.79E-02
Kidney	Effluent	Child	Vegetation	0.5 mi NNE	2.26E+00
Lung	Environmental	Child	Vegetation	201 (0.53 mi NE)	1.36E-02
Lung	Effluent	Child	Vegetation	0.5 mi NNE	2.26E+00
GI-LLI	Environmental	Adult	Vegetation	201 (0.53 mi NE)	1.93E-03
GI-LLI	Effluent	Child	Vegetation	0.5 mi NNE	2.26E+00

(1) Critical Age is the highest total dose (all pathways) to an age group.

(2) Critical Pathway is the highest individual dose within the identified Critical Age group.

(3) Maximum dose is a summation of the ground/plane, inhalation, milk and vegetation pathways.

**TABLE 4.1-B***Maximum Individual Dose for 2017 based on Environmental Measurements (mrem) for Catawba Nuclear Station*

Age	Sample Medium	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Skin
<b>Infant</b>	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL	0.00E+00	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02	0.00E+00
<b>Child</b>	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	3.45E-02	3.45E-02	3.45E-02	3.45E-02	3.45E-02	3.45E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Broadleaf Vegetation	1.22E-01	1.16E-01	1.72E-02	0.00E+00	3.79E-02	1.36E-02	7.29E-04	0.00E+00
	Fish	0.00E+00	7.92E-03	7.92E-03	7.92E-03	7.92E-03	7.92E-03	7.92E-03	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.22E-01	1.58E-01	5.96E-02	4.24E-02	8.03E-02	5.60E-02	4.31E-02	0.00E+00	
<b>Teen</b>	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	1.80E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Broadleaf Vegetation	6.73E-02	8.95E-02	3.12E-02	0.00E+00	3.05E-02	1.18E-02	1.27E-03	0.00E+00
	Fish	0.00E+00	9.59E-03	9.59E-03	9.59E-03	9.59E-03	9.59E-03	9.59E-03	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.73E-02	1.17E-01	5.88E-02	2.76E-02	5.81E-02	3.94E-02	2.89E-02	0.00E+00	
<b>Adult</b>	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Broadleaf Vegetation	7.29E-02	9.98E-02	6.53E-02	0.00E+00	3.39E-02	1.13E-02	1.93E-03	0.00E+00
	Fish	0.00E+00	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TOTAL	7.29E-02	1.38E-01	1.03E-01	3.80E-02	7.19E-02	4.93E-02	3.99E-02	0.00E+00	

Note: Dose tables are provided for sample media displaying positive nuclide occurrence.

**Catawba Nuclear Station**  
**Dose from Drinking Water Pathway for 2017 Data**  
**Maximum Exposed Infant**

Infant Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year) = 330 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.99E-05	4.51E-06	NO DATA	4.41E-06	NO DATA	7.31E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	3.60E-06	8.98E-06	NO DATA	NO DATA	NO DATA	8.97E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	3.08E-05	5.38E-05	2.12E-05	NO DATA	NO DATA	1.59E-05	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	1.08E-05	2.55E-05	NO DATA	NO DATA	NO DATA	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.84E-05	6.31E-05	2.91E-05	NO DATA	3.06E-05	NO DATA	5.33E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	4.20E-08	1.73E-08	1.00E-08	NO DATA	1.24E-08	NO DATA	1.46E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	2.06E-07	5.02E-08	3.56E-08	NO DATA	5.41E-08	NO DATA	2.50E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	NO DATA	1.51E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	3.77E-04	7.03E-04	7.10E-05	NO DATA	1.81E-04	7.42E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	5.22E-04	6.11E-04	4.33E-05	NO DATA	1.64E-04	6.64E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	1.71E-04	1.71E-07	8.81E-06	NO DATA	4.06E-08	1.05E-07	4.20E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	214	333	0.00E+00	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02
Dose Commitment (mrem) =										0.00E+00	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02	3.38E-02

**Catawba Nuclear Station**  
**Dose from Drinking Water Pathway for 2017 Data**  
**Maximum Exposed Child**

Child Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year) = 510 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C0-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	214	333	0.00E+00	3.45E-02	3.45E-02	3.45E-02	3.45E-02	3.45E-02	3.45E-02
Dose Commitment (mrem) =										0.00E+00	3.45E-02	3.45E-02	3.45E-02	3.45E-02	3.45E-02	3.45E-02

**Catawba Nuclear Station**  
**Dose from Broadleaf Vegetation Pathway for 2017 Data**  
**Maximum Exposed Child**

Child Dose from Vegetation Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

Usage (intake in one year) = 26 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	201	14.3	1.22E-01	1.16E-01	1.72E-02	0.00E+00	3.79E-02	1.36E-02	7.29E-04
Dose Commitment (mrem) =										1.22E-01	1.16E-01	1.72E-02	0.00E+00	3.79E-02	1.36E-02	7.29E-04

*Catawba Nuclear Station  
Dose from Fish Pathway for 2017 Data  
Maximum Exposed Child*

Child Dose from Fish Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

H-3 Concentration in Fish = Surface Water pCi/l x Bioaccumulation Factor 0.9 pCi/kg per pCi/l = 6280 pCi/l x 0.9 = 5652 pCi/kg

Usage (intake in one year)= 6.9 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Fish (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	208	5652	0.00E+00	7.92E-03	7.92E-03	7.92E-03	7.92E-03	7.92E-03	7.92E-03
Dose Commitment (mrem) =										0.00E+00	7.92E-03	7.92E-03	7.92E-03	7.92E-03	7.92E-03	7.92E-03



**Catawba Nuclear Station**  
**Dose from Drinking Water Pathway for 2017 Data**  
**Maximum Exposed Teen**

Teen Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year)= 510 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	9.72E-07	2.24E-06	NO DATA	NO DATA	NO DATA	1.34E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	5.87E-06	1.37E-05	5.29E-06	NO DATA	NO DATA	4.32E-06	3.24E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.81E-06	6.33E-06	NO DATA	NO DATA	NO DATA	3.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	5.76E-06	2.00E-05	9.33E-06	NO DATA	1.28E-05	NO DATA	8.47E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.91E-08	NO DATA	3.00E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	214	333	0.00E+00	1.80E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02
Dose Commitment (mrem)=										0.00E+00	1.80E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02

*Catawba Nuclear Station  
Dose from Broadleaf Vegetation Pathway for 2017 Data  
Maximum Exposed Teen*

Teen Dose from Vegetation Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

Usage (intake in one year) = 42 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	201	14.3	6.73E-02	8.95E-02	3.12E-02	0.00E+00	3.05E-02	1.18E-02	1.27E-03
Dose Commitment (mrem) =										6.73E-02	8.95E-02	3.12E-02	0.00E+00	3.05E-02	1.18E-02	1.27E-03

**Catawba Nuclear Station**  
**Dose from Fish Pathway for 2017 Data**  
**Maximum Exposed Teen**

Teen Dose from Fish Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

H-3 Concentration in Fish = Surface Water pCi/l x Bioaccumulation Factor 0.9 pCi/kg per pCi/l = 6280 pCi/l x 0.9 = 5652 pCi/kg

Usage (intake in one year) = 16 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	(pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	9.72E-07	2.24E-06	NO DATA	NO DATA	NO DATA	1.34E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	5.87E-06	1.37E-05	5.29E-06	NO DATA	NO DATA	4.32E-06	3.24E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.81E-06	6.33E-06	NO DATA	NO DATA	NO DATA	3.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	5.76E-06	2.00E-05	9.33E-06	NO DATA	1.28E-05	NO DATA	8.47E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	208	5652	0.00E+00	9.59E-03	9.59E-03	9.59E-03	9.59E-03	9.59E-03	9.59E-03
Dose Commitment (mrem) =										0.00E+00	9.59E-03	9.59E-03	9.59E-03	9.59E-03	9.59E-03	9.59E-03

**Catawba Nuclear Station**  
**Dose from Drinking Water Pathway for 2017 Data**  
**Maximum Exposed Adult**

Adult Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year)= 730 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	7.45E-07	1.67E-06	NO DATA	NO DATA	NO DATA	1.51E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	4.34E-06	1.02E-05	3.91E-06	NO DATA	NO DATA	2.85E-06	3.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.14E-06	4.72E-06	NO DATA	NO DATA	NO DATA	4.02E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	4.84E-06	1.54E-05	6.96E-06	NO DATA	1.03E-05	NO DATA	9.70E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	3.04E-08	9.75E-09	6.60E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.46E-08	4.18E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	214	333	0.00E+00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02
Dose Commitment (mrem) =										0.00E+00	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02	2.55E-02

***Catawba Nuclear Station  
Dose from Broadleaf Vegetation Pathway for 2017 Data  
Maximum Exposed Adult***

**Adult Dose from Vegetation (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)**

**Usage (intake in one year) = 64 kg**

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	201	14.3	7.29E-02	9.98E-02	6.53E-02	0.00E+00	3.39E-02	1.13E-02	1.93E-03
<b>Dose Commitment (mrem) =</b>										7.29E-02	9.98E-02	6.53E-02	0.00E+00	3.39E-02	1.13E-02	1.93E-03

*Catawba Nuclear Station  
Dose from Fish Pathway for 2017 Data  
Maximum Exposed Adult*

Adult Dose from Fish Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

H-3 Concentration in Fish = Surface Water pCi/l x Bioaccumulation Factor 0.9 pCi/kg per pCi/l = 6280 pCi/l x 0.9 = 5652 pCi/kg

Usage (intake in one year) = 21 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	(pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	7.45E-07	1.67E-06	NO DATA	NO DATA	NO DATA	1.51E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	4.34E-06	1.02E-05	3.91E-06	NO DATA	NO DATA	2.85E-06	3.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.14E-06	4.72E-06	NO DATA	NO DATA	NO DATA	4.02E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	4.84E-06	1.54E-05	6.96E-06	NO DATA	1.03E-05	NO DATA	9.70E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	208	5652	0.00E+00	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02
Dose Commitment (mrem) =										0.00E+00	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02

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## 5.0 QUALITY ASSURANCE

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### 5.1 SAMPLE COLLECTION

EnRad Laboratories and the Environmental Water Resources Group performed the environmental sample collections as specified by approved sample collection procedures.

### 5.2 SAMPLE ANALYSIS

EnRad Laboratories performed the environmental sample analyses as specified by approved analysis procedures. EnRad Laboratories is located in Huntersville, North Carolina, at Duke Energy's Environmental Center.

### 5.3 DOSIMETRY ANALYSIS

The Radiation Dosimetry and Records group performed the environmental dosimetry measurements as specified by approved dosimetry analysis procedures.

### 5.4 LABORATORY EQUIPMENT QUALITY ASSURANCE

#### 5.4.1 DAILY QUALITY CONTROL

EnRad Laboratories has an internal quality assurance program which monitors each type of instrumentation for reliability and accuracy. Daily quality control checks ensure that instruments are in proper working order and these checks are used to monitor instrument performance.

#### 5.4.2 CALIBRATION VERIFICATION

National Institute of Standards and Technology (NIST) standards that represent counting geometries are analyzed as unknowns at various frequencies ranging from weekly to annually to verify that efficiency calibrations are valid. The frequency is dependent upon instrument use and performance. Investigations are performed and documented should calibration verification data fall outside of the acceptable limits.

#### 5.4.3 BATCH PROCESSING

Method quality control samples are analyzed with sample analyses that are processed in batches. These include tritium analyses in drinking water, surface water, and ground water samples.

### 5.5 DUKE ENERGY INTERLABORATORY COMPARISON PROGRAM

In 2017 Duke Energy Environmental Laboratory (EnRad) participated in interlaboratory programs to satisfy Radiological Environmental Monitoring Program requirements in

Duke Energy nuclear plant Offsite Dose Calculation Manuals and Selected Licensee Commitments Manuals, as applicable. The EnRad organization, in 2017, elected to voluntarily withdraw its North Carolina State Drinking Water Certification with the North Carolina Department of Health and Human Services, State Laboratory of Public Health. It was determined that there was no longer a business case for maintaining this certification (NCR # 02093314). Samples requiring this certification are sent to General Engineering Laboratories, LLC (GEL), which maintains the necessary certifications to meet regulatory commitments for drinking water.

EnRad Laboratory participated in an interlaboratory program with Eckert & Ziegler Analytics (EZA) in 2017. EZA results were evaluated against the NRC Inspection Manual Procedure 84750 (IP 84750) acceptance criteria stated in EnRad Procedure 515, Cross Check Program Administration. All regulatory requirements continue to be met by the EZA Cross Check Program.

#### **5.5.1 DUKE ENERGY INTERLABORATORY PROGRAM**

EnRad Laboratories made the determination in 2017 to discontinue its participation in the Duke Energy Fleet Scientific Services (FSS) Interlaboratory Program, as EnRad already maintains a sufficient cross check program through EZA. Historically, Duke Energy FSS has maintained its own Interlaboratory Program supporting the Duke Energy Fleet. At EnRad, this has been a supplement to EnRad's participation in the EZA Cross Check Program. In 2017, FSS determined that shifting business needs had reduced the need for the FSS Interlaboratory Program and the majority of the Interlaboratory Program has been discontinued.

#### **5.5.2 ECKERT & ZIEGLER ANALYTICS CROSS CHECK PROGRAM**

EnRad Laboratories participated in the Eckert & Ziegler Analytics (EZA) Cross Check Program during 2017. Cross check samples including mixed gamma in liquid, mixed gamma in vegetation, low-level I-131 in liquid, mixed gamma air filters (single and composites), mixed gamma and I-131 air cartridges, strontium in water, gross alpha and beta in water, gross alpha and beta in filters, and tritium in water were analyzed at various times of the year. A summary of the EnRad Laboratory program results for 2017 is documented in Table 5.0-A.

Interlaboratory cross check samples from EZA were received and analyzed in all four quarters of 2017. Table 5.0-A lists the performance for specific samples. Eighty-seven nuclide results were reported to EZA of which eighty-six (98.9%) met the acceptance criteria based on IP 84750. One EZA cross check nuclide result did exhibit a high bias and EnRad proactively initiated an NCR to investigate this bias.

In the second quarter of 2017, a mixed gamma in filter cross check (E11890) yielded a disagreement on only the Zinc-65 nuclide value (ratio to the known of 130%). An overall high bias was noted across all other nuclides, primarily in the high energy range. NCR # 02138003 was written to investigate and document the failure. It was determined that the geometry used for gamma filter counting



contained compounding biases, leading to consistently high results in the upper energy range. Following the implementation of a new filter geometry, an equivalent filter cross check (E12011) was analyzed in the fourth quarter of 2017. The cross check passed with reduced biases, and a Zinc-65 nuclide value of 111% of the known.

### **5.5.3 ERA PROFICIENCY TESTING**

EnRad Laboratories made the determination in 2017 to discontinue its participation in the Environmental Resource Associates (ERA) Proficiency Testing program, as this program's participation was solely for the purpose of maintaining EnRad's North Carolina State Drinking Water Certification requirements (NCR # 02093314).

## **5.6 INTERCOMPARISON PROGRAM**

Catawba Nuclear Station routinely participates in an environmental sample intercomparison program. Program elements include sampling frequency and analysis parameters for drinking water, surface water, milk, fish, broadleaf vegetation, and shoreline sediment samples that have been collected. Samples are routinely split with a vendor laboratory for intercomparison analysis.

## **5.7 TLD INTERCOMPARISON PROGRAM**

### **5.7.1 NUCLEAR TECHNOLOGY SERVICES INTERCOMPARISON PROGRAM**

Radiation Dosimetry and Records participates in a quarterly TLD intercomparison program administered by Nuclear Technology Services, Inc. of Roswell, GA. Nuclear Technology Services irradiates environmental dosimeters quarterly and sends them to the Radiation Dosimetry and Records group for analysis of the unknown estimated delivered exposure. A summary of the 2017 Nuclear Technology Services Intercomparison Report is documented in Table 5.0-B.

The individual measurements were evaluated and results falling outside the acceptable ratio criteria had an evaluation performed to identify any recommended remedial actions and to reduce anomalous errors. During first quarter of 2017 an environmental external TLD cross check failed and NCR # 02147847 was written to document the failure of the four individual TLDs; however, the overall result fell within both the Duke Energy and Nuclear Technology Services, Inc. acceptance criteria. To prevent recurrence, the four TLDs were pulled and visually inspected for abnormalities in the elements and overall integrity of the TLDs and no abnormalities were found. The four TLDs were checked per procedure and TLDs # 533830 and 103632 were both removed from service.

### **5.7.2 INTERNAL CROSS CHECK (DUKE ENERGY)**

Radiation Dosimetry and Records participates in a quarterly TLD internal comparison program administered internally by the Dosimetry Lab. The Dosimetry Lab Staff irradiates environmental dosimeters quarterly and submits them for

analysis of the unknown estimated delivered exposure. A summary of the 2017 Internal Cross Check (Duke Energy) Program is documented in Table 5.0-B.

# TABLE 5.0-A

## ECKERT & ZIEGLER ANALYTICS

### CROSS CHECK PROGRAM

#### 2017 Cross Check Results for EnRad Laboratories

Interlaboratory cross check samples from EZA were received and analyzed in all four quarters of 2017. Results are reported directly to Eckert & Ziegler Analytics. Environmental cross check samples were analyzed in replicate, and the result closest to the mean is reported to Eckert & Ziegler Analytics. The acceptance criteria for the program was based on the NRC Inspection Manual Procedure 84750 (IP 84750). Table 5.0-A lists the performance for specific samples. Eighty-seven nuclide results were reported to EZA of which eighty-six (98.9%) met the acceptance criteria based on IP 84750.

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Beta Filter in Planchet	E11755	Cs-137	1	pCi	247	244	1.01	Agreement
	E11925A	Cs-137	3	pCi	191	199	0.96	Agreement
Gamma in Cartridge	E11924	Ce-141	3	pCi	58.8	60.0	0.98	Agreement
		Co-58	3	pCi	81.0	80.7	1.00	Agreement
		Co-60	3	pCi	182	181	1.01	Agreement
		Cr-51	3	pCi	144	150	0.96	Agreement
		Cs-134	3	pCi	132	138	0.95	Agreement
		Cs-137	3	pCi	123	119	1.04	Agreement
		Fe-59	3	pCi	88.3	86.5	1.02	Agreement
		Mn-54	3	pCi	89.7	84.7	1.06	Agreement
		Zn-65	3	pCi	141	127	1.11	Agreement
LLI-131 in Water	E12007	I-131	4	pCi/L	58.8	57.7	1.02	Agreement
LLI-131 in Milk	E11889	I-131	2	pCi/L	95.4	96.3	0.99	Agreement
I-131 in Charcoal Cartridge	E11754	I-131	1	pCi	98.1	93.5	1.05	Agreement
	E12003	I-131	3	pCi	64.7	64.5	1.00	Agreement
Gamma in Simulated Vegetation (Coffee Grounds)	E12010	Ce-141	4	pCi/g	0.202	0.195	1.04	Agreement
		Co-58	4	pCi/g	0.181	0.178	1.02	Agreement
		Co-60	4	pCi/g	0.334	0.342	0.98	Agreement
		Cr-51	4	pCi/g	0.423	0.479	0.88	Agreement
		Cs-134	4	pCi/g	0.220	0.247	0.89	Agreement
		Cs-137	4	pCi/g	0.281	0.280	1.00	Agreement
		Fe-59	4	pCi/g	0.227	0.224	1.01	Agreement
		Mn-54	4	pCi/g	0.337	0.318	1.06	Agreement
Zn-65	4	pCi/g	0.447	0.418	1.07	Agreement		

## TABLE 5.0-A (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Gamma in Composite Filter	E11752	Ce-141	1	pCi	101	97.3	1.04	Agreement
		Cr-51	1	pCi	202	195	1.04	Agreement
		Cs-134	1	pCi	90.4	80.5	1.12	Agreement
		Cs-137	1	pCi	99.8	93.9	1.06	Agreement
		Co-58	1	pCi	106	100	1.06	Agreement
		Mn-54	1	pCi	126	110	1.14	Agreement
		Fe-59	1	pCi	101	86.4	1.17	Agreement
		Zn-65	1	pCi	164	134	1.22	Agreement
		Co-60	1	pCi	132	123	1.08	Agreement
Gamma in Water	E11753	I-131	1	pCi/L	101	97.8	1.03	Agreement
		Ce-141	1	pCi/L	149	145	1.03	Agreement
		Cr-51	1	pCi/L	282	291	0.97	Agreement
		Cs-134	1	pCi/L	117	120	0.97	Agreement
		Cs-137	1	pCi/L	142	140	1.01	Agreement
		Co-58	1	pCi/L	154	150	1.03	Agreement
		Mn-54	1	pCi/L	174	165	1.06	Agreement
		Fe-59	1	pCi/L	139	129	1.08	Agreement
		Zn-65	1	pCi/L	226	200	1.13	Agreement
		Co-60	1	pCi/L	189	183	1.03	Agreement
Gamma in Water	E12006	I-131	3	pCi/L	71.8	79.2	0.91	Agreement
		Ce-141	3	pCi/L	105	99.5	1.06	Agreement
		Cr-51	3	pCi/L	240	248	0.97	Agreement
		Cs-134	3	pCi/L	208	229	0.91	Agreement
		Cs-137	3	pCi/L	202	196	1.03	Agreement
		Co-58	3	pCi/L	135	134	1.01	Agreement
		Mn-54	3	pCi/L	148	140	1.05	Agreement
		Fe-59	3	pCi/L	148	143	1.03	Agreement
		Zn-65	3	pCi/L	238	210	1.13	Agreement
		Co-60	3	pCi/L	294	299	0.98	Agreement

## TABLE 5.0-A (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Gamma in Filter (Falcon)	E11890	Ce-141	2	pCi	119	114	1.04	Agreement
		Co-58	2	pCi	124	117	1.06	Agreement
		Co-60	2	pCi	150	144	1.04	Agreement
		Cr-51	2	pCi	240	238	1.01	Agreement
		Cs-134	2	pCi	148	142	1.04	Agreement
		Cs-137	2	pCi	122	113	1.08	Agreement
		Fe-59	2	pCi	107	87.0	1.23	Agreement
		Mn-54	2	pCi	146	130	1.13	Agreement
		Zn-65	2	pCi	200	154	1.30	Non-Agreement <sup>1</sup>
Gamma in Filter (Falcon)	E12011	Ce-141	4	pCi	82.5	76.2	1.08	Agreement
		Co-58	4	pCi	70.8	69.6	1.02	Agreement
		Co-60	4	pCi	144	134	1.07	Agreement
		Cr-51	4	pCi	202	188	1.08	Agreement
		Cs-134	4	pCi	97.4	96.7	1.01	Agreement
		Cs-137	4	pCi	119	110	1.09	Agreement
		Fe-59	4	pCi	98.5	87.9	1.12	Agreement
		Mn-54	4	pCi	132	125	1.06	Agreement
		Zn-65	4	pCi	181	164	1.11	Agreement
Gamma in Milk	E11756	I-131	1	pCi/L	105	97.9	1.07	Agreement
		Ce-141	1	pCi/L	149	145	1.03	Agreement
		Cr-51	1	pCi/L	331	290	1.14	Agreement
		Cs-134	1	pCi/L	116	120	0.97	Agreement
		Cs-137	1	pCi/L	150	140	1.07	Agreement
		Co-58	1	pCi/L	152	150	1.02	Agreement
		Mn-54	1	pCi/L	177	164	1.08	Agreement
		Fe-59	1	pCi/L	148	129	1.15	Agreement
		Zn-65	1	pCi/L	224	199	1.12	Agreement
		Co-60	1	pCi/L	194	183	1.06	Agreement
Gross Beta in Water	E11892	Cs-137	2	pCi/L	255	270	0.94	Agreement
	E12009	Cs-137	4	pCi/L	250	265	0.94	Agreement
Tritium in Water	E11891	H-3	2	pCi/L	14300	14000	1.02	Agreement
	E12008	H-3	4	pCi/L	13200	13400	0.98	Agreement

1) NCR # 02138003

# TABLE 5.0-B

## 2017 ENVIRONMENTAL DOSIMETER

### CROSS-CHECK RESULTS

#### Nuclear Technology Services

Radiation Dosimetry and Records participates in a quarterly TLD intercomparison program administered by Nuclear Technology Services, Inc. of Roswell, GA. Nuclear Technology Services irradiates environmental dosimeters quarterly and sends them to Radiation Dosimetry and Records group for analysis of the unknown estimated delivered exposure. The individual measurements were evaluated and results falling outside the acceptable ratio criteria had an evaluation performed to identify any recommended remedial actions and to reduce anomalous errors.

1st Quarter 2017						2nd Quarter 2017					
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail
103469	79.16	72.16	9.70	<+/-15%	Pass	103126	20.33	18.90	7.57	<+/-15%	Pass
103632	83.94	72.16	16.32	<+/-15%	Fail**	103068	20.20	18.90	6.88	<+/-15%	Pass
103636	76.22	72.16	5.63	<+/-15%	Pass	103065	19.51	18.90	3.23	<+/-15%	Pass
103637	77.82	72.16	7.84	<+/-15%	Pass	102830	20.64	18.90	9.21	<+/-15%	Pass
103642	79.08	72.16	9.59	<+/-15%	Pass	103002	20.18	18.90	6.77	<+/-15%	Pass
Average Bias (B)			9.82			Average Bias (B)			6.73		
Standard Deviation (S)			4.00			Standard Deviation (S)			2.19		
Measure Performance  B +S			13.81	<15%	Pass	Measure Performance  B +S			8.92	<15%	Pass
3rd Quarter 2017						4th Quarter 2017					
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail
102253	60.07	60.04	0.05	<+/-15%	Pass	102343	72.30	70.02	3.26	<+/-15%	Pass
101122	62.80	60.04	4.60	<+/-15%	Pass	102265	72.85	70.02	4.04	<+/-15%	Pass
103099	60.78	60.04	1.23	<+/-15%	Pass	102340	71.25	70.02	1.76	<+/-15%	Pass
102288	61.20	60.04	1.93	<+/-15%	Pass	103972	66.99	70.02	-4.33	<+/-15%	Pass
100163	59.82	60.04	-0.37	<+/-15%	Pass	103921	68.54	70.02	-2.11	<+/-15%	Pass
Average Bias (B)			1.49			Average Bias (B)			0.52		
Standard Deviation (S)			1.96			Standard Deviation (S)			3.60		
Measure Performance  B +S			3.45	<15%	Pass	Measure Performance  B +S			4.12	<15%	Pass

Fail\*\* refers to NCR # 02147847

# TABLE 5.0-B (Cont.)

## 2017 ENVIRONMENTAL DOSIMETER

### CROSS CHECK RESULTS

#### Internal Crosscheck (Duke Energy)

Radiation Dosimetry and Records participates in a quarterly TLD internal comparison program administered internally by the Dosimetry Lab. The Dosimetry Lab Staff irradiates environmental dosimetry quarterly and submits them for analysis of the unknown estimated delivered exposure.

1st Quarter 2017						2nd Quarter 2017						
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	
102207	49.22	48.0	2.54	<+/-15%	Pass	102519	46.79	43.0	8.81	<+/-15%	Pass	
102208	47.57	48.0	-0.90	<+/-15%	Pass	102870	49.18	43.0	14.37	<+/-15%	Pass	
103410	52.06	48.0	8.46	<+/-15%	Pass	103537	46.05	43.0	7.09	<+/-15%	Pass	
102167	49.65	48.0	3.44	<+/-15%	Pass	103541	47.33	43.0	10.07	<+/-15%	Pass	
102079	51.39	48.0	7.06	<+/-15%	Pass	103111	48.21	43.0	12.12	<+/-15%	Pass	
103409	50.33	48.0	4.85	<+/-15%	Pass	102304	45.04	43.0	4.74	<+/-15%	Pass	
102209	49.32	48.0	2.75	<+/-15%	Pass	102873	47.59	43.0	10.67	<+/-15%	Pass	
102214	49.46	48.0	3.04	<+/-15%	Pass	102872	47.85	43.0	11.28	<+/-15%	Pass	
102117	49.94	48.0	4.04	<+/-15%	Pass	102871	47.80	43.0	11.16	<+/-15%	Pass	
102201	49.83	48.0	3.81	<+/-15%	Pass	102861	48.11	43.0	11.88	<+/-15%	Pass	
Average Bias (B)			3.91				Average Bias (B)			10.22		
Standard Deviation (S)			2.56				Standard Deviation (S)			2.74		
Measure Performance  B +S			6.47	<15%	Pass	Measure Performance  B +S			12.96	<15%	Pass	
3rd Quarter 2017						4th Quarter 2017						
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	
101195	19.81	18.8	5.15	<+/-15%	Pass	103951	50.92	50.0	1.84	<+/-15%	Pass	
103731	19.45	18.8	3.24	<+/-15%	Pass	103949	51.06	50.0	2.12	<+/-15%	Pass	
101190	19.90	18.8	5.63	<+/-15%	Pass	103950	51.04	50.0	2.08	<+/-15%	Pass	
103532	20.61	18.8	9.39	<+/-15%	Pass	104011	51.38	50.0	2.76	<+/-15%	Pass	
100314	19.70	18.8	4.56	<+/-15%	Pass	103931	51.10	50.0	2.20	<+/-15%	Pass	
101264	18.93	18.8	0.48	<+/-15%	Pass	104004	50.74	50.0	1.48	<+/-15%	Pass	
101345	19.18	18.8	1.80	<+/-15%	Pass	103996	49.63	50.0	-0.74	<+/-15%	Pass	
101397	20.06	18.8	6.48	<+/-15%	Pass	103963	52.97	50.0	5.94	<+/-15%	Pass	
100868	20.45	18.8	8.55	<+/-15%	Pass	103947	49.17	50.0	-1.66	<+/-15%	Pass	
103078	20.51	18.8	8.86	<+/-15%	Pass	103929	49.88	50.0	-0.24	<+/-15%	Pass	
Average Bias (B)			5.41				Average Bias (B)			1.58		
Standard Deviation (S)			3.01				Standard Deviation (S)			2.12		
Measure Performance  B +S			8.43	<15%	Pass	Measure Performance  B +S			3.70	<15%	Pass	

**APPENDIX A**

**ENVIRONMENTAL SAMPLING  
&  
ANALYSIS PROCEDURES**



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# APPENDIX A

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## ENVIRONMENTAL SAMPLING AND ANALYSIS PROCEDURES

Adherence to established procedures for sampling and analysis of all environmental media at Catawba Nuclear Station was required to ensure compliance with Station Selected Licensee Commitments. Analytical procedures were employed to ensure that Selected Licensee Commitments detection capabilities were achieved.

Environmental sampling and analyses were performed by EnRad Laboratories, Dosimetry and Records, Fisheries and Aquatic Ecology.

This appendix describes the environmental sampling frequencies and analysis procedures by media type.

### I. CHANGE OF SAMPLING PROCEDURES

No changes were made to the sampling procedures during 2017.

### II. DESCRIPTION OF ANALYSIS PROCEDURES

Gamma spectroscopy analyses are performed using high purity germanium gamma detectors and Canberra analytical software. Designated sample volumes are transferred to appropriate counting geometries and analyzed by gamma spectroscopy. Perishable samples such as fish and broadleaf vegetation are ground to achieve a homogeneous mixture. Soils and sediments are dried, sifted to remove foreign objects (rocks, clams, glass, etc.) then transferred to appropriate counting geometry.

Low-level iodine analyses are performed by passing a designated sample aliquot through a pre-measured amount of ion exchange resin to remove and concentrate any iodine in the aqueous sample (milk). The resin is then dried, mixed thoroughly, and a net resin weight determined before being transferred to appropriate counting geometry and analyzed by gamma spectroscopy.

Tritium analyses are performed by using low-level environmental liquid scintillation analysis technique on a Perkin-Elmer 2900TR liquid scintillation system or Perkin-Elmer 3100TR liquid scintillation system. Tritium samples are distilled and batch processed with a laboratory fortified blank, matrix spike, matrix spike duplicate, and blank to verify instrument performance and sample preparation technique are acceptable.

Gross beta analysis is performed by concentrating a designated aliquot of sample precipitate and analyzing by Tennelec XLB Series 5 gas-flow proportional counters. Samples are batch processed with a blank to ensure sample contamination has not occurred.

### **III. CHANGE OF ANALYSIS PROCEDURES**

The tritium preparation procedure was modified during 2017 to align with ASTM Method D4107-08, Standard Test Method for Tritium in Drinking Water; Water and Environmental Technology, Volume 11.02. 2014 Edition. Tritium dark adaptation times were also reduced (NCR # 02134015).

### **IV. SAMPLING AND ANALYSIS PROCEDURES**

#### **A.1 AIRBORNE PARTICULATE AND RADIOIODINE**

Airborne particulate and radioiodine samples at each of six locations were composited continuously by means of continuous air samplers. Air particulates were collected on a particulate filter and radioiodines were collected in a charcoal cartridge positioned behind the filter in the sampler. The samplers are designed to operate at a constant flow rate (in order to compensate for any filter loading) and are set to sample approximately 2 cubic feet per minute. Filters and cartridges were collected weekly. A separate weekly gamma analysis was performed on each charcoal cartridge. A weekly gross beta analysis was performed on each filter. A quarterly gamma analysis was performed on the quarterly filter composite (by location). The continuous composite samples were collected from the locations listed below.

Location 200 = Site Boundary (0.63 mi. NNE)  
Location 201 = Site Boundary (0.53 mi. NE)  
Location 208 = Discharge Canal (0.45 mi. S)  
Location 212 = Tega Cay (3.32 mi. E)  
Location 258 = Fairhope Road (9.84 mi. W)(Control)  
Location 261 = Site Boundary (0.72 mi. N)

#### **A.2 DRINKING WATER**

Monthly composite drinking water samples were collected at each of two locations. A gross beta and gamma analysis was performed on monthly composites. Tritium analysis was performed on the quarterly composites. The composites were collected monthly from the locations listed below.

Location 214 = Rock Hill Water Supply (7.30 mi. SSE)  
Location 218 = Belmont Water Supply (13.5 mi. NNE)(Control)

### **A.3 SURFACE WATER**

Monthly composite samples were collected at each of three locations. A gamma analysis was performed on the monthly composites. Tritium analysis was performed on the quarterly composites. The composites were collected monthly from the locations listed below.

Location 208 = Discharge Canal (0.45 mi. S)

Location 211 = Wylie Dam (4.06 mi. ESE)

Location 215 = River Pointe - Hwy 49 (4.21 mi. NNE)(Control)

### **A.4 MILK**

Biweekly grab samples were collected at one location. A gamma and low-level Iodine-131 analysis was performed on each sample. The biweekly grab samples were collected from the location listed below.

Location 221 = Dairy (14.5 mi. NW)(Control)

### **A.5 BROADLEAF VEGETATION**

Monthly samples were collected at each of five locations. A gamma analysis was performed on each sample. The samples were collected from the locations listed below.

Location 200 = Site Boundary (0.63 mi. NNE)

Location 201 = Site Boundary (0.53 mi. NE)

Location 222 = Site Boundary (0.70 mi. N)

Location 226 = Site Boundary (0.48 mi. S)

Location 258 = Fairhope Road (9.84 mi. W)(Control)

### **A.6 FOOD PRODUCTS**

Monthly samples were collected when available during the harvest season at one location. A gamma analysis was performed on each sample. The samples were collected from the location listed below.

Location 260 = Irrigated Gardens (2.00 mi. SSE)

### **A.7 FISH**

Semiannual samples were collected at each of two locations. A gamma analysis was performed on the edible portions of each sample. Boney fish (i.e. Sunfish) were prepared whole minus the head and tail portions. The samples were collected from the locations listed below.

Location 208 = Discharge Canal (0.45 mi. S)  
Location 216 = Hwy 49 Bridge (4.19 mi. NNE)(Control)

#### **A.8 SHORELINE SEDIMENT**

Semiannual samples were collected at each of three locations. A gamma analysis was performed on each sample following the drying and removal of rocks and clams. The samples were collected from the locations listed below.

Location 208 = Discharge Canal (0.45 mi. S)  
Location 210 = Ebenezer Access (2.31 mi. SE)  
Location 215 = River Pointe - Hwy 49 (4.21 mi. NNE)(Control)

#### **A.9 DIRECT GAMMA RADIATION (TLD)**

Thermoluminescent dosimeters (TLD) were collected quarterly at forty-one locations. A gamma exposure rate was determined for each TLD. TLD locations are listed in Table 2.1-B. The TLDs were placed as indicated below.

- \* An inner ring of 16 TLDs, one in each meteorological sector in the general area of the site boundary.
- \* An outer ring of 16 TLDs, one in each meteorological sector in the 6 to 8 kilometer range.
- \* The remaining TLDs were placed in special interest areas such as population centers, residential areas, schools, and at three control locations.

#### **A.10 ANNUAL LAND USE CENSUS**

An Annual Land Use Census was conducted to identify within a distance of 8 kilometers (5.0 miles) from the station, the nearest location from the site boundary in each of the sixteen meteorological sectors, the following:

- \* The Nearest Residence
- \* The Nearest Garden greater than 50 square meters or 500 square feet
- \* The Nearest Milk-giving Animal (cow, goat, etc.)

The census was conducted during the growing season on 7/12 and 7/13/2017. Results are shown in Table 3.11. No changes were made to the sampling procedures during 2017 as a result of the 2017 census.

## V. GLOBAL POSITIONING SYSTEM (GPS) ANALYSIS

The Catawba site centerline used for GPS measurements was referenced from the Catawba Nuclear Station Updated Final Safety Analysis Report (UFSAR), section 2.1.1.1, Specification of Location. Waypoint coordinates used for CNS GPS measurements were latitude 35°-3'-5"N and longitude 81°-4'-10"W. Maps and tables were generated using North American Datum (NAD) 27. Data normally reflect accuracy to within 2 to 5 meters from point of measurement. All GPS field measurements were taken as close as possible to the item of interest. Distances for the locations are displayed using three significant figures.

**APPENDIX B**

**RADIOLOGICAL  
ENVIRONMENTAL MONITORING  
PROGRAM**

**SUMMARY OF RESULTS**

**CATAWBA NUCLEAR STATION  
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM DATA SUMMARY**

Catawba Nuclear Station  
York County, South Carolina

Docket Numbers 50-413, 414  
Calendar Year 2017

Medium or Pathway Sampled or Measured (Unit of Measurement)	Type and Total No. of Measurements Performed	Lower Limit of Detection (LLD) <sup>(1)</sup>	All Indicator Locations <sup>(2)(3)</sup> Mean Range	Location w/Highest Annual Mean		Control Locations Mean Range <sup>(2)(3)</sup>	No. of Non-Routine Report Meas.
				Name, Distance, and Direction	Mean Range <sup>(2)(3)</sup>		
Air Particulate (pCi/m <sup>3</sup> )	Gross Beta 318 <sup>(4)(6)</sup>	See Table 2.2-C	2.23E-2 (265/265) 9.51E-3 – 4.55E-2	208 (0.45 mi S)	2.35E-2 (53/53) 9.51E-3 – 4.55E-2	258 (9.84 mi W) 2.21E-2 (53/53) 1.02E-2 – 4.09E-2	0
	Gamma 30 <sup>(4)(6)</sup>	See Table 2.2-C	All less than LLD	----	----	All less than LLD	0
Air Radioiodine (pCi/m <sup>3</sup> )	Gamma 318 <sup>(4)(6)</sup>	See Table 2.2-C	All less than LLD	----	----	All less than LLD	0
Drinking Water (pCi/l)	Gross Beta 28 <sup>(4)(7)</sup>	4	2.20 (14/14) 0.83 – 4.47	214 (7.30 mi SSE)	2.20 (14/14) 0.83 – 4.47	218 (13.5 mi NNE) 1.76 (14/14) 0.93 – 2.57	0
	Gamma 28 <sup>(4)(7)</sup>	See Table 2.2-C	All less than LLD	----	----	All less than LLD	0
	Tritium 10 <sup>(4)(7)</sup>	2000	916 (5/5) 769 - 1270	214 (7.30 mi SSE)	916 (5/5) 769 - 1270	583 (5/5) 396 – 830	0
Surface Water (pCi/l)	Gamma 42 <sup>(4)(7)</sup>	See Table 2.2-C	All less than LLD	----	----	All less than LLD	0
	Tritium 15 <sup>(4)(7)</sup>	2000	3854 (10/10) 675 - 8350	208 (0.45 mi S)	6804 (5/5) 4500 - 8350	215 (4.21 mi NNE) 524 (5/5) 264 – 635	0
Milk (pCi/l)	Gamma 26	See Table 2.2-C	No Indicator Location	----	----	All less than LLD	0
	I-131 26	See Table 2.2-C	No Indicator Location	----	----	All less than LLD	0

**CATAWBA NUCLEAR STATION  
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM DATA SUMMARY**

Catawba Nuclear Station  
York County, South Carolina

Docket Numbers 50-413, 414  
Calendar Year 2017

Medium or Pathway Sampled or Measured (Unit of Measurement)	Type and Total No. of Measurements Performed	Lower Limit of Detection (LLD) <sup>(1)</sup>	All Indicator Locations <sup>(2)(3)</sup> Mean Range	Location w/Highest Annual Mean		Control Locations Mean Range <sup>(2)(3)</sup>	No. of Non-Routine Report Meas.
				Name, Distance, and Direction	Mean Range <sup>(2)(3)</sup>		
Broadleaf Vegetation (pCi/kg, wet)	Gamma 60 Cs-137	See Table 2.2-C	14.3 (1/48) 14.3 – 14.3	201 (0.53 mi NE)	14.3 (1/12) 14.3 – 14.3	All less than LLD	0
Food Products (pCi/kg, wet)	Gamma 9 <sup>(4)</sup>	See Table 2.2-C	All less than LLD	-----	-----	No Control Location	0
Fish (pCi/kg, wet)	Gamma 12	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
Sediments--Shoreline (pCi/kg, dry)	Gamma 6	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
TLD (mR per quarter) <sup>(5)</sup>	TLD Readout 164 <sup>(4)</sup>	-----	17.5 (152/152) 9.94 – 25.9	229 (0.84 mi NW)	22.5 (4/4) 19.2 – 25.9	217 (10.3 mi SSE) 247 (7.33 mi ESE) 251 (9.72 mi WNW) 13.5 (12/12) 10.0 – 17.3	0



## Footnotes to Appendix B

1. The Lower Limit of Detection (LLD) is the smallest concentration of radioactive material in a sample that will yield a net count above system background which will be detected with 95 percent probability and with only 5 percent probability of falsely concluding that a blank observation represents a "real" signal. Due to counting statistics and varying volumes, occasionally lower LLDs are achieved. Refer to Section 2.3.2 for an explanation of how LLD values were derived.
2. Mean and range are based on detectable measurements only.
3. The fractions of all samples with detectable activities at specific locations are indicated in parentheses.
4. Missing samples or surveillances are discussed in Appendix C or Appendix D.
5. TLD exposure is reported in milliroentgen (mR) per standard quarter (91 days). TLD data indicated in section 3.9 (Direct Gamma Radiation) are reported in mrem /yr ( $n * 0.95 \text{ ergs/g-Roentgen}$ )<sup>2</sup>.
6. Gamma filter composite calendar reconciliation period, 2017 (NCR # 02174799).
7. Tritium composite calendar reconciliation period, 2017 (NCR # 02174927).

<sup>2</sup> Cember, H. (2009). Introduction to Health Physics, 4<sup>th</sup> Edition. United States: McGraw-Hill Companies, Inc.

**APPENDIX C**

**SAMPLING DEVIATIONS  
&  
UNAVAILABLE ANALYSES**

# APPENDIX C

## CATAWBA NUCLEAR STATION SAMPLING DEVIATIONS & UNAVAILABLE ANALYSES

DEVIATION & UNAVAILABLE REASON CODES			
BF	Blown Fuse	PM	Preventive Maintenance
CN	Construction	PO	Power Outage
FZ	Sample Frozen	PS	Pump out of service / Undergoing repair
IV	Insufficient Volume	SL	Sample Loss/Lost due to Lab Accident
IW	Inclement Weather	SM	Motor / Rotor Seized
LC	Line Clog to Sampler	SU	Seasonally Unavailable
OT	Other	TF	Torn Filter
PI	Power Interrupt	VN	Vandalism

### C.1 SAMPLING DEVIATIONS

#### Air Particulate and Air Radioiodine

REMP weekly air samples (Air Particulate (AP) or Air Radioiodine (AR)) that experience any downtime during a surveillance period are reported as a Deviation and classified as a “Sampling Deviation.” However, the sample is counted and the data reported, whereas a Deviation with no available sample is classified as an “Unavailable Analyses” and does not have any data reported. The Catawba REMP air samplers operated for a total of 99.9% availability in 2017.

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
201	11/13 – 11/20/2017	PI	0.48 hours downtime due to power interruption, cause undetermined.	NCR # 02168172

#### Drinking Water and Surface Water

REMP monthly drinking water samples (Drinking Water (DW)) that experience any downtime during a surveillance period are reported as a deviation and classified as a “Sampling Deviation.” However, the sample is counted and the data reported, whereas a Deviation with no available sample is classified as an “Unavailable Analyses” and does not have any data reported. The water samplers operated for a total of 98.1% availability in 2017.

#### Drinking Water

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
218	1/31 – 2/28/2017	OT	Water supply to sampling equipment was turned off by water plant personnel (despite signage requesting continuous water supply) during composite period causing an 11.2% sampling availability.	NCR # 02104674

## Surface Water

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
211	5/23 – 6/20/2017 6/20 – 7/18/2017	PO	Power to sampling equipment was interrupted due to auxiliary bus work/construction performed at the Wylie dam facility. Power was interrupted 6/19/2017 12:00, restored 6/27/2017 11:59 for total downtime of 192 hours.	NCR # 02132277 NCR # 02138020

## C.2 UNAVAILABLE ANALYSES

### Food Products / Crops

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
260	1/4/2017	SU	Sample seasonally unavailable at time of collection.	NCR # 02089295
260	2/7/2017	SU	Sample seasonally unavailable at time of collection.	NCR # 02097911
260	3/7/2017	SU	Sample seasonally unavailable at time of collection.	NCR # 02105881

**APPENDIX D**

**ANALYTICAL DEVIATIONS**

# APPENDIX D

## CATAWBA NUCLEAR STATION ANALYTICAL DEVIATIONS

DEVIATION & UNAVAILABLE REASON CODES			
BF	Blown Fuse	PO	Power Outage
FZ	Sample Frozen	PS	Pump out of service / Undergoing Repair
IW	Inclement Weather	SL	Sample Loss/Lost due to Lab Accident
LC	Line Clog to Sampler	SM	Motor / Rotor Seized
OT	Other	TF	Torn Filter
PI	Power Interrupt	VN	Vandalism
PM	Preventive Maintenance	CN	Construction
AD	Analytical Deviation		

### D.1 ANALYTICAL DEVIATIONS

Catawba environmental Alpha (A) and Bravo (B) TLDs are co-located TLDs placed next to each other to comply with ANSI/HPS N13.37-2014 Section 7.1 Paragraph 7. The TLD collections indicated incurred tampering/vandalism with one of the two co-located TLDs. One TLD for each collection was available and did not appear to have experienced any tampering/vandalism during the quarter. The remaining Alpha (A) TLD was collected and analyzed, but did not get averaged with the unusable Bravo (B) TLD which is normally included in the established process for the Catawba REMP TLDs.

#### TLD

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
233	3/16 – 6/15/2017	VN	Bravo TLD vandalized, not usable, 1 TLD reported.	NCR # 02131748
236	6/15 – 9/14/2017	VN	Bravo TLD vandalized, not usable, 1 TLD reported.	NCR # 02151032

**APPENDIX E**

**RADIOLOGICAL  
ENVIRONMENTAL MONITORING  
PROGRAM RESULTS**

**2017**

This appendix includes sample analysis report summaries and supportive data generated from each sample medium for 2017.

# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
431779	12/28/2016 - 1/4/2017	Beta	1.30E-02	2.63E-03	3.15E-03
432176	1/4/2017 - 1/10/2017	Beta	1.95E-02	2.89E-03	2.94E-03
432884	1/10/2017 - 1/17/2017	Beta	1.59E-02	2.84E-03	3.27E-03
433281	1/17/2017 - 1/24/2017	Beta	1.44E-02	2.53E-03	2.99E-03
433698	1/24/2017 - 1/31/2017	Beta	1.97E-02	2.78E-03	3.03E-03
434433	1/31/2017 - 2/7/2017	Beta	2.47E-02	3.25E-03	3.19E-03
435080	2/7/2017 - 2/14/2017	Beta	1.97E-02	3.00E-03	3.19E-03
435787	2/14/2017 - 2/21/2017	Beta	2.01E-02	2.79E-03	2.96E-03
436237	2/21/2017 - 2/28/2017	Beta	1.91E-02	2.97E-03	3.12E-03
436688	2/28/2017 - 3/7/2017	Beta	2.29E-02	2.81E-03	2.66E-03
437552	3/7/2017 - 3/14/2017	Beta	1.74E-02	2.94E-03	3.25E-03
438279	3/14/2017 - 3/21/2017	Beta	2.17E-02	2.76E-03	2.67E-03
438782	3/21/2017 - 3/28/2017	Beta	1.75E-02	2.79E-03	3.00E-03
439138	12/28/2016 - 3/28/2017	Cs-134	<5.79E-04	0.00E+00	5.79E-04
		Cs-137	<3.55E-04	0.00E+00	3.55E-04
		Be-7	1.69E-01	2.45E-02	1.17E-02
		K-40	8.85E-03	4.98E-03	1.85E-03
439132	3/28/2017 - 4/4/2017	Beta	9.85E-03	2.56E-03	3.40E-03
439981	4/4/2017 - 4/11/2017	Beta	1.80E-02	2.60E-03	2.70E-03
440576	4/11/2017 - 4/18/2017	Beta	2.32E-02	2.83E-03	2.70E-03
441390	4/18/2017 - 4/25/2017	Beta	1.19E-02	2.65E-03	3.31E-03
441835	4/25/2017 - 5/2/2017	Beta	1.63E-02	2.87E-03	3.23E-03
442266	5/2/2017 - 5/9/2017	Beta	1.82E-02	2.99E-03	3.31E-03
442849	5/9/2017 - 5/15/2017	Beta	2.31E-02	3.53E-03	3.84E-03
443277	5/15/2017 - 5/23/2017	Beta	2.63E-02	2.78E-03	2.45E-03
443835	5/23/2017 - 5/31/2017	Beta	1.66E-02	2.60E-03	2.78E-03





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
444237	5/31/2017 - 6/6/2017	Beta	2.44E-02	3.21E-03	3.21E-03
445299	6/6/2017 - 6/13/2017	Beta	1.67E-02	2.59E-03	2.84E-03
446298	6/13/2017 - 6/20/2017	Beta	1.69E-02	2.62E-03	2.93E-03
446802	6/20/2017 - 6/27/2017	Beta	1.33E-02	2.78E-03	3.47E-03
447149	3/28/2017 - 6/27/2017	Cs-134	<4.88E-04	0.00E+00	4.88E-04
		Cs-137	<6.60E-04	0.00E+00	6.60E-04
		Be-7	1.73E-01	2.63E-02	5.27E-03
		K-40	<1.42E-02	0.00E+00	1.42E-02
447143	6/27/2017 - 7/3/2017	Beta	2.01E-02	3.27E-03	3.43E-03
447781	7/3/2017 - 7/11/2017	Beta	1.59E-02	2.63E-03	2.88E-03
448245	7/11/2017 - 7/18/2017	Beta	1.80E-02	3.10E-03	3.68E-03
448871	7/18/2017 - 7/25/2017	Beta	3.00E-02	3.52E-03	3.20E-03
449195	7/25/2017 - 8/1/2017	Beta	2.42E-02	2.84E-03	2.60E-03
449926	8/1/2017 - 8/8/2017	Beta	2.03E-02	2.72E-03	2.73E-03
450171	8/8/2017 - 8/15/2017	Beta	1.37E-02	2.80E-03	3.48E-03
450704	8/15/2017 - 8/22/2017	Beta	2.37E-02	2.92E-03	2.88E-03
451163	8/22/2017 - 8/29/2017	Beta	2.56E-02	3.01E-03	2.93E-03
451517	8/29/2017 - 9/5/2017	Beta	1.94E-02	2.63E-03	2.68E-03
452321	9/5/2017 - 9/12/2017	Beta	1.59E-02	2.57E-03	2.87E-03
452764	9/12/2017 - 9/19/2017	Beta	3.09E-02	3.17E-03	2.72E-03
453418	9/19/2017 - 9/26/2017	Beta	4.12E-02	4.02E-03	3.34E-03
454182	6/27/2017 - 9/26/2017	Cs-134	<1.89E-03	0.00E+00	1.89E-03
		Cs-137	<1.31E-03	0.00E+00	1.31E-03
		Be-7	1.20E-01	3.66E-02	4.00E-02
		K-40	<3.44E-02	0.00E+00	3.44E-02
454176	9/26/2017 - 10/3/2017	Beta	2.55E-02	3.35E-03	3.43E-03
455036	10/3/2017 - 10/10/2017	Beta	1.60E-02	2.78E-03	3.03E-03
455391	10/10/2017 - 10/17/2017	Beta	1.51E-02	2.41E-03	2.53E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
456016	10/17/2017 - 10/24/2017	Beta	2.81E-02	3.13E-03	3.00E-03
461392	10/24/2017 - 10/30/2017	Beta	1.75E-02	2.78E-03	2.99E-03
461938	10/30/2017 - 11/7/2017	Beta	2.76E-02	2.82E-03	2.44E-03
462574	11/7/2017 - 11/13/2017	Beta	1.72E-02	2.86E-03	3.23E-03
463066	11/13/2017 - 11/20/2017	Beta	2.87E-02	3.47E-03	3.23E-03
463482	11/20/2017 - 11/28/2017	Beta	2.98E-02	3.16E-03	2.46E-03
464141	11/28/2017 - 12/5/2017	Beta	4.17E-02	3.91E-03	3.12E-03
464671	12/5/2017 - 12/12/2017	Beta	2.55E-02	3.27E-03	3.15E-03
464940	12/12/2017 - 12/19/2017	Beta	2.80E-02	3.40E-03	3.18E-03
465187	12/19/2017 - 12/27/2017	Beta	2.66E-02	2.99E-03	2.63E-03
465575	9/26/2017 - 12/27/2017	Cs-134	<1.50E-03	0.00E+00	1.50E-03
		Cs-137	<1.50E-03	0.00E+00	1.50E-03
		Be-7	1.73E-01	3.68E-02	1.76E-02
		K-40	3.95E-02	1.68E-02	4.65E-03
465569	12/27/2017 - 1/3/2018	Beta	3.07E-02	3.59E-03	3.40E-03
		Cs-134	<1.24E-02	0.00E+00	1.24E-02
		Cs-137	<9.31E-03	0.00E+00	9.31E-03
		Be-7	1.15E-01	9.53E-02	1.49E-01
		K-40	1.55E-01	1.15E-01	1.61E-01

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
431780	12/28/2016 - 1/4/2017	Beta	1.44E-02	2.71E-03	3.16E-03
432177	1/4/2017 - 1/10/2017	Beta	2.54E-02	3.18E-03	2.93E-03
432885	1/10/2017 - 1/17/2017	Beta	1.66E-02	2.88E-03	3.27E-03
433282	1/17/2017 - 1/24/2017	Beta	1.23E-02	2.43E-03	3.00E-03
433699	1/24/2017 - 1/31/2017	Beta	1.61E-02	2.63E-03	3.04E-03
434434	1/31/2017 - 2/7/2017	Beta	2.40E-02	3.21E-03	3.19E-03
435081	2/7/2017 - 2/14/2017	Beta	1.79E-02	2.91E-03	3.19E-03
435788	2/14/2017 - 2/21/2017	Beta	2.07E-02	2.81E-03	2.96E-03
436238	2/21/2017 - 2/28/2017	Beta	1.71E-02	2.88E-03	3.12E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
436689	2/28/2017 - 3/7/2017	Beta	2.24E-02	2.78E-03	2.66E-03
437553	3/7/2017 - 3/14/2017	Beta	1.45E-02	2.79E-03	3.25E-03
438280	3/14/2017 - 3/21/2017	Beta	2.27E-02	2.80E-03	2.67E-03
438783	3/21/2017 - 3/28/2017	Beta	2.18E-02	3.10E-03	3.17E-03
439139	12/28/2016 - 3/28/2017	Cs-134	<6.68E-04	0.00E+00	6.68E-04
		Cs-137	<5.69E-04	0.00E+00	5.69E-04
		Be-7	1.71E-01	2.51E-02	8.63E-03
		K-40	1.50E-02	6.68E-03	1.93E-03
439133	3/28/2017 - 4/4/2017	Beta	1.19E-02	2.67E-03	3.39E-03
439982	4/4/2017 - 4/11/2017	Beta	1.91E-02	2.66E-03	2.70E-03
440577	4/11/2017 - 4/18/2017	Beta	2.39E-02	2.86E-03	2.69E-03
441391	4/18/2017 - 4/25/2017	Beta	1.10E-02	2.61E-03	3.32E-03
441836	4/25/2017 - 5/2/2017	Beta	1.45E-02	2.77E-03	3.23E-03
442267	5/2/2017 - 5/9/2017	Beta	1.86E-02	3.02E-03	3.32E-03
442850	5/9/2017 - 5/15/2017	Beta	2.29E-02	3.51E-03	3.81E-03
443278	5/15/2017 - 5/23/2017	Beta	2.60E-02	2.77E-03	2.46E-03
443836	5/23/2017 - 5/31/2017	Beta	1.68E-02	2.60E-03	2.77E-03
444238	5/31/2017 - 6/6/2017	Beta	2.52E-02	3.25E-03	3.21E-03
445300	6/6/2017 - 6/13/2017	Beta	1.75E-02	2.63E-03	2.84E-03
446299	6/13/2017 - 6/20/2017	Beta	1.48E-02	2.53E-03	2.94E-03
446803	6/20/2017 - 6/27/2017	Beta	1.50E-02	2.88E-03	3.48E-03
447150	3/28/2017 - 6/27/2017	Cs-134	<3.53E-04	0.00E+00	3.53E-04
		Cs-137	<6.33E-04	0.00E+00	6.33E-04
		Be-7	1.49E-01	2.30E-02	1.29E-02
		K-40	9.23E-03	5.64E-03	5.91E-03
447144	6/27/2017 - 7/3/2017	Beta	1.97E-02	3.23E-03	3.42E-03
447782	7/3/2017 - 7/11/2017	Beta	1.75E-02	2.71E-03	2.87E-03
448246	7/11/2017 - 7/18/2017	Beta	1.79E-02	3.10E-03	3.69E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
448872	7/18/2017 - 7/25/2017	Beta	3.48E-02	3.72E-03	3.19E-03
449196	7/25/2017 - 8/1/2017	Beta	2.35E-02	2.82E-03	2.60E-03
449927	8/1/2017 - 8/8/2017	Beta	2.01E-02	2.71E-03	2.72E-03
450172	8/8/2017 - 8/15/2017	Beta	1.47E-02	2.86E-03	3.50E-03
450705	8/15/2017 - 8/22/2017	Beta	2.30E-02	2.89E-03	2.87E-03
451164	8/22/2017 - 8/29/2017	Beta	2.48E-02	2.98E-03	2.93E-03
451518	8/29/2017 - 9/5/2017	Beta	2.09E-02	2.70E-03	2.67E-03
452322	9/5/2017 - 9/12/2017	Beta	1.65E-02	2.61E-03	2.88E-03
452765	9/12/2017 - 9/19/2017	Beta	3.09E-02	3.17E-03	2.71E-03
453419	9/19/2017 - 9/26/2017	Beta	3.94E-02	3.95E-03	3.33E-03
454183	6/27/2017 - 9/26/2017	Cs-134	<1.86E-03	0.00E+00	1.86E-03
		Cs-137	<1.64E-03	0.00E+00	1.64E-03
		Be-7	1.65E-01	4.30E-02	4.26E-02
		K-40	<3.50E-02	0.00E+00	3.50E-02
454177	9/26/2017 - 10/3/2017	Beta	2.60E-02	3.38E-03	3.43E-03
455037	10/3/2017 - 10/10/2017	Beta	1.92E-02	2.94E-03	3.03E-03
455392	10/10/2017 - 10/17/2017	Beta	1.54E-02	2.42E-03	2.53E-03
456017	10/17/2017 - 10/24/2017	Beta	2.66E-02	3.07E-03	3.00E-03
461393	10/24/2017 - 10/30/2017	Beta	1.69E-02	2.75E-03	3.00E-03
461939	10/30/2017 - 11/7/2017	Beta	2.65E-02	2.78E-03	2.45E-03
462575	11/7/2017 - 11/13/2017	Beta	1.68E-02	2.83E-03	3.22E-03
463067	11/13/2017 - 11/20/2017	Beta	2.85E-02	3.48E-03	3.24E-03
463483	11/20/2017 - 11/28/2017	Beta	3.39E-02	3.32E-03	2.46E-03
464142	11/28/2017 - 12/5/2017	Beta	4.02E-02	3.86E-03	3.13E-03
464672	12/5/2017 - 12/12/2017	Beta	2.91E-02	3.43E-03	3.14E-03
464941	12/12/2017 - 12/19/2017	Beta	2.87E-02	3.42E-03	3.18E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

## Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465188	12/19/2017 - 12/27/2017	Beta	2.54E-02	2.94E-03	2.63E-03
465576	9/26/2017 - 12/27/2017	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<1.72E-03	0.00E+00	1.72E-03
		Cs-137	<1.41E-03	0.00E+00	1.41E-03
		Be-7	1.56E-01	3.55E-02	2.55E-02
		K-40	<2.46E-02	0.00E+00	2.46E-02
465570	12/27/2017 - 1/3/2018	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.31E-02	3.69E-03	3.41E-03
		Cs-134	<1.45E-02	0.00E+00	1.45E-02
		Cs-137	<1.24E-02	0.00E+00	1.24E-02
		Be-7	1.59E-01	8.40E-02	1.16E-01
		K-40	<2.12E-01	0.00E+00	2.12E-01

## Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431781	12/28/2016 - 1/4/2017	Beta	1.48E-02	2.73E-03	3.16E-03
432178	1/4/2017 - 1/10/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.13E-02	2.98E-03	2.94E-03
432886	1/10/2017 - 1/17/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.84E-02	2.97E-03	3.26E-03
433283	1/17/2017 - 1/24/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.30E-02	2.46E-03	3.00E-03
433700	1/24/2017 - 1/31/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.83E-02	2.73E-03	3.04E-03
434435	1/31/2017 - 2/7/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.75E-02	3.37E-03	3.18E-03
435082	2/7/2017 - 2/14/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.70E-02	2.86E-03	3.19E-03
435789	2/14/2017 - 2/21/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.87E-02	2.72E-03	2.96E-03
436239	2/21/2017 - 2/28/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.10E-02	3.07E-03	3.12E-03
436690	2/28/2017 - 3/7/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.35E-02	2.83E-03	2.66E-03
437554	3/7/2017 - 3/14/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.02E-02	3.09E-03	3.25E-03
438281	3/14/2017 - 3/21/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.88E-02	2.62E-03	2.67E-03
438784	3/21/2017 - 3/28/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.55E-02	3.28E-03	3.17E-03
439140	12/28/2016 - 3/28/2017	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<5.82E-04	0.00E+00	5.82E-04
		Cs-137	<4.13E-04	0.00E+00	4.13E-04
		Be-7	1.62E-01	2.36E-02	9.32E-03
		K-40	<1.03E-02	0.00E+00	1.03E-02
439134	3/28/2017 - 4/4/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	9.51E-03	2.53E-03	3.39E-03
439983	4/4/2017 - 4/11/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.89E-02	2.65E-03	2.70E-03
440578	4/11/2017 - 4/18/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.34E-02	2.84E-03	2.69E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
441392	4/18/2017 - 4/25/2017	Beta	1.24E-02	2.69E-03	3.32E-03
441837	4/25/2017 - 5/2/2017	Beta	1.39E-02	2.72E-03	3.21E-03
442268	5/2/2017 - 5/9/2017	Beta	1.71E-02	2.95E-03	3.33E-03
442851	5/9/2017 - 5/15/2017	Beta	2.29E-02	3.51E-03	3.82E-03
443279	5/15/2017 - 5/23/2017	Beta	2.59E-02	2.76E-03	2.46E-03
443837	5/23/2017 - 5/31/2017	Beta	1.68E-02	2.60E-03	2.78E-03
444239	5/31/2017 - 6/6/2017	Beta	2.80E-02	3.37E-03	3.21E-03
445301	6/6/2017 - 6/13/2017	Beta	2.02E-02	2.76E-03	2.84E-03
446300	6/13/2017 - 6/20/2017	Beta	1.69E-02	2.63E-03	2.94E-03
446804	6/20/2017 - 6/27/2017	Beta	1.57E-02	2.91E-03	3.48E-03
447151	3/28/2017 - 6/27/2017	Cs-134	<7.05E-04	0.00E+00	7.05E-04
		Cs-137	<4.86E-04	0.00E+00	4.86E-04
		Be-7	1.71E-01	2.47E-02	1.09E-02
		K-40	9.46E-03	5.97E-03	6.89E-03
447145	6/27/2017 - 7/3/2017	Beta	1.94E-02	3.22E-03	3.42E-03
447783	7/3/2017 - 7/11/2017	Beta	1.77E-02	2.72E-03	2.87E-03
448247	7/11/2017 - 7/18/2017	Beta	1.73E-02	3.07E-03	3.69E-03
448873	7/18/2017 - 7/25/2017	Beta	3.06E-02	3.66E-03	3.36E-03
449197	7/25/2017 - 8/1/2017	Beta	2.57E-02	2.91E-03	2.60E-03
449928	8/1/2017 - 8/8/2017	Beta	2.33E-02	2.85E-03	2.73E-03
450173	8/8/2017 - 8/15/2017	Beta	1.52E-02	2.89E-03	3.49E-03
450706	8/15/2017 - 8/22/2017	Beta	2.65E-02	3.04E-03	2.87E-03
451165	8/22/2017 - 8/29/2017	Beta	2.61E-02	3.04E-03	2.93E-03
451519	8/29/2017 - 9/5/2017	Beta	1.88E-02	2.60E-03	2.67E-03
452323	9/5/2017 - 9/12/2017	Beta	2.03E-02	2.79E-03	2.88E-03
452766	9/12/2017 - 9/19/2017	Beta	3.85E-02	3.44E-03	2.71E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

## Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
453420	9/19/2017 - 9/26/2017	Beta	4.55E-02	4.17E-03	3.33E-03
454184	6/27/2017 - 9/26/2017	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<1.46E-03	0.00E+00	1.46E-03
		Cs-137	<1.19E-03	0.00E+00	1.19E-03
		Be-7	1.60E-01	4.03E-02	3.72E-02
		K-40	<2.81E-02	0.00E+00	2.81E-02
454178	9/26/2017 - 10/3/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.92E-02	3.51E-03	3.43E-03
455038	10/3/2017 - 10/10/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.01E-02	3.00E-03	3.03E-03
455393	10/10/2017 - 10/17/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.64E-02	2.47E-03	2.53E-03
456018	10/17/2017 - 10/24/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.14E-02	3.26E-03	3.00E-03
461394	10/24/2017 - 10/30/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.32E-02	3.06E-03	3.00E-03
461940	10/30/2017 - 11/7/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.06E-02	2.94E-03	2.45E-03
462576	11/7/2017 - 11/13/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.00E-02	2.99E-03	3.22E-03
463068	11/13/2017 - 11/20/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.61E-02	3.78E-03	3.23E-03
463484	11/20/2017 - 11/28/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.54E-02	3.39E-03	2.46E-03
464143	11/28/2017 - 12/5/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	4.50E-02	4.05E-03	3.13E-03
464673	12/5/2017 - 12/12/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.28E-02	3.59E-03	3.14E-03
464942	12/12/2017 - 12/19/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.59E-02	3.73E-03	3.18E-03
465189	12/19/2017 - 12/27/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.57E-02	2.95E-03	2.63E-03
465577	9/26/2017 - 12/27/2017	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<1.35E-03	0.00E+00	1.35E-03
		Cs-137	<1.44E-03	0.00E+00	1.44E-03
		Be-7	1.83E-01	3.95E-02	2.39E-02
		K-40	<2.54E-02	0.00E+00	2.54E-02
465571	12/27/2017 - 1/3/2018	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.73E-02	3.86E-03	3.41E-03
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<1.27E-02	0.00E+00	1.27E-02
		Be-7	1.90E-01	9.42E-02	1.32E-01
		K-40	1.42E-01	9.73E-02	1.27E-01

## Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431782	12/28/2016 - 1/4/2017	Beta	1.13E-02	2.52E-03	3.14E-03
432179	1/4/2017 - 1/10/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.02E-02	2.93E-03	2.95E-03
432887	1/10/2017 - 1/17/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.55E-02	2.83E-03	3.27E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
433284	1/17/2017 - 1/24/2017	Beta	1.16E-02	2.39E-03	3.00E-03
433701	1/24/2017 - 1/31/2017	Beta	1.64E-02	2.63E-03	3.02E-03
434436	1/31/2017 - 2/7/2017	Beta	2.52E-02	3.28E-03	3.20E-03
435083	2/7/2017 - 2/14/2017	Beta	2.03E-02	3.04E-03	3.19E-03
435790	2/14/2017 - 2/21/2017	Beta	1.87E-02	2.72E-03	2.96E-03
436240	2/21/2017 - 2/28/2017	Beta	2.16E-02	3.10E-03	3.11E-03
436691	2/28/2017 - 3/7/2017	Beta	2.21E-02	2.78E-03	2.67E-03
437555	3/7/2017 - 3/14/2017	Beta	1.54E-02	2.83E-03	3.25E-03
438282	3/14/2017 - 3/21/2017	Beta	1.81E-02	2.59E-03	2.67E-03
438785	3/21/2017 - 3/28/2017	Beta	1.93E-02	2.97E-03	3.14E-03
439141	12/28/2016 - 3/28/2017	Cs-134	<7.18E-04	0.00E+00	7.18E-04
		Cs-137	<5.68E-04	0.00E+00	5.68E-04
		Be-7	1.82E-01	2.67E-02	1.24E-02
		K-40	1.71E-02	7.15E-03	1.93E-03
439135	3/28/2017 - 4/4/2017	Beta	1.05E-02	2.60E-03	3.41E-03
439984	4/4/2017 - 4/11/2017	Beta	1.71E-02	2.56E-03	2.70E-03
440579	4/11/2017 - 4/18/2017	Beta	2.42E-02	2.88E-03	2.70E-03
441393	4/18/2017 - 4/25/2017	Beta	1.16E-02	2.63E-03	3.30E-03
441838	4/25/2017 - 5/2/2017	Beta	1.63E-02	2.88E-03	3.24E-03
442269	5/2/2017 - 5/9/2017	Beta	2.03E-02	3.10E-03	3.31E-03
442852	5/9/2017 - 5/15/2017	Beta	2.16E-02	3.45E-03	3.82E-03
443280	5/15/2017 - 5/23/2017	Beta	2.50E-02	2.71E-03	2.43E-03
443838	5/23/2017 - 5/31/2017	Beta	1.76E-02	2.67E-03	2.81E-03
444240	5/31/2017 - 6/6/2017	Beta	2.37E-02	3.16E-03	3.19E-03
445302	6/6/2017 - 6/13/2017	Beta	1.93E-02	2.72E-03	2.86E-03
446301	6/13/2017 - 6/20/2017	Beta	1.52E-02	2.53E-03	2.92E-03





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
446805	6/20/2017 - 6/27/2017	Beta	1.74E-02	3.00E-03	3.49E-03
447152	3/28/2017 - 6/27/2017	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<5.07E-04	0.00E+00	5.07E-04
		Cs-137	<5.60E-04	0.00E+00	5.60E-04
		Be-7	1.51E-01	2.37E-02	1.49E-02
		K-40	<1.37E-02	0.00E+00	1.37E-02
447146	6/27/2017 - 7/3/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.08E-02	3.30E-03	3.43E-03
447784	7/3/2017 - 7/11/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.87E-02	2.77E-03	2.87E-03
448248	7/11/2017 - 7/18/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.39E-02	2.89E-03	3.66E-03
448874	7/18/2017 - 7/25/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.74E-02	3.83E-03	3.21E-03
449198	7/25/2017 - 8/1/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.22E-02	2.75E-03	2.60E-03
449929	8/1/2017 - 8/8/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.68E-02	3.00E-03	2.73E-03
450174	8/8/2017 - 8/15/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.71E-02	2.97E-03	3.47E-03
450707	8/15/2017 - 8/22/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.22E-02	2.87E-03	2.89E-03
451166	8/22/2017 - 8/29/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.37E-02	2.92E-03	2.91E-03
451520	8/29/2017 - 9/5/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.78E-02	2.57E-03	2.69E-03
452324	9/5/2017 - 9/12/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.71E-02	2.63E-03	2.86E-03
452767	9/12/2017 - 9/19/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	3.11E-02	3.18E-03	2.72E-03
453421	9/19/2017 - 9/26/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	4.01E-02	3.98E-03	3.35E-03
454185	6/27/2017 - 9/26/2017	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<1.09E-03	0.00E+00	1.09E-03
		Cs-137	<1.71E-03	0.00E+00	1.71E-03
		Be-7	1.64E-01	4.06E-02	3.32E-02
		K-40	<2.74E-02	0.00E+00	2.74E-02
454179	9/26/2017 - 10/3/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.53E-02	3.34E-03	3.43E-03
455039	10/3/2017 - 10/10/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.68E-02	2.81E-03	3.02E-03
455394	10/10/2017 - 10/17/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.40E-02	2.35E-03	2.54E-03
456019	10/17/2017 - 10/24/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.92E-02	3.18E-03	3.00E-03
461395	10/24/2017 - 10/30/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.22E-02	3.01E-03	2.99E-03
461941	10/30/2017 - 11/7/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	2.95E-02	2.89E-03	2.44E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
462577	11/7/2017 - 11/13/2017	Beta	1.93E-02	2.97E-03	3.24E-03
463069	11/13/2017 - 11/20/2017	Beta	3.09E-02	3.57E-03	3.24E-03
463485	11/20/2017 - 11/28/2017	Beta	3.26E-02	3.28E-03	2.47E-03
464144	11/28/2017 - 12/5/2017	Beta	4.10E-02	3.88E-03	3.11E-03
464674	12/5/2017 - 12/12/2017	Beta	3.20E-02	3.57E-03	3.16E-03
464943	12/12/2017 - 12/19/2017	Beta	3.28E-02	3.60E-03	3.18E-03
465190	12/19/2017 - 12/27/2017	Beta	2.53E-02	2.93E-03	2.63E-03
465578	9/26/2017 - 12/27/2017	Beta			
		Cs-134	<1.43E-03	0.00E+00	1.43E-03
		Cs-137	<1.17E-03	0.00E+00	1.17E-03
		Be-7	1.49E-01	3.56E-02	2.89E-02
		K-40	<2.76E-02	0.00E+00	2.76E-02
465572	12/27/2017 - 1/3/2018	Beta	3.54E-02	3.77E-03	3.38E-03
		Cs-134	<1.27E-02	0.00E+00	1.27E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	2.38E-01	8.64E-02	1.01E-01
		K-40	<1.99E-01	0.00E+00	1.99E-01

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
431783	12/28/2016 - 1/4/2017	Beta	1.02E-02	2.48E-03	3.18E-03
432180	1/4/2017 - 1/10/2017	Beta	2.17E-02	2.99E-03	2.92E-03
432888	1/10/2017 - 1/17/2017	Beta	1.86E-02	2.98E-03	3.27E-03
433285	1/17/2017 - 1/24/2017	Beta	1.09E-02	2.36E-03	2.99E-03
433702	1/24/2017 - 1/31/2017	Beta	1.68E-02	2.66E-03	3.04E-03
434437	1/31/2017 - 2/7/2017	Beta	2.84E-02	3.41E-03	3.19E-03
435084	2/7/2017 - 2/14/2017	Beta	1.99E-02	3.00E-03	3.18E-03
435791	2/14/2017 - 2/21/2017	Beta	2.10E-02	2.82E-03	2.96E-03
436241	2/21/2017 - 2/28/2017	Beta	1.84E-02	2.94E-03	3.12E-03
436692	2/28/2017 - 3/7/2017	Beta	2.25E-02	2.80E-03	2.66E-03
437556	3/7/2017 - 3/14/2017	Beta	1.69E-02	2.91E-03	3.24E-03
438283	3/14/2017 - 3/21/2017	Beta	2.37E-02	2.85E-03	2.68E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
438786	3/21/2017 - 3/28/2017	Beta	1.65E-02	2.84E-03	3.16E-03
439142	12/28/2016 - 3/28/2017	Cs-134	<5.69E-04	0.00E+00	5.69E-04
		Cs-137	<5.63E-04	0.00E+00	5.63E-04
		Be-7	1.64E-01	2.39E-02	1.11E-02
		K-40	<1.32E-02	0.00E+00	1.32E-02
439136	3/28/2017 - 4/4/2017	Beta	1.20E-02	2.68E-03	3.39E-03
439985	4/4/2017 - 4/11/2017	Beta	1.70E-02	2.55E-03	2.70E-03
440580	4/11/2017 - 4/18/2017	Beta	2.46E-02	2.89E-03	2.69E-03
441394	4/18/2017 - 4/25/2017	Beta	1.09E-02	2.60E-03	3.33E-03
441839	4/25/2017 - 5/2/2017	Beta	1.21E-02	2.63E-03	3.24E-03
442270	5/2/2017 - 5/9/2017	Beta	1.73E-02	2.96E-03	3.31E-03
442853	5/9/2017 - 5/15/2017	Beta	1.89E-02	3.31E-03	3.81E-03
443281	5/15/2017 - 5/23/2017	Beta	2.63E-02	2.79E-03	2.46E-03
443839	5/23/2017 - 5/31/2017	Beta	1.63E-02	2.57E-03	2.77E-03
444241	5/31/2017 - 6/6/2017	Beta	2.74E-02	3.35E-03	3.22E-03
445303	6/6/2017 - 6/13/2017	Beta	1.84E-02	2.67E-03	2.83E-03
446302	6/13/2017 - 6/20/2017	Beta	1.89E-02	2.72E-03	2.94E-03
446806	6/20/2017 - 6/27/2017	Beta	1.57E-02	2.91E-03	3.48E-03
447153	3/28/2017 - 6/27/2017	Cs-134	<6.26E-04	0.00E+00	6.26E-04
		Cs-137	<6.19E-04	0.00E+00	6.19E-04
		Be-7	1.57E-01	2.50E-02	1.45E-02
		K-40	<1.40E-02	0.00E+00	1.40E-02
447147	6/27/2017 - 7/3/2017	Beta	1.98E-02	3.25E-03	3.43E-03
447785	7/3/2017 - 7/11/2017	Beta	1.92E-02	2.79E-03	2.87E-03
448249	7/11/2017 - 7/18/2017	Beta	1.94E-02	3.18E-03	3.69E-03
448875	7/18/2017 - 7/25/2017	Beta	3.36E-02	3.67E-03	3.19E-03
449199	7/25/2017 - 8/1/2017	Beta	2.55E-02	2.91E-03	2.62E-03
449930	8/1/2017 - 8/8/2017	Beta	2.14E-02	2.76E-03	2.71E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
450175	8/8/2017 - 8/15/2017	Beta	1.69E-02	2.98E-03	3.50E-03
450708	8/15/2017 - 8/22/2017	Beta	2.88E-02	3.13E-03	2.87E-03
451167	8/22/2017 - 8/29/2017	Beta	2.60E-02	3.03E-03	2.94E-03
451521	8/29/2017 - 9/5/2017	Beta	1.51E-02	2.43E-03	2.68E-03
452325	9/5/2017 - 9/12/2017	Beta	1.88E-02	2.71E-03	2.88E-03
452768	9/12/2017 - 9/19/2017	Beta	3.10E-02	3.17E-03	2.71E-03
453422	9/19/2017 - 9/26/2017	Beta	4.09E-02	3.99E-03	3.32E-03
454186	6/27/2017 - 9/26/2017	Cs-134	<1.38E-03	0.00E+00	1.38E-03
		Cs-137	<2.11E-03	0.00E+00	2.11E-03
		Be-7	1.55E-01	4.26E-02	4.32E-02
		K-40	<2.89E-02	0.00E+00	2.89E-02
454180	9/26/2017 - 10/3/2017	Beta	2.46E-02	3.32E-03	3.44E-03
455040	10/3/2017 - 10/10/2017	Beta	1.84E-02	2.91E-03	3.03E-03
455395	10/10/2017 - 10/17/2017	Beta	1.64E-02	2.46E-03	2.52E-03
456020	10/17/2017 - 10/24/2017	Beta	2.84E-02	3.14E-03	3.00E-03
461396	10/24/2017 - 10/30/2017	Beta	2.03E-02	2.92E-03	2.99E-03
461942	10/30/2017 - 11/7/2017	Beta	3.16E-02	2.97E-03	2.45E-03
462578	11/7/2017 - 11/13/2017	Beta	2.03E-02	3.00E-03	3.21E-03
463070	11/13/2017 - 11/20/2017	Beta	2.82E-02	3.46E-03	3.24E-03
463486	11/20/2017 - 11/28/2017	Beta	3.27E-02	3.28E-03	2.46E-03
464145	11/28/2017 - 12/5/2017	Beta	3.11E-02	3.51E-03	3.14E-03
464675	12/5/2017 - 12/12/2017	Beta	2.75E-02	3.36E-03	3.13E-03
464944	12/12/2017 - 12/19/2017	Beta	3.25E-02	3.59E-03	3.18E-03
465191	12/19/2017 - 12/27/2017	Beta	2.75E-02	3.02E-03	2.63E-03
465579	9/26/2017 - 12/27/2017	Cs-134	<1.03E-03	0.00E+00	1.03E-03
		Cs-137	<1.62E-03	0.00E+00	1.62E-03
		Be-7	1.66E-01	3.89E-02	3.20E-02
		K-40	2.15E-02	1.40E-02	1.56E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465573	12/27/2017 - 1/3/2018	Beta	3.43E-02	3.75E-03	3.42E-03
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.34E-02	0.00E+00	1.34E-02
		Be-7	<1.74E-01	0.00E+00	1.74E-01
		K-40	1.76E-01	1.00E-01	1.02E-01

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431784	12/28/2016 - 1/4/2017	Beta	1.47E-02	2.72E-03	3.15E-03
432181	1/4/2017 - 1/10/2017	Beta	2.33E-02	3.09E-03	2.94E-03
432889	1/10/2017 - 1/17/2017	Beta	2.00E-02	3.05E-03	3.27E-03
433286	1/17/2017 - 1/24/2017	Beta	1.13E-02	2.38E-03	3.00E-03
433703	1/24/2017 - 1/31/2017	Beta	1.75E-02	2.68E-03	3.03E-03
434438	1/31/2017 - 2/7/2017	Beta	2.75E-02	3.38E-03	3.19E-03
435085	2/7/2017 - 2/14/2017	Beta	1.90E-02	2.98E-03	3.19E-03
435792	2/14/2017 - 2/21/2017	Beta	2.17E-02	2.86E-03	2.96E-03
436242	2/21/2017 - 2/28/2017	Beta	1.89E-02	2.96E-03	3.12E-03
436693	2/28/2017 - 3/7/2017	Beta	2.30E-02	2.82E-03	2.66E-03
437557	3/7/2017 - 3/14/2017	Beta	1.69E-02	2.92E-03	3.25E-03
438284	3/14/2017 - 3/21/2017	Beta	1.95E-02	2.66E-03	2.67E-03
438787	3/21/2017 - 3/28/2017	Beta	2.12E-02	3.07E-03	3.15E-03
439143	12/28/2016 - 3/28/2017	Cs-134	<8.33E-04	0.00E+00	8.33E-04
		Cs-137	<5.88E-04	0.00E+00	5.88E-04
		Be-7	1.72E-01	2.60E-02	1.28E-02
		K-40	<1.32E-02	0.00E+00	1.32E-02
439137	3/28/2017 - 4/4/2017	Beta	1.14E-02	2.65E-03	3.40E-03
439986	4/4/2017 - 4/11/2017	Beta	1.85E-02	2.63E-03	2.70E-03
440581	4/11/2017 - 4/18/2017	Beta	2.48E-02	2.90E-03	2.70E-03
441395	4/18/2017 - 4/25/2017	Beta	1.15E-02	2.63E-03	3.31E-03
441840	4/25/2017 - 5/2/2017	Beta	1.72E-02	2.92E-03	3.23E-03
442271	5/2/2017 - 5/9/2017	Beta	1.80E-02	2.99E-03	3.31E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
442854	5/9/2017 - 5/15/2017	Beta	2.30E-02	3.53E-03	3.84E-03
443282	5/15/2017 - 5/23/2017	Beta	2.23E-02	2.61E-03	2.45E-03
443840	5/23/2017 - 5/31/2017	Beta	1.35E-02	2.44E-03	2.78E-03
444242	5/31/2017 - 6/6/2017	Beta	2.40E-02	3.20E-03	3.21E-03
445304	6/6/2017 - 6/13/2017	Beta	1.81E-02	2.66E-03	2.84E-03
446303	6/13/2017 - 6/20/2017	Beta	1.63E-02	2.59E-03	2.93E-03
446807	6/20/2017 - 6/27/2017	Beta	1.63E-02	2.94E-03	3.47E-03
447154	3/28/2017 - 6/27/2017	Cs-134	<6.48E-04	0.00E+00	6.48E-04
		Cs-137	<4.21E-04	0.00E+00	4.21E-04
		Be-7	1.54E-01	2.36E-02	6.81E-03
		K-40	<1.29E-02	0.00E+00	1.29E-02
447148	6/27/2017 - 7/3/2017	Beta	2.32E-02	3.43E-03	3.43E-03
447786	7/3/2017 - 7/11/2017	Beta	1.53E-02	2.60E-03	2.88E-03
448250	7/11/2017 - 7/18/2017	Beta	1.41E-02	2.91E-03	3.67E-03
448876	7/18/2017 - 7/25/2017	Beta	3.33E-02	3.66E-03	3.20E-03
449200	7/25/2017 - 8/1/2017	Beta	2.73E-02	2.98E-03	2.60E-03
449931	8/1/2017 - 8/8/2017	Beta	2.82E-02	3.06E-03	2.73E-03
450176	8/8/2017 - 8/15/2017	Beta	1.87E-02	3.06E-03	3.48E-03
450709	8/15/2017 - 8/22/2017	Beta	2.57E-02	3.01E-03	2.88E-03
451168	8/22/2017 - 8/29/2017	Beta	2.72E-02	3.09E-03	2.93E-03
451522	8/29/2017 - 9/5/2017	Beta	1.93E-02	2.63E-03	2.68E-03
452326	9/5/2017 - 9/12/2017	Beta	1.86E-02	2.70E-03	2.87E-03
452769	9/12/2017 - 9/19/2017	Beta	3.00E-02	3.13E-03	2.72E-03
453423	9/19/2017 - 9/26/2017	Beta	3.93E-02	3.95E-03	3.34E-03
454187	6/27/2017 - 9/26/2017	Cs-134	<9.74E-04	0.00E+00	9.74E-04
		Cs-137	<1.72E-03	0.00E+00	1.72E-03
		Be-7	1.28E-01	3.62E-02	3.66E-02
		K-40	<3.06E-02	0.00E+00	3.06E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
454181	9/26/2017 - 10/3/2017	Beta	2.78E-02	3.45E-03	3.43E-03
455041	10/3/2017 - 10/10/2017	Beta	1.99E-02	2.99E-03	3.03E-03
455396	10/10/2017 - 10/17/2017	Beta	1.37E-02	2.33E-03	2.53E-03
456021	10/17/2017 - 10/24/2017	Beta	2.77E-02	3.12E-03	3.00E-03
461397	10/24/2017 - 10/30/2017	Beta	2.60E-02	3.18E-03	3.00E-03
461943	10/30/2017 - 11/7/2017	Beta	2.92E-02	2.88E-03	2.44E-03
462579	11/7/2017 - 11/13/2017	Beta	2.15E-02	3.08E-03	3.23E-03
463071	11/13/2017 - 11/20/2017	Beta	3.26E-02	3.65E-03	3.23E-03
463487	11/20/2017 - 11/28/2017	Beta	3.22E-02	3.25E-03	2.46E-03
464146	11/28/2017 - 12/5/2017	Beta	3.90E-02	3.81E-03	3.12E-03
464676	12/5/2017 - 12/12/2017	Beta	2.99E-02	3.47E-03	3.15E-03
464945	12/12/2017 - 12/19/2017	Beta	3.16E-02	3.55E-03	3.18E-03
465192	12/19/2017 - 12/27/2017	Beta	2.46E-02	2.91E-03	2.63E-03
465580	9/26/2017 - 12/27/2017	Cs-134	<1.41E-03	0.00E+00	1.41E-03
		Cs-137	<1.29E-03	0.00E+00	1.29E-03
		Be-7	1.34E-01	3.59E-02	3.61E-02
		K-40	<3.68E-02	0.00E+00	3.68E-02
465574	12/27/2017 - 1/3/2018	Beta	3.26E-02	3.67E-03	3.40E-03
		Cs-134	<1.15E-02	0.00E+00	1.15E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	1.57E-01	8.14E-02	1.12E-01
		K-40	<1.97E-01	0.00E+00	1.97E-01

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431791	12/28/2016 - 1/4/2017	I-131	<8.73E-03	0.00E+00	8.73E-03
		Cs-134	<6.47E-03	0.00E+00	6.47E-03
		Cs-137	<5.70E-03	0.00E+00	5.70E-03
		Be-7	<4.23E-02	0.00E+00	4.23E-02
		K-40	3.21E-01	1.18E-01	2.81E-02
432182	1/4/2017 - 1/10/2017	I-131	<7.62E-03	0.00E+00	7.62E-03
		Cs-134	<8.48E-03	0.00E+00	8.48E-03
		Cs-137	<9.21E-03	0.00E+00	9.21E-03
		Be-7	<6.70E-02	0.00E+00	6.70E-02
		K-40	4.83E-01	1.59E-01	3.27E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432890	1/10/2017 - 1/17/2017	I-131	<7.91E-03	0.00E+00	7.91E-03
		Cs-134	<6.03E-03	0.00E+00	6.03E-03
		Cs-137	<8.19E-03	0.00E+00	8.19E-03
		Be-7	<5.94E-02	0.00E+00	5.94E-02
		K-40	2.91E-01	1.49E-01	1.89E-01
433287	1/17/2017 - 1/24/2017	I-131	<8.29E-03	0.00E+00	8.29E-03
		Cs-134	<6.01E-03	0.00E+00	6.01E-03
		Cs-137	<4.59E-03	0.00E+00	4.59E-03
		Be-7	<5.17E-02	0.00E+00	5.17E-02
		K-40	4.24E-01	1.45E-01	1.03E-01
433704	1/24/2017 - 1/31/2017	I-131	<1.08E-02	0.00E+00	1.08E-02
		Cs-134	<6.65E-03	0.00E+00	6.65E-03
		Cs-137	<6.80E-03	0.00E+00	6.80E-03
		Be-7	<5.70E-02	0.00E+00	5.70E-02
		K-40	3.77E-01	1.51E-01	1.52E-01
434439	1/31/2017 - 2/7/2017	I-131	<6.87E-03	0.00E+00	6.87E-03
		Cs-134	<6.60E-03	0.00E+00	6.60E-03
		Cs-137	<5.82E-03	0.00E+00	5.82E-03
		Be-7	<6.29E-02	0.00E+00	6.29E-02
		K-40	3.41E-01	1.55E-01	1.83E-01
435086	2/7/2017 - 2/14/2017	I-131	<8.72E-03	0.00E+00	8.72E-03
		Cs-134	<7.70E-03	0.00E+00	7.70E-03
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<6.10E-02	0.00E+00	6.10E-02
		K-40	<2.92E-01	0.00E+00	2.92E-01
435793	2/14/2017 - 2/21/2017	I-131	<9.67E-03	0.00E+00	9.67E-03
		Cs-134	<6.55E-03	0.00E+00	6.55E-03
		Cs-137	<1.08E-02	0.00E+00	1.08E-02
		Be-7	<6.10E-02	0.00E+00	6.10E-02
		K-40	<2.16E-01	0.00E+00	2.16E-01
436243	2/21/2017 - 2/28/2017	I-131	<8.59E-03	0.00E+00	8.59E-03
		Cs-134	<8.10E-03	0.00E+00	8.10E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<6.10E-02	0.00E+00	6.10E-02
		K-40	2.52E-01	1.32E-01	1.57E-01
436694	2/28/2017 - 3/7/2017	I-131	<8.18E-03	0.00E+00	8.18E-03
		Cs-134	<5.06E-03	0.00E+00	5.06E-03
		Cs-137	<9.55E-03	0.00E+00	9.55E-03
		Be-7	<5.19E-02	0.00E+00	5.19E-02
		K-40	1.71E-01	1.09E-01	1.35E-01
437558	3/7/2017 - 3/14/2017	I-131	<8.28E-03	0.00E+00	8.28E-03
		Cs-134	<6.77E-03	0.00E+00	6.77E-03
		Cs-137	<4.39E-03	0.00E+00	4.39E-03
		Be-7	<6.39E-02	0.00E+00	6.39E-02
		K-40	1.47E-01	9.46E-02	1.14E-01
438285	3/14/2017 - 3/21/2017	I-131	<7.33E-03	0.00E+00	7.33E-03
		Cs-134	<7.12E-03	0.00E+00	7.12E-03
		Cs-137	<9.51E-03	0.00E+00	9.51E-03
		Be-7	<5.69E-02	0.00E+00	5.69E-02
		K-40	<2.49E-01	0.00E+00	2.49E-01





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
438788	3/21/2017 - 3/28/2017	I-131	<8.11E-03	0.00E+00	8.11E-03
		Cs-134	<6.12E-03	0.00E+00	6.12E-03
		Cs-137	<8.94E-03	0.00E+00	8.94E-03
		Be-7	<5.74E-02	0.00E+00	5.74E-02
		K-40	1.71E-01	8.67E-02	2.89E-02
439144	3/28/2017 - 4/4/2017	I-131	<9.09E-03	0.00E+00	9.09E-03
		Cs-134	<5.18E-03	0.00E+00	5.18E-03
		Cs-137	<9.48E-03	0.00E+00	9.48E-03
		Be-7	<5.78E-02	0.00E+00	5.78E-02
		K-40	1.77E-01	1.03E-01	1.20E-01
439987	4/4/2017 - 4/11/2017	I-131	<9.40E-03	0.00E+00	9.40E-03
		Cs-134	<8.95E-03	0.00E+00	8.95E-03
		Cs-137	<1.07E-02	0.00E+00	1.07E-02
		Be-7	<5.31E-02	0.00E+00	5.31E-02
		K-40	4.47E-01	1.58E-01	1.32E-01
440582	4/11/2017 - 4/18/2017	I-131	<9.20E-03	0.00E+00	9.20E-03
		Cs-134	<5.88E-03	0.00E+00	5.88E-03
		Cs-137	<8.15E-03	0.00E+00	8.15E-03
		Be-7	<4.66E-02	0.00E+00	4.66E-02
		K-40	3.78E-01	1.35E-01	3.10E-02
441396	4/18/2017 - 4/25/2017	I-131	<9.51E-03	0.00E+00	9.51E-03
		Cs-134	<5.73E-03	0.00E+00	5.73E-03
		Cs-137	<8.89E-03	0.00E+00	8.89E-03
		Be-7	<6.08E-02	0.00E+00	6.08E-02
		K-40	3.94E-01	1.42E-01	1.17E-01
441841	4/25/2017 - 5/2/2017	I-131	<8.54E-03	0.00E+00	8.54E-03
		Cs-134	<7.00E-03	0.00E+00	7.00E-03
		Cs-137	<7.97E-03	0.00E+00	7.97E-03
		Be-7	<7.19E-02	0.00E+00	7.19E-02
		K-40	<3.34E-01	0.00E+00	3.34E-01
442272	5/2/2017 - 5/9/2017	I-131	<8.17E-03	0.00E+00	8.17E-03
		Cs-134	<6.57E-03	0.00E+00	6.57E-03
		Cs-137	<7.31E-03	0.00E+00	7.31E-03
		Be-7	<5.20E-02	0.00E+00	5.20E-02
		K-40	3.78E-01	1.35E-01	3.11E-02
442855	5/9/2017 - 5/15/2017	I-131	<4.44E-03	0.00E+00	4.44E-03
		Cs-134	<8.04E-03	0.00E+00	8.04E-03
		Cs-137	<8.53E-03	0.00E+00	8.53E-03
		Be-7	<4.85E-02	0.00E+00	4.85E-02
		K-40	3.61E-01	1.46E-01	1.23E-01
443283	5/15/2017 - 5/23/2017	I-131	<6.66E-03	0.00E+00	6.66E-03
		Cs-134	<6.03E-03	0.00E+00	6.03E-03
		Cs-137	<3.91E-03	0.00E+00	3.91E-03
		Be-7	<3.20E-02	0.00E+00	3.20E-02
		K-40	3.65E-01	1.20E-01	2.47E-02
443841	5/23/2017 - 5/31/2017	I-131	<4.65E-03	0.00E+00	4.65E-03
		Cs-134	<7.01E-03	0.00E+00	7.01E-03
		Cs-137	<8.28E-03	0.00E+00	8.28E-03
		Be-7	<3.66E-02	0.00E+00	3.66E-02
		K-40	1.37E-01	8.08E-02	8.71E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
444243	5/31/2017 - 6/6/2017	I-131	<6.19E-03	0.00E+00	6.19E-03
		Cs-134	<8.17E-03	0.00E+00	8.17E-03
		Cs-137	<9.31E-03	0.00E+00	9.31E-03
		Be-7	<5.93E-02	0.00E+00	5.93E-02
		K-40	2.35E-01	1.13E-01	3.54E-02
445305	6/6/2017 - 6/13/2017	I-131	<7.97E-03	0.00E+00	7.97E-03
		Cs-134	<7.55E-03	0.00E+00	7.55E-03
		Cs-137	<9.40E-03	0.00E+00	9.40E-03
		Be-7	<5.59E-02	0.00E+00	5.59E-02
		K-40	<1.92E-01	0.00E+00	1.92E-01
446304	6/13/2017 - 6/20/2017	I-131	<7.29E-03	0.00E+00	7.29E-03
		Cs-134	<6.28E-03	0.00E+00	6.28E-03
		Cs-137	<1.12E-02	0.00E+00	1.12E-02
		Be-7	<4.14E-02	0.00E+00	4.14E-02
		K-40	<2.35E-01	0.00E+00	2.35E-01
446808	6/20/2017 - 6/27/2017	I-131	<8.22E-03	0.00E+00	8.22E-03
		Cs-134	<7.96E-03	0.00E+00	7.96E-03
		Cs-137	<1.03E-02	0.00E+00	1.03E-02
		Be-7	<6.09E-02	0.00E+00	6.09E-02
		K-40	2.34E-01	9.97E-02	2.75E-02
447155	6/27/2017 - 7/3/2017	I-131	<8.51E-03	0.00E+00	8.51E-03
		Cs-134	<5.92E-03	0.00E+00	5.92E-03
		Cs-137	<1.03E-02	0.00E+00	1.03E-02
		Be-7	<5.81E-02	0.00E+00	5.81E-02
		K-40	2.82E-01	1.18E-01	3.18E-02
447787	7/3/2017 - 7/11/2017	I-131	<5.83E-03	0.00E+00	5.83E-03
		Cs-134	<6.30E-03	0.00E+00	6.30E-03
		Cs-137	<9.27E-03	0.00E+00	9.27E-03
		Be-7	<4.64E-02	0.00E+00	4.64E-02
		K-40	<1.64E-01	0.00E+00	1.64E-01
448251	7/11/2017 - 7/18/2017	I-131	<6.64E-03	0.00E+00	6.64E-03
		Cs-134	<8.65E-03	0.00E+00	8.65E-03
		Cs-137	<6.38E-03	0.00E+00	6.38E-03
		Be-7	<6.40E-02	0.00E+00	6.40E-02
		K-40	1.52E-01	7.98E-02	2.75E-02
448877	7/18/2017 - 7/25/2017	I-131	<6.78E-03	0.00E+00	6.78E-03
		Cs-134	<8.02E-03	0.00E+00	8.02E-03
		Cs-137	<1.62E-03	0.00E+00	1.62E-03
		Be-7	<5.74E-02	0.00E+00	5.74E-02
		K-40	<1.63E-01	0.00E+00	1.63E-01
449201	7/25/2017 - 8/1/2017	I-131	<9.68E-03	0.00E+00	9.68E-03
		Cs-134	<5.06E-03	0.00E+00	5.06E-03
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<4.04E-02	0.00E+00	4.04E-02
		K-40	<2.44E-01	0.00E+00	2.44E-01
449932	8/1/2017 - 8/8/2017	I-131	<8.59E-03	0.00E+00	8.59E-03
		Cs-134	<5.52E-03	0.00E+00	5.52E-03
		Cs-137	<9.01E-03	0.00E+00	9.01E-03
		Be-7	<4.86E-02	0.00E+00	4.86E-02
		K-40	<2.62E-01	0.00E+00	2.62E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
450177	8/8/2017 - 8/15/2017	I-131	<8.67E-03	0.00E+00	8.67E-03
		Cs-134	<6.75E-03	0.00E+00	6.75E-03
		Cs-137	<9.92E-03	0.00E+00	9.92E-03
		Be-7	<4.61E-02	0.00E+00	4.61E-02
		K-40	1.50E-01	8.75E-02	8.77E-02
450710	8/15/2017 - 8/22/2017	I-131	<1.06E-02	0.00E+00	1.06E-02
		Cs-134	<7.21E-03	0.00E+00	7.21E-03
		Cs-137	<1.24E-02	0.00E+00	1.24E-02
		Be-7	<6.55E-02	0.00E+00	6.55E-02
		K-40	<2.17E-01	0.00E+00	2.17E-01
451169	8/22/2017 - 8/29/2017	I-131	<9.28E-03	0.00E+00	9.28E-03
		Cs-134	<6.56E-03	0.00E+00	6.56E-03
		Cs-137	<9.88E-03	0.00E+00	9.88E-03
		Be-7	<5.97E-02	0.00E+00	5.97E-02
		K-40	1.80E-01	1.01E-01	1.10E-01
451523	8/29/2017 - 9/5/2017	I-131	<6.96E-03	0.00E+00	6.96E-03
		Cs-134	<7.33E-03	0.00E+00	7.33E-03
		Cs-137	<1.12E-02	0.00E+00	1.12E-02
		Be-7	<4.46E-02	0.00E+00	4.46E-02
		K-40	<2.67E-01	0.00E+00	2.67E-01
452327	9/5/2017 - 9/12/2017	I-131	<7.88E-03	0.00E+00	7.88E-03
		Cs-134	<7.76E-03	0.00E+00	7.76E-03
		Cs-137	<1.06E-02	0.00E+00	1.06E-02
		Be-7	<6.55E-02	0.00E+00	6.55E-02
		K-40	1.32E-01	1.16E-01	1.75E-01
452770	9/12/2017 - 9/19/2017	I-131	<7.39E-03	0.00E+00	7.39E-03
		Cs-134	<6.95E-03	0.00E+00	6.95E-03
		Cs-137	<8.02E-03	0.00E+00	8.02E-03
		Be-7	<2.91E-02	0.00E+00	2.91E-02
		K-40	<2.05E-01	0.00E+00	2.05E-01
453424	9/19/2017 - 9/26/2017	I-131	<7.43E-03	0.00E+00	7.43E-03
		Cs-134	<1.12E-02	0.00E+00	1.12E-02
		Cs-137	<9.40E-03	0.00E+00	9.40E-03
		Be-7	<5.56E-02	0.00E+00	5.56E-02
		K-40	1.02E-01	1.34E-01	2.20E-01
454188	9/26/2017 - 10/3/2017	I-131	<1.52E-02	0.00E+00	1.52E-02
		Cs-134	<1.75E-02	0.00E+00	1.75E-02
		Cs-137	<1.27E-02	0.00E+00	1.27E-02
		Be-7	<9.63E-02	0.00E+00	9.63E-02
		K-40	2.18E-01	1.49E-01	2.08E-01
455042	10/3/2017 - 10/10/2017	I-131	<2.45E-02	0.00E+00	2.45E-02
		Cs-134	<1.31E-02	0.00E+00	1.31E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	3.69E-01	1.59E-01	1.56E-01
455397	10/10/2017 - 10/17/2017	I-131	<3.73E-02	0.00E+00	3.73E-02
		Cs-134	<1.54E-02	0.00E+00	1.54E-02
		Cs-137	<1.97E-02	0.00E+00	1.97E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	4.11E-01	1.78E-01	1.94E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
456022	10/17/2017 - 10/24/2017	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.07E-01	2.03E-01	2.28E-01
461398	10/24/2017 - 10/30/2017	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.89E-02	0.00E+00	1.89E-02
		Cs-137	<1.93E-02	0.00E+00	1.93E-02
		Be-7	<1.25E-01	0.00E+00	1.25E-01
		K-40	3.64E-01	2.09E-01	2.83E-01
461944	10/30/2017 - 11/7/2017	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<9.60E-02	0.00E+00	9.60E-02
		K-40	4.39E-01	1.78E-01	1.99E-01
462580	11/7/2017 - 11/13/2017	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<2.07E-02	0.00E+00	2.07E-02
		Cs-137	<2.16E-02	0.00E+00	2.16E-02
		Be-7	<1.47E-01	0.00E+00	1.47E-01
		K-40	5.61E-01	1.87E-01	4.00E-02
463072	11/13/2017 - 11/20/2017	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.93E-02	0.00E+00	1.93E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	4.24E-01	1.93E-01	2.32E-01
463488	11/20/2017 - 11/28/2017	I-131	<1.90E-02	0.00E+00	1.90E-02
		Cs-134	<1.28E-02	0.00E+00	1.28E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	5.02E-01	1.91E-01	2.11E-01
464147	11/28/2017 - 12/5/2017	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.97E-02	0.00E+00	1.97E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	6.01E-01	2.18E-01	2.34E-01
464677	12/5/2017 - 12/12/2017	I-131	<1.97E-02	0.00E+00	1.97E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.37E-02	0.00E+00	1.37E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	4.99E-01	2.03E-01	2.30E-01
464946	12/12/2017 - 12/19/2017	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.93E-02	0.00E+00	1.93E-02
		Cs-137	<2.01E-02	0.00E+00	2.01E-02
		Be-7	<9.68E-02	0.00E+00	9.68E-02
		K-40	5.92E-01	1.91E-01	1.37E-01
465193	12/19/2017 - 12/27/2017	I-131	<2.18E-02	0.00E+00	2.18E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.22E-02	0.00E+00	1.22E-02
		Be-7	<1.09E-01	0.00E+00	1.09E-01
		K-40	4.04E-01	1.77E-01	2.14E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465581	12/27/2017 - 1/3/2018	I-131	<2.99E-02	0.00E+00	2.99E-02
		Cs-134	<1.76E-02	0.00E+00	1.76E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.37E-01	0.00E+00	1.37E-01
		K-40	4.71E-01	1.70E-01	1.28E-01

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431792	12/28/2016 - 1/4/2017	I-131	<8.18E-03	0.00E+00	8.18E-03
		Cs-134	<8.64E-03	0.00E+00	8.64E-03
		Cs-137	<8.90E-03	0.00E+00	8.90E-03
		Be-7	<2.81E-02	0.00E+00	2.81E-02
		K-40	4.17E-01	1.36E-01	2.76E-02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432183	1/4/2017 - 1/10/2017	I-131	<1.06E-02	0.00E+00	1.06E-02
		Cs-134	<9.51E-03	0.00E+00	9.51E-03
		Cs-137	<1.05E-02	0.00E+00	1.05E-02
		Be-7	<6.64E-02	0.00E+00	6.64E-02
		K-40	4.46E-01	2.29E-01	3.12E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432891	1/10/2017 - 1/17/2017	I-131	<7.79E-03	0.00E+00	7.79E-03
		Cs-134	<7.24E-03	0.00E+00	7.24E-03
		Cs-137	<7.20E-03	0.00E+00	7.20E-03
		Be-7	<6.38E-02	0.00E+00	6.38E-02
		K-40	3.02E-01	1.33E-01	1.39E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
433288	1/17/2017 - 1/24/2017	I-131	<9.70E-03	0.00E+00	9.70E-03
		Cs-134	<8.03E-03	0.00E+00	8.03E-03
		Cs-137	<7.20E-03	0.00E+00	7.20E-03
		Be-7	<5.01E-02	0.00E+00	5.01E-02
		K-40	3.92E-01	1.58E-01	1.70E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
433705	1/24/2017 - 1/31/2017	I-131	<7.35E-03	0.00E+00	7.35E-03
		Cs-134	<6.88E-03	0.00E+00	6.88E-03
		Cs-137	<7.94E-03	0.00E+00	7.94E-03
		Be-7	<4.71E-02	0.00E+00	4.71E-02
		K-40	4.90E-01	1.66E-01	1.48E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
434440	1/31/2017 - 2/7/2017	I-131	<9.37E-03	0.00E+00	9.37E-03
		Cs-134	<8.05E-03	0.00E+00	8.05E-03
		Cs-137	<7.88E-03	0.00E+00	7.88E-03
		Be-7	<5.03E-02	0.00E+00	5.03E-02
		K-40	3.62E-01	1.36E-01	1.09E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
435087	2/7/2017 - 2/14/2017	I-131	<8.23E-03	0.00E+00	8.23E-03
		Cs-134	<6.29E-03	0.00E+00	6.29E-03
		Cs-137	<7.83E-03	0.00E+00	7.83E-03
		Be-7	<6.06E-02	0.00E+00	6.06E-02
		K-40	1.54E-01	1.13E-01	1.59E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
435794	2/14/2017 - 2/21/2017	I-131	<8.15E-03	0.00E+00	8.15E-03
		Cs-134	<7.68E-03	0.00E+00	7.68E-03
		Cs-137	<8.35E-03	0.00E+00	8.35E-03
		Be-7	<3.75E-02	0.00E+00	3.75E-02
		K-40	1.64E-01	1.06E-01	1.31E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
436244	2/21/2017 - 2/28/2017	I-131	<6.60E-03	0.00E+00	6.60E-03
		Cs-134	<4.44E-03	0.00E+00	4.44E-03
		Cs-137	<7.78E-03	0.00E+00	7.78E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
436244	2/21/2017 - 2/28/2017	Be-7	<4.14E-02	0.00E+00	4.14E-02
		K-40	<2.39E-01	0.00E+00	2.39E-01
436695	2/28/2017 - 3/7/2017	I-131	<8.14E-03	0.00E+00	8.14E-03
		Cs-134	<8.10E-03	0.00E+00	8.10E-03
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<6.05E-02	0.00E+00	6.05E-02
		K-40	1.99E-01	1.32E-01	1.81E-01
437559	3/7/2017 - 3/14/2017	I-131	<6.84E-03	0.00E+00	6.84E-03
		Cs-134	<8.94E-03	0.00E+00	8.94E-03
		Cs-137	<9.40E-03	0.00E+00	9.40E-03
		Be-7	<7.39E-02	0.00E+00	7.39E-02
		K-40	2.05E-01	1.09E-01	1.12E-01
438286	3/14/2017 - 3/21/2017	I-131	<1.04E-02	0.00E+00	1.04E-02
		Cs-134	<6.11E-03	0.00E+00	6.11E-03
		Cs-137	<1.27E-02	0.00E+00	1.27E-02
		Be-7	<5.71E-02	0.00E+00	5.71E-02
		K-40	<2.71E-01	0.00E+00	2.71E-01
438789	3/21/2017 - 3/28/2017	I-131	<7.43E-03	0.00E+00	7.43E-03
		Cs-134	<6.46E-03	0.00E+00	6.46E-03
		Cs-137	<9.71E-03	0.00E+00	9.71E-03
		Be-7	<5.58E-02	0.00E+00	5.58E-02
		K-40	<2.37E-01	0.00E+00	2.37E-01
439145	3/28/2017 - 4/4/2017	I-131	<8.14E-03	0.00E+00	8.14E-03
		Cs-134	<6.12E-03	0.00E+00	6.12E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<5.28E-02	0.00E+00	5.28E-02
		K-40	2.38E-01	1.17E-01	1.19E-01
439988	4/4/2017 - 4/11/2017	I-131	<5.59E-03	0.00E+00	5.59E-03
		Cs-134	<6.82E-03	0.00E+00	6.82E-03
		Cs-137	<1.63E-03	0.00E+00	1.63E-03
		Be-7	<5.77E-02	0.00E+00	5.77E-02
		K-40	3.82E-01	1.30E-01	2.80E-02
440583	4/11/2017 - 4/18/2017	I-131	<6.79E-03	0.00E+00	6.79E-03
		Cs-134	<5.14E-03	0.00E+00	5.14E-03
		Cs-137	<1.08E-02	0.00E+00	1.08E-02
		Be-7	<2.80E-02	0.00E+00	2.80E-02
		K-40	5.48E-01	1.57E-01	2.75E-02
441397	4/18/2017 - 4/25/2017	I-131	<7.87E-03	0.00E+00	7.87E-03
		Cs-134	<6.41E-03	0.00E+00	6.41E-03
		Cs-137	<7.97E-03	0.00E+00	7.97E-03
		Be-7	<4.71E-02	0.00E+00	4.71E-02
		K-40	<2.95E-01	0.00E+00	2.95E-01
441842	4/25/2017 - 5/2/2017	I-131	<1.21E-02	0.00E+00	1.21E-02
		Cs-134	<5.87E-03	0.00E+00	5.87E-03
		Cs-137	<6.29E-03	0.00E+00	6.29E-03
		Be-7	<3.25E-02	0.00E+00	3.25E-02
		K-40	3.30E-01	1.39E-01	1.26E-01
442273	5/2/2017 - 5/9/2017	I-131	<8.39E-03	0.00E+00	8.39E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
442273	5/2/2017 - 5/9/2017	Cs-134	<6.58E-03	0.00E+00	6.58E-03
		Cs-137	<6.73E-03	0.00E+00	6.73E-03
		Be-7	<3.68E-02	0.00E+00	3.68E-02
		K-40	4.08E-01	1.58E-01	1.62E-01
442856	5/9/2017 - 5/15/2017	I-131	<9.14E-03	0.00E+00	9.14E-03
		Cs-134	<7.29E-03	0.00E+00	7.29E-03
		Cs-137	<9.89E-03	0.00E+00	9.89E-03
		Be-7	<5.17E-02	0.00E+00	5.17E-02
443284	5/15/2017 - 5/23/2017	K-40	4.37E-01	1.62E-01	1.19E-01
		I-131	<6.13E-03	0.00E+00	6.13E-03
		Cs-134	<6.81E-03	0.00E+00	6.81E-03
		Cs-137	<8.46E-03	0.00E+00	8.46E-03
443842	5/23/2017 - 5/31/2017	Be-7	<6.03E-02	0.00E+00	6.03E-02
		K-40	3.47E-01	1.26E-01	1.01E-01
		I-131	<7.19E-03	0.00E+00	7.19E-03
		Cs-134	<8.08E-03	0.00E+00	8.08E-03
444244	5/31/2017 - 6/6/2017	Cs-137	<5.73E-03	0.00E+00	5.73E-03
		Be-7	<6.03E-02	0.00E+00	6.03E-02
		K-40	9.47E-02	8.04E-02	1.14E-01
		I-131	<9.53E-03	0.00E+00	9.53E-03
445306	6/6/2017 - 6/13/2017	Cs-134	<5.78E-03	0.00E+00	5.78E-03
		Cs-137	<1.16E-02	0.00E+00	1.16E-02
		Be-7	<6.91E-02	0.00E+00	6.91E-02
		K-40	3.65E-01	1.42E-01	3.54E-02
446305	6/13/2017 - 6/20/2017	I-131	<3.92E-03	0.00E+00	3.92E-03
		Cs-134	<6.94E-03	0.00E+00	6.94E-03
		Cs-137	<8.63E-03	0.00E+00	8.63E-03
		Be-7	<4.71E-02	0.00E+00	4.71E-02
446809	6/20/2017 - 6/27/2017	K-40	2.79E-01	1.30E-01	1.38E-01
		I-131	<9.00E-03	0.00E+00	9.00E-03
		Cs-134	<1.03E-02	0.00E+00	1.03E-02
		Cs-137	<8.76E-03	0.00E+00	8.76E-03
447156	6/27/2017 - 7/3/2017	Be-7	<6.63E-02	0.00E+00	6.63E-02
		K-40	<1.90E-01	0.00E+00	1.90E-01
		I-131	<4.12E-03	0.00E+00	4.12E-03
		Cs-134	<7.77E-03	0.00E+00	7.77E-03
447788	7/3/2017 - 7/11/2017	Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<5.54E-02	0.00E+00	5.54E-02
		K-40	1.99E-01	9.29E-02	2.84E-02
		I-131	<1.28E-02	0.00E+00	1.28E-02
447788	7/3/2017 - 7/11/2017	Cs-134	<1.02E-02	0.00E+00	1.02E-02
		Cs-137	<1.26E-02	0.00E+00	1.26E-02
		Be-7	<6.58E-02	0.00E+00	6.58E-02
		K-40	<2.85E-01	0.00E+00	2.85E-01
447788	7/3/2017 - 7/11/2017	I-131	<8.68E-03	0.00E+00	8.68E-03
		Cs-134	<8.37E-03	0.00E+00	8.37E-03
		Cs-137	<7.01E-03	0.00E+00	7.01E-03
		Be-7	<4.50E-02	0.00E+00	4.50E-02
447788	7/3/2017 - 7/11/2017	K-40	<1.67E-01	0.00E+00	1.67E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
448252	7/11/2017 - 7/18/2017	I-131	<8.80E-03	0.00E+00	8.80E-03
		Cs-134	<5.77E-03	0.00E+00	5.77E-03
		Cs-137	<9.95E-03	0.00E+00	9.95E-03
		Be-7	<7.00E-02	0.00E+00	7.00E-02
		K-40	1.85E-01	1.05E-01	1.22E-01
448878	7/18/2017 - 7/25/2017	I-131	<9.86E-03	0.00E+00	9.86E-03
		Cs-134	<8.02E-03	0.00E+00	8.02E-03
		Cs-137	<1.29E-02	0.00E+00	1.29E-02
		Be-7	<7.04E-02	0.00E+00	7.04E-02
		K-40	2.48E-01	1.20E-01	1.18E-01
449202	7/25/2017 - 8/1/2017	I-131	<6.06E-03	0.00E+00	6.06E-03
		Cs-134	<4.60E-03	0.00E+00	4.60E-03
		Cs-137	<7.13E-03	0.00E+00	7.13E-03
		Be-7	<3.28E-02	0.00E+00	3.28E-02
		K-40	1.38E-01	6.45E-02	6.95E-02
449933	8/1/2017 - 8/8/2017	I-131	<5.82E-03	0.00E+00	5.82E-03
		Cs-134	<6.15E-03	0.00E+00	6.15E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<4.35E-02	0.00E+00	4.35E-02
		K-40	2.72E-01	1.11E-01	2.95E-02
450178	8/8/2017 - 8/15/2017	I-131	<8.70E-03	0.00E+00	8.70E-03
		Cs-134	<7.62E-03	0.00E+00	7.62E-03
		Cs-137	<8.42E-03	0.00E+00	8.42E-03
		Be-7	<4.14E-02	0.00E+00	4.14E-02
		K-40	1.95E-01	9.11E-02	2.78E-02
450711	8/15/2017 - 8/22/2017	I-131	<5.65E-03	0.00E+00	5.65E-03
		Cs-134	<5.33E-03	0.00E+00	5.33E-03
		Cs-137	<7.36E-03	0.00E+00	7.36E-03
		Be-7	<4.44E-02	0.00E+00	4.44E-02
		K-40	3.06E-01	9.40E-02	7.73E-02
451170	8/22/2017 - 8/29/2017	I-131	<5.24E-03	0.00E+00	5.24E-03
		Cs-134	<6.35E-03	0.00E+00	6.35E-03
		Cs-137	<5.51E-03	0.00E+00	5.51E-03
		Be-7	<3.51E-02	0.00E+00	3.51E-02
		K-40	1.57E-01	6.60E-02	6.49E-02
451524	8/29/2017 - 9/5/2017	I-131	<7.51E-03	0.00E+00	7.51E-03
		Cs-134	<5.02E-03	0.00E+00	5.02E-03
		Cs-137	<8.71E-03	0.00E+00	8.71E-03
		Be-7	<4.49E-02	0.00E+00	4.49E-02
		K-40	2.46E-01	1.16E-01	1.18E-01
452328	9/5/2017 - 9/12/2017	I-131	<8.45E-03	0.00E+00	8.45E-03
		Cs-134	<5.90E-03	0.00E+00	5.90E-03
		Cs-137	<9.16E-03	0.00E+00	9.16E-03
		Be-7	<5.93E-02	0.00E+00	5.93E-02
		K-40	<1.97E-01	0.00E+00	1.97E-01
452771	9/12/2017 - 9/19/2017	I-131	<1.02E-02	0.00E+00	1.02E-02
		Cs-134	<3.68E-03	0.00E+00	3.68E-03
		Cs-137	<7.48E-03	0.00E+00	7.48E-03
		Be-7	<6.32E-02	0.00E+00	6.32E-02
		K-40	<2.11E-01	0.00E+00	2.11E-01





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
453425	9/19/2017 - 9/26/2017	I-131	<1.01E-02	0.00E+00	1.01E-02
		Cs-134	<7.71E-03	0.00E+00	7.71E-03
		Cs-137	<1.09E-02	0.00E+00	1.09E-02
		Be-7	<6.67E-02	0.00E+00	6.67E-02
		K-40	3.19E-01	1.18E-01	2.79E-02
454189	9/26/2017 - 10/3/2017	I-131	<1.35E-02	0.00E+00	1.35E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	3.05E-01	1.69E-01	2.24E-01
455043	10/3/2017 - 10/10/2017	I-131	<2.45E-02	0.00E+00	2.45E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	<2.62E-01	0.00E+00	2.62E-01
455398	10/10/2017 - 10/17/2017	I-131	<4.36E-02	0.00E+00	4.36E-02
		Cs-134	<1.82E-02	0.00E+00	1.82E-02
		Cs-137	<1.60E-02	0.00E+00	1.60E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	5.80E-01	2.10E-01	2.17E-01
456023	10/17/2017 - 10/24/2017	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	<3.39E-01	0.00E+00	3.39E-01
461399	10/24/2017 - 10/30/2017	I-131	<2.66E-02	0.00E+00	2.66E-02
		Cs-134	<1.97E-02	0.00E+00	1.97E-02
		Cs-137	<2.18E-02	0.00E+00	2.18E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	4.52E-01	1.96E-01	2.12E-01
461945	10/30/2017 - 11/7/2017	I-131	<1.92E-02	0.00E+00	1.92E-02
		Cs-134	<1.76E-02	0.00E+00	1.76E-02
		Cs-137	<1.26E-02	0.00E+00	1.26E-02
		Be-7	<9.33E-02	0.00E+00	9.33E-02
		K-40	4.17E-01	1.65E-01	1.71E-01
462581	11/7/2017 - 11/13/2017	I-131	<2.84E-02	0.00E+00	2.84E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.94E-02	0.00E+00	1.94E-02
		Be-7	<1.33E-01	0.00E+00	1.33E-01
		K-40	6.88E-01	2.23E-01	1.70E-01
463073	11/13/2017 - 11/20/2017	I-131	<2.21E-02	0.00E+00	2.21E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.61E-01	2.03E-01	2.02E-01
463489	11/20/2017 - 11/28/2017	I-131	<2.05E-02	0.00E+00	2.05E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.46E-02	0.00E+00	1.46E-02
		Be-7	<8.63E-02	0.00E+00	8.63E-02
		K-40	3.72E-01	1.50E-01	1.45E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

## Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
464148	11/28/2017 - 12/5/2017	I-131	<1.66E-02	0.00E+00	1.66E-02
		Cs-134	<1.85E-02	0.00E+00	1.85E-02
		Cs-137	<2.18E-02	0.00E+00	2.18E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	5.16E-01	1.75E-01	1.18E-01
464678	12/5/2017 - 12/12/2017	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	3.57E-01	1.80E-01	2.24E-01
464947	12/12/2017 - 12/19/2017	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<2.05E-02	0.00E+00	2.05E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	5.88E-01	2.13E-01	2.24E-01
465194	12/19/2017 - 12/27/2017	I-131	<1.51E-02	0.00E+00	1.51E-02
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.37E-02	0.00E+00	1.37E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	3.76E-01	1.42E-01	1.16E-01
465582	12/27/2017 - 1/3/2018	I-131	<3.16E-02	0.00E+00	3.16E-02
		Cs-134	<1.46E-02	0.00E+00	1.46E-02
		Cs-137	<1.86E-02	0.00E+00	1.86E-02
		Be-7	<9.53E-02	0.00E+00	9.53E-02
		K-40	4.58E-01	1.92E-01	2.15E-01

## Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431793	12/28/2016 - 1/4/2017	I-131	<9.01E-03	0.00E+00	9.01E-03
		Cs-134	<8.82E-03	0.00E+00	8.82E-03
		Cs-137	<8.89E-03	0.00E+00	8.89E-03
		Be-7	<6.06E-02	0.00E+00	6.06E-02
		K-40	3.89E-01	1.43E-01	1.12E-01
432184	1/4/2017 - 1/10/2017	I-131	<1.01E-02	0.00E+00	1.01E-02
		Cs-134	<7.37E-03	0.00E+00	7.37E-03
		Cs-137	<6.49E-03	0.00E+00	6.49E-03
		Be-7	<5.35E-02	0.00E+00	5.35E-02
		K-40	4.93E-01	1.82E-01	1.77E-01
432892	1/10/2017 - 1/17/2017	I-131	<9.04E-03	0.00E+00	9.04E-03
		Cs-134	<5.52E-03	0.00E+00	5.52E-03
		Cs-137	<5.93E-03	0.00E+00	5.93E-03
		Be-7	<6.43E-02	0.00E+00	6.43E-02
		K-40	4.47E-01	1.45E-01	2.95E-02
433289	1/17/2017 - 1/24/2017	I-131	<6.47E-03	0.00E+00	6.47E-03
		Cs-134	<9.65E-03	0.00E+00	9.65E-03
		Cs-137	<9.58E-03	0.00E+00	9.58E-03
		Be-7	<7.04E-02	0.00E+00	7.04E-02
		K-40	3.70E-01	1.42E-01	1.20E-01
433706	1/24/2017 - 1/31/2017	I-131	<9.02E-03	0.00E+00	9.02E-03
		Cs-134	<6.39E-03	0.00E+00	6.39E-03
		Cs-137	<9.32E-03	0.00E+00	9.32E-03



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
433706	1/24/2017 - 1/31/2017	Be-7	<5.57E-02	0.00E+00	5.57E-02
		K-40	3.54E-01	1.42E-01	1.28E-01
434441	1/31/2017 - 2/7/2017	I-131	<9.40E-03	0.00E+00	9.40E-03
		Cs-134	<6.17E-03	0.00E+00	6.17E-03
		Cs-137	<5.94E-03	0.00E+00	5.94E-03
		Be-7	<6.75E-02	0.00E+00	6.75E-02
		K-40	4.26E-01	1.41E-01	2.96E-02
435088	2/7/2017 - 2/14/2017	I-131	<9.06E-03	0.00E+00	9.06E-03
		Cs-134	<6.75E-03	0.00E+00	6.75E-03
		Cs-137	<1.23E-02	0.00E+00	1.23E-02
		Be-7	<5.38E-02	0.00E+00	5.38E-02
		K-40	1.69E-01	9.25E-02	8.97E-02
435795	2/14/2017 - 2/21/2017	I-131	<7.81E-03	0.00E+00	7.81E-03
		Cs-134	<6.28E-03	0.00E+00	6.28E-03
		Cs-137	<8.39E-03	0.00E+00	8.39E-03
		Be-7	<6.93E-02	0.00E+00	6.93E-02
		K-40	1.83E-01	8.80E-02	2.76E-02
436245	2/21/2017 - 2/28/2017	I-131	<9.72E-03	0.00E+00	9.72E-03
		Cs-134	<8.87E-03	0.00E+00	8.87E-03
		Cs-137	<8.57E-03	0.00E+00	8.57E-03
		Be-7	<4.22E-02	0.00E+00	4.22E-02
		K-40	1.73E-01	9.52E-02	9.37E-02
436696	2/28/2017 - 3/7/2017	I-131	<6.80E-03	0.00E+00	6.80E-03
		Cs-134	<5.14E-03	0.00E+00	5.14E-03
		Cs-137	<9.88E-03	0.00E+00	9.88E-03
		Be-7	<5.72E-02	0.00E+00	5.72E-02
		K-40	2.95E-01	1.13E-01	2.75E-02
437560	3/7/2017 - 3/14/2017	I-131	<8.40E-03	0.00E+00	8.40E-03
		Cs-134	<7.08E-03	0.00E+00	7.08E-03
		Cs-137	<1.13E-02	0.00E+00	1.13E-02
		Be-7	<5.58E-02	0.00E+00	5.58E-02
		K-40	1.79E-01	8.81E-02	2.85E-02
438287	3/14/2017 - 3/21/2017	I-131	<8.21E-03	0.00E+00	8.21E-03
		Cs-134	<6.72E-03	0.00E+00	6.72E-03
		Cs-137	<8.88E-03	0.00E+00	8.88E-03
		Be-7	<6.08E-02	0.00E+00	6.08E-02
		K-40	<2.22E-01	0.00E+00	2.22E-01
438790	3/21/2017 - 3/28/2017	I-131	<7.85E-03	0.00E+00	7.85E-03
		Cs-134	<7.68E-03	0.00E+00	7.68E-03
		Cs-137	<9.54E-03	0.00E+00	9.54E-03
		Be-7	<5.09E-02	0.00E+00	5.09E-02
		K-40	2.48E-01	1.04E-01	2.80E-02
439146	3/28/2017 - 4/4/2017	I-131	<9.03E-03	0.00E+00	9.03E-03
		Cs-134	<9.59E-03	0.00E+00	9.59E-03
		Cs-137	<6.90E-03	0.00E+00	6.90E-03
		Be-7	<4.99E-02	0.00E+00	4.99E-02
		K-40	3.35E-01	1.20E-01	2.75E-02
439989	4/4/2017 - 4/11/2017	Nuclide	Activity	2 Sigma Error	MDA
		I-131	<6.25E-03	0.00E+00	6.25E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
43989	4/4/2017 - 4/11/2017	Cs-134	<5.79E-03	0.00E+00	5.79E-03
		Cs-137	<6.45E-03	0.00E+00	6.45E-03
		Be-7	<4.61E-02	0.00E+00	4.61E-02
		K-40	3.57E-01	1.37E-01	1.18E-01
440584	4/11/2017 - 4/18/2017	I-131	<8.20E-03	0.00E+00	8.20E-03
		Cs-134	<6.76E-03	0.00E+00	6.76E-03
		Cs-137	<9.45E-03	0.00E+00	9.45E-03
		Be-7	<6.91E-02	0.00E+00	6.91E-02
		K-40	4.55E-01	1.63E-01	1.58E-01
441398	4/18/2017 - 4/25/2017	I-131	<8.03E-03	0.00E+00	8.03E-03
		Cs-134	<7.15E-03	0.00E+00	7.15E-03
		Cs-137	<1.02E-02	0.00E+00	1.02E-02
		Be-7	<6.14E-02	0.00E+00	6.14E-02
		K-40	4.72E-01	1.69E-01	1.53E-01
441843	4/25/2017 - 5/2/2017	I-131	<5.61E-03	0.00E+00	5.61E-03
		Cs-134	<7.49E-03	0.00E+00	7.49E-03
		Cs-137	<6.67E-03	0.00E+00	6.67E-03
		Be-7	<6.37E-02	0.00E+00	6.37E-02
		K-40	3.78E-01	1.56E-01	1.72E-01
442274	5/2/2017 - 5/9/2017	I-131	<7.35E-03	0.00E+00	7.35E-03
		Cs-134	<7.26E-03	0.00E+00	7.26E-03
		Cs-137	<7.22E-03	0.00E+00	7.22E-03
		Be-7	<4.14E-02	0.00E+00	4.14E-02
		K-40	4.03E-01	1.34E-01	2.80E-02
442857	5/9/2017 - 5/15/2017	I-131	<9.07E-03	0.00E+00	9.07E-03
		Cs-134	<8.35E-03	0.00E+00	8.35E-03
		Cs-137	<8.30E-03	0.00E+00	8.30E-03
		Be-7	<5.81E-02	0.00E+00	5.81E-02
		K-40	4.76E-01	1.56E-01	3.22E-02
443285	5/15/2017 - 5/23/2017	I-131	<6.40E-03	0.00E+00	6.40E-03
		Cs-134	<6.85E-03	0.00E+00	6.85E-03
		Cs-137	<8.01E-03	0.00E+00	8.01E-03
		Be-7	<4.39E-02	0.00E+00	4.39E-02
		K-40	4.75E-01	1.42E-01	2.63E-02
443843	5/23/2017 - 5/31/2017	I-131	<7.71E-03	0.00E+00	7.71E-03
		Cs-134	<3.45E-03	0.00E+00	3.45E-03
		Cs-137	<6.99E-03	0.00E+00	6.99E-03
		Be-7	<4.92E-02	0.00E+00	4.92E-02
		K-40	<2.36E-01	0.00E+00	2.36E-01
444245	5/31/2017 - 6/6/2017	I-131	<1.18E-02	0.00E+00	1.18E-02
		Cs-134	<9.93E-03	0.00E+00	9.93E-03
		Cs-137	<1.24E-02	0.00E+00	1.24E-02
		Be-7	<7.43E-02	0.00E+00	7.43E-02
		K-40	<2.92E-01	0.00E+00	2.92E-01
445307	6/6/2017 - 6/13/2017	I-131	<8.31E-03	0.00E+00	8.31E-03
		Cs-134	<7.64E-03	0.00E+00	7.64E-03
		Cs-137	<8.44E-03	0.00E+00	8.44E-03
		Be-7	<6.69E-02	0.00E+00	6.69E-02
		K-40	2.15E-01	9.59E-02	2.78E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
446306	6/13/2017 - 6/20/2017	I-131	<1.02E-02	0.00E+00	1.02E-02
		Cs-134	<8.01E-03	0.00E+00	8.01E-03
		Cs-137	<9.35E-03	0.00E+00	9.35E-03
		Be-7	<5.60E-02	0.00E+00	5.60E-02
		K-40	1.90E-01	9.36E-02	3.03E-02
446810	6/20/2017 - 6/27/2017	I-131	<9.00E-03	0.00E+00	9.00E-03
		Cs-134	<5.75E-03	0.00E+00	5.75E-03
		Cs-137	<1.16E-02	0.00E+00	1.16E-02
		Be-7	<6.01E-02	0.00E+00	6.01E-02
		K-40	3.14E-01	1.33E-01	1.19E-01
447157	6/27/2017 - 7/3/2017	I-131	<1.03E-02	0.00E+00	1.03E-02
		Cs-134	<8.19E-03	0.00E+00	8.19E-03
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<5.30E-02	0.00E+00	5.30E-02
		K-40	<2.73E-01	0.00E+00	2.73E-01
447789	7/3/2017 - 7/11/2017	I-131	<6.56E-03	0.00E+00	6.56E-03
		Cs-134	<7.26E-03	0.00E+00	7.26E-03
		Cs-137	<9.49E-03	0.00E+00	9.49E-03
		Be-7	<5.76E-02	0.00E+00	5.76E-02
		K-40	2.62E-01	1.14E-01	1.07E-01
448253	7/11/2017 - 7/18/2017	I-131	<8.17E-03	0.00E+00	8.17E-03
		Cs-134	<7.21E-03	0.00E+00	7.21E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<5.35E-02	0.00E+00	5.35E-02
		K-40	<2.25E-01	0.00E+00	2.25E-01
448879	7/18/2017 - 7/25/2017	I-131	<8.31E-03	0.00E+00	8.31E-03
		Cs-134	<6.89E-03	0.00E+00	6.89E-03
		Cs-137	<7.86E-03	0.00E+00	7.86E-03
		Be-7	<6.23E-02	0.00E+00	6.23E-02
		K-40	2.21E-01	1.00E-01	2.99E-02
449203	7/25/2017 - 8/1/2017	I-131	<1.07E-02	0.00E+00	1.07E-02
		Cs-134	<9.25E-03	0.00E+00	9.25E-03
		Cs-137	<8.32E-03	0.00E+00	8.32E-03
		Be-7	<7.36E-02	0.00E+00	7.36E-02
		K-40	2.74E-01	1.21E-01	1.08E-01
449934	8/1/2017 - 8/8/2017	I-131	<6.80E-03	0.00E+00	6.80E-03
		Cs-134	<8.70E-03	0.00E+00	8.70E-03
		Cs-137	<7.81E-03	0.00E+00	7.81E-03
		Be-7	<5.01E-02	0.00E+00	5.01E-02
		K-40	<2.40E-01	0.00E+00	2.40E-01
450179	8/8/2017 - 8/15/2017	I-131	<8.08E-03	0.00E+00	8.08E-03
		Cs-134	<7.21E-03	0.00E+00	7.21E-03
		Cs-137	<8.97E-03	0.00E+00	8.97E-03
		Be-7	<6.11E-02	0.00E+00	6.11E-02
		K-40	2.20E-01	1.26E-01	1.56E-01
450712	8/15/2017 - 8/22/2017	I-131	<8.26E-03	0.00E+00	8.26E-03
		Cs-134	<9.06E-03	0.00E+00	9.06E-03
		Cs-137	<9.48E-03	0.00E+00	9.48E-03
		Be-7	<4.13E-02	0.00E+00	4.13E-02
		K-40	<2.00E-01	0.00E+00	2.00E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
451171	8/22/2017 - 8/29/2017	I-131	<6.02E-03	0.00E+00	6.02E-03
		Cs-134	<4.45E-03	0.00E+00	4.45E-03
		Cs-137	<6.85E-03	0.00E+00	6.85E-03
		Be-7	<4.21E-02	0.00E+00	4.21E-02
		K-40	1.75E-01	7.12E-02	7.01E-02
451525	8/29/2017 - 9/5/2017	I-131	<7.84E-03	0.00E+00	7.84E-03
		Cs-134	<9.35E-03	0.00E+00	9.35E-03
		Cs-137	<6.65E-03	0.00E+00	6.65E-03
		Be-7	<6.59E-02	0.00E+00	6.59E-02
		K-40	<2.31E-01	0.00E+00	2.31E-01
452329	9/5/2017 - 9/12/2017	I-131	<6.16E-03	0.00E+00	6.16E-03
		Cs-134	<8.38E-03	0.00E+00	8.38E-03
		Cs-137	<1.09E-02	0.00E+00	1.09E-02
		Be-7	<4.84E-02	0.00E+00	4.84E-02
		K-40	2.64E-01	1.17E-01	9.72E-02
452772	9/12/2017 - 9/19/2017	I-131	<9.79E-03	0.00E+00	9.79E-03
		Cs-134	<1.03E-02	0.00E+00	1.03E-02
		Cs-137	<9.57E-03	0.00E+00	9.57E-03
		Be-7	<6.16E-02	0.00E+00	6.16E-02
		K-40	<2.08E-01	0.00E+00	2.08E-01
453426	9/19/2017 - 9/26/2017	I-131	<6.90E-03	0.00E+00	6.90E-03
		Cs-134	<8.94E-03	0.00E+00	8.94E-03
		Cs-137	<7.49E-03	0.00E+00	7.49E-03
		Be-7	<5.17E-02	0.00E+00	5.17E-02
		K-40	<1.98E-01	0.00E+00	1.98E-01
454190	9/26/2017 - 10/3/2017	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<9.99E-02	0.00E+00	9.99E-02
		K-40	2.68E-01	1.43E-01	1.68E-01
455044	10/3/2017 - 10/10/2017	I-131	<2.85E-02	0.00E+00	2.85E-02
		Cs-134	<1.64E-02	0.00E+00	1.64E-02
		Cs-137	<1.25E-02	0.00E+00	1.25E-02
		Be-7	<1.41E-01	0.00E+00	1.41E-01
		K-40	1.82E-01	1.60E-01	2.43E-01
455399	10/10/2017 - 10/17/2017	I-131	<4.38E-02	0.00E+00	4.38E-02
		Cs-134	<1.94E-02	0.00E+00	1.94E-02
		Cs-137	<1.36E-02	0.00E+00	1.36E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	4.28E-01	1.85E-01	2.09E-01
456024	10/17/2017 - 10/24/2017	I-131	<2.40E-02	0.00E+00	2.40E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.87E-02	0.00E+00	1.87E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	<3.39E-01	0.00E+00	3.39E-01
461400	10/24/2017 - 10/30/2017	I-131	<2.27E-02	0.00E+00	2.27E-02
		Cs-134	<2.12E-02	0.00E+00	2.12E-02
		Cs-137	<2.09E-02	0.00E+00	2.09E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	4.12E-01	2.25E-01	3.03E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
461946	10/30/2017 - 11/7/2017	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.26E-02	0.00E+00	1.26E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	3.45E-01	1.60E-01	1.89E-01
462582	11/7/2017 - 11/13/2017	I-131	<2.34E-02	0.00E+00	2.34E-02
		Cs-134	<2.40E-02	0.00E+00	2.40E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	1.15E-02	8.82E-02	1.59E-01
		K-40	5.63E-01	1.98E-01	1.45E-01
463074	11/13/2017 - 11/20/2017	I-131	<2.09E-02	0.00E+00	2.09E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.84E-02	0.00E+00	1.84E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	3.49E-01	1.78E-01	2.23E-01
463490	11/20/2017 - 11/28/2017	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.54E-02	0.00E+00	1.54E-02
		Cs-137	<1.46E-02	0.00E+00	1.46E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	5.10E-01	1.87E-01	1.98E-01
464149	11/28/2017 - 12/5/2017	I-131	<1.92E-02	0.00E+00	1.92E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	5.21E-01	1.91E-01	1.85E-01
464679	12/5/2017 - 12/12/2017	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	4.85E-01	1.81E-01	1.66E-01
464948	12/12/2017 - 12/19/2017	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	6.04E-01	1.83E-01	3.48E-02
465195	12/19/2017 - 12/27/2017	I-131	<1.59E-02	0.00E+00	1.59E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<1.09E-01	0.00E+00	1.09E-01
		K-40	3.61E-01	1.53E-01	1.65E-01
465583	12/27/2017 - 1/3/2018	I-131	<3.38E-02	0.00E+00	3.38E-02
		Cs-134	<1.77E-02	0.00E+00	1.77E-02
		Cs-137	<1.67E-02	0.00E+00	1.67E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	3.81E-01	1.72E-01	1.91E-01

## Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431794	12/28/2016 - 1/4/2017	I-131	<6.47E-03	0.00E+00	6.47E-03
		Cs-134	<7.85E-03	0.00E+00	7.85E-03
		Cs-137	<7.03E-03	0.00E+00	7.03E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
431794	12/28/2016 - 1/4/2017	Be-7	<4.08E-02	0.00E+00	4.08E-02
		K-40	4.80E-01	1.54E-01	1.12E-01
432185	1/4/2017 - 1/10/2017	I-131	<8.35E-03	0.00E+00	8.35E-03
		Cs-134	<9.17E-03	0.00E+00	9.17E-03
		Cs-137	<5.29E-03	0.00E+00	5.29E-03
		Be-7	<5.49E-02	0.00E+00	5.49E-02
		K-40	6.19E-01	1.93E-01	1.32E-01
432893	1/10/2017 - 1/17/2017	I-131	<7.31E-03	0.00E+00	7.31E-03
		Cs-134	<7.21E-03	0.00E+00	7.21E-03
		Cs-137	<7.17E-03	0.00E+00	7.17E-03
		Be-7	<4.12E-02	0.00E+00	4.12E-02
		K-40	3.17E-01	1.46E-01	1.71E-01
433290	1/17/2017 - 1/24/2017	I-131	<8.96E-03	0.00E+00	8.96E-03
		Cs-134	<8.70E-03	0.00E+00	8.70E-03
		Cs-137	<8.41E-03	0.00E+00	8.41E-03
		Be-7	<4.11E-02	0.00E+00	4.11E-02
		K-40	4.29E-01	1.38E-01	2.77E-02
433707	1/24/2017 - 1/31/2017	I-131	<9.61E-03	0.00E+00	9.61E-03
		Cs-134	<8.24E-03	0.00E+00	8.24E-03
		Cs-137	<7.39E-03	0.00E+00	7.39E-03
		Be-7	<5.15E-02	0.00E+00	5.15E-02
		K-40	4.45E-01	1.51E-01	1.16E-01
434442	1/31/2017 - 2/7/2017	I-131	<5.56E-03	0.00E+00	5.56E-03
		Cs-134	<9.09E-03	0.00E+00	9.09E-03
		Cs-137	<1.00E-02	0.00E+00	1.00E-02
		Be-7	<5.04E-02	0.00E+00	5.04E-02
		K-40	3.87E-01	1.43E-01	1.23E-01
435089	2/7/2017 - 2/14/2017	I-131	<7.43E-03	0.00E+00	7.43E-03
		Cs-134	<9.22E-03	0.00E+00	9.22E-03
		Cs-137	<7.98E-03	0.00E+00	7.98E-03
		Be-7	<4.20E-02	0.00E+00	4.20E-02
		K-40	1.95E-01	9.99E-02	9.20E-02
435796	2/14/2017 - 2/21/2017	I-131	<7.43E-03	0.00E+00	7.43E-03
		Cs-134	<5.27E-03	0.00E+00	5.27E-03
		Cs-137	<9.14E-03	0.00E+00	9.14E-03
		Be-7	<5.85E-02	0.00E+00	5.85E-02
		K-40	1.06E-01	8.16E-02	1.04E-01
436246	2/21/2017 - 2/28/2017	I-131	<8.37E-03	0.00E+00	8.37E-03
		Cs-134	<8.43E-03	0.00E+00	8.43E-03
		Cs-137	<9.92E-03	0.00E+00	9.92E-03
		Be-7	<6.72E-02	0.00E+00	6.72E-02
		K-40	<2.24E-01	0.00E+00	2.24E-01
436697	2/28/2017 - 3/7/2017	I-131	<9.18E-03	0.00E+00	9.18E-03
		Cs-134	<7.35E-03	0.00E+00	7.35E-03
		Cs-137	<9.66E-03	0.00E+00	9.66E-03
		Be-7	<5.11E-02	0.00E+00	5.11E-02
		K-40	2.20E-01	9.80E-02	2.84E-02
437561	3/7/2017 - 3/14/2017	I-131	<8.73E-03	0.00E+00	8.73E-03





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
437561	3/7/2017 - 3/14/2017	Cs-134	<7.73E-03	0.00E+00	7.73E-03
		Cs-137	<9.60E-03	0.00E+00	9.60E-03
		Be-7	<4.67E-02	0.00E+00	4.67E-02
		K-40	1.19E-01	9.40E-02	1.26E-01
438288	3/14/2017 - 3/21/2017	I-131	<1.00E-02	0.00E+00	1.00E-02
		Cs-134	<8.83E-03	0.00E+00	8.83E-03
		Cs-137	<8.53E-03	0.00E+00	8.53E-03
		Be-7	<5.12E-02	0.00E+00	5.12E-02
438791	3/21/2017 - 3/28/2017	K-40	<2.22E-01	0.00E+00	2.22E-01
		I-131	<9.57E-03	0.00E+00	9.57E-03
		Cs-134	<8.11E-03	0.00E+00	8.11E-03
		Cs-137	<8.34E-03	0.00E+00	8.34E-03
439147	3/28/2017 - 4/4/2017	Be-7	<5.74E-02	0.00E+00	5.74E-02
		K-40	<2.12E-01	0.00E+00	2.12E-01
		I-131	<8.78E-03	0.00E+00	8.78E-03
		Cs-134	<7.37E-03	0.00E+00	7.37E-03
439990	4/4/2017 - 4/11/2017	Cs-137	<9.16E-03	0.00E+00	9.16E-03
		Be-7	<4.69E-02	0.00E+00	4.69E-02
		K-40	1.24E-01	9.62E-02	1.32E-01
		I-131	<8.46E-03	0.00E+00	8.46E-03
440585	4/11/2017 - 4/18/2017	Cs-134	<8.52E-03	0.00E+00	8.52E-03
		Cs-137	<6.21E-03	0.00E+00	6.21E-03
		Be-7	<5.99E-02	0.00E+00	5.99E-02
		K-40	3.81E-01	1.47E-01	1.28E-01
441399	4/18/2017 - 4/25/2017	I-131	<7.42E-03	0.00E+00	7.42E-03
		Cs-134	<5.89E-03	0.00E+00	5.89E-03
		Cs-137	<6.56E-03	0.00E+00	6.56E-03
		Be-7	<3.62E-02	0.00E+00	3.62E-02
441844	4/25/2017 - 5/2/2017	K-40	4.88E-01	1.61E-01	1.28E-01
		I-131	<8.71E-03	0.00E+00	8.71E-03
		Cs-134	<5.34E-03	0.00E+00	5.34E-03
		Cs-137	<7.41E-03	0.00E+00	7.41E-03
442275	5/2/2017 - 5/9/2017	Be-7	<5.16E-02	0.00E+00	5.16E-02
		K-40	5.11E-01	1.59E-01	1.07E-01
		I-131	<9.61E-03	0.00E+00	9.61E-03
		Cs-134	<7.53E-03	0.00E+00	7.53E-03
442858	5/9/2017 - 5/15/2017	Cs-137	<4.59E-03	0.00E+00	4.59E-03
		Be-7	<5.29E-02	0.00E+00	5.29E-02
		K-40	3.60E-01	1.35E-01	1.04E-01
		I-131	<5.57E-03	0.00E+00	5.57E-03
442858	5/9/2017 - 5/15/2017	Cs-134	<8.36E-03	0.00E+00	8.36E-03
		Cs-137	<6.42E-03	0.00E+00	6.42E-03
		Be-7	<5.39E-02	0.00E+00	5.39E-02
		K-40	3.52E-01	1.30E-01	9.32E-02
442858	5/9/2017 - 5/15/2017	I-131	<7.76E-03	0.00E+00	7.76E-03
		Cs-134	<7.14E-03	0.00E+00	7.14E-03
		Cs-137	<8.13E-03	0.00E+00	8.13E-03
		Be-7	<6.90E-02	0.00E+00	6.90E-02
442858	5/9/2017 - 5/15/2017	K-40	4.52E-01	1.51E-01	3.14E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
443286	5/15/2017 - 5/23/2017	I-131	<6.57E-03	0.00E+00	6.57E-03
		Cs-134	<5.96E-03	0.00E+00	5.96E-03
		Cs-137	<6.30E-03	0.00E+00	6.30E-03
		Be-7	<5.41E-02	0.00E+00	5.41E-02
		K-40	2.96E-01	1.23E-01	1.27E-01
443844	5/23/2017 - 5/31/2017	I-131	<1.20E-02	0.00E+00	1.20E-02
		Cs-134	<5.81E-03	0.00E+00	5.81E-03
		Cs-137	<9.19E-03	0.00E+00	9.19E-03
		Be-7	<4.99E-02	0.00E+00	4.99E-02
		K-40	2.42E-01	9.69E-02	2.52E-02
444246	5/31/2017 - 6/6/2017	I-131	<9.74E-03	0.00E+00	9.74E-03
		Cs-134	<7.99E-03	0.00E+00	7.99E-03
		Cs-137	<1.06E-02	0.00E+00	1.06E-02
		Be-7	<5.42E-02	0.00E+00	5.42E-02
		K-40	2.91E-01	1.21E-01	3.28E-02
445308	6/6/2017 - 6/13/2017	I-131	<8.26E-03	0.00E+00	8.26E-03
		Cs-134	<8.77E-03	0.00E+00	8.77E-03
		Cs-137	<8.25E-03	0.00E+00	8.25E-03
		Be-7	<7.63E-02	0.00E+00	7.63E-02
		K-40	<1.64E-01	0.00E+00	1.64E-01
446307	6/13/2017 - 6/20/2017	I-131	<7.57E-03	0.00E+00	7.57E-03
		Cs-134	<6.65E-03	0.00E+00	6.65E-03
		Cs-137	<9.48E-03	0.00E+00	9.48E-03
		Be-7	<6.42E-02	0.00E+00	6.42E-02
		K-40	1.64E-01	1.22E-01	1.72E-01
446811	6/20/2017 - 6/27/2017	I-131	<1.02E-02	0.00E+00	1.02E-02
		Cs-134	<1.03E-02	0.00E+00	1.03E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<5.25E-02	0.00E+00	5.25E-02
		K-40	<2.08E-01	0.00E+00	2.08E-01
447158	6/27/2017 - 7/3/2017	I-131	<6.13E-03	0.00E+00	6.13E-03
		Cs-134	<7.35E-03	0.00E+00	7.35E-03
		Cs-137	<1.56E-02	0.00E+00	1.56E-02
		Be-7	<6.78E-02	0.00E+00	6.78E-02
		K-40	<2.76E-01	0.00E+00	2.76E-01
447790	7/3/2017 - 7/11/2017	I-131	<8.98E-03	0.00E+00	8.98E-03
		Cs-134	<7.45E-03	0.00E+00	7.45E-03
		Cs-137	<1.00E-02	0.00E+00	1.00E-02
		Be-7	<4.11E-02	0.00E+00	4.11E-02
		K-40	2.55E-01	9.91E-02	2.47E-02
448254	7/11/2017 - 7/18/2017	I-131	<8.37E-03	0.00E+00	8.37E-03
		Cs-134	<6.86E-03	0.00E+00	6.86E-03
		Cs-137	<1.14E-02	0.00E+00	1.14E-02
		Be-7	<4.69E-02	0.00E+00	4.69E-02
		K-40	1.97E-01	9.23E-02	2.82E-02
448880	7/18/2017 - 7/25/2017	I-131	<6.96E-03	0.00E+00	6.96E-03
		Cs-134	<8.24E-03	0.00E+00	8.24E-03
		Cs-137	<1.28E-02	0.00E+00	1.28E-02
		Be-7	<6.13E-02	0.00E+00	6.13E-02
		K-40	<2.25E-01	0.00E+00	2.25E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
449204	7/25/2017 - 8/1/2017	I-131	<7.25E-03	0.00E+00	7.25E-03
		Cs-134	<8.50E-03	0.00E+00	8.50E-03
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<4.70E-02	0.00E+00	4.70E-02
		K-40	1.50E-01	9.13E-02	1.00E-01
449935	8/1/2017 - 8/8/2017	I-131	<8.35E-03	0.00E+00	8.35E-03
		Cs-134	<7.80E-03	0.00E+00	7.80E-03
		Cs-137	<8.01E-03	0.00E+00	8.01E-03
		Be-7	<4.70E-02	0.00E+00	4.70E-02
		K-40	<2.18E-01	0.00E+00	2.18E-01
450180	8/8/2017 - 8/15/2017	I-131	<7.11E-03	0.00E+00	7.11E-03
		Cs-134	<6.70E-03	0.00E+00	6.70E-03
		Cs-137	<5.48E-03	0.00E+00	5.48E-03
		Be-7	<6.06E-02	0.00E+00	6.06E-02
		K-40	<2.48E-01	0.00E+00	2.48E-01
450713	8/15/2017 - 8/22/2017	I-131	<8.82E-03	0.00E+00	8.82E-03
		Cs-134	<7.85E-03	0.00E+00	7.85E-03
		Cs-137	<1.07E-02	0.00E+00	1.07E-02
		Be-7	<5.91E-02	0.00E+00	5.91E-02
		K-40	1.31E-01	1.17E-01	1.77E-01
451172	8/22/2017 - 8/29/2017	I-131	<7.12E-03	0.00E+00	7.12E-03
		Cs-134	<7.93E-03	0.00E+00	7.93E-03
		Cs-137	<8.33E-03	0.00E+00	8.33E-03
		Be-7	<5.74E-02	0.00E+00	5.74E-02
		K-40	2.23E-01	9.71E-02	2.74E-02
451526	8/29/2017 - 9/5/2017	I-131	<8.45E-03	0.00E+00	8.45E-03
		Cs-134	<7.42E-03	0.00E+00	7.42E-03
		Cs-137	<7.61E-03	0.00E+00	7.61E-03
		Be-7	<5.30E-02	0.00E+00	5.30E-02
		K-40	<1.94E-01	0.00E+00	1.94E-01
452330	9/5/2017 - 9/12/2017	I-131	<9.61E-03	0.00E+00	9.61E-03
		Cs-134	<5.87E-03	0.00E+00	5.87E-03
		Cs-137	<1.13E-02	0.00E+00	1.13E-02
		Be-7	<4.03E-02	0.00E+00	4.03E-02
		K-40	1.77E-01	1.02E-01	1.04E-01
452773	9/12/2017 - 9/19/2017	I-131	<7.77E-03	0.00E+00	7.77E-03
		Cs-134	<6.34E-03	0.00E+00	6.34E-03
		Cs-137	<1.13E-02	0.00E+00	1.13E-02
		Be-7	<7.03E-02	0.00E+00	7.03E-02
		K-40	2.27E-01	9.90E-02	2.80E-02
453427	9/19/2017 - 9/26/2017	I-131	<9.20E-03	0.00E+00	9.20E-03
		Cs-134	<8.74E-03	0.00E+00	8.74E-03
		Cs-137	<9.62E-03	0.00E+00	9.62E-03
		Be-7	<4.04E-02	0.00E+00	4.04E-02
		K-40	2.32E-01	1.18E-01	1.18E-01
454191	9/26/2017 - 10/3/2017	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.09E-02	0.00E+00	1.09E-02
		Cs-137	<1.67E-02	0.00E+00	1.67E-02
		Be-7	<9.36E-02	0.00E+00	9.36E-02
		K-40	4.35E-01	1.59E-01	1.28E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
455045	10/3/2017 - 10/10/2017	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.39E-02	0.00E+00	1.39E-02
		Be-7	<1.03E-01	0.00E+00	1.03E-01
		K-40	2.28E-01	1.22E-01	1.33E-01
455400	10/10/2017 - 10/17/2017	I-131	<4.77E-02	0.00E+00	4.77E-02
		Cs-134	<1.90E-02	0.00E+00	1.90E-02
		Cs-137	<1.61E-02	0.00E+00	1.61E-02
		Be-7	<1.41E-01	0.00E+00	1.41E-01
		K-40	5.79E-01	2.13E-01	2.26E-01
456025	10/17/2017 - 10/24/2017	I-131	<2.18E-02	0.00E+00	2.18E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	5.24E-01	1.69E-01	3.46E-02
461401	10/24/2017 - 10/30/2017	I-131	<2.30E-02	0.00E+00	2.30E-02
		Cs-134	<2.38E-02	0.00E+00	2.38E-02
		Cs-137	<2.03E-02	0.00E+00	2.03E-02
		Be-7	<1.45E-01	0.00E+00	1.45E-01
		K-40	5.95E-01	2.34E-01	2.61E-01
461947	10/30/2017 - 11/7/2017	I-131	<2.12E-02	0.00E+00	2.12E-02
		Cs-134	<1.19E-02	0.00E+00	1.19E-02
		Cs-137	<1.50E-02	0.00E+00	1.50E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	3.81E-01	1.52E-01	1.46E-01
462583	11/7/2017 - 11/13/2017	I-131	<2.38E-02	0.00E+00	2.38E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<2.01E-02	0.00E+00	2.01E-02
		Be-7	<1.30E-01	0.00E+00	1.30E-01
		K-40	6.19E-01	2.46E-01	2.83E-01
463075	11/13/2017 - 11/20/2017	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.75E-02	0.00E+00	1.75E-02
		Cs-137	<1.30E-02	0.00E+00	1.30E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	5.78E-01	2.03E-01	1.93E-01
463491	11/20/2017 - 11/28/2017	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.50E-02	0.00E+00	1.50E-02
		Be-7	<8.96E-02	0.00E+00	8.96E-02
		K-40	4.03E-01	1.68E-01	1.85E-01
464150	11/28/2017 - 12/5/2017	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.78E-02	0.00E+00	1.78E-02
		Cs-137	<1.34E-02	0.00E+00	1.34E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	3.11E-01	1.62E-01	1.97E-01
464680	12/5/2017 - 12/12/2017	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.61E-02	0.00E+00	1.61E-02
		Cs-137	<2.29E-02	0.00E+00	2.29E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	4.32E-01	1.75E-01	1.73E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

## Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
464949	12/12/2017 - 12/19/2017	I-131	<1.97E-02	0.00E+00	1.97E-02
		Cs-134	<1.93E-02	0.00E+00	1.93E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	5.43E-01	1.82E-01	1.30E-01
465196	12/19/2017 - 12/27/2017	I-131	<1.86E-02	0.00E+00	1.86E-02
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.22E-02	0.00E+00	1.22E-02
		Be-7	<9.34E-02	0.00E+00	9.34E-02
		K-40	4.61E-01	1.68E-01	1.64E-01
465584	12/27/2017 - 1/3/2018	I-131	<2.85E-02	0.00E+00	2.85E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.37E-02	0.00E+00	1.37E-02
		Be-7	<9.45E-02	0.00E+00	9.45E-02
		K-40	3.70E-01	1.71E-01	1.93E-01

## Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431795	12/28/2016 - 1/4/2017	I-131	<7.88E-03	0.00E+00	7.88E-03
		Cs-134	<6.39E-03	0.00E+00	6.39E-03
		Cs-137	<9.09E-03	0.00E+00	9.09E-03
		Be-7	<5.88E-02	0.00E+00	5.88E-02
		K-40	4.67E-01	1.56E-01	1.20E-01
432186	1/4/2017 - 1/10/2017	I-131	<1.11E-02	0.00E+00	1.11E-02
		Cs-134	<7.50E-03	0.00E+00	7.50E-03
		Cs-137	<9.33E-03	0.00E+00	9.33E-03
		Be-7	<7.37E-02	0.00E+00	7.37E-02
		K-40	4.62E-01	1.92E-01	2.10E-01
432894	1/10/2017 - 1/17/2017	I-131	<3.90E-03	0.00E+00	3.90E-03
		Cs-134	<5.29E-03	0.00E+00	5.29E-03
		Cs-137	<9.17E-03	0.00E+00	9.17E-03
		Be-7	<3.63E-02	0.00E+00	3.63E-02
		K-40	3.08E-01	1.25E-01	1.02E-01
433291	1/17/2017 - 1/24/2017	I-131	<7.41E-03	0.00E+00	7.41E-03
		Cs-134	<7.78E-03	0.00E+00	7.78E-03
		Cs-137	<6.56E-03	0.00E+00	6.56E-03
		Be-7	<5.50E-02	0.00E+00	5.50E-02
		K-40	3.71E-01	1.46E-01	1.41E-01
433708	1/24/2017 - 1/31/2017	I-131	<1.08E-02	0.00E+00	1.08E-02
		Cs-134	<8.17E-03	0.00E+00	8.17E-03
		Cs-137	<8.12E-03	0.00E+00	8.12E-03
		Be-7	<5.23E-02	0.00E+00	5.23E-02
		K-40	3.78E-01	1.45E-01	1.20E-01
434443	1/31/2017 - 2/7/2017	I-131	<5.69E-03	0.00E+00	5.69E-03
		Cs-134	<6.45E-03	0.00E+00	6.45E-03
		Cs-137	<1.02E-02	0.00E+00	1.02E-02
		Be-7	<4.22E-02	0.00E+00	4.22E-02
		K-40	3.29E-01	1.30E-01	1.06E-01
435090	2/7/2017 - 2/14/2017	I-131	<9.00E-03	0.00E+00	9.00E-03
		Cs-134	<6.98E-03	0.00E+00	6.98E-03
		Cs-137	<9.94E-03	0.00E+00	9.94E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
435090	2/7/2017 - 2/14/2017	Be-7	<5.95E-02	0.00E+00	5.95E-02
		K-40	1.82E-01	1.04E-01	1.10E-01
435797	2/14/2017 - 2/21/2017	I-131	<8.01E-03	0.00E+00	8.01E-03
		Cs-134	<7.53E-03	0.00E+00	7.53E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<5.54E-02	0.00E+00	5.54E-02
		K-40	<2.69E-01	0.00E+00	2.69E-01
436247	2/21/2017 - 2/28/2017	I-131	<9.30E-03	0.00E+00	9.30E-03
		Cs-134	<5.38E-03	0.00E+00	5.38E-03
		Cs-137	<1.04E-02	0.00E+00	1.04E-02
		Be-7	<5.60E-02	0.00E+00	5.60E-02
		K-40	<2.17E-01	0.00E+00	2.17E-01
436698	2/28/2017 - 3/7/2017	I-131	<7.46E-03	0.00E+00	7.46E-03
		Cs-134	<8.01E-03	0.00E+00	8.01E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<5.54E-02	0.00E+00	5.54E-02
		K-40	2.06E-01	1.14E-01	1.26E-01
437562	3/7/2017 - 3/14/2017	I-131	<7.85E-03	0.00E+00	7.85E-03
		Cs-134	<6.31E-03	0.00E+00	6.31E-03
		Cs-137	<9.98E-03	0.00E+00	9.98E-03
		Be-7	<4.60E-02	0.00E+00	4.60E-02
		K-40	<2.01E-01	0.00E+00	2.01E-01
438289	3/14/2017 - 3/21/2017	I-131	<9.00E-03	0.00E+00	9.00E-03
		Cs-134	<6.40E-03	0.00E+00	6.40E-03
		Cs-137	<6.15E-03	0.00E+00	6.15E-03
		Be-7	<6.38E-02	0.00E+00	6.38E-02
		K-40	<2.31E-01	0.00E+00	2.31E-01
438792	3/21/2017 - 3/28/2017	I-131	<4.12E-03	0.00E+00	4.12E-03
		Cs-134	<7.64E-03	0.00E+00	7.64E-03
		Cs-137	<9.48E-03	0.00E+00	9.48E-03
		Be-7	<5.82E-02	0.00E+00	5.82E-02
		K-40	1.95E-01	1.04E-01	1.11E-01
439148	3/28/2017 - 4/4/2017	I-131	<9.91E-03	0.00E+00	9.91E-03
		Cs-134	<5.74E-03	0.00E+00	5.74E-03
		Cs-137	<1.10E-02	0.00E+00	1.10E-02
		Be-7	<3.11E-02	0.00E+00	3.11E-02
		K-40	1.82E-01	1.03E-01	1.09E-01
439991	4/4/2017 - 4/11/2017	I-131	<5.70E-03	0.00E+00	5.70E-03
		Cs-134	<8.57E-03	0.00E+00	8.57E-03
		Cs-137	<9.18E-03	0.00E+00	9.18E-03
		Be-7	<4.70E-02	0.00E+00	4.70E-02
		K-40	2.98E-01	1.59E-01	2.10E-01
440586	4/11/2017 - 4/18/2017	I-131	<4.61E-03	0.00E+00	4.61E-03
		Cs-134	<5.05E-03	0.00E+00	5.05E-03
		Cs-137	<4.55E-03	0.00E+00	4.55E-03
		Be-7	<4.02E-02	0.00E+00	4.02E-02
		K-40	4.22E-01	1.10E-01	8.58E-02
441400	4/18/2017 - 4/25/2017	I-131	<5.57E-03	0.00E+00	5.57E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
441400	4/18/2017 - 4/25/2017	Cs-134	<6.42E-03	0.00E+00	6.42E-03
		Cs-137	<1.16E-02	0.00E+00	1.16E-02
		Be-7	<6.40E-02	0.00E+00	6.40E-02
		K-40	4.92E-01	1.55E-01	3.03E-02
441845	4/25/2017 - 5/2/2017	I-131	<7.86E-03	0.00E+00	7.86E-03
		Cs-134	<4.96E-03	0.00E+00	4.96E-03
		Cs-137	<9.97E-03	0.00E+00	9.97E-03
		Be-7	<5.66E-02	0.00E+00	5.66E-02
442276	5/2/2017 - 5/9/2017	K-40	3.79E-01	1.46E-01	1.26E-01
		I-131	<5.71E-03	0.00E+00	5.71E-03
		Cs-134	<7.79E-03	0.00E+00	7.79E-03
		Cs-137	<9.16E-03	0.00E+00	9.16E-03
442859	5/9/2017 - 5/15/2017	Be-7	<5.13E-02	0.00E+00	5.13E-02
		K-40	3.76E-01	1.44E-01	1.30E-01
		I-131	<1.03E-02	0.00E+00	1.03E-02
		Cs-134	<8.19E-03	0.00E+00	8.19E-03
443287	5/15/2017 - 5/23/2017	Cs-137	<8.68E-03	0.00E+00	8.68E-03
		Be-7	<7.29E-02	0.00E+00	7.29E-02
		K-40	4.40E-01	1.67E-01	1.47E-01
		I-131	<7.85E-03	0.00E+00	7.85E-03
443845	5/23/2017 - 5/31/2017	Cs-134	<5.74E-03	0.00E+00	5.74E-03
		Cs-137	<6.53E-03	0.00E+00	6.53E-03
		Be-7	<4.99E-02	0.00E+00	4.99E-02
		K-40	3.65E-01	1.30E-01	1.01E-01
444247	5/31/2017 - 6/6/2017	I-131	<8.42E-03	0.00E+00	8.42E-03
		Cs-134	<7.57E-03	0.00E+00	7.57E-03
		Cs-137	<8.36E-03	0.00E+00	8.36E-03
		Be-7	<4.61E-02	0.00E+00	4.61E-02
445309	6/6/2017 - 6/13/2017	K-40	<1.67E-01	0.00E+00	1.67E-01
		I-131	<9.45E-03	0.00E+00	9.45E-03
		Cs-134	<6.88E-03	0.00E+00	6.88E-03
		Cs-137	<1.39E-02	0.00E+00	1.39E-02
446308	6/13/2017 - 6/20/2017	Be-7	<7.56E-02	0.00E+00	7.56E-02
		K-40	2.47E-01	1.26E-01	1.27E-01
		I-131	<1.04E-02	0.00E+00	1.04E-02
		Cs-134	<7.15E-03	0.00E+00	7.15E-03
446812	6/20/2017 - 6/27/2017	Cs-137	<8.13E-03	0.00E+00	8.13E-03
		Be-7	<5.25E-02	0.00E+00	5.25E-02
		K-40	<1.81E-01	0.00E+00	1.81E-01
		I-131	<7.23E-03	0.00E+00	7.23E-03
		Cs-134	<5.77E-03	0.00E+00	5.77E-03
		Cs-137	<1.08E-02	0.00E+00	1.08E-02
		Be-7	<5.44E-02	0.00E+00	5.44E-02
		K-40	3.24E-01	1.25E-01	9.05E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
447159	6/27/2017 - 7/3/2017	I-131	<9.35E-03	0.00E+00	9.35E-03
		Cs-134	<6.57E-03	0.00E+00	6.57E-03
		Cs-137	<1.07E-02	0.00E+00	1.07E-02
		Be-7	<6.91E-02	0.00E+00	6.91E-02
		K-40	<2.57E-01	0.00E+00	2.57E-01
447791	7/3/2017 - 7/11/2017	I-131	<9.18E-03	0.00E+00	9.18E-03
		Cs-134	<7.92E-03	0.00E+00	7.92E-03
		Cs-137	<7.11E-03	0.00E+00	7.11E-03
		Be-7	<4.58E-02	0.00E+00	4.58E-02
		K-40	1.79E-01	9.35E-02	9.49E-02
448255	7/11/2017 - 7/18/2017	I-131	<9.85E-03	0.00E+00	9.85E-03
		Cs-134	<7.93E-03	0.00E+00	7.93E-03
		Cs-137	<8.77E-03	0.00E+00	8.77E-03
		Be-7	<4.78E-02	0.00E+00	4.78E-02
		K-40	<2.11E-01	0.00E+00	2.11E-01
448881	7/18/2017 - 7/25/2017	I-131	<7.80E-03	0.00E+00	7.80E-03
		Cs-134	<7.97E-03	0.00E+00	7.97E-03
		Cs-137	<9.90E-03	0.00E+00	9.90E-03
		Be-7	<3.54E-02	0.00E+00	3.54E-02
		K-40	1.29E-01	9.95E-02	1.38E-01
449205	7/25/2017 - 8/1/2017	I-131	<7.22E-03	0.00E+00	7.22E-03
		Cs-134	<6.43E-03	0.00E+00	6.43E-03
		Cs-137	<9.38E-03	0.00E+00	9.38E-03
		Be-7	<3.97E-02	0.00E+00	3.97E-02
		K-40	2.31E-01	1.25E-01	1.45E-01
449936	8/1/2017 - 8/8/2017	I-131	<8.95E-03	0.00E+00	8.95E-03
		Cs-134	<5.73E-03	0.00E+00	5.73E-03
		Cs-137	<7.13E-03	0.00E+00	7.13E-03
		Be-7	<3.91E-02	0.00E+00	3.91E-02
		K-40	<2.74E-01	0.00E+00	2.74E-01
450181	8/8/2017 - 8/15/2017	I-131	<7.91E-03	0.00E+00	7.91E-03
		Cs-134	<7.77E-03	0.00E+00	7.77E-03
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<4.23E-02	0.00E+00	4.23E-02
		K-40	1.95E-01	1.11E-01	1.31E-01
450714	8/15/2017 - 8/22/2017	I-131	<1.03E-02	0.00E+00	1.03E-02
		Cs-134	<7.03E-03	0.00E+00	7.03E-03
		Cs-137	<8.74E-03	0.00E+00	8.74E-03
		Be-7	<7.39E-02	0.00E+00	7.39E-02
		K-40	2.31E-01	1.12E-01	1.02E-01
451173	8/22/2017 - 8/29/2017	I-131	<9.38E-03	0.00E+00	9.38E-03
		Cs-134	<5.29E-03	0.00E+00	5.29E-03
		Cs-137	<8.01E-03	0.00E+00	8.01E-03
		Be-7	<5.18E-02	0.00E+00	5.18E-02
		K-40	2.43E-01	1.18E-01	1.24E-01
451527	8/29/2017 - 9/5/2017	I-131	<9.08E-03	0.00E+00	9.08E-03
		Cs-134	<6.71E-03	0.00E+00	6.71E-03
		Cs-137	<1.03E-02	0.00E+00	1.03E-02
		Be-7	<4.11E-02	0.00E+00	4.11E-02
		K-40	1.90E-01	1.20E-01	1.59E-01





**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
452331	9/5/2017 - 9/12/2017	I-131	<1.06E-02	0.00E+00	1.06E-02
		Cs-134	<9.28E-03	0.00E+00	9.28E-03
		Cs-137	<1.11E-02	0.00E+00	1.11E-02
		Be-7	<5.93E-02	0.00E+00	5.93E-02
		K-40	<2.18E-01	0.00E+00	2.18E-01
452774	9/12/2017 - 9/19/2017	I-131	<1.01E-02	0.00E+00	1.01E-02
		Cs-134	<6.73E-03	0.00E+00	6.73E-03
		Cs-137	<1.20E-02	0.00E+00	1.20E-02
		Be-7	<4.41E-02	0.00E+00	4.41E-02
		K-40	2.14E-01	1.18E-01	1.38E-01
453428	9/19/2017 - 9/26/2017	I-131	<9.84E-03	0.00E+00	9.84E-03
		Cs-134	<9.98E-03	0.00E+00	9.98E-03
		Cs-137	<8.97E-03	0.00E+00	8.97E-03
		Be-7	<7.60E-02	0.00E+00	7.60E-02
		K-40	2.95E-01	1.26E-01	1.12E-01
454192	9/26/2017 - 10/3/2017	I-131	<1.50E-02	0.00E+00	1.50E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.09E-02	0.00E+00	1.09E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	<2.47E-01	0.00E+00	2.47E-01
455046	10/3/2017 - 10/10/2017	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.90E-02	0.00E+00	1.90E-02
		Cs-137	<1.39E-02	0.00E+00	1.39E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	4.65E-01	1.83E-01	1.89E-01
455401	10/10/2017 - 10/17/2017	I-131	<4.29E-02	0.00E+00	4.29E-02
		Cs-134	<1.88E-02	0.00E+00	1.88E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	5.22E-01	1.84E-01	1.54E-01
456026	10/17/2017 - 10/24/2017	I-131	<2.39E-02	0.00E+00	2.39E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.48E-02	0.00E+00	1.48E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.89E-01	2.00E-01	1.81E-01
461402	10/24/2017 - 10/30/2017	I-131	<1.92E-02	0.00E+00	1.92E-02
		Cs-134	<2.25E-02	0.00E+00	2.25E-02
		Cs-137	<2.13E-02	0.00E+00	2.13E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	7.14E-01	2.55E-01	2.72E-01
461948	10/30/2017 - 11/7/2017	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.20E-02	0.00E+00	1.20E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	3.50E-01	1.56E-01	1.74E-01
462584	11/7/2017 - 11/13/2017	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.90E-02	0.00E+00	1.90E-02
		Cs-137	<2.29E-02	0.00E+00	2.29E-02
		Be-7	<1.37E-01	0.00E+00	1.37E-01
		K-40	3.38E-01	2.14E-01	3.02E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
463076	11/13/2017 - 11/20/2017	I-131	<2.21E-02	0.00E+00	2.21E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<2.13E-02	0.00E+00	2.13E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	4.61E-01	1.85E-01	1.92E-01
463492	11/20/2017 - 11/28/2017	I-131	<1.81E-02	0.00E+00	1.81E-02
		Cs-134	<1.65E-02	0.00E+00	1.65E-02
		Cs-137	<1.50E-02	0.00E+00	1.50E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	4.05E-01	1.73E-01	2.00E-01
464151	11/28/2017 - 12/5/2017	I-131	<1.91E-02	0.00E+00	1.91E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	5.59E-01	1.88E-01	1.49E-01
464681	12/5/2017 - 12/12/2017	I-131	<1.89E-02	0.00E+00	1.89E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<9.68E-02	0.00E+00	9.68E-02
		K-40	5.50E-01	1.97E-01	1.89E-01
464950	12/12/2017 - 12/19/2017	I-131	<2.12E-02	0.00E+00	2.12E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	5.73E-01	1.85E-01	1.19E-01
465197	12/19/2017 - 12/27/2017	I-131	<1.78E-02	0.00E+00	1.78E-02
		Cs-134	<1.37E-02	0.00E+00	1.37E-02
		Cs-137	<1.49E-02	0.00E+00	1.49E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.29E-01	1.52E-01	1.19E-01
465585	12/27/2017 - 1/3/2018	I-131	<3.25E-02	0.00E+00	3.25E-02
		Cs-134	<1.97E-02	0.00E+00	1.97E-02
		Cs-137	<1.72E-02	0.00E+00	1.72E-02
		Be-7	<1.44E-01	0.00E+00	1.44E-01
		K-40	5.35E-01	1.95E-01	1.85E-01

## Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
431796	12/28/2016 - 1/4/2017	I-131	<9.39E-03	0.00E+00	9.39E-03
		Cs-134	<7.44E-03	0.00E+00	7.44E-03
		Cs-137	<7.88E-03	0.00E+00	7.88E-03
		Be-7	<3.10E-02	0.00E+00	3.10E-02
		K-40	5.07E-01	1.66E-01	1.24E-01
432187	1/4/2017 - 1/10/2017	I-131	<4.35E-03	0.00E+00	4.35E-03
		Cs-134	<6.33E-03	0.00E+00	6.33E-03
		Cs-137	<9.60E-03	0.00E+00	9.60E-03
		Be-7	<6.92E-02	0.00E+00	6.92E-02
		K-40	3.83E-01	1.65E-01	1.75E-01
432895	1/10/2017 - 1/17/2017	I-131	<9.44E-03	0.00E+00	9.44E-03
		Cs-134	<7.56E-03	0.00E+00	7.56E-03
		Cs-137	<7.17E-03	0.00E+00	7.17E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432895	1/10/2017 - 1/17/2017	Be-7	<3.12E-02	0.00E+00	3.12E-02
		K-40	3.40E-01	1.36E-01	1.10E-01
433292	1/17/2017 - 1/24/2017	I-131	<7.93E-03	0.00E+00	7.93E-03
		Cs-134	<7.02E-03	0.00E+00	7.02E-03
		Cs-137	<1.00E-02	0.00E+00	1.00E-02
		Be-7	<7.37E-02	0.00E+00	7.37E-02
		K-40	4.33E-01	1.67E-01	1.67E-01
433709	1/24/2017 - 1/31/2017	I-131	<9.13E-03	0.00E+00	9.13E-03
		Cs-134	<6.72E-03	0.00E+00	6.72E-03
		Cs-137	<8.36E-03	0.00E+00	8.36E-03
		Be-7	<6.07E-02	0.00E+00	6.07E-02
		K-40	3.71E-01	1.34E-01	9.61E-02
434444	1/31/2017 - 2/7/2017	I-131	<7.40E-03	0.00E+00	7.40E-03
		Cs-134	<6.46E-03	0.00E+00	6.46E-03
		Cs-137	<1.06E-02	0.00E+00	1.06E-02
		Be-7	<6.38E-02	0.00E+00	6.38E-02
		K-40	5.10E-01	1.66E-01	1.11E-01
435091	2/7/2017 - 2/14/2017	I-131	<8.78E-03	0.00E+00	8.78E-03
		Cs-134	<6.00E-03	0.00E+00	6.00E-03
		Cs-137	<7.48E-03	0.00E+00	7.48E-03
		Be-7	<4.24E-02	0.00E+00	4.24E-02
		K-40	<2.18E-01	0.00E+00	2.18E-01
435798	2/14/2017 - 2/21/2017	I-131	<8.35E-03	0.00E+00	8.35E-03
		Cs-134	<6.00E-03	0.00E+00	6.00E-03
		Cs-137	<7.47E-03	0.00E+00	7.47E-03
		Be-7	<5.55E-02	0.00E+00	5.55E-02
		K-40	<2.17E-01	0.00E+00	2.17E-01
436248	2/21/2017 - 2/28/2017	I-131	<8.02E-03	0.00E+00	8.02E-03
		Cs-134	<8.18E-03	0.00E+00	8.18E-03
		Cs-137	<1.02E-02	0.00E+00	1.02E-02
		Be-7	<6.14E-02	0.00E+00	6.14E-02
		K-40	1.30E-01	1.11E-01	1.61E-01
436699	2/28/2017 - 3/7/2017	I-131	<7.90E-03	0.00E+00	7.90E-03
		Cs-134	<5.37E-03	0.00E+00	5.37E-03
		Cs-137	<6.69E-03	0.00E+00	6.69E-03
		Be-7	<4.73E-02	0.00E+00	4.73E-02
		K-40	2.43E-01	1.17E-01	1.21E-01
437563	3/7/2017 - 3/14/2017	I-131	<9.49E-03	0.00E+00	9.49E-03
		Cs-134	<9.31E-03	0.00E+00	9.31E-03
		Cs-137	<9.01E-03	0.00E+00	9.01E-03
		Be-7	<4.87E-02	0.00E+00	4.87E-02
		K-40	2.39E-01	1.19E-01	1.23E-01
438290	3/14/2017 - 3/21/2017	I-131	<4.07E-03	0.00E+00	4.07E-03
		Cs-134	<4.62E-03	0.00E+00	4.62E-03
		Cs-137	<9.29E-03	0.00E+00	9.29E-03
		Be-7	<6.27E-02	0.00E+00	6.27E-02
		K-40	<2.16E-01	0.00E+00	2.16E-01
438793	3/21/2017 - 3/28/2017	I-131	<8.94E-03	0.00E+00	8.94E-03



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
438793	3/21/2017 - 3/28/2017	Cs-134	<7.79E-03	0.00E+00	7.79E-03
		Cs-137	<1.06E-02	0.00E+00	1.06E-02
		Be-7	<5.17E-02	0.00E+00	5.17E-02
		K-40	<2.18E-01	0.00E+00	2.18E-01
439149	3/28/2017 - 4/4/2017	I-131	<6.97E-03	0.00E+00	6.97E-03
		Cs-134	<7.15E-03	0.00E+00	7.15E-03
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<6.49E-02	0.00E+00	6.49E-02
		K-40	<1.82E-01	0.00E+00	1.82E-01
439992	4/4/2017 - 4/11/2017	I-131	<9.52E-03	0.00E+00	9.52E-03
		Cs-134	<6.03E-03	0.00E+00	6.03E-03
		Cs-137	<8.82E-03	0.00E+00	8.82E-03
		Be-7	<5.58E-02	0.00E+00	5.58E-02
		K-40	4.04E-01	1.51E-01	1.41E-01
440587	4/11/2017 - 4/18/2017	I-131	<7.42E-03	0.00E+00	7.42E-03
		Cs-134	<6.55E-03	0.00E+00	6.55E-03
		Cs-137	<1.68E-03	0.00E+00	1.68E-03
		Be-7	<5.56E-02	0.00E+00	5.56E-02
		K-40	3.69E-01	1.37E-01	1.08E-01
441401	4/18/2017 - 4/25/2017	I-131	<9.50E-03	0.00E+00	9.50E-03
		Cs-134	<7.66E-03	0.00E+00	7.66E-03
		Cs-137	<5.89E-03	0.00E+00	5.89E-03
		Be-7	<5.32E-02	0.00E+00	5.32E-02
		K-40	4.55E-01	1.46E-01	2.93E-02
441846	4/25/2017 - 5/2/2017	I-131	<1.12E-02	0.00E+00	1.12E-02
		Cs-134	<9.09E-03	0.00E+00	9.09E-03
		Cs-137	<6.29E-03	0.00E+00	6.29E-03
		Be-7	<4.75E-02	0.00E+00	4.75E-02
		K-40	5.03E-01	1.57E-01	3.10E-02
442277	5/2/2017 - 5/9/2017	I-131	<6.80E-03	0.00E+00	6.80E-03
		Cs-134	<8.49E-03	0.00E+00	8.49E-03
		Cs-137	<1.16E-02	0.00E+00	1.16E-02
		Be-7	<5.55E-02	0.00E+00	5.55E-02
		K-40	5.16E-01	1.68E-01	1.22E-01
442860	5/9/2017 - 5/15/2017	I-131	<9.43E-03	0.00E+00	9.43E-03
		Cs-134	<5.10E-03	0.00E+00	5.10E-03
		Cs-137	<8.95E-03	0.00E+00	8.95E-03
		Be-7	<6.93E-02	0.00E+00	6.93E-02
		K-40	4.22E-01	1.76E-01	1.95E-01
443288	5/15/2017 - 5/23/2017	I-131	<7.82E-03	0.00E+00	7.82E-03
		Cs-134	<7.92E-03	0.00E+00	7.92E-03
		Cs-137	<7.09E-03	0.00E+00	7.09E-03
		Be-7	<4.10E-02	0.00E+00	4.10E-02
		K-40	3.78E-01	1.45E-01	1.41E-01
443846	5/23/2017 - 5/31/2017	I-131	<7.98E-03	0.00E+00	7.98E-03
		Cs-134	<5.93E-03	0.00E+00	5.93E-03
		Cs-137	<9.82E-03	0.00E+00	9.82E-03
		Be-7	<5.11E-02	0.00E+00	5.11E-02
		K-40	1.43E-01	8.94E-02	1.10E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m<sup>3</sup>

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
444248	5/31/2017 - 6/6/2017	I-131	<9.22E-03	0.00E+00	9.22E-03
		Cs-134	<9.72E-03	0.00E+00	9.72E-03
		Cs-137	<1.21E-02	0.00E+00	1.21E-02
		Be-7	<5.31E-02	0.00E+00	5.31E-02
		K-40	1.83E-01	1.14E-01	1.36E-01
445310	6/6/2017 - 6/13/2017	I-131	<8.71E-03	0.00E+00	8.71E-03
		Cs-134	<4.49E-03	0.00E+00	4.49E-03
		Cs-137	<7.89E-03	0.00E+00	7.89E-03
		Be-7	<5.04E-02	0.00E+00	5.04E-02
		K-40	1.55E-01	8.12E-02	2.80E-02
446309	6/13/2017 - 6/20/2017	I-131	<9.68E-03	0.00E+00	9.68E-03
		Cs-134	<5.49E-03	0.00E+00	5.49E-03
		Cs-137	<8.31E-03	0.00E+00	8.31E-03
		Be-7	<4.38E-02	0.00E+00	4.38E-02
		K-40	2.63E-01	1.42E-01	1.80E-01
446813	6/20/2017 - 6/27/2017	I-131	<7.27E-03	0.00E+00	7.27E-03
		Cs-134	<4.63E-03	0.00E+00	4.63E-03
		Cs-137	<8.75E-03	0.00E+00	8.75E-03
		Be-7	<6.60E-02	0.00E+00	6.60E-02
		K-40	<2.04E-01	0.00E+00	2.04E-01
447160	6/27/2017 - 7/3/2017	I-131	<9.78E-03	0.00E+00	9.78E-03
		Cs-134	<9.58E-03	0.00E+00	9.58E-03
		Cs-137	<9.64E-03	0.00E+00	9.64E-03
		Be-7	<5.81E-02	0.00E+00	5.81E-02
		K-40	1.85E-01	1.03E-01	9.71E-02
447792	7/3/2017 - 7/11/2017	I-131	<3.85E-03	0.00E+00	3.85E-03
		Cs-134	<7.97E-03	0.00E+00	7.97E-03
		Cs-137	<8.92E-03	0.00E+00	8.92E-03
		Be-7	<6.33E-02	0.00E+00	6.33E-02
		K-40	1.15E-01	8.45E-02	1.08E-01
448256	7/11/2017 - 7/18/2017	I-131	<9.28E-03	0.00E+00	9.28E-03
		Cs-134	<5.85E-03	0.00E+00	5.85E-03
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<4.04E-02	0.00E+00	4.04E-02
		K-40	2.23E-01	1.11E-01	1.03E-01
448882	7/18/2017 - 7/25/2017	I-131	<4.90E-03	0.00E+00	4.90E-03
		Cs-134	<6.43E-03	0.00E+00	6.43E-03
		Cs-137	<8.60E-03	0.00E+00	8.60E-03
		Be-7	<5.12E-02	0.00E+00	5.12E-02
		K-40	<2.30E-01	0.00E+00	2.30E-01
449206	7/25/2017 - 8/1/2017	I-131	<8.31E-03	0.00E+00	8.31E-03
		Cs-134	<7.03E-03	0.00E+00	7.03E-03
		Cs-137	<6.68E-03	0.00E+00	6.68E-03
		Be-7	<6.28E-02	0.00E+00	6.28E-02
		K-40	1.57E-01	8.75E-02	7.81E-02
449937	8/1/2017 - 8/8/2017	I-131	<8.76E-03	0.00E+00	8.76E-03
		Cs-134	<6.57E-03	0.00E+00	6.57E-03
		Cs-137	<8.18E-03	0.00E+00	8.18E-03
		Be-7	<5.57E-02	0.00E+00	5.57E-02
		K-40	<1.83E-01	0.00E+00	1.83E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
450182	8/8/2017 - 8/15/2017	I-131	<1.12E-02	0.00E+00	1.12E-02
		Cs-134	<7.50E-03	0.00E+00	7.50E-03
		Cs-137	<1.20E-02	0.00E+00	1.20E-02
		Be-7	<4.57E-02	0.00E+00	4.57E-02
		K-40	<2.79E-01	0.00E+00	2.79E-01
450715	8/15/2017 - 8/22/2017	I-131	<8.38E-03	0.00E+00	8.38E-03
		Cs-134	<8.40E-03	0.00E+00	8.40E-03
		Cs-137	<1.09E-02	0.00E+00	1.09E-02
		Be-7	<5.21E-02	0.00E+00	5.21E-02
		K-40	<2.43E-01	0.00E+00	2.43E-01
451174	8/22/2017 - 8/29/2017	I-131	<9.01E-03	0.00E+00	9.01E-03
		Cs-134	<6.43E-03	0.00E+00	6.43E-03
		Cs-137	<1.21E-02	0.00E+00	1.21E-02
		Be-7	<5.59E-02	0.00E+00	5.59E-02
		K-40	1.79E-01	1.10E-01	1.31E-01
451528	8/29/2017 - 9/5/2017	I-131	<8.73E-03	0.00E+00	8.73E-03
		Cs-134	<6.24E-03	0.00E+00	6.24E-03
		Cs-137	<8.46E-03	0.00E+00	8.46E-03
		Be-7	<4.46E-02	0.00E+00	4.46E-02
		K-40	3.48E-01	1.27E-01	2.94E-02
452332	9/5/2017 - 9/12/2017	I-131	<1.06E-02	0.00E+00	1.06E-02
		Cs-134	<6.27E-03	0.00E+00	6.27E-03
		Cs-137	<1.13E-02	0.00E+00	1.13E-02
		Be-7	<7.82E-02	0.00E+00	7.82E-02
		K-40	2.81E-01	1.24E-01	1.09E-01
452775	9/12/2017 - 9/19/2017	I-131	<5.15E-03	0.00E+00	5.15E-03
		Cs-134	<8.03E-03	0.00E+00	8.03E-03
		Cs-137	<6.44E-03	0.00E+00	6.44E-03
		Be-7	<5.46E-02	0.00E+00	5.46E-02
		K-40	3.07E-01	1.16E-01	2.78E-02
453429	9/19/2017 - 9/26/2017	I-131	<8.39E-03	0.00E+00	8.39E-03
		Cs-134	<5.36E-03	0.00E+00	5.36E-03
		Cs-137	<1.06E-02	0.00E+00	1.06E-02
		Be-7	<5.12E-02	0.00E+00	5.12E-02
		K-40	<2.42E-01	0.00E+00	2.42E-01
454193	9/26/2017 - 10/3/2017	I-131	<1.26E-02	0.00E+00	1.26E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.24E-02	0.00E+00	1.24E-02
		Be-7	<9.69E-02	0.00E+00	9.69E-02
		K-40	1.73E-01	1.21E-01	1.56E-01
455047	10/3/2017 - 10/10/2017	I-131	<2.37E-02	0.00E+00	2.37E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.35E-02	0.00E+00	1.35E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	<2.97E-01	0.00E+00	2.97E-01
455402	10/10/2017 - 10/17/2017	I-131	<4.56E-02	0.00E+00	4.56E-02
		Cs-134	<1.89E-02	0.00E+00	1.89E-02
		Cs-137	<1.84E-02	0.00E+00	1.84E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	5.64E-01	2.28E-01	2.73E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
456027	10/17/2017 - 10/24/2017	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<9.34E-02	0.00E+00	9.34E-02
		K-40	3.56E-01	1.90E-01	2.50E-01
461403	10/24/2017 - 10/30/2017	I-131	<2.40E-02	0.00E+00	2.40E-02
		Cs-134	<2.38E-02	0.00E+00	2.38E-02
		Cs-137	<1.81E-02	0.00E+00	1.81E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	6.86E-01	2.07E-01	3.95E-02
461949	10/30/2017 - 11/7/2017	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.20E-02	0.00E+00	1.20E-02
		Cs-137	<1.62E-02	0.00E+00	1.62E-02
		Be-7	<8.69E-02	0.00E+00	8.69E-02
		K-40	3.69E-01	1.51E-01	1.50E-01
462585	11/7/2017 - 11/13/2017	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<2.00E-02	0.00E+00	2.00E-02
		Be-7	<1.37E-01	0.00E+00	1.37E-01
		K-40	4.14E-01	2.27E-01	3.05E-01
463077	11/13/2017 - 11/20/2017	I-131	<1.78E-02	0.00E+00	1.78E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	3.30E-01	1.67E-01	2.01E-01
463493	11/20/2017 - 11/28/2017	I-131	<1.65E-02	0.00E+00	1.65E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	4.13E-01	1.60E-01	1.57E-01
464152	11/28/2017 - 12/5/2017	I-131	<2.31E-02	0.00E+00	2.31E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.52E-02	0.00E+00	1.52E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	4.08E-01	1.68E-01	1.67E-01
464682	12/5/2017 - 12/12/2017	I-131	<2.01E-02	0.00E+00	2.01E-02
		Cs-134	<1.88E-02	0.00E+00	1.88E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	4.50E-01	1.62E-01	1.04E-01
464951	12/12/2017 - 12/19/2017	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<2.12E-02	0.00E+00	2.12E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	4.65E-01	1.69E-01	1.32E-01
465198	12/19/2017 - 12/27/2017	I-131	<1.97E-02	0.00E+00	1.97E-02
		Cs-134	<1.31E-02	0.00E+00	1.31E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	4.25E-01	1.55E-01	1.37E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [ INDICATOR - N @ 0.72 miles ]

Sample ID:	Sample Dates:		Nuclide	Activity	2 Sigma Error	MDA
465586	12/27/2017 - 1/3/2018		I-131	<3.23E-02	0.00E+00	3.23E-02
			Cs-134	<1.46E-02	0.00E+00	1.46E-02
			Cs-137	<1.66E-02	0.00E+00	1.66E-02
			Be-7	<1.31E-01	0.00E+00	1.31E-01
			K-40	4.11E-01	1.78E-01	1.93E-01

Media Type: CROPS Concentration (Activity): pCi/kg

Sample Point 260 [ INDICATOR - SSE @ 2 miles ]

Sample ID:	Sample Dates:	MIXEDCROPS	Nuclide	Activity	2 Sigma Error	MDA
439993	4/4/2017 - 4/4/2017		I-131	<1.36E+01	0.00E+00	1.36E+01
			Cs-134	<1.19E+01	0.00E+00	1.19E+01
			Cs-137	<1.19E+01	0.00E+00	1.19E+01
			Be-7	1.91E+02	1.01E+02	1.46E+02
			K-40	3.00E+03	4.42E+02	2.29E+02
442491	5/2/2017 - 5/2/2017		I-131	<8.04E+00	0.00E+00	8.04E+00
			Cs-134	<9.30E+00	0.00E+00	9.30E+00
			Cs-137	<8.10E+00	0.00E+00	8.10E+00
			Be-7	3.67E+02	8.67E+01	8.38E+01
			K-40	2.41E+03	3.26E+02	1.07E+02
444936	6/6/2017 - 6/6/2017		I-131	<7.03E+00	0.00E+00	7.03E+00
			Cs-134	<1.41E+01	0.00E+00	1.41E+01
			Cs-137	<1.30E+01	0.00E+00	1.30E+01
			Be-7	<7.24E+01	0.00E+00	7.24E+01
			K-40	2.09E+03	3.42E+02	1.72E+02
447612	7/3/2017 - 7/3/2017		I-131	<9.35E+00	0.00E+00	9.35E+00
			Cs-134	<9.32E+00	0.00E+00	9.32E+00
			Cs-137	<9.96E+00	0.00E+00	9.96E+00
			Be-7	<6.31E+01	0.00E+00	6.31E+01
			K-40	1.85E+03	2.85E+02	1.18E+02
449881	8/1/2017 - 8/1/2017		I-131	<7.23E+00	0.00E+00	7.23E+00
			Cs-134	<9.90E+00	0.00E+00	9.90E+00
			Cs-137	<9.77E+00	0.00E+00	9.77E+00
			Be-7	<6.15E+01	0.00E+00	6.15E+01
			K-40	2.14E+03	3.10E+02	1.69E+02
451498	9/5/2017 - 9/5/2017		I-131	<1.01E+01	0.00E+00	1.01E+01
			Cs-134	<1.41E+01	0.00E+00	1.41E+01
			Cs-137	<1.55E+01	0.00E+00	1.55E+01
			Be-7	<7.44E+01	0.00E+00	7.44E+01
			K-40	2.70E+03	4.31E+02	2.30E+02
454145	10/3/2017 - 10/3/2017		I-131	<1.08E+01	0.00E+00	1.08E+01
			Cs-134	<1.27E+01	0.00E+00	1.27E+01
			Cs-137	<1.05E+01	0.00E+00	1.05E+01
			Be-7	<8.50E+01	0.00E+00	8.50E+01
			K-40	2.39E+03	3.79E+02	2.09E+02
461404	11/7/2017 - 11/7/2017		I-131	<2.33E+01	0.00E+00	2.33E+01
			Cs-134	<3.47E+01	0.00E+00	3.47E+01
			Cs-137	<2.99E+01	0.00E+00	2.99E+01
			Be-7	<1.98E+02	0.00E+00	1.98E+02
			K-40	2.63E+03	6.40E+02	6.26E+02
463726	12/5/2017 - 12/5/2017		I-131	<4.75E+01	0.00E+00	4.75E+01
			Cs-134	<4.10E+01	0.00E+00	4.10E+01





**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: CROPS Concentration (Activity): pCi/kg

Sample Point 260 [ INDICATOR - SSE @ 2 miles ]

Sample ID:	Sample Dates:	MIXEDCROPS	Nuclide	Activity	2 Sigma Error	MDA
463726	12/5/2017 - 12/5/2017		Cs-137	<4.30E+01	0.00E+00	4.30E+01
			Be-7	1.24E+02	2.33E+02	3.95E+02
			K-40	4.45E+03	8.31E+02	5.43E+02

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [ INDICATOR - SSE @ 7.3 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431601	12/6/2016 - 1/4/2017	Beta	1.19E+00	9.45E-01	1.56E+00
		Mn-54	<3.82E+00	0.00E+00	3.82E+00
		Co-58	<3.79E+00	0.00E+00	3.79E+00
		Fe-59	<8.20E+00	0.00E+00	8.20E+00
		Co-60	<3.46E+00	0.00E+00	3.46E+00
		Zn-65	<6.83E+00	0.00E+00	6.83E+00
		Zr-95	<4.15E+00	0.00E+00	4.15E+00
		Nb-95	<3.85E+00	0.00E+00	3.85E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<3.13E+00	0.00E+00	3.13E+00
		Cs-137	<3.02E+00	0.00E+00	3.02E+00
		BaLa-140	<1.13E+01	0.00E+00	1.13E+01
		Be-7	<2.77E+01	0.00E+00	2.77E+01
		K-40	5.45E+01	3.80E+01	5.52E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
433487	1/4/2017 - 1/31/2017	Beta	2.50E+00	9.33E-01	1.43E+00
		Mn-54	<4.99E+00	0.00E+00	4.99E+00
		Co-58	<4.75E+00	0.00E+00	4.75E+00
		Fe-59	<7.74E+00	0.00E+00	7.74E+00
		Co-60	<2.46E+00	0.00E+00	2.46E+00
		Zn-65	<6.58E+00	0.00E+00	6.58E+00
		Zr-95	<6.80E+00	0.00E+00	6.80E+00
		Nb-95	<4.25E+00	0.00E+00	4.25E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.88E+00	0.00E+00	3.88E+00
		Cs-137	<4.01E+00	0.00E+00	4.01E+00
		BaLa-140	<8.00E+00	0.00E+00	8.00E+00
		Be-7	<3.45E+01	0.00E+00	3.45E+01
		K-40	<6.87E+01	0.00E+00	6.87E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
434732	12/6/2016 - 2/28/2017	H3DW	7.79E+02	1.33E+02	1.86E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
436092	1/31/2017 - 2/28/2017	Beta	1.30E+00	9.12E-01	1.49E+00
		Mn-54	<3.13E+00	0.00E+00	3.13E+00
		Co-58	<3.71E+00	0.00E+00	3.71E+00
		Fe-59	<6.72E+00	0.00E+00	6.72E+00
		Co-60	<4.53E+00	0.00E+00	4.53E+00
		Zn-65	<9.35E+00	0.00E+00	9.35E+00
		Zr-95	<8.45E+00	0.00E+00	8.45E+00
		Nb-95	<4.39E+00	0.00E+00	4.39E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.99E+00	0.00E+00	4.99E+00
		Cs-137	<5.07E+00	0.00E+00	5.07E+00
		BaLa-140	<9.08E+00	0.00E+00	9.08E+00
		Be-7	<3.94E+01	0.00E+00	3.94E+01
		K-40	<6.20E+01	0.00E+00	6.20E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
438660	2/28/2017 - 3/28/2017	Beta	1.54E+00	9.04E-01	1.46E+00
		Mn-54	<3.02E+00	0.00E+00	3.02E+00
		Co-58	<3.60E+00	0.00E+00	3.60E+00
		Fe-59	<5.44E+00	0.00E+00	5.44E+00
		Co-60	<2.16E+00	0.00E+00	2.16E+00
		Zn-65	<6.42E+00	0.00E+00	6.42E+00
		Zr-95	<6.81E+00	0.00E+00	6.81E+00
		Nb-95	<3.86E+00	0.00E+00	3.86E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [ INDICATOR - SSE @ 7.3 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
438660	2/28/2017 - 3/28/2017	I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.35E+00	0.00E+00	3.35E+00
		Cs-137	<3.38E+00	0.00E+00	3.38E+00
		BaLa-140	<4.52E+00	0.00E+00	4.52E+00
		Be-7	<2.70E+01	0.00E+00	2.70E+01
		K-40	2.96E+01	2.48E+01	3.64E+01
440789	3/28/2017 - 4/25/2017	Beta	8.33E-01	9.45E-01	1.58E+00
		Mn-54	<4.18E+00	0.00E+00	4.18E+00
		Co-58	<2.73E+00	0.00E+00	2.73E+00
		Fe-59	<6.45E+00	0.00E+00	6.45E+00
		Co-60	<4.61E+00	0.00E+00	4.61E+00
		Zn-65	<7.41E+00	0.00E+00	7.41E+00
		Zr-95	<6.35E+00	0.00E+00	6.35E+00
		Nb-95	<3.98E+00	0.00E+00	3.98E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<4.45E+00	0.00E+00	4.45E+00
		Cs-137	<3.55E+00	0.00E+00	3.55E+00
		BaLa-140	<8.68E+00	0.00E+00	8.68E+00
		Be-7	<4.00E+01	0.00E+00	4.00E+01
		K-40	2.32E+01	3.45E+01	5.78E+01
442283	2/28/2017 - 5/23/2017	H3DW	7.69E+02	1.37E+02	1.95E+02
443059	4/25/2017 - 5/23/2017	Beta	2.32E+00	9.34E-01	1.45E+00
		Mn-54	<3.19E+00	0.00E+00	3.19E+00
		Co-58	<4.17E+00	0.00E+00	4.17E+00
		Fe-59	<5.66E+00	0.00E+00	5.66E+00
		Co-60	<3.54E+00	0.00E+00	3.54E+00
		Zn-65	<7.44E+00	0.00E+00	7.44E+00
		Zr-95	<5.15E+00	0.00E+00	5.15E+00
		Nb-95	<4.30E+00	0.00E+00	4.30E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.72E+00	0.00E+00	3.72E+00
		Cs-137	<4.15E+00	0.00E+00	4.15E+00
		BaLa-140	<5.29E+00	0.00E+00	5.29E+00
		Be-7	<3.12E+01	0.00E+00	3.12E+01
		K-40	5.23E+01	3.38E+01	4.63E+01
445664	5/23/2017 - 6/20/2017	Beta	3.60E+00	9.78E-01	1.42E+00
		Mn-54	<3.04E+00	0.00E+00	3.04E+00
		Co-58	<4.19E+00	0.00E+00	4.19E+00
		Fe-59	<1.05E+01	0.00E+00	1.05E+01
		Co-60	<4.46E+00	0.00E+00	4.46E+00
		Zn-65	<8.18E+00	0.00E+00	8.18E+00
		Zr-95	<7.42E+00	0.00E+00	7.42E+00
		Nb-95	<4.07E+00	0.00E+00	4.07E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<4.22E+00	0.00E+00	4.22E+00
		Cs-137	<3.89E+00	0.00E+00	3.89E+00
		BaLa-140	<1.18E+01	0.00E+00	1.18E+01
		Be-7	<3.80E+01	0.00E+00	3.80E+01
		K-40	<7.58E+01	0.00E+00	7.58E+01
447957	6/20/2017 - 7/18/2017	Beta	2.16E+00	9.17E-01	1.43E+00
		Mn-54	<3.24E+00	0.00E+00	3.24E+00
		Co-58	<2.76E+00	0.00E+00	2.75E+00
		Fe-59	<6.27E+00	0.00E+00	6.27E+00
		Co-60	<2.93E+00	0.00E+00	2.93E+00
		Zn-65	<7.62E+00	0.00E+00	7.62E+00
		Zr-95	<5.73E+00	0.00E+00	5.73E+00
		Nb-95	<4.06E+00	0.00E+00	4.06E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [ INDICATOR - SSE @ 7.3 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
447957	6/20/2017 - 7/18/2017	I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<3.43E+00	0.00E+00	3.43E+00
		Cs-137	<3.00E+00	0.00E+00	3.00E+00
		BaLa-140	<8.10E+00	0.00E+00	8.10E+00
		Be-7	<2.81E+01	0.00E+00	2.81E+01
		K-40	1.02E+02	4.12E+01	5.38E+01
450041	5/23/2017 - 8/15/2017	H3DW	8.98E+02	1.36E+02	1.86E+02
450086	7/18/2017 - 8/15/2017	Beta	2.60E+00	9.46E-01	1.44E+00
		Mn-54	<3.69E+00	0.00E+00	3.69E+00
		Co-58	<4.79E+00	0.00E+00	4.79E+00
		Fe-59	<6.40E+00	0.00E+00	6.40E+00
		Co-60	<2.53E+00	0.00E+00	2.53E+00
		Zn-65	<6.02E+00	0.00E+00	6.02E+00
		Zr-95	<6.64E+00	0.00E+00	6.64E+00
		Nb-95	<4.54E+00	0.00E+00	4.54E+00
		I-131	<1.03E+01	0.00E+00	1.03E+01
		Cs-134	<2.96E+00	0.00E+00	2.96E+00
		Cs-137	<3.58E+00	0.00E+00	3.58E+00
		BaLa-140	<1.15E+01	0.00E+00	1.15E+01
		Be-7	<3.44E+01	0.00E+00	3.44E+01
		K-40	<5.75E+01	0.00E+00	5.75E+01
		451819	8/15/2017 - 9/12/2017	Beta	1.84E+00
Mn-54	<3.66E+00			0.00E+00	3.66E+00
Co-58	<3.01E+00			0.00E+00	3.01E+00
Fe-59	<6.68E+00			0.00E+00	6.68E+00
Co-60	<2.91E+00			0.00E+00	2.91E+00
Zn-65	<8.10E+00			0.00E+00	8.10E+00
Zr-95	<5.64E+00			0.00E+00	5.64E+00
Nb-95	<3.36E+00			0.00E+00	3.36E+00
I-131	<1.16E+01			0.00E+00	1.16E+01
Cs-134	<3.37E+00			0.00E+00	3.37E+00
Cs-137	<2.32E+00			0.00E+00	2.32E+00
BaLa-140	<4.71E+00			0.00E+00	4.71E+00
Be-7	<2.65E+01			0.00E+00	2.65E+01
K-40	1.87E+01			2.44E+01	3.99E+01
454583	9/12/2017 - 10/10/2017			Beta	3.03E+00
		Mn-54	<3.30E+00	0.00E+00	3.30E+00
		Co-58	<3.87E+00	0.00E+00	3.87E+00
		Fe-59	<7.35E+00	0.00E+00	7.35E+00
		Co-60	<3.38E+00	0.00E+00	3.38E+00
		Zn-65	<6.92E+00	0.00E+00	6.92E+00
		Zr-95	<6.86E+00	0.00E+00	6.86E+00
		Nb-95	<6.45E+00	0.00E+00	6.45E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.12E+00	0.00E+00	3.12E+00
		Cs-137	<4.42E+00	0.00E+00	4.42E+00
		BaLa-140	<1.00E+01	0.00E+00	1.00E+01
		Be-7	<3.28E+01	0.00E+00	3.28E+01
		K-40	<5.64E+01	0.00E+00	5.64E+01
		461744	10/10/2017 - 11/7/2017	Beta	1.49E+00
Mn-54	<3.20E+00			0.00E+00	3.20E+00
Co-58	<3.53E+00			0.00E+00	3.53E+00
Fe-59	<7.22E+00			0.00E+00	7.22E+00
Co-60	<3.23E+00			0.00E+00	3.23E+00
Zn-65	<6.80E+00			0.00E+00	6.80E+00
Zr-95	<6.51E+00			0.00E+00	6.51E+00
Nb-95	<4.68E+00			0.00E+00	4.68E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [ INDICATOR - SSE @ 7.3 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
461744	10/10/2017 - 11/7/2017	I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<4.23E+00	0.00E+00	4.23E+00
		Cs-137	<3.23E+00	0.00E+00	3.23E+00
		BaLa-140	<7.82E+00	0.00E+00	7.82E+00
		Be-7	9.00E+00	2.21E+01	3.83E+01
		K-40	6.76E+01	3.94E+01	5.50E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
462362	8/15/2017 - 12/5/2017	H3DW	8.65E+02	1.36E+02	1.88E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
463800	11/7/2017 - 12/5/2017	Beta	1.99E+00	9.49E-01	1.50E+00
		Mn-54	<2.70E+00	0.00E+00	2.69E+00
		Co-58	<3.61E+00	0.00E+00	3.61E+00
		Fe-59	<4.80E+00	0.00E+00	4.80E+00
		Co-60	<3.23E+00	0.00E+00	3.23E+00
		Zn-65	<5.95E+00	0.00E+00	5.95E+00
		Zr-95	<6.81E+00	0.00E+00	6.81E+00
		Nb-95	<4.05E+00	0.00E+00	4.05E+00
		I-131	<1.03E+01	0.00E+00	1.03E+01
		Cs-134	<2.56E+00	0.00E+00	2.56E+00
		Cs-137	<2.93E+00	0.00E+00	2.93E+00
		BaLa-140	<7.27E+00	0.00E+00	7.27E+00
		Be-7	<2.58E+01	0.00E+00	2.58E+01
		K-40	5.52E+01	2.75E+01	3.48E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465387	12/5/2017 - 1/3/2018	Beta	4.47E+00	8.81E-01	1.20E+00
		Mn-54	<1.64E+00	0.00E+00	1.64E+00
		Co-58	<1.91E+00	0.00E+00	1.91E+00
		Fe-59	<3.24E+00	0.00E+00	3.24E+00
		Co-60	<1.27E+00	0.00E+00	1.27E+00
		Zn-65	<3.02E+00	0.00E+00	3.02E+00
		Zr-95	<3.40E+00	0.00E+00	3.40E+00
		Nb-95	<2.31E+00	0.00E+00	2.31E+00
		I-131	<9.42E+00	0.00E+00	9.42E+00
		Cs-134	<1.93E+00	0.00E+00	1.93E+00
		Cs-137	<1.70E+00	0.00E+00	1.70E+00
		BaLa-140	<4.89E+00	0.00E+00	4.89E+00
		Be-7	<1.61E+01	0.00E+00	1.61E+01
		K-40	4.89E+01	2.29E+01	3.34E+01
		H3DW	1.27E+03	1.44E+02	1.82E+02

## Sample Point 218 [ CONTROL - NNE @ 13.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
431602	12/6/2016 - 1/4/2017	Beta	1.06E+00	9.29E-01	1.54E+00
		Mn-54	<4.37E+00	0.00E+00	4.37E+00
		Co-58	<4.85E+00	0.00E+00	4.85E+00
		Fe-59	<8.08E+00	0.00E+00	8.08E+00
		Co-60	<4.11E+00	0.00E+00	4.11E+00
		Zn-65	<5.77E+00	0.00E+00	5.77E+00
		Zr-95	<7.12E+00	0.00E+00	7.12E+00
		Nb-95	<4.50E+00	0.00E+00	4.50E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<2.24E+00	0.00E+00	2.24E+00
		Cs-137	<4.49E+00	0.00E+00	4.49E+00
		BaLa-140	<5.87E+00	0.00E+00	5.87E+00
		Be-7	1.79E+01	2.42E+01	4.01E+01
		K-40	<5.43E+01	0.00E+00	5.43E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
433488	1/4/2017 - 1/31/2017	Beta	2.49E+00	9.43E-01	1.45E+00
		Mn-54	<3.18E+00	0.00E+00	3.18E+00
		Co-58	<3.84E+00	0.00E+00	3.84E+00
		Fe-59	<8.70E+00	0.00E+00	8.70E+00
		Co-60	<3.24E+00	0.00E+00	3.24E+00



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [ CONTROL - NNE @ 13.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
433488	1/4/2017 - 1/31/2017	Zn-65	<6.48E+00	0.00E+00	6.48E+00
		Zr-95	<6.80E+00	0.00E+00	6.80E+00
		Nb-95	<3.21E+00	0.00E+00	3.21E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.87E+00	0.00E+00	3.87E+00
		Cs-137	<3.79E+00	0.00E+00	3.79E+00
		BaLa-140	<9.21E+00	0.00E+00	9.21E+00
		Be-7	<3.46E+01	0.00E+00	3.46E+01
		K-40	3.52E+01	2.52E+01	3.35E+01
		434733	12/6/2016 - 2/28/2017	H3DW	3.96E+02
436093	1/31/2017 - 2/28/2017	Beta	1.50E+00	9.15E-01	1.48E+00
		Mn-54	<2.97E+00	0.00E+00	2.97E+00
		Co-58	<3.31E+00	0.00E+00	3.31E+00
		Fe-59	<4.86E+00	0.00E+00	4.86E+00
		Co-60	<3.85E+00	0.00E+00	3.85E+00
		Zn-65	<5.31E+00	0.00E+00	5.31E+00
		Zr-95	<6.59E+00	0.00E+00	6.59E+00
		Nb-95	<2.69E+00	0.00E+00	2.69E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<2.68E+00	0.00E+00	2.68E+00
		Cs-137	<2.68E+00	0.00E+00	2.68E+00
		BaLa-140	<6.89E+00	0.00E+00	6.89E+00
		Be-7	9.13E+00	1.61E+01	2.74E+01
		K-40	5.62E+01	2.71E+01	3.18E+01
438661	2/28/2017 - 3/28/2017	Beta	2.11E+00	9.14E-01	1.43E+00
		Mn-54	<3.66E+00	0.00E+00	3.66E+00
		Co-58	<3.93E+00	0.00E+00	3.93E+00
		Fe-59	<7.14E+00	0.00E+00	7.14E+00
		Co-60	<3.01E+00	0.00E+00	3.01E+00
		Zn-65	<7.05E+00	0.00E+00	7.05E+00
		Zr-95	<5.04E+00	0.00E+00	5.04E+00
		Nb-95	<4.63E+00	0.00E+00	4.63E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<4.27E+00	0.00E+00	4.27E+00
		Cs-137	<3.34E+00	0.00E+00	3.34E+00
		BaLa-140	<1.66E+00	0.00E+00	1.66E+00
		Be-7	<2.91E+01	0.00E+00	2.91E+01
		K-40	1.25E+02	4.17E+01	4.30E+01
440790	3/28/2017 - 4/25/2017	Beta	9.25E-01	9.38E-01	1.56E+00
		Mn-54	<3.93E+00	0.00E+00	3.93E+00
		Co-58	<3.58E+00	0.00E+00	3.58E+00
		Fe-59	<1.03E+01	0.00E+00	1.03E+01
		Co-60	<3.08E+00	0.00E+00	3.08E+00
		Zn-65	<8.00E+00	0.00E+00	8.00E+00
		Zr-95	<8.07E+00	0.00E+00	8.07E+00
		Nb-95	<4.83E+00	0.00E+00	4.83E+00
		I-131	<1.13E+01	0.00E+00	1.13E+01
		Cs-134	<4.58E+00	0.00E+00	4.58E+00
		Cs-137	<3.38E+00	0.00E+00	3.38E+00
		BaLa-140	<6.47E+00	0.00E+00	6.47E+00
		Be-7	<2.87E+01	0.00E+00	2.87E+01
		K-40	4.33E+01	3.43E+01	4.92E+01
442284	2/28/2017 - 5/23/2017	H3DW	8.30E+02	1.40E+02	1.97E+02
443060	4/25/2017 - 5/23/2017	Beta	1.76E+00	8.95E-01	1.42E+00
		Mn-54	<4.13E+00	0.00E+00	4.13E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [ CONTROL - NNE @ 13.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
443060	4/25/2017 - 5/23/2017	Co-58	<2.01E+00	0.00E+00	2.01E+00
		Fe-59	<6.99E+00	0.00E+00	6.99E+00
		Co-60	<4.35E+00	0.00E+00	4.35E+00
		Zn-65	<8.61E+00	0.00E+00	8.61E+00
		Zr-95	<8.80E+00	0.00E+00	8.80E+00
		Nb-95	<5.95E+00	0.00E+00	5.95E+00
		I-131	<1.10E+01	0.00E+00	1.10E+01
		Cs-134	<4.36E+00	0.00E+00	4.36E+00
		Cs-137	<3.38E+00	0.00E+00	3.38E+00
		BaLa-140	<6.53E+00	0.00E+00	6.53E+00
		Be-7	<2.88E+01	0.00E+00	2.88E+01
		K-40	<5.95E+01	0.00E+00	5.95E+01
		445665	5/23/2017 - 6/20/2017	Beta	2.33E+00
Mn-54	<2.32E+00			0.00E+00	2.32E+00
Co-58	<4.56E+00			0.00E+00	4.56E+00
Fe-59	<7.60E+00			0.00E+00	7.60E+00
Co-60	<2.78E+00			0.00E+00	2.78E+00
Zn-65	<5.71E+00			0.00E+00	5.71E+00
Zr-95	<4.56E+00			0.00E+00	4.56E+00
Nb-95	<3.98E+00			0.00E+00	3.98E+00
I-131	<1.14E+01			0.00E+00	1.14E+01
Cs-134	<3.58E+00			0.00E+00	3.58E+00
Cs-137	<3.13E+00			0.00E+00	3.13E+00
BaLa-140	<8.29E+00			0.00E+00	8.29E+00
Be-7	<2.51E+01			0.00E+00	2.51E+01
K-40	<6.01E+01	0.00E+00	6.01E+01		
447958	6/20/2017 - 7/18/2017	Beta	2.14E+00	9.09E-01	1.42E+00
		Mn-54	<2.97E+00	0.00E+00	2.97E+00
		Co-58	<3.86E+00	0.00E+00	3.86E+00
		Fe-59	<8.50E+00	0.00E+00	8.50E+00
		Co-60	<3.08E+00	0.00E+00	3.08E+00
		Zn-65	<8.60E+00	0.00E+00	8.60E+00
		Zr-95	<6.83E+00	0.00E+00	6.83E+00
		Nb-95	<6.50E+00	0.00E+00	6.50E+00
		I-131	<1.04E+01	0.00E+00	1.04E+01
		Cs-134	<4.13E+00	0.00E+00	4.13E+00
		Cs-137	<4.35E+00	0.00E+00	4.35E+00
		BaLa-140	<1.16E+01	0.00E+00	1.16E+01
		Be-7	<3.33E+01	0.00E+00	3.33E+01
K-40	5.76E+01	3.05E+01	2.93E+01		
450042	5/23/2017 - 8/15/2017	Nuclide	Activity	2 Sigma Error	MDA
		H3DW	5.63E+02	1.26E+02	1.86E+02
450087	7/18/2017 - 8/15/2017	Beta	1.75E+00	8.89E-01	1.41E+00
		Mn-54	<3.13E+00	0.00E+00	3.13E+00
		Co-58	<4.00E+00	0.00E+00	4.00E+00
		Fe-59	<7.50E+00	0.00E+00	7.50E+00
		Co-60	<3.63E+00	0.00E+00	3.63E+00
		Zn-65	<7.72E+00	0.00E+00	7.72E+00
		Zr-95	<5.87E+00	0.00E+00	5.87E+00
		Nb-95	<4.73E+00	0.00E+00	4.73E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<3.32E+00	0.00E+00	3.32E+00
		Cs-137	<3.71E+00	0.00E+00	3.71E+00
		BaLa-140	<6.06E+00	0.00E+00	6.06E+00
		Be-7	<2.42E+01	0.00E+00	2.42E+01
K-40	6.39E+01	3.35E+01	4.26E+01		
451820	8/15/2017 - 9/12/2017	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.46E+00	8.82E-01	1.41E+00
		Mn-54	<3.46E+00	0.00E+00	3.46E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [ CONTROL - NNE @ 13.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
451820	8/15/2017 - 9/12/2017	Co-58	<3.53E+00	0.00E+00	3.53E+00
		Fe-59	<6.79E+00	0.00E+00	6.79E+00
		Co-60	<2.96E+00	0.00E+00	2.96E+00
		Zn-65	<7.55E+00	0.00E+00	7.55E+00
		Zr-95	<5.70E+00	0.00E+00	5.70E+00
		Nb-95	<3.94E+00	0.00E+00	3.94E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.55E+00	0.00E+00	3.55E+00
		Cs-137	<2.96E+00	0.00E+00	2.96E+00
		BaLa-140	<9.34E+00	0.00E+00	9.34E+00
		Be-7	<2.57E+01	0.00E+00	2.57E+01
		K-40	6.78E+01	3.62E+01	4.76E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
454584	9/12/2017 - 10/10/2017	Beta	2.57E+00	7.50E-01	1.09E+00
		Mn-54	<3.23E+00	0.00E+00	3.23E+00
		Co-58	<3.69E+00	0.00E+00	3.69E+00
		Fe-59	<6.91E+00	0.00E+00	6.91E+00
		Co-60	<2.68E+00	0.00E+00	2.68E+00
		Zn-65	<7.42E+00	0.00E+00	7.42E+00
		Zr-95	<5.89E+00	0.00E+00	5.89E+00
		Nb-95	<4.12E+00	0.00E+00	4.12E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<4.13E+00	0.00E+00	4.13E+00
		Cs-137	<2.80E+00	0.00E+00	2.80E+00
		BaLa-140	<1.63E+00	0.00E+00	1.63E+00
		Be-7	<2.88E+01	0.00E+00	2.88E+01
		K-40	3.93E+01	3.34E+01	5.13E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
461745	10/10/2017 - 11/7/2017	Beta	1.12E+00	9.10E-01	1.50E+00
		Mn-54	<2.74E+00	0.00E+00	2.74E+00
		Co-58	<4.18E+00	0.00E+00	4.18E+00
		Fe-59	<8.83E+00	0.00E+00	8.83E+00
		Co-60	<2.40E+00	0.00E+00	2.40E+00
		Zn-65	<7.56E+00	0.00E+00	7.56E+00
		Zr-95	<6.34E+00	0.00E+00	6.34E+00
		Nb-95	<3.99E+00	0.00E+00	3.99E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<4.59E+00	0.00E+00	4.59E+00
		Cs-137	<3.79E+00	0.00E+00	3.79E+00
		BaLa-140	<7.45E+00	0.00E+00	7.45E+00
		Be-7	<3.54E+01	0.00E+00	3.54E+01
		K-40	4.86E+01	3.28E+01	4.60E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
462363	8/15/2017 - 12/5/2017	H3DW	6.62E+02	1.30E+02	1.87E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
463801	11/7/2017 - 12/5/2017	Beta	1.21E+00	9.05E-01	1.48E+00
		Mn-54	<3.09E+00	0.00E+00	3.09E+00
		Co-58	<2.59E+00	0.00E+00	2.59E+00
		Fe-59	<8.54E+00	0.00E+00	8.54E+00
		Co-60	<2.21E+00	0.00E+00	2.21E+00
		Zn-65	<5.74E+00	0.00E+00	5.74E+00
		Zr-95	<5.26E+00	0.00E+00	5.26E+00
		Nb-95	<4.03E+00	0.00E+00	4.03E+00
		I-131	<1.06E+01	0.00E+00	1.06E+01
		Cs-134	<3.83E+00	0.00E+00	3.83E+00
		Cs-137	<2.86E+00	0.00E+00	2.86E+00
		BaLa-140	<6.19E+00	0.00E+00	6.19E+00
		Be-7	<2.80E+01	0.00E+00	2.80E+01
		K-40	4.54E+01	3.16E+01	4.53E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465388	12/5/2017 - 1/3/2018	Beta	2.22E+00	7.85E-01	1.19E+00
		Mn-54	<1.86E+00	0.00E+00	1.86E+00



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [ CONTROL - NNE @ 13.5 miles ]

Sample ID:	465388	Sample Dates:	12/5/2017 - 1/3/2018		Nuclide	Activity	2 Sigma Error	MDA
					Co-58	<2.30E+00	0.00E+00	2.30E+00
					Fe-59	<4.62E+00	0.00E+00	4.62E+00
					Co-60	<1.83E+00	0.00E+00	1.83E+00
					Zn-65	<3.62E+00	0.00E+00	3.62E+00
					Zr-95	<3.58E+00	0.00E+00	3.58E+00
					Nb-95	<2.28E+00	0.00E+00	2.28E+00
					I-131	<1.02E+01	0.00E+00	1.02E+01
					Cs-134	<2.26E+00	0.00E+00	2.26E+00
					Cs-137	<1.58E+00	0.00E+00	1.58E+00
					BaLa-140	<6.37E+00	0.00E+00	6.37E+00
					Be-7	<1.97E+01	0.00E+00	1.97E+01
					K-40	<2.90E+01	0.00E+00	2.90E+01
					H3DW	4.64E+02	1.21E+02	1.82E+02

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	439929	Sample Dates:	4/10/2017 - 4/10/2017	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
					Mn-54	<7.27E+01	0.00E+00	7.27E+01
					Co-58	<7.53E+01	0.00E+00	7.53E+01
					Fe-59	<1.78E+02	0.00E+00	1.78E+02
					Co-60	<5.16E+01	0.00E+00	5.16E+01
					Zn-65	<9.10E+01	0.00E+00	9.10E+01
					Nb-95	<7.68E+01	0.00E+00	7.68E+01
					I-131	<9.36E+01	0.00E+00	9.36E+01
					Cs-134	<8.10E+01	0.00E+00	8.10E+01
					Cs-137	<4.98E+01	0.00E+00	4.98E+01
					Be-7	<5.06E+02	0.00E+00	5.06E+02
					K-40	4.71E+03	1.32E+03	1.01E+03
					Ag-110M	<6.96E+01	0.00E+00	6.96E+01
					Sb-122	<2.75E+02	0.00E+00	2.75E+02
					Sb-125	<1.79E+02	0.00E+00	1.79E+02

Sample ID:	439930	Sample Dates:	4/10/2017 - 4/10/2017	FORAGER	Nuclide	Activity	2 Sigma Error	MDA
					Mn-54	<4.14E+01	0.00E+00	4.14E+01
					Co-58	<5.61E+01	0.00E+00	5.61E+01
					Fe-59	<1.41E+02	0.00E+00	1.41E+02
					Co-60	<5.18E+01	0.00E+00	5.18E+01
					Zn-65	<9.13E+01	0.00E+00	9.13E+01
					Nb-95	<4.87E+01	0.00E+00	4.87E+01
					I-131	<9.06E+01	0.00E+00	9.06E+01
					Cs-134	<6.79E+01	0.00E+00	6.79E+01
					Cs-137	<4.82E+01	0.00E+00	4.82E+01
					Be-7	<3.59E+02	0.00E+00	3.59E+02
					K-40	2.39E+03	8.61E+02	8.29E+02
					Ag-110M	<3.57E+01	0.00E+00	3.57E+01
					Sb-122	<2.19E+02	0.00E+00	2.19E+02
					Sb-125	<1.48E+02	0.00E+00	1.48E+02

Sample ID:	439931	Sample Dates:	4/10/2017 - 4/10/2017	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	MDA
					Mn-54	<3.25E+01	0.00E+00	3.25E+01
					Co-58	<4.70E+01	0.00E+00	4.70E+01
					Fe-59	<1.05E+02	0.00E+00	1.05E+02
					Co-60	<4.09E+01	0.00E+00	4.09E+01
					Zn-65	<5.70E+01	0.00E+00	5.70E+01
					Nb-95	<4.79E+01	0.00E+00	4.79E+01
					I-131	<5.35E+01	0.00E+00	5.35E+01
					Cs-134	<3.62E+01	0.00E+00	3.62E+01
					Cs-137	<3.79E+01	0.00E+00	3.79E+01
					Be-7	<3.01E+02	0.00E+00	3.01E+02
					K-40	3.53E+03	8.43E+02	1.20E+02
					Ag-110M	<3.68E+01	0.00E+00	3.68E+01
					Sb-122	<2.61E+02	0.00E+00	2.61E+02
					Sb-125	<8.45E+01	0.00E+00	8.45E+01

Sample ID:	455008	Sample Dates:	10/4/2017 - 10/4/2017	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
					Mn-54	<6.00E+01	0.00E+00	6.00E+01





**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
455008	10/4/2017 - 10/4/2017		Co-58	<5.20E+01	0.00E+00	5.20E+01
			Fe-59	<1.43E+02	0.00E+00	1.43E+02
			Co-60	<1.68E+01	0.00E+00	1.68E+01
			Zn-65	<1.17E+02	0.00E+00	1.17E+02
			Nb-95	<4.64E+01	0.00E+00	4.64E+01
			I-131	<5.42E+01	0.00E+00	5.42E+01
			Cs-134	<5.71E+01	0.00E+00	5.71E+01
			Cs-137	<4.91E+01	0.00E+00	4.91E+01
			Be-7	<4.37E+02	0.00E+00	4.37E+02
			K-40	3.23E+03	9.96E+02	7.26E+02
			Ag-110M	<5.17E+01	0.00E+00	5.17E+01
			Sb-122	<1.93E+02	0.00E+00	1.93E+02
			Sb-125	<7.84E+01	0.00E+00	7.84E+01

Sample ID:	Sample Dates:	FORAGER	Nuclide	Activity	2 Sigma Error	MDA
455009	10/4/2017 - 10/4/2017		Mn-54	<5.71E+01	0.00E+00	5.71E+01
			Co-58	<4.64E+01	0.00E+00	4.64E+01
			Fe-59	<1.57E+02	0.00E+00	1.57E+02
			Co-60	<6.91E+01	0.00E+00	6.91E+01
			Zn-65	<1.34E+02	0.00E+00	1.34E+02
			Nb-95	<5.84E+01	0.00E+00	5.84E+01
			I-131	<4.08E+01	0.00E+00	4.08E+01
			Cs-134	<5.27E+01	0.00E+00	5.27E+01
			Cs-137	<6.34E+01	0.00E+00	6.34E+01
			Be-7	<2.92E+02	0.00E+00	2.92E+02
			K-40	3.76E+03	1.07E+03	6.53E+02
			Ag-110M	<2.76E+01	0.00E+00	2.76E+01
			Sb-122	<6.39E+01	0.00E+00	6.39E+01
			Sb-125	<1.05E+02	0.00E+00	1.05E+02

Sample ID:	Sample Dates:	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	MDA
455010	10/4/2017 - 10/4/2017		Mn-54	<4.35E+01	0.00E+00	4.35E+01
			Co-58	<3.29E+01	0.00E+00	3.29E+01
			Fe-59	<9.86E+01	0.00E+00	9.86E+01
			Co-60	<3.35E+01	0.00E+00	3.35E+01
			Zn-65	<8.48E+01	0.00E+00	8.48E+01
			Nb-95	<3.52E+01	0.00E+00	3.52E+01
			I-131	<3.10E+01	0.00E+00	3.10E+01
			Cs-134	<5.20E+01	0.00E+00	5.20E+01
			Cs-137	<4.98E+01	0.00E+00	4.98E+01
			Be-7	<2.88E+02	0.00E+00	2.88E+02
			K-40	4.75E+03	1.04E+03	4.83E+02
			Ag-110M	<3.19E+01	0.00E+00	3.19E+01
			Sb-122	<5.89E+01	0.00E+00	5.89E+01
			Sb-125	<9.27E+01	0.00E+00	9.27E+01

**Sample Point 216 [ CONTROL - NNE @ 4.19 miles ]**

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
439932	4/10/2017 - 4/10/2017		Mn-54	<1.85E+01	0.00E+00	1.85E+01
			Co-58	<2.34E+01	0.00E+00	2.34E+01
			Fe-59	<3.09E+01	0.00E+00	3.09E+01
			Co-60	<2.67E+01	0.00E+00	2.67E+01
			Zn-65	<5.26E+01	0.00E+00	5.26E+01
			Nb-95	<2.57E+01	0.00E+00	2.57E+01
			I-131	<3.35E+01	0.00E+00	3.35E+01
			Cs-134	<2.52E+01	0.00E+00	2.52E+01
			Cs-137	<2.33E+01	0.00E+00	2.33E+01
			Be-7	<1.99E+02	0.00E+00	1.99E+02
			K-40	3.74E+03	7.02E+02	3.29E+02
			Ag-110M	<1.79E+01	0.00E+00	1.79E+01
			Sb-122	<1.38E+02	0.00E+00	1.38E+02
			Sb-125	<4.45E+01	0.00E+00	4.45E+01

Sample ID:	Sample Dates:	FORAGER	Nuclide	Activity	2 Sigma Error	MDA
439933	4/10/2017 - 4/10/2017		Mn-54	<3.34E+01	0.00E+00	3.34E+01
			Co-58	<3.08E+01	0.00E+00	3.08E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 216 [ CONTROL - NNE @ 4.19 miles ]

Sample ID:	Sample Dates:	FORAGER	Nuclide	Activity	2 Sigma Error	MDA
439933	4/10/2017 - 4/10/2017		Fe-59	<5.52E+01	0.00E+00	5.52E+01
			Co-60	<2.23E+01	0.00E+00	2.23E+01
			Zn-65	<6.43E+01	0.00E+00	6.43E+01
			Nb-95	<3.54E+01	0.00E+00	3.54E+01
			I-131	<3.51E+01	0.00E+00	3.51E+01
			Cs-134	<2.53E+01	0.00E+00	2.53E+01
			Cs-137	<2.65E+01	0.00E+00	2.65E+01
			Be-7	<1.98E+02	0.00E+00	1.98E+02
			K-40	2.27E+03	6.03E+02	4.68E+02
			Ag-110M	<2.19E+01	0.00E+00	2.19E+01
			Sb-122	<1.95E+02	0.00E+00	1.95E+02
			Sb-125	<7.60E+01	0.00E+00	7.60E+01

Sample ID:	Sample Dates:	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	MDA
439934	4/10/2017 - 4/10/2017		Mn-54	<2.41E+01	0.00E+00	2.41E+01
			Co-58	<2.12E+01	0.00E+00	2.12E+01
			Fe-59	<4.99E+01	0.00E+00	4.99E+01
			Co-60	<1.81E+01	0.00E+00	1.81E+01
			Zn-65	<5.21E+01	0.00E+00	5.21E+01
			Nb-95	<1.95E+01	0.00E+00	1.95E+01
			I-131	<3.37E+01	0.00E+00	3.37E+01
			Cs-134	<2.50E+01	0.00E+00	2.50E+01
			Cs-137	<1.52E+01	0.00E+00	1.52E+01
			Be-7	<1.61E+02	0.00E+00	1.61E+02
			K-40	2.35E+03	5.39E+02	3.19E+02
			Ag-110M	<1.94E+01	0.00E+00	1.94E+01
			Sb-122	<1.59E+02	0.00E+00	1.59E+02
			Sb-125	<5.10E+01	0.00E+00	5.10E+01

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
455011	10/4/2017 - 10/4/2017		Mn-54	<1.94E+01	0.00E+00	1.94E+01
			Co-58	<1.37E+01	0.00E+00	1.37E+01
			Fe-59	<2.69E+01	0.00E+00	2.69E+01
			Co-60	<1.38E+01	0.00E+00	1.38E+01
			Zn-65	<2.41E+01	0.00E+00	2.41E+01
			Nb-95	<1.47E+01	0.00E+00	1.47E+01
			I-131	<1.44E+01	0.00E+00	1.44E+01
			Cs-134	<2.04E+01	0.00E+00	2.04E+01
			Cs-137	<9.21E+00	0.00E+00	9.21E+00
			Be-7	<9.62E+01	0.00E+00	9.62E+01
			K-40	1.75E+03	4.03E+02	2.11E+02
			Ag-110M	<1.03E+01	0.00E+00	1.03E+01
			Sb-122	<2.09E+01	0.00E+00	2.09E+01
			Sb-125	<4.28E+01	0.00E+00	4.28E+01

Sample ID:	Sample Dates:	FORAGER	Nuclide	Activity	2 Sigma Error	MDA
455012	10/4/2017 - 10/4/2017		Mn-54	<5.38E+01	0.00E+00	5.38E+01
			Co-58	<4.67E+01	0.00E+00	4.67E+01
			Fe-59	<1.19E+02	0.00E+00	1.19E+02
			Co-60	<5.98E+01	0.00E+00	5.98E+01
			Zn-65	<9.04E+01	0.00E+00	9.04E+01
			Nb-95	<4.65E+01	0.00E+00	4.65E+01
			I-131	<5.50E+01	0.00E+00	5.50E+01
			Cs-134	<5.59E+01	0.00E+00	5.59E+01
			Cs-137	<3.94E+01	0.00E+00	3.94E+01
			Be-7	<4.09E+02	0.00E+00	4.09E+02
			K-40	2.48E+03	8.49E+02	7.31E+02
			Ag-110M	<2.42E+01	0.00E+00	2.42E+01
			Sb-122	<1.73E+02	0.00E+00	1.73E+02
			Sb-125	<1.25E+02	0.00E+00	1.25E+02

Sample ID:	Sample Dates:	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	MDA
455013	10/4/2017 - 10/4/2017		Mn-54	<1.39E+01	0.00E+00	1.39E+01
			Co-58	<2.01E+01	0.00E+00	2.01E+01
			Fe-59	<6.37E+01	0.00E+00	6.37E+01
			Co-60	<3.30E+01	0.00E+00	3.30E+01
			Zn-65	<1.29E+01	0.00E+00	1.29E+01



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 216 [ CONTROL - NNE @ 4.19 miles ]

Sample ID:	455013	Sample Dates:	10/4/2017 - 10/4/2017	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	MDA
					Nb-95	<1.93E+01	0.00E+00	1.93E+01
					I-131	<1.90E+01	0.00E+00	1.90E+01
					Cs-134	<2.28E+01	0.00E+00	2.28E+01
					Cs-137	<2.41E+01	0.00E+00	2.41E+01
					Be-7	<1.55E+02	0.00E+00	1.55E+02
					K-40	2.85E+03	6.31E+02	3.61E+02
					Ag-110M	<1.52E+01	0.00E+00	1.52E+01
					Sb-122	<3.36E+01	0.00E+00	3.36E+01
					Sb-125	<4.55E+01	0.00E+00	4.55E+01

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [ CONTROL - NW @ 14.5 miles ]

Sample ID:	432896	Sample Dates:	1/10/2017 - 1/10/2017	Nuclide	Activity	2 Sigma Error	MDA
				LLI-131	<4.60E-01	0.00E+00	4.60E-01
				I-131	<6.25E+00	0.00E+00	6.25E+00
				Cs-134	<8.24E+00	0.00E+00	8.24E+00
				Cs-137	<9.74E+00	0.00E+00	9.74E+00
				BaLa-140	<2.31E+00	0.00E+00	2.31E+00
				Be-7	<4.81E+01	0.00E+00	4.81E+01
				K-40	1.52E+03	2.47E+02	1.19E+02

Sample ID:	433710	Sample Dates:	1/24/2017 - 1/24/2017	Nuclide	Activity	2 Sigma Error	MDA
				LLI-131	<5.74E-01	0.00E+00	5.74E-01
				I-131	<7.53E+00	0.00E+00	7.53E+00
				Cs-134	<8.00E+00	0.00E+00	8.00E+00
				Cs-137	<1.07E+01	0.00E+00	1.07E+01
				BaLa-140	<7.64E+00	0.00E+00	7.64E+00
				Be-7	<5.75E+01	0.00E+00	5.75E+01
				K-40	1.49E+03	2.51E+02	1.65E+02

Sample ID:	435092	Sample Dates:	2/7/2017 - 2/7/2017	Nuclide	Activity	2 Sigma Error	MDA
				LLI-131	<5.76E-01	0.00E+00	5.76E-01
				I-131	<6.85E+00	0.00E+00	6.85E+00
				Cs-134	<8.70E+00	0.00E+00	8.70E+00
				Cs-137	<6.85E+00	0.00E+00	6.85E+00
				BaLa-140	<5.83E+00	0.00E+00	5.83E+00
				Be-7	<5.81E+01	0.00E+00	5.81E+01
				K-40	1.34E+03	2.20E+02	8.21E+01

Sample ID:	436249	Sample Dates:	2/21/2017 - 2/21/2017	Nuclide	Activity	2 Sigma Error	MDA
				LLI-131	<6.28E-01	0.00E+00	6.28E-01
				I-131	<4.76E+00	0.00E+00	4.76E+00
				Cs-134	<7.39E+00	0.00E+00	7.39E+00
				Cs-137	<8.08E+00	0.00E+00	8.08E+00
				BaLa-140	<9.22E+00	0.00E+00	9.22E+00
				Be-7	<5.09E+01	0.00E+00	5.09E+01
				K-40	1.36E+03	2.23E+02	1.06E+02

Sample ID:	437564	Sample Dates:	3/7/2017 - 3/7/2017	Nuclide	Activity	2 Sigma Error	MDA
				LLI-131	<5.82E-01	0.00E+00	5.82E-01
				I-131	<6.35E+00	0.00E+00	6.35E+00
				Cs-134	<8.32E+00	0.00E+00	8.32E+00
				Cs-137	<6.96E+00	0.00E+00	6.96E+00
				BaLa-140	<9.22E+00	0.00E+00	9.22E+00
				Be-7	<4.31E+01	0.00E+00	4.31E+01
				K-40	1.35E+03	2.26E+02	1.33E+02

Sample ID:	438794	Sample Dates:	3/21/2017 - 3/21/2017	Nuclide	Activity	2 Sigma Error	MDA
				LLI-131	<5.69E-01	0.00E+00	5.69E-01
				I-131	<4.75E+00	0.00E+00	4.75E+00
				Cs-134	<6.29E+00	0.00E+00	6.29E+00
				Cs-137	<7.36E+00	0.00E+00	7.36E+00
				BaLa-140	<2.07E+00	0.00E+00	2.07E+00
				Be-7	<4.31E+01	0.00E+00	4.31E+01
				K-40	1.35E+03	2.18E+02	6.91E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [ CONTROL - NW @ 14.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
439994	4/4/2017 - 4/4/2017	LLI-131	<5.43E-01	0.00E+00	5.43E-01
		I-131	<6.73E+00	0.00E+00	6.73E+00
		Cs-134	<6.28E+00	0.00E+00	6.28E+00
		Cs-137	<8.39E+00	0.00E+00	8.39E+00
		BaLa-140	<5.82E+00	0.00E+00	5.82E+00
		Be-7	<5.13E+01	0.00E+00	5.13E+01
		K-40	1.34E+03	2.23E+02	1.22E+02
441402	4/18/2017 - 4/18/2017	LLI-131	<4.74E-01	0.00E+00	4.74E-01
		I-131	<6.84E+00	0.00E+00	6.84E+00
		Cs-134	<7.44E+00	0.00E+00	7.44E+00
		Cs-137	<9.10E+00	0.00E+00	9.10E+00
		BaLa-140	<2.23E+00	0.00E+00	2.23E+00
		Be-7	<5.75E+01	0.00E+00	5.75E+01
		K-40	1.45E+03	2.41E+02	1.33E+02
442285	5/2/2017 - 5/2/2017	LLI-131	<5.95E-01	0.00E+00	5.95E-01
		I-131	<6.14E+00	0.00E+00	6.14E+00
		Cs-134	<9.55E+00	0.00E+00	9.55E+00
		Cs-137	<5.23E+00	0.00E+00	5.23E+00
		BaLa-140	<2.15E+00	0.00E+00	2.15E+00
		Be-7	<5.08E+01	0.00E+00	5.08E+01
		K-40	1.33E+03	2.19E+02	8.51E+01
443289	5/15/2017 - 5/15/2017	LLI-131	<6.35E-01	0.00E+00	6.35E-01
		I-131	<5.96E+00	0.00E+00	5.96E+00
		Cs-134	<8.74E+00	0.00E+00	8.74E+00
		Cs-137	<6.08E+00	0.00E+00	6.08E+00
		BaLa-140	<7.39E+00	0.00E+00	7.39E+00
		Be-7	<5.14E+01	0.00E+00	5.14E+01
		K-40	1.47E+03	2.30E+02	8.26E+01
444249	5/31/2017 - 5/31/2017	LLI-131	<6.12E-01	0.00E+00	6.12E-01
		I-131	<7.38E+00	0.00E+00	7.38E+00
		Cs-134	<7.87E+00	0.00E+00	7.87E+00
		Cs-137	<6.54E+00	0.00E+00	6.54E+00
		BaLa-140	<7.37E+00	0.00E+00	7.37E+00
		Be-7	<5.37E+01	0.00E+00	5.37E+01
		K-40	1.32E+03	2.16E+02	8.70E+01
446310	6/13/2017 - 6/13/2017	LLI-131	<6.14E-01	0.00E+00	6.14E-01
		I-131	<6.58E+00	0.00E+00	6.58E+00
		Cs-134	<7.87E+00	0.00E+00	7.87E+00
		Cs-137	<7.73E+00	0.00E+00	7.73E+00
		BaLa-140	<7.13E+00	0.00E+00	7.13E+00
		Be-7	<4.59E+01	0.00E+00	4.59E+01
		K-40	1.50E+03	2.34E+02	8.56E+01
447161	6/27/2017 - 6/27/2017	LLI-131	<4.27E-01	0.00E+00	4.27E-01
		I-131	<8.05E+00	0.00E+00	8.05E+00
		Cs-134	<8.25E+00	0.00E+00	8.25E+00
		Cs-137	<9.39E+00	0.00E+00	9.39E+00
		BaLa-140	<2.40E+00	0.00E+00	2.40E+00
		Be-7	<6.00E+01	0.00E+00	6.00E+01
		K-40	1.38E+03	2.28E+02	7.79E+01
448257	7/11/2017 - 7/11/2017	LLI-131	<5.58E-01	0.00E+00	5.58E-01
		I-131	<7.12E+00	0.00E+00	7.12E+00
		Cs-134	<9.45E+00	0.00E+00	9.45E+00
		Cs-137	<1.07E+01	0.00E+00	1.07E+01
		BaLa-140	<7.66E+00	0.00E+00	7.66E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [ CONTROL - NW @ 14.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
448257	7/11/2017 - 7/11/2017	Be-7	<6.22E+01	0.00E+00	6.22E+01
		K-40	1.57E+03	2.54E+02	1.39E+02
449207	7/25/2017 - 7/25/2017	LLI-131	<4.70E-01	0.00E+00	4.70E-01
		I-131	<5.86E+00	0.00E+00	5.86E+00
		Cs-134	<5.64E+00	0.00E+00	5.64E+00
		Cs-137	<8.08E+00	0.00E+00	8.08E+00
		BaLa-140	<5.64E+00	0.00E+00	5.64E+00
		Be-7	<6.33E+01	0.00E+00	6.33E+01
		K-40	1.37E+03	2.24E+02	1.11E+02
450183	8/8/2017 - 8/8/2017	LLI-131	<5.86E-01	0.00E+00	5.86E-01
		I-131	<5.84E+00	0.00E+00	5.84E+00
		Cs-134	<6.29E+00	0.00E+00	6.29E+00
		Cs-137	<9.33E+00	0.00E+00	9.33E+00
		BaLa-140	<2.07E+00	0.00E+00	2.07E+00
		Be-7	<5.75E+01	0.00E+00	5.75E+01
		K-40	1.57E+03	2.37E+02	1.73E+01
451175	8/22/2017 - 8/22/2017	LLI-131	<6.10E-01	0.00E+00	6.10E-01
		I-131	<5.61E+00	0.00E+00	5.61E+00
		Cs-134	<6.87E+00	0.00E+00	6.87E+00
		Cs-137	<8.08E+00	0.00E+00	8.08E+00
		BaLa-140	<5.64E+00	0.00E+00	5.64E+00
		Be-7	<5.95E+01	0.00E+00	5.95E+01
		K-40	1.30E+03	2.20E+02	1.22E+02
452333	9/5/2017 - 9/5/2017	LLI-131	<5.92E-01	0.00E+00	5.92E-01
		I-131	<6.90E+00	0.00E+00	6.90E+00
		Cs-134	<8.52E+00	0.00E+00	8.52E+00
		Cs-137	<7.96E+00	0.00E+00	7.96E+00
		BaLa-140	<2.29E+00	0.00E+00	2.29E+00
		Be-7	<3.99E+01	0.00E+00	3.99E+01
		K-40	1.57E+03	2.45E+02	7.88E+01
453430	9/19/2017 - 9/19/2017	LLI-131	<5.47E-01	0.00E+00	5.47E-01
		I-131	<5.37E+00	0.00E+00	5.37E+00
		Cs-134	<9.13E+00	0.00E+00	9.13E+00
		Cs-137	<7.36E+00	0.00E+00	7.36E+00
		BaLa-140	<5.86E+00	0.00E+00	5.86E+00
		Be-7	<5.81E+01	0.00E+00	5.81E+01
		K-40	1.33E+03	2.22E+02	1.18E+02
455048	10/3/2017 - 10/3/2017	LLI-131	<5.57E-01	0.00E+00	5.57E-01
		I-131	<7.66E+00	0.00E+00	7.66E+00
		Cs-134	<9.01E+00	0.00E+00	9.01E+00
		Cs-137	<9.10E+00	0.00E+00	9.10E+00
		BaLa-140	<2.34E+00	0.00E+00	2.34E+00
		Be-7	<5.02E+01	0.00E+00	5.02E+01
		K-40	1.55E+03	2.50E+02	1.30E+02
456028	10/17/2017 - 10/17/2017	LLI-131	<5.29E-01	0.00E+00	5.29E-01
		I-131	<5.31E+00	0.00E+00	5.31E+00
		Cs-134	<8.80E+00	0.00E+00	8.80E+00
		Cs-137	<7.78E+00	0.00E+00	7.78E+00
		BaLa-140	<7.84E+00	0.00E+00	7.84E+00
		Be-7	<6.33E+01	0.00E+00	6.33E+01
		K-40	1.45E+03	2.33E+02	7.76E+01
461950	10/30/2017 - 10/30/2017	LLI-131	<5.91E-01	0.00E+00	5.91E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [ CONTROL - NW @ 14.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
461950	10/30/2017 - 10/30/2017	I-131	<5.32E+00	0.00E+00	5.32E+00
		Cs-134	<9.24E+00	0.00E+00	9.24E+00
		Cs-137	<5.89E+00	0.00E+00	5.89E+00
		BaLa-140	<9.11E+00	0.00E+00	9.11E+00
		Be-7	<5.66E+01	0.00E+00	5.66E+01
		K-40	1.24E+03	2.23E+02	1.45E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
463078	11/13/2017 - 11/13/2017	LLI-131	<5.88E-01	0.00E+00	5.88E-01
		I-131	<6.64E+00	0.00E+00	6.64E+00
		Cs-134	<6.28E+00	0.00E+00	6.28E+00
		Cs-137	<7.34E+00	0.00E+00	7.34E+00
		BaLa-140	<5.77E+00	0.00E+00	5.77E+00
		Be-7	<6.37E+01	0.00E+00	6.37E+01
		K-40	1.37E+03	2.21E+02	8.34E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
464153	11/28/2017 - 11/28/2017	LLI-131	<5.60E-01	0.00E+00	5.60E-01
		I-131	<5.51E+00	0.00E+00	5.51E+00
		Cs-134	<8.72E+00	0.00E+00	8.72E+00
		Cs-137	<9.01E+00	0.00E+00	9.01E+00
		BaLa-140	<8.66E+00	0.00E+00	8.66E+00
		Be-7	<4.06E+01	0.00E+00	4.06E+01
		K-40	1.43E+03	2.23E+02	1.72E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
464952	12/12/2017 - 12/12/2017	LLI-131	<5.80E-01	0.00E+00	5.79E-01
		I-131	<5.35E+00	0.00E+00	5.35E+00
		Cs-134	<6.85E+00	0.00E+00	6.85E+00
		Cs-137	<8.06E+00	0.00E+00	8.06E+00
		BaLa-140	<7.08E+00	0.00E+00	7.08E+00
		Be-7	<5.32E+01	0.00E+00	5.32E+01
		K-40	1.35E+03	2.21E+02	1.01E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465587	12/27/2017 - 12/27/2017	LLI-131	<6.45E-01	0.00E+00	6.45E-01
		I-131	<1.05E+01	0.00E+00	1.05E+01
		Cs-134	<9.46E+00	0.00E+00	9.46E+00
		Cs-137	<1.04E+01	0.00E+00	1.04E+01
		BaLa-140	<6.30E+00	0.00E+00	6.30E+00
		Be-7	<3.59E+01	0.00E+00	3.59E+01
		K-40	1.52E+03	2.46E+02	1.20E+02

Media Type: SEDIMENT\_SHORE Concentration (Activity): pCi/kg

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
437565	3/21/2017 - 3/21/2017	Mn-54	<2.15E+01	0.00E+00	2.15E+01
		Co-58	<2.04E+01	0.00E+00	2.04E+01
		Fe-59	<5.34E+01	0.00E+00	5.34E+01
		Co-60	<2.47E+01	0.00E+00	2.47E+01
		Zn-65	<5.30E+01	0.00E+00	5.30E+01
		Zr-95	<4.78E+01	0.00E+00	4.78E+01
		Nb-95	<3.16E+01	0.00E+00	3.16E+01
		I-131	<2.44E+01	0.00E+00	2.44E+01
		Cs-134	<3.46E+01	0.00E+00	3.46E+01
		Cs-137	<2.27E+01	0.00E+00	2.27E+01
		Be-7	<2.17E+02	0.00E+00	2.17E+02
		K-40	1.53E+04	1.53E+03	3.93E+02
		Co-57	<2.09E+01	0.00E+00	2.09E+01
		Mo-99	<8.26E+02	0.00E+00	8.26E+02
		Ag-110M	<2.38E+01	0.00E+00	2.38E+01
		Sb-122	<1.17E+02	0.00E+00	1.17E+02
		Sb-125	<5.33E+01	0.00E+00	5.33E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
452334	9/19/2017 - 9/19/2017	Mn-54	<2.85E+01	0.00E+00	2.85E+01



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SEDIMENT\_SHORE Concentration (Activity): pCi/kg

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
452334	9/19/2017 - 9/19/2017	Co-58	<2.37E+01	0.00E+00	2.37E+01
		Fe-59	<6.54E+01	0.00E+00	6.54E+01
		Co-60	<2.86E+01	0.00E+00	2.86E+01
		Zn-65	<6.48E+01	0.00E+00	6.48E+01
		Zr-95	<6.14E+01	0.00E+00	6.14E+01
		Nb-95	<2.69E+01	0.00E+00	2.69E+01
		I-131	<3.49E+01	0.00E+00	3.49E+01
		Cs-134	<8.09E+01	0.00E+00	8.09E+01
		Cs-137	<2.54E+01	0.00E+00	2.54E+01
		Be-7	<2.10E+02	0.00E+00	2.10E+02
		K-40	1.93E+04	1.89E+03	3.59E+02
		Co-57	<2.10E+01	0.00E+00	2.10E+01
		Mo-99	<9.10E+02	0.00E+00	9.10E+02
		Ag-110M	<2.39E+01	0.00E+00	2.39E+01
		Sb-122	<1.47E+02	0.00E+00	1.47E+02
		Sb-125	<5.83E+01	0.00E+00	5.83E+01

Sample Point 210 [ INDICATOR - SE @ 2.31 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
437566	3/21/2017 - 3/21/2017	Mn-54	<2.32E+01	0.00E+00	2.32E+01
		Co-58	<1.51E+01	0.00E+00	1.51E+01
		Fe-59	<4.57E+01	0.00E+00	4.57E+01
		Co-60	<2.42E+01	0.00E+00	2.42E+01
		Zn-65	<5.05E+01	0.00E+00	5.05E+01
		Zr-95	<4.71E+01	0.00E+00	4.71E+01
		Nb-95	<2.30E+01	0.00E+00	2.30E+01
		I-131	<2.54E+01	0.00E+00	2.54E+01
		Cs-134	<3.29E+01	0.00E+00	3.29E+01
		Cs-137	<2.02E+01	0.00E+00	2.02E+01
		Be-7	<1.59E+02	0.00E+00	1.59E+02
		K-40	1.08E+04	1.13E+03	2.70E+02
		Co-57	<1.75E+01	0.00E+00	1.75E+01
		Mo-99	<6.42E+02	0.00E+00	6.42E+02
		Ag-110M	<1.82E+01	0.00E+00	1.82E+01
		Sb-122	<1.00E+02	0.00E+00	1.00E+02
		Sb-125	<5.26E+01	0.00E+00	5.26E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
452335	9/19/2017 - 9/19/2017	Mn-54	<2.56E+01	0.00E+00	2.56E+01
		Co-58	<1.55E+01	0.00E+00	1.55E+01
		Fe-59	<4.19E+01	0.00E+00	4.19E+01
		Co-60	<1.55E+01	0.00E+00	1.55E+01
		Zn-65	<4.79E+01	0.00E+00	4.79E+01
		Zr-95	<2.69E+01	0.00E+00	2.69E+01
		Nb-95	<1.96E+01	0.00E+00	1.96E+01
		I-131	<2.49E+01	0.00E+00	2.49E+01
		Cs-134	<2.19E+01	0.00E+00	2.19E+01
		Cs-137	<2.05E+01	0.00E+00	2.05E+01
		Be-7	<1.47E+02	0.00E+00	1.47E+02
		K-40	1.02E+04	1.15E+03	4.02E+02
		Co-57	<1.55E+01	0.00E+00	1.55E+01
		Mo-99	<7.69E+02	0.00E+00	7.69E+02
		Ag-110M	<2.08E+01	0.00E+00	2.08E+01
		Sb-122	<9.02E+01	0.00E+00	9.02E+01
		Sb-125	<4.43E+01	0.00E+00	4.43E+01

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
437567	3/21/2017 - 3/21/2017	Mn-54	<2.43E+01	0.00E+00	2.43E+01
		Co-58	<2.08E+01	0.00E+00	2.08E+01
		Fe-59	<4.85E+01	0.00E+00	4.85E+01
		Co-60	<2.74E+01	0.00E+00	2.74E+01
		Zn-65	<6.26E+01	0.00E+00	6.26E+01
		Zr-95	<3.22E+01	0.00E+00	3.22E+01
		Nb-95	<2.37E+01	0.00E+00	2.37E+01



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SEDIMENT\_SHORE Concentration (Activity): pCi/kg

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
437567	3/21/2017 - 3/21/2017	I-131	<2.81E+01	0.00E+00	2.81E+01
		Cs-134	<3.09E+01	0.00E+00	3.09E+01
		Cs-137	<1.94E+01	0.00E+00	1.94E+01
		Be-7	<1.73E+02	0.00E+00	1.73E+02
		K-40	1.95E+04	1.89E+03	3.14E+02
		Co-57	<1.67E+01	0.00E+00	1.67E+01
		Mo-99	<5.99E+02	0.00E+00	5.99E+02
		Ag-110M	<1.68E+01	0.00E+00	1.68E+01
		Sb-122	<9.81E+01	0.00E+00	9.81E+01
		Sb-125	<4.86E+01	0.00E+00	4.86E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
452336	9/19/2017 - 9/19/2017	Mn-54	<2.07E+01	0.00E+00	2.07E+01
		Co-58	<2.17E+01	0.00E+00	2.17E+01
		Fe-59	<5.67E+01	0.00E+00	5.67E+01
		Co-60	<1.64E+01	0.00E+00	1.64E+01
		Zn-65	<4.29E+01	0.00E+00	4.29E+01
		Zr-95	<3.77E+01	0.00E+00	3.77E+01
		Nb-95	<2.48E+01	0.00E+00	2.48E+01
		I-131	<2.11E+01	0.00E+00	2.11E+01
		Cs-134	<2.48E+01	0.00E+00	2.48E+01
		Cs-137	<2.60E+01	0.00E+00	2.60E+01
		Be-7	<1.64E+02	0.00E+00	1.64E+02
		K-40	1.46E+04	1.48E+03	3.05E+02
		Co-57	<1.58E+01	0.00E+00	1.58E+01
		Mo-99	<6.90E+02	0.00E+00	6.90E+02
		Ag-110M	<2.04E+01	0.00E+00	2.04E+01
		Sb-122	<1.02E+02	0.00E+00	1.02E+02
		Sb-125	<4.68E+01	0.00E+00	4.68E+01

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432188	12/6/2016 - 1/4/2017	Mn-54	<3.17E+00	0.00E+00	3.17E+00
		Co-58	<3.34E+00	0.00E+00	3.34E+00
		Fe-59	<7.00E+00	0.00E+00	7.00E+00
		Co-60	<3.56E+00	0.00E+00	3.56E+00
		Zn-65	<5.52E+00	0.00E+00	5.52E+00
		Zr-95	<4.83E+00	0.00E+00	4.83E+00
		Nb-95	<3.41E+00	0.00E+00	3.41E+00
		I-131	<1.09E+01	0.00E+00	1.09E+01
		Cs-134	<2.95E+00	0.00E+00	2.95E+00
		Cs-137	<2.36E+00	0.00E+00	2.36E+00
		BaLa-140	<6.18E+00	0.00E+00	6.18E+00
		Be-7	<2.74E+01	0.00E+00	2.74E+01
		K-40	3.74E+01	2.46E+01	3.44E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
434445	1/4/2017 - 1/31/2017	Mn-54	<4.06E+00	0.00E+00	4.06E+00
		Co-58	<4.13E+00	0.00E+00	4.13E+00
		Fe-59	<8.86E+00	0.00E+00	8.86E+00
		Co-60	<3.45E+00	0.00E+00	3.45E+00
		Zn-65	<6.94E+00	0.00E+00	6.94E+00
		Zr-95	<5.51E+00	0.00E+00	5.51E+00
		Nb-95	<4.58E+00	0.00E+00	4.58E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<4.67E+00	0.00E+00	4.67E+00
		Cs-137	<2.26E+00	0.00E+00	2.26E+00
		BaLa-140	<9.75E+00	0.00E+00	9.75E+00
		Be-7	<3.64E+01	0.00E+00	3.64E+01
		K-40	<4.52E+01	0.00E+00	4.52E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
434734	12/6/2016 - 2/28/2017	H3SW	6.84E+03	2.54E+02	1.85E+02





**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
436700	1/31/2017 - 2/28/2017	Mn-54	<2.55E+00	0.00E+00	2.55E+00
		Co-58	<3.48E+00	0.00E+00	3.48E+00
		Fe-59	<7.51E+00	0.00E+00	7.51E+00
		Co-60	<2.91E+00	0.00E+00	2.91E+00
		Zn-65	<6.69E+00	0.00E+00	6.69E+00
		Zr-95	<6.88E+00	0.00E+00	6.88E+00
		Nb-95	<4.18E+00	0.00E+00	4.18E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<4.39E+00	0.00E+00	4.39E+00
		Cs-137	<3.53E+00	0.00E+00	3.53E+00
		BaLa-140	<7.68E+00	0.00E+00	7.68E+00
		Be-7	<3.28E+01	0.00E+00	3.28E+01
		K-40	9.74E+01	3.84E+01	4.25E+01
		439150	2/28/2017 - 3/28/2017	Mn-54	<3.99E+00
Co-58	<3.46E+00			0.00E+00	3.46E+00
Fe-59	<5.82E+00			0.00E+00	5.82E+00
Co-60	<4.54E+00			0.00E+00	4.54E+00
Zn-65	<9.84E+00			0.00E+00	9.84E+00
Zr-95	<8.49E+00			0.00E+00	8.49E+00
Nb-95	<4.67E+00			0.00E+00	4.67E+00
I-131	<1.09E+01			0.00E+00	1.09E+01
Cs-134	<3.19E+00			0.00E+00	3.19E+00
Cs-137	<2.79E+00			0.00E+00	2.79E+00
BaLa-140	<1.12E+01			0.00E+00	1.12E+01
Be-7	<3.95E+01			0.00E+00	3.95E+01
K-40	5.13E+01			3.92E+01	5.70E+01
441847	3/28/2017 - 4/25/2017			Mn-54	<2.96E+00
		Co-58	<3.73E+00	0.00E+00	3.73E+00
		Fe-59	<6.40E+00	0.00E+00	6.40E+00
		Co-60	<4.72E+00	0.00E+00	4.72E+00
		Zn-65	<5.53E+00	0.00E+00	5.53E+00
		Zr-95	<7.77E+00	0.00E+00	7.77E+00
		Nb-95	<3.82E+00	0.00E+00	3.82E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.28E+00	0.00E+00	3.28E+00
		Cs-137	<3.40E+00	0.00E+00	3.40E+00
		BaLa-140	<7.98E+00	0.00E+00	7.98E+00
		Be-7	<3.81E+01	0.00E+00	3.81E+01
		K-40	<6.80E+01	0.00E+00	6.80E+01
		442286	2/28/2017 - 5/23/2017	Nuclide	Activity
H3SW	7.62E+03			2.71E+02	1.98E+02
443847	4/25/2017 - 5/23/2017	Mn-54	<2.67E+00	0.00E+00	2.67E+00
		Co-58	<3.17E+00	0.00E+00	3.17E+00
		Fe-59	<7.54E+00	0.00E+00	7.54E+00
		Co-60	<3.29E+00	0.00E+00	3.29E+00
		Zn-65	<5.41E+00	0.00E+00	5.41E+00
		Zr-95	<7.23E+00	0.00E+00	7.23E+00
		Nb-95	<4.72E+00	0.00E+00	4.72E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<3.93E+00	0.00E+00	3.93E+00
		Cs-137	<3.44E+00	0.00E+00	3.44E+00
		BaLa-140	<5.37E+00	0.00E+00	5.37E+00
		Be-7	<2.87E+01	0.00E+00	2.87E+01
		K-40	<7.29E+01	0.00E+00	7.29E+01
		446814	5/23/2017 - 6/20/2017	Nuclide	Activity
Mn-54	<3.33E+00			0.00E+00	3.33E+00
Co-58	<3.34E+00			0.00E+00	3.34E+00
Fe-59	<5.53E+00			0.00E+00	5.53E+00
Co-60	<2.60E+00			0.00E+00	2.60E+00



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
446814	5/23/2017 - 6/20/2017	Zn-65	<4.28E+00	0.00E+00	4.28E+00
		Zr-95	<6.52E+00	0.00E+00	6.52E+00
		Nb-95	<4.10E+00	0.00E+00	4.10E+00
		I-131	<1.07E+01	0.00E+00	1.07E+01
		Cs-134	<3.48E+00	0.00E+00	3.48E+00
		Cs-137	<3.41E+00	0.00E+00	3.41E+00
		BaLa-140	<7.55E+00	0.00E+00	7.55E+00
		Be-7	<3.06E+01	0.00E+00	3.06E+01
		K-40	3.25E+01	3.03E+01	4.72E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
448883	6/20/2017 - 7/18/2017	Mn-54	<3.96E+00	0.00E+00	3.96E+00
		Co-58	<3.09E+00	0.00E+00	3.09E+00
		Fe-59	<8.05E+00	0.00E+00	8.05E+00
		Co-60	<3.95E+00	0.00E+00	3.95E+00
		Zn-65	<6.90E+00	0.00E+00	6.90E+00
		Zr-95	<6.25E+00	0.00E+00	6.25E+00
		Nb-95	<4.75E+00	0.00E+00	4.75E+00
		I-131	<1.06E+01	0.00E+00	1.06E+01
		Cs-134	<3.81E+00	0.00E+00	3.81E+00
		Cs-137	<3.74E+00	0.00E+00	3.74E+00
		BaLa-140	<1.00E+01	0.00E+00	1.00E+01
		Be-7	<3.20E+01	0.00E+00	3.20E+01
		K-40	3.57E+01	3.10E+01	4.74E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
450043	5/23/2017 - 8/15/2017	H3SW	4.50E+03	2.14E+02	1.86E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
450716	7/18/2017 - 8/15/2017	Mn-54	<3.11E+00	0.00E+00	3.11E+00
		Co-58	<4.99E+00	0.00E+00	4.99E+00
		Fe-59	<1.02E+01	0.00E+00	1.02E+01
		Co-60	<4.90E+00	0.00E+00	4.90E+00
		Zn-65	<8.38E+00	0.00E+00	8.38E+00
		Zr-95	<9.21E+00	0.00E+00	9.21E+00
		Nb-95	<5.80E+00	0.00E+00	5.80E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<5.22E+00	0.00E+00	5.22E+00
		Cs-137	<4.37E+00	0.00E+00	4.37E+00
		BaLa-140	<1.00E+01	0.00E+00	1.00E+01
		Be-7	<3.64E+01	0.00E+00	3.64E+01
		K-40	5.75E+01	3.87E+01	5.26E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
452776	8/15/2017 - 9/12/2017	Mn-54	<2.36E+00	0.00E+00	2.36E+00
		Co-58	<3.69E+00	0.00E+00	3.69E+00
		Fe-59	<7.18E+00	0.00E+00	7.18E+00
		Co-60	<4.10E+00	0.00E+00	4.10E+00
		Zn-65	<6.75E+00	0.00E+00	6.75E+00
		Zr-95	<8.30E+00	0.00E+00	8.30E+00
		Nb-95	<4.42E+00	0.00E+00	4.42E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<5.68E+00	0.00E+00	5.68E+00
		Cs-137	<3.24E+00	0.00E+00	3.24E+00
		BaLa-140	<8.46E+00	0.00E+00	8.46E+00
		Be-7	<3.71E+01	0.00E+00	3.71E+01
		K-40	4.53E+01	3.42E+01	4.76E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
455403	9/12/2017 - 10/10/2017	Mn-54	<3.72E+00	0.00E+00	3.72E+00
		Co-58	<3.29E+00	0.00E+00	3.29E+00
		Fe-59	<7.79E+00	0.00E+00	7.79E+00
		Co-60	<3.57E+00	0.00E+00	3.57E+00
		Zn-65	<6.57E+00	0.00E+00	6.57E+00
		Zr-95	<8.44E+00	0.00E+00	8.44E+00
		Nb-95	<5.32E+00	0.00E+00	5.32E+00
		I-131	<1.05E+01	0.00E+00	1.05E+01



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
455403	9/12/2017 - 10/10/2017	Cs-134	<3.88E+00	0.00E+00	3.88E+00
		Cs-137	<4.00E+00	0.00E+00	4.00E+00
		BaLa-140	<9.52E+00	0.00E+00	9.52E+00
		Be-7	<3.60E+01	0.00E+00	3.60E+01
		K-40	4.71E+01	3.33E+01	4.48E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
462586	10/10/2017 - 11/7/2017	Mn-54	<2.64E+00	0.00E+00	2.64E+00
		Co-58	<3.52E+00	0.00E+00	3.52E+00
		Fe-59	<6.92E+00	0.00E+00	6.92E+00
		Co-60	<3.68E+00	0.00E+00	3.68E+00
		Zn-65	<6.26E+00	0.00E+00	6.26E+00
		Zr-95	<6.85E+00	0.00E+00	6.85E+00
		Nb-95	<2.84E+00	0.00E+00	2.84E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<2.82E+00	0.00E+00	2.82E+00
		Cs-137	<4.04E+00	0.00E+00	4.04E+00
		BaLa-140	<7.30E+00	0.00E+00	7.30E+00
		Be-7	<3.22E+01	0.00E+00	3.22E+01
		K-40	7.85E+01	3.65E+01	4.83E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
462364	8/15/2017 - 12/5/2017	H3SW	8.35E+03	2.75E+02	1.89E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
464683	11/7/2017 - 12/5/2017	Mn-54	<3.38E+00	0.00E+00	3.38E+00
		Co-58	<3.35E+00	0.00E+00	3.35E+00
		Fe-59	<5.36E+00	0.00E+00	5.36E+00
		Co-60	<2.49E+00	0.00E+00	2.49E+00
		Zn-65	<5.00E+00	0.00E+00	5.00E+00
		Zr-95	<4.30E+00	0.00E+00	4.30E+00
		Nb-95	<3.88E+00	0.00E+00	3.88E+00
		I-131	<1.04E+01	0.00E+00	1.04E+01
		Cs-134	<2.86E+00	0.00E+00	2.86E+00
		Cs-137	<3.01E+00	0.00E+00	3.01E+00
		BaLa-140	<8.63E+00	0.00E+00	8.63E+00
		Be-7	<2.43E+01	0.00E+00	2.43E+01
		K-40	2.12E+01	2.65E+01	4.33E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465961	12/5/2017 - 1/3/2018	Mn-54	<2.57E+00	0.00E+00	2.57E+00
		Co-58	<2.33E+00	0.00E+00	2.33E+00
		Fe-59	<5.41E+00	0.00E+00	5.41E+00
		Co-60	<2.00E+00	0.00E+00	2.00E+00
		Zn-65	<4.91E+00	0.00E+00	4.91E+00
		Zr-95	<4.73E+00	0.00E+00	4.73E+00
		Nb-95	<3.49E+00	0.00E+00	3.49E+00
		I-131	<1.06E+01	0.00E+00	1.06E+01
		Cs-134	<2.39E+00	0.00E+00	2.39E+00
		Cs-137	<2.41E+00	0.00E+00	2.41E+00
		BaLa-140	<4.72E+00	0.00E+00	4.72E+00
		Be-7	<2.23E+01	0.00E+00	2.23E+01
		K-40	3.77E+01	2.23E+01	3.24E+01
		H3SW	6.71E+03	2.48E+02	1.82E+02

**Sample Point 211 [ INDICATOR - ESE @ 4.06 miles ]**

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432189	12/6/2016 - 1/4/2017	Mn-54	<4.02E+00	0.00E+00	4.02E+00
		Co-58	<4.10E+00	0.00E+00	4.10E+00
		Fe-59	<8.80E+00	0.00E+00	8.80E+00
		Co-60	<3.69E+00	0.00E+00	3.69E+00
		Zn-65	<7.89E+00	0.00E+00	7.89E+00
		Zr-95	<6.55E+00	0.00E+00	6.55E+00
		Nb-95	<4.14E+00	0.00E+00	4.14E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<3.83E+00	0.00E+00	3.83E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [ INDICATOR - ESE @ 4.06 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432189	12/6/2016 - 1/4/2017	Cs-137	<4.36E+00	0.00E+00	4.36E+00
		BaLa-140	<6.25E+00	0.00E+00	6.25E+00
		Be-7	<2.88E+01	0.00E+00	2.88E+01
		K-40	6.63E+01	4.40E+01	6.51E+01
434446	1/4/2017 - 1/31/2017	Mn-54	<2.89E+00	0.00E+00	2.89E+00
		Co-58	<4.39E+00	0.00E+00	4.39E+00
		Fe-59	<9.09E+00	0.00E+00	9.09E+00
		Co-60	<2.18E+00	0.00E+00	2.18E+00
		Zn-65	<7.12E+00	0.00E+00	7.12E+00
		Zr-95	<7.15E+00	0.00E+00	7.15E+00
		Nb-95	<5.23E+00	0.00E+00	5.23E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.68E+00	0.00E+00	3.68E+00
		Cs-137	<4.30E+00	0.00E+00	4.30E+00
		BaLa-140	<5.59E+00	0.00E+00	5.59E+00
		Be-7	<3.61E+01	0.00E+00	3.61E+01
		K-40	<8.13E+01	0.00E+00	8.13E+01
434735	12/6/2016 - 2/28/2017	H3SW	8.72E+02	1.35E+02	1.85E+02
436701	1/31/2017 - 2/28/2017	Mn-54	<3.49E+00	0.00E+00	3.49E+00
		Co-58	<4.33E+00	0.00E+00	4.33E+00
		Fe-59	<9.11E+00	0.00E+00	9.11E+00
		Co-60	<3.57E+00	0.00E+00	3.57E+00
		Zn-65	<1.02E+01	0.00E+00	1.02E+01
		Zr-95	<5.20E+00	0.00E+00	5.20E+00
		Nb-95	<4.56E+00	0.00E+00	4.56E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.36E+00	0.00E+00	4.36E+00
		Cs-137	<4.35E+00	0.00E+00	4.35E+00
		BaLa-140	<9.38E+00	0.00E+00	9.38E+00
		Be-7	<4.06E+01	0.00E+00	4.06E+01
		K-40	<7.37E+01	0.00E+00	7.37E+01
439151	2/28/2017 - 3/28/2017	Mn-54	<2.57E+00	0.00E+00	2.57E+00
		Co-58	<2.83E+00	0.00E+00	2.83E+00
		Fe-59	<9.39E+00	0.00E+00	9.39E+00
		Co-60	<2.98E+00	0.00E+00	2.98E+00
		Zn-65	<7.73E+00	0.00E+00	7.73E+00
		Zr-95	<8.78E+00	0.00E+00	8.78E+00
		Nb-95	<5.10E+00	0.00E+00	5.10E+00
		I-131	<1.04E+01	0.00E+00	1.04E+01
		Cs-134	<4.99E+00	0.00E+00	4.99E+00
		Cs-137	<4.03E+00	0.00E+00	4.03E+00
		BaLa-140	<7.87E+00	0.00E+00	7.87E+00
		Be-7	<3.94E+01	0.00E+00	3.94E+01
		K-40	3.57E+01	3.79E+01	5.99E+01
441848	3/28/2017 - 4/25/2017	Mn-54	<3.37E+00	0.00E+00	3.37E+00
		Co-58	<4.17E+00	0.00E+00	4.17E+00
		Fe-59	<9.38E+00	0.00E+00	9.38E+00
		Co-60	<2.98E+00	0.00E+00	2.98E+00
		Zn-65	<7.08E+00	0.00E+00	7.08E+00
		Zr-95	<7.00E+00	0.00E+00	7.00E+00
		Nb-95	<5.10E+00	0.00E+00	5.10E+00
		I-131	<9.92E+00	0.00E+00	9.92E+00
		Cs-134	<5.33E+00	0.00E+00	5.33E+00
		Cs-137	<5.07E+00	0.00E+00	5.07E+00
		BaLa-140	<1.11E+01	0.00E+00	1.11E+01
		Be-7	<3.48E+01	0.00E+00	3.48E+01
		K-40	3.94E+01	3.71E+01	5.71E+01



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [ INDICATOR - ESE @ 4.06 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
442287	2/28/2017 - 5/23/2017	H3SW	7.76E+02	1.37E+02	1.95E+02
443848	4/25/2017 - 5/23/2017	Mn-54	<3.40E+00	0.00E+00	3.40E+00
		Co-58	<2.99E+00	0.00E+00	2.99E+00
		Fe-59	<3.48E+00	0.00E+00	3.48E+00
		Co-60	<3.18E+00	0.00E+00	3.18E+00
		Zn-65	<4.14E+00	0.00E+00	4.14E+00
		Zr-95	<6.87E+00	0.00E+00	6.87E+00
		Nb-95	<4.32E+00	0.00E+00	4.32E+00
		I-131	<1.09E+01	0.00E+00	1.09E+01
		Cs-134	<3.34E+00	0.00E+00	3.34E+00
		Cs-137	<3.63E+00	0.00E+00	3.63E+00
		BaLa-140	<4.72E+00	0.00E+00	4.72E+00
		Be-7	<3.43E+01	0.00E+00	3.43E+01
		K-40	<5.53E+01	0.00E+00	5.53E+01
446815	5/23/2017 - 6/20/2017	Mn-54	<4.52E+00	0.00E+00	4.52E+00
		Co-58	<5.02E+00	0.00E+00	5.02E+00
		Fe-59	<7.38E+00	0.00E+00	7.38E+00
		Co-60	<5.21E+00	0.00E+00	5.21E+00
		Zn-65	<1.07E+01	0.00E+00	1.07E+01
		Zr-95	<9.61E+00	0.00E+00	9.61E+00
		Nb-95	<4.85E+00	0.00E+00	4.85E+00
		I-131	<1.04E+01	0.00E+00	1.04E+01
		Cs-134	<6.46E+00	0.00E+00	6.46E+00
		Cs-137	<4.37E+00	0.00E+00	4.37E+00
		BaLa-140	<7.02E+00	0.00E+00	7.02E+00
		Be-7	<3.52E+01	0.00E+00	3.52E+01
		K-40	8.06E+01	4.68E+01	6.26E+01
448884	6/27/2017 - 7/18/2017	Mn-54	<3.11E+00	0.00E+00	3.11E+00
		Co-58	<4.04E+00	0.00E+00	4.04E+00
		Fe-59	<9.39E+00	0.00E+00	9.39E+00
		Co-60	<3.45E+00	0.00E+00	3.45E+00
		Zn-65	<8.23E+00	0.00E+00	8.23E+00
		Zr-95	<7.82E+00	0.00E+00	7.82E+00
		Nb-95	<3.86E+00	0.00E+00	3.86E+00
		I-131	<8.63E+00	0.00E+00	8.63E+00
		Cs-134	<3.17E+00	0.00E+00	3.17E+00
		Cs-137	<2.78E+00	0.00E+00	2.78E+00
		BaLa-140	<6.50E+00	0.00E+00	6.50E+00
		Be-7	<3.08E+01	0.00E+00	3.08E+01
		K-40	4.54E+01	4.59E+01	7.28E+01
450044	5/23/2017 - 8/15/2017	H3SW	9.05E+02	1.36E+02	1.86E+02
450717	7/18/2017 - 8/15/2017	Mn-54	<3.53E+00	0.00E+00	3.53E+00
		Co-58	<5.56E+00	0.00E+00	5.56E+00
		Fe-59	<8.56E+00	0.00E+00	8.56E+00
		Co-60	<4.37E+00	0.00E+00	4.37E+00
		Zn-65	<6.61E+00	0.00E+00	6.61E+00
		Zr-95	<6.91E+00	0.00E+00	6.91E+00
		Nb-95	<3.71E+00	0.00E+00	3.71E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<4.63E+00	0.00E+00	4.63E+00
		Cs-137	<4.41E+00	0.00E+00	4.41E+00
		BaLa-140	<6.54E+00	0.00E+00	6.54E+00
		Be-7	<4.03E+01	0.00E+00	4.03E+01
		K-40	1.46E+01	2.24E+01	3.78E+01
452777	8/15/2017 - 9/12/2017	Mn-54	<3.20E+00	0.00E+00	3.20E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [ INDICATOR - ESE @ 4.06 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA		
452777	8/15/2017 - 9/12/2017	Co-58	<3.53E+00	0.00E+00	3.53E+00		
		Fe-59	<7.77E+00	0.00E+00	7.77E+00		
		Co-60	<4.57E+00	0.00E+00	4.57E+00		
		Zn-65	<1.05E+01	0.00E+00	1.05E+01		
		Zr-95	<7.72E+00	0.00E+00	7.72E+00		
		Nb-95	<4.42E+00	0.00E+00	4.42E+00		
		I-131	<1.11E+01	0.00E+00	1.11E+01		
		Cs-134	<4.38E+00	0.00E+00	4.38E+00		
		Cs-137	<3.99E+00	0.00E+00	3.99E+00		
		BaLa-140	<1.13E+01	0.00E+00	1.13E+01		
		Be-7	<2.47E+01	0.00E+00	2.47E+01		
		K-40	<5.25E+01	0.00E+00	5.25E+01		
		455404	9/12/2017 - 10/10/2017	Mn-54	<2.84E+00	0.00E+00	2.84E+00
				Co-58	<3.62E+00	0.00E+00	3.62E+00
Fe-59	<7.09E+00			0.00E+00	7.09E+00		
Co-60	<2.61E+00			0.00E+00	2.61E+00		
Zn-65	<6.35E+00			0.00E+00	6.35E+00		
Zr-95	<6.42E+00			0.00E+00	6.42E+00		
Nb-95	<3.78E+00			0.00E+00	3.78E+00		
I-131	<1.16E+01			0.00E+00	1.16E+01		
Cs-134	<2.87E+00			0.00E+00	2.87E+00		
Cs-137	<2.38E+00			0.00E+00	2.38E+00		
BaLa-140	<6.93E+00			0.00E+00	6.93E+00		
Be-7	<2.77E+01			0.00E+00	2.77E+01		
K-40	1.87E+01			2.21E+01	3.55E+01		
462587	10/10/2017 - 11/7/2017			Mn-54	<3.80E+00	0.00E+00	3.80E+00
		Co-58	<5.14E+00	0.00E+00	5.14E+00		
		Fe-59	<8.22E+00	0.00E+00	8.22E+00		
		Co-60	<4.22E+00	0.00E+00	4.22E+00		
		Zn-65	<8.87E+00	0.00E+00	8.87E+00		
		Zr-95	<7.42E+00	0.00E+00	7.42E+00		
		Nb-95	<4.15E+00	0.00E+00	4.15E+00		
		I-131	<1.09E+01	0.00E+00	1.09E+01		
		Cs-134	<4.63E+00	0.00E+00	4.63E+00		
		Cs-137	<3.87E+00	0.00E+00	3.87E+00		
		BaLa-140	<1.12E+01	0.00E+00	1.12E+01		
		Be-7	<3.95E+01	0.00E+00	3.95E+01		
		K-40	<8.14E+01	0.00E+00	8.14E+01		
		462365	8/15/2017 - 12/5/2017	H3SW	6.75E+02	1.31E+02	1.89E+02
464684	11/7/2017 - 12/5/2017	Mn-54	<3.63E+00	0.00E+00	3.63E+00		
		Co-58	<4.61E+00	0.00E+00	4.61E+00		
		Fe-59	<8.53E+00	0.00E+00	8.53E+00		
		Co-60	<3.67E+00	0.00E+00	3.67E+00		
		Zn-65	<7.39E+00	0.00E+00	7.39E+00		
		Zr-95	<7.15E+00	0.00E+00	7.15E+00		
		Nb-95	<4.52E+00	0.00E+00	4.52E+00		
		I-131	<1.19E+01	0.00E+00	1.19E+01		
		Cs-134	<3.05E+00	0.00E+00	3.05E+00		
		Cs-137	<3.51E+00	0.00E+00	3.51E+00		
		BaLa-140	<6.22E+00	0.00E+00	6.22E+00		
		Be-7	<3.69E+01	0.00E+00	3.69E+01		
		K-40	1.90E+01	3.11E+01	5.29E+01		
		465962	12/5/2017 - 1/3/2018	Mn-54	<1.90E+00	0.00E+00	1.90E+00
Co-58	<2.88E+00			0.00E+00	2.88E+00		
Fe-59	<4.12E+00			0.00E+00	4.12E+00		
Co-60	<2.43E+00			0.00E+00	2.43E+00		
Zn-65	<4.52E+00			0.00E+00	4.52E+00		



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [ INDICATOR - ESE @ 4.06 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465962	12/5/2017 - 1/3/2018	Zr-95	<4.79E+00	0.00E+00	4.79E+00
		Nb-95	<2.90E+00	0.00E+00	2.90E+00
		I-131	<1.02E+01	0.00E+00	1.02E+01
		Cs-134	<2.33E+00	0.00E+00	2.33E+00
		Cs-137	<2.27E+00	0.00E+00	2.27E+00
		BaLa-140	<7.09E+00	0.00E+00	7.09E+00
		Be-7	<2.26E+01	0.00E+00	2.26E+01
		K-40	4.44E+01	2.31E+01	3.12E+01
		H3SW	1.29E+03	1.45E+02	1.83E+02

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
432190	12/6/2016 - 1/4/2017	Mn-54	<3.37E+00	0.00E+00	3.37E+00
		Co-58	<3.73E+00	0.00E+00	3.73E+00
		Fe-59	<7.57E+00	0.00E+00	7.57E+00
		Co-60	<3.46E+00	0.00E+00	3.46E+00
		Zn-65	<6.36E+00	0.00E+00	6.36E+00
		Zr-95	<7.04E+00	0.00E+00	7.04E+00
		Nb-95	<4.93E+00	0.00E+00	4.93E+00
		I-131	<1.09E+01	0.00E+00	1.09E+01
		Cs-134	<3.98E+00	0.00E+00	3.98E+00
		Cs-137	<4.03E+00	0.00E+00	4.03E+00
		BaLa-140	<8.09E+00	0.00E+00	8.09E+00
		Be-7	<3.24E+01	0.00E+00	3.24E+01
		K-40	<6.60E+01	0.00E+00	6.60E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
434447	1/4/2017 - 1/31/2017	Mn-54	<2.89E+00	0.00E+00	2.89E+00
		Co-58	<3.38E+00	0.00E+00	3.38E+00
		Fe-59	<9.27E+00	0.00E+00	9.27E+00
		Co-60	<4.36E+00	0.00E+00	4.36E+00
		Zn-65	<6.06E+00	0.00E+00	6.06E+00
		Zr-95	<6.64E+00	0.00E+00	6.64E+00
		Nb-95	<4.16E+00	0.00E+00	4.16E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.21E+00	0.00E+00	3.21E+00
		Cs-137	<3.31E+00	0.00E+00	3.31E+00
		BaLa-140	<9.30E+00	0.00E+00	9.30E+00
		Be-7	<2.75E+01	0.00E+00	2.75E+01
		K-40	<5.65E+01	0.00E+00	5.65E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
434736	12/6/2016 - 2/28/2017	H3SW	2.64E+02	1.16E+02	1.85E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
436702	1/31/2017 - 2/28/2017	Mn-54	<3.43E+00	0.00E+00	3.43E+00
		Co-58	<4.42E+00	0.00E+00	4.42E+00
		Fe-59	<4.99E+00	0.00E+00	4.99E+00
		Co-60	<3.90E+00	0.00E+00	3.90E+00
		Zn-65	<8.83E+00	0.00E+00	8.83E+00
		Zr-95	<8.56E+00	0.00E+00	8.56E+00
		Nb-95	<4.20E+00	0.00E+00	4.20E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<3.97E+00	0.00E+00	3.97E+00
		Cs-137	<3.47E+00	0.00E+00	3.47E+00
		BaLa-140	<1.98E+00	0.00E+00	1.98E+00
		Be-7	<2.76E+01	0.00E+00	2.76E+01
		K-40	<5.17E+01	0.00E+00	5.17E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
439152	2/28/2017 - 3/28/2017	Mn-54	<3.78E+00	0.00E+00	3.78E+00
		Co-58	<4.71E+00	0.00E+00	4.71E+00
		Fe-59	<7.74E+00	0.00E+00	7.74E+00
		Co-60	<3.63E+00	0.00E+00	3.63E+00
		Zn-65	<7.29E+00	0.00E+00	7.29E+00
		Zr-95	<7.39E+00	0.00E+00	7.39E+00



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
439152	2/28/2017 - 3/28/2017	Nb-95	<4.64E+00	0.00E+00	4.64E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<4.56E+00	0.00E+00	4.56E+00
		Cs-137	<3.31E+00	0.00E+00	3.31E+00
		BaLa-140	<2.16E+00	0.00E+00	2.16E+00
		Be-7	<3.94E+01	0.00E+00	3.94E+01
		K-40	<5.21E+01	0.00E+00	5.21E+01
441849	3/28/2017 - 4/25/2017	Mn-54	<3.04E+00	0.00E+00	3.04E+00
		Co-58	<3.35E+00	0.00E+00	3.35E+00
		Fe-59	<6.15E+00	0.00E+00	6.15E+00
		Co-60	<3.16E+00	0.00E+00	3.16E+00
		Zn-65	<4.59E+00	0.00E+00	4.59E+00
		Zr-95	<6.97E+00	0.00E+00	6.97E+00
		Nb-95	<5.63E+00	0.00E+00	5.63E+00
		I-131	<1.09E+01	0.00E+00	1.09E+01
		Cs-134	<3.68E+00	0.00E+00	3.68E+00
		Cs-137	<3.89E+00	0.00E+00	3.89E+00
		BaLa-140	<1.08E+01	0.00E+00	1.08E+01
		Be-7	<3.80E+01	0.00E+00	3.80E+01
		K-40	7.31E+01	3.89E+01	4.56E+01
442288	2/28/2017 - 5/23/2017	H3SW	6.35E+02	1.34E+02	1.96E+02
443849	4/25/2017 - 5/23/2017	Mn-54	<3.38E+00	0.00E+00	3.38E+00
		Co-58	<3.46E+00	0.00E+00	3.46E+00
		Fe-59	<9.95E+00	0.00E+00	9.95E+00
		Co-60	<4.22E+00	0.00E+00	4.22E+00
		Zn-65	<7.09E+00	0.00E+00	7.09E+00
		Zr-95	<5.62E+00	0.00E+00	5.62E+00
		Nb-95	<4.91E+00	0.00E+00	4.91E+00
		I-131	<9.60E+00	0.00E+00	9.60E+00
		Cs-134	<4.82E+00	0.00E+00	4.82E+00
		Cs-137	<3.68E+00	0.00E+00	3.68E+00
		BaLa-140	<1.03E+01	0.00E+00	1.03E+01
		Be-7	<3.23E+01	0.00E+00	3.23E+01
		K-40	<7.50E+01	0.00E+00	7.50E+01
446816	5/23/2017 - 6/20/2017	Mn-54	<3.34E+00	0.00E+00	3.34E+00
		Co-58	<3.18E+00	0.00E+00	3.18E+00
		Fe-59	<1.01E+01	0.00E+00	1.01E+01
		Co-60	<3.86E+00	0.00E+00	3.86E+00
		Zn-65	<6.20E+00	0.00E+00	6.20E+00
		Zr-95	<8.63E+00	0.00E+00	8.63E+00
		Nb-95	<4.11E+00	0.00E+00	4.11E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.38E+00	0.00E+00	3.38E+00
		Cs-137	<3.24E+00	0.00E+00	3.24E+00
		BaLa-140	<8.19E+00	0.00E+00	8.19E+00
		Be-7	<3.16E+01	0.00E+00	3.16E+01
		K-40	3.30E+01	2.32E+01	2.99E+01
448885	6/20/2017 - 7/18/2017	Mn-54	<2.87E+00	0.00E+00	2.87E+00
		Co-58	<3.46E+00	0.00E+00	3.46E+00
		Fe-59	<6.75E+00	0.00E+00	6.75E+00
		Co-60	<3.86E+00	0.00E+00	3.86E+00
		Zn-65	<7.74E+00	0.00E+00	7.74E+00
		Zr-95	<8.48E+00	0.00E+00	8.48E+00
		Nb-95	<4.42E+00	0.00E+00	4.42E+00
		I-131	<9.02E+00	0.00E+00	9.02E+00
		Cs-134	<3.48E+00	0.00E+00	3.48E+00
		Cs-137	<4.04E+00	0.00E+00	4.04E+00





**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
448885	6/20/2017 - 7/18/2017	BaLa-140	<7.93E+00	0.00E+00	7.93E+00
		Be-7	<3.95E+01	0.00E+00	3.95E+01
		K-40	<6.61E+01	0.00E+00	6.61E+01
450045	5/23/2017 - 8/15/2017	H3SW	5.75E+02	1.26E+02	1.86E+02
450718	7/18/2017 - 8/15/2017	Mn-54	<3.80E+00	0.00E+00	3.80E+00
		Co-58	<3.73E+00	0.00E+00	3.73E+00
		Fe-59	<8.24E+00	0.00E+00	8.24E+00
		Co-60	<3.86E+00	0.00E+00	3.86E+00
		Zn-65	<7.75E+00	0.00E+00	7.75E+00
		Zr-95	<6.14E+00	0.00E+00	6.14E+00
		Nb-95	<4.68E+00	0.00E+00	4.68E+00
		I-131	<9.69E+00	0.00E+00	9.69E+00
		Cs-134	<3.48E+00	0.00E+00	3.48E+00
		Cs-137	<5.21E+00	0.00E+00	5.21E+00
		BaLa-140	<1.13E+01	0.00E+00	1.13E+01
		Be-7	<4.27E+01	0.00E+00	4.27E+01
		K-40	<6.80E+01	0.00E+00	6.80E+01
452778	8/15/2017 - 9/12/2017	Mn-54	<3.59E+00	0.00E+00	3.59E+00
		Co-58	<3.17E+00	0.00E+00	3.17E+00
		Fe-59	<4.62E+00	0.00E+00	4.62E+00
		Co-60	<3.86E+00	0.00E+00	3.86E+00
		Zn-65	<8.33E+00	0.00E+00	8.33E+00
		Zr-95	<6.60E+00	0.00E+00	6.60E+00
		Nb-95	<4.67E+00	0.00E+00	4.67E+00
		I-131	<1.10E+01	0.00E+00	1.10E+01
		Cs-134	<3.75E+00	0.00E+00	3.75E+00
		Cs-137	<3.48E+00	0.00E+00	3.48E+00
		BaLa-140	<9.22E+00	0.00E+00	9.22E+00
		Be-7	<4.36E+01	0.00E+00	4.36E+01
		K-40	<5.32E+01	0.00E+00	5.32E+01
455405	9/12/2017 - 10/10/2017	Mn-54	<2.62E+00	0.00E+00	2.62E+00
		Co-58	<2.90E+00	0.00E+00	2.90E+00
		Fe-59	<5.57E+00	0.00E+00	5.57E+00
		Co-60	<2.86E+00	0.00E+00	2.86E+00
		Zn-65	<5.25E+00	0.00E+00	5.25E+00
		Zr-95	<6.11E+00	0.00E+00	6.11E+00
		Nb-95	<3.84E+00	0.00E+00	3.84E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<2.01E+00	0.00E+00	2.01E+00
		Cs-137	<3.11E+00	0.00E+00	3.11E+00
		BaLa-140	<7.07E+00	0.00E+00	7.07E+00
		Be-7	<2.28E+01	0.00E+00	2.28E+01
		K-40	5.65E+01	2.74E+01	3.29E+01
462588	10/10/2017 - 11/7/2017	Mn-54	<2.56E+00	0.00E+00	2.56E+00
		Co-58	<2.98E+00	0.00E+00	2.98E+00
		Fe-59	<6.71E+00	0.00E+00	6.71E+00
		Co-60	<3.44E+00	0.00E+00	3.44E+00
		Zn-65	<5.93E+00	0.00E+00	5.93E+00
		Zr-95	<5.55E+00	0.00E+00	5.55E+00
		Nb-95	<3.65E+00	0.00E+00	3.65E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<4.34E+00	0.00E+00	4.34E+00
		Cs-137	<3.22E+00	0.00E+00	3.22E+00
		BaLa-140	<9.64E+00	0.00E+00	9.64E+00
		Be-7	<3.11E+01	0.00E+00	3.11E+01
		K-40	<5.34E+01	0.00E+00	5.34E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
462366	8/15/2017 - 12/5/2017	H3SW	5.36E+02	1.26E+02	1.87E+02
464685	11/7/2017 - 12/5/2017	Mn-54	<3.23E+00	0.00E+00	3.23E+00
		Co-58	<3.88E+00	0.00E+00	3.88E+00
		Fe-59	<6.89E+00	0.00E+00	6.89E+00
		Co-60	<2.29E+00	0.00E+00	2.29E+00
		Zn-65	<6.42E+00	0.00E+00	6.42E+00
		Zr-95	<2.69E+00	0.00E+00	2.69E+00
		Nb-95	<3.67E+00	0.00E+00	3.67E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<3.58E+00	0.00E+00	3.58E+00
		Cs-137	<2.36E+00	0.00E+00	2.36E+00
		BaLa-140	<7.34E+00	0.00E+00	7.34E+00
		Be-7	<2.73E+01	0.00E+00	2.73E+01
		K-40	<5.49E+01	0.00E+00	5.49E+01
465963	12/5/2017 - 1/3/2018	Mn-54	<1.92E+00	0.00E+00	1.92E+00
		Co-58	<1.95E+00	0.00E+00	1.95E+00
		Fe-59	<4.74E+00	0.00E+00	4.74E+00
		Co-60	<1.78E+00	0.00E+00	1.78E+00
		Zn-65	<4.58E+00	0.00E+00	4.58E+00
		Zr-95	<4.99E+00	0.00E+00	4.99E+00
		Nb-95	<2.82E+00	0.00E+00	2.82E+00
		I-131	<1.06E+01	0.00E+00	1.06E+01
		Cs-134	<2.65E+00	0.00E+00	2.65E+00
		Cs-137	<1.97E+00	0.00E+00	1.97E+00
		BaLa-140	<4.99E+00	0.00E+00	4.99E+00
		Be-7	<2.00E+01	0.00E+00	2.00E+01
		K-40	6.00E+01	2.64E+01	3.46E+01
		H3SW	6.14E+02	1.25E+02	1.82E+02

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437110	12/15/2016 - 3/16/2017	mR/Std Qtr	19.09
445008	3/16/2017 - 6/15/2017	mR/Std Qtr	16.19
452039	6/15/2017 - 9/14/2017	mR/Std Qtr	15.02
464421	9/14/2017 - 12/14/2017	mR/Std Qtr	16.51

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437111	12/15/2016 - 3/16/2017	mR/Std Qtr	17.91
445009	3/16/2017 - 6/15/2017	mR/Std Qtr	16.12
452040	6/15/2017 - 9/14/2017	mR/Std Qtr	14.14
464422	9/14/2017 - 12/14/2017	mR/Std Qtr	16.67

Sample Point 203 [ INDICATOR - ESE @ 0.38 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437112	12/15/2016 - 3/16/2017	mR/Std Qtr	21.21



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

## Sample Point 203 [ INDICATOR - ESE @ 0.38 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
445010	3/16/2017 - 6/15/2017	mR/Std Qtr	15.49
452041	6/15/2017 - 9/14/2017	mR/Std Qtr	16.74
464423	9/14/2017 - 12/14/2017	mR/Std Qtr	20.89

## Sample Point 204 [ INDICATOR - SSW @ 0.48 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437113	12/15/2016 - 3/16/2017	mR/Std Qtr	19.01
445011	3/16/2017 - 6/15/2017	mR/Std Qtr	14.95
452042	6/15/2017 - 9/14/2017	mR/Std Qtr	14.83
464424	9/14/2017 - 12/14/2017	mR/Std Qtr	17.39

## Sample Point 205 [ INDICATOR - SW @ 0.5 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437114	12/15/2016 - 3/16/2017	mR/Std Qtr	20.78
445012	3/16/2017 - 6/15/2017	mR/Std Qtr	18.00
452043	6/15/2017 - 9/14/2017	mR/Std Qtr	17.12
464425	9/14/2017 - 12/14/2017	mR/Std Qtr	17.19

## Sample Point 206 [ INDICATOR - WNW @ 0.67 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437115	12/15/2016 - 3/16/2017	mR/Std Qtr	24.08
445013	3/16/2017 - 6/15/2017	mR/Std Qtr	21.31
452044	6/15/2017 - 9/14/2017	mR/Std Qtr	19.83
464426	9/14/2017 - 12/14/2017	mR/Std Qtr	23.4

## Sample Point 207 [ INDICATOR - NNW @ 0.95 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437116	12/15/2016 - 3/16/2017	mR/Std Qtr	21.85
445014	3/16/2017 - 6/15/2017	mR/Std Qtr	19.36
452045	6/15/2017 - 9/14/2017	mR/Std Qtr	17.61
464427	9/14/2017 - 12/14/2017	mR/Std Qtr	19.42

## Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
437117	12/15/2016 - 3/16/2017	mR/Std Qtr	17.17
445015	3/16/2017 - 6/15/2017	mR/Std Qtr	14.85

# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

## Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
452046	6/15/2017 - 9/14/2017	mR/Std Qtr	13.68
464428	9/14/2017 - 12/14/2017	mR/Std Qtr	16.41

## Sample Point 217 [ CONTROL - SSE @ 10.3 miles ]

TLD RING TLD\_CTRL

Sample ID:	Sample Dates:	Nuclide	Activity
437118	12/15/2016 - 3/16/2017	mR/Std Qtr	12.72
445016	3/16/2017 - 6/15/2017	mR/Std Qtr	11.00
452047	6/15/2017 - 9/14/2017	mR/Std Qtr	10.00
464429	9/14/2017 - 12/14/2017	mR/Std Qtr	11.20

## Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437119	12/15/2016 - 3/16/2017	mR/Std Qtr	18.96
445017	3/16/2017 - 6/15/2017	mR/Std Qtr	15.78
452048	6/15/2017 - 9/14/2017	mR/Std Qtr	15.03
464430	9/14/2017 - 12/14/2017	mR/Std Qtr	17.43

## Sample Point 223 [ INDICATOR - E @ 0.57 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437120	12/15/2016 - 3/16/2017	mR/Std Qtr	23.53
445018	3/16/2017 - 6/15/2017	mR/Std Qtr	18.31
452049	6/15/2017 - 9/14/2017	mR/Std Qtr	17.49
464431	9/14/2017 - 12/14/2017	mR/Std Qtr	20.74

## Sample Point 225 [ INDICATOR - SE @ 0.68 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437121	12/15/2016 - 3/16/2017	mR/Std Qtr	22.93
445019	3/16/2017 - 6/15/2017	mR/Std Qtr	18.70
452050	6/15/2017 - 9/14/2017	mR/Std Qtr	16.95
464432	9/14/2017 - 12/14/2017	mR/Std Qtr	17.98

## Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437122	12/15/2016 - 3/16/2017	mR/Std Qtr	19.08
445020	3/16/2017 - 6/15/2017	mR/Std Qtr	16.99
452051	6/15/2017 - 9/14/2017	mR/Std Qtr	16.56



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

TLD RING TLD\_INNER

Sample ID: 464433	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	17.76

Sample Point 227 [ INDICATOR - WSW @ 0.52 miles ]

TLD RING TLD\_INNER

Sample ID: 437123	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	18.54

Sample ID: 445021	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	17.79

Sample ID: 452052	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	15.90

Sample ID: 464434	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	17.33

Sample Point 228 [ INDICATOR - W @ 0.61 miles ]

TLD RING TLD\_INNER

Sample ID: 437124	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	19.34

Sample ID: 445022	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	18.37

Sample ID: 452053	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	16.87

Sample ID: 464435	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	19.05

Sample Point 229 [ INDICATOR - NW @ 0.84 miles ]

TLD RING TLD\_INNER

Sample ID: 437125	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	25.87

Sample ID: 445023	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	22.75

Sample ID: 452054	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	19.15

Sample ID: 464436	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	22.20

Sample Point 230 [ INDICATOR - N @ 4.37 miles ]

TLD RING TLD\_OUTER

Sample ID: 437126	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	16.69

Sample ID: 445024	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	12.27

Sample ID: 452055	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	11.95

Sample ID: 464437	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	12.68

Sample Point 231 [ INDICATOR - NNE @ 4.21 miles ]

TLD RING TLD\_OUTER

Sample ID: 437127	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	18.57

Sample ID: 445025	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	15.67

Sample ID: 452056	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	16.99

Sample ID: 464438	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	16.77



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: TLD Concentration (Activity): mR/Standard Quarter

**Sample Point 232 [ INDICATOR - NE @ 4.18 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437128	12/15/2016 - 3/16/2017	mR/Std Qtr	24.09
445026	3/16/2017 - 6/15/2017	mR/Std Qtr	20.48
452057	6/15/2017 - 9/14/2017	mR/Std Qtr	19.70
464439	9/14/2017 - 12/14/2017	mR/Std Qtr	22.61

**Sample Point 233 [ INDICATOR - ENE @ 3.95 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437129	12/15/2016 - 3/16/2017	mR/Std Qtr	17.46
445027	3/16/2017 - 6/15/2017	mR/Std Qtr	11.83
452058	6/15/2017 - 9/14/2017	mR/Std Qtr	13.23
464440	9/14/2017 - 12/14/2017	mR/Std Qtr	14.77

**Sample Point 234 [ INDICATOR - E @ 4.5 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437130	12/15/2016 - 3/16/2017	mR/Std Qtr	19.93
445028	3/16/2017 - 6/15/2017	mR/Std Qtr	17.41
452059	6/15/2017 - 9/14/2017	mR/Std Qtr	16.22
464441	9/14/2017 - 12/14/2017	mR/Std Qtr	15.96

**Sample Point 235 [ INDICATOR - ESE @ 4.07 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437131	12/15/2016 - 3/16/2017	mR/Std Qtr	18.38
445029	3/16/2017 - 6/15/2017	mR/Std Qtr	15.20
452060	6/15/2017 - 9/14/2017	mR/Std Qtr	15.12
464442	9/14/2017 - 12/14/2017	mR/Std Qtr	16.70

**Sample Point 236 [ INDICATOR - SE @ 4.25 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437132	12/15/2016 - 3/16/2017	mR/Std Qtr	23.27
445030	3/16/2017 - 6/15/2017	mR/Std Qtr	20.53
452061	6/15/2017 - 9/14/2017	mR/Std Qtr	22.78
464443	9/14/2017 - 12/14/2017	mR/Std Qtr	21.76

**Sample Point 237 [ INDICATOR - SSE @ 4.75 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437133	12/15/2016 - 3/16/2017	mR/Std Qtr	24.67



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: TLD Concentration (Activity): mR/Standard Quarter

**Sample Point 237 [ INDICATOR - SSE @ 4.75 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
445031	3/16/2017 - 6/15/2017	mR/Std Qtr	20.23
452062	6/15/2017 - 9/14/2017	mR/Std Qtr	20.04
464444	9/14/2017 - 12/14/2017	mR/Std Qtr	21.65

**Sample Point 238 [ INDICATOR - S @ 4.02 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437134	12/15/2016 - 3/16/2017	mR/Std Qtr	18.91
445032	3/16/2017 - 6/15/2017	mR/Std Qtr	15.86
452063	6/15/2017 - 9/14/2017	mR/Std Qtr	16.78
464445	9/14/2017 - 12/14/2017	mR/Std Qtr	16.86

**Sample Point 239 [ INDICATOR - SSW @ 4.49 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437135	12/15/2016 - 3/16/2017	mR/Std Qtr	21.50
445033	3/16/2017 - 6/15/2017	mR/Std Qtr	15.60
452064	6/15/2017 - 9/14/2017	mR/Std Qtr	15.53
464446	9/14/2017 - 12/14/2017	mR/Std Qtr	19.28

**Sample Point 240 [ INDICATOR - SW @ 4.07 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437136	12/15/2016 - 3/16/2017	mR/Std Qtr	13.60
445034	3/16/2017 - 6/15/2017	mR/Std Qtr	10.73
452065	6/15/2017 - 9/14/2017	mR/Std Qtr	9.94
464447	9/14/2017 - 12/14/2017	mR/Std Qtr	12.05

**Sample Point 241 [ INDICATOR - WSW @ 4.58 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437137	12/15/2016 - 3/16/2017	mR/Std Qtr	12.62
445035	3/16/2017 - 6/15/2017	mR/Std Qtr	11.19
452066	6/15/2017 - 9/14/2017	mR/Std Qtr	11.46
464448	9/14/2017 - 12/14/2017	mR/Std Qtr	12.71

**Sample Point 242 [ INDICATOR - W @ 4.56 miles ]**

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
437138	12/15/2016 - 3/16/2017	mR/Std Qtr	18.10
445036	3/16/2017 - 6/15/2017	mR/Std Qtr	14.83



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 242 [ INDICATOR - W @ 4.56 miles ]

TLD RING TLD\_OUTER

Sample ID:	452067	Sample Dates:	6/15/2017 - 9/14/2017	Nuclide	Activity
				mR/Std Qtr	13.43

Sample ID:	464449	Sample Dates:	9/14/2017 - 12/14/2017	Nuclide	Activity
				mR/Std Qtr	14.53

Sample Point 243 [ INDICATOR - WNW @ 4.39 miles ]

TLD RING TLD\_OUTER

Sample ID:	437139	Sample Dates:	12/15/2016 - 3/16/2017	Nuclide	Activity
				mR/Std Qtr	17.82

Sample ID:	445037	Sample Dates:	3/16/2017 - 6/15/2017	Nuclide	Activity
				mR/Std Qtr	14.49

Sample ID:	452068	Sample Dates:	6/15/2017 - 9/14/2017	Nuclide	Activity
				mR/Std Qtr	12.89

Sample ID:	464450	Sample Dates:	9/14/2017 - 12/14/2017	Nuclide	Activity
				mR/Std Qtr	16.01

Sample Point 244 [ INDICATOR - NW @ 4.02 miles ]

TLD RING TLD\_OUTER

Sample ID:	437140	Sample Dates:	12/15/2016 - 3/16/2017	Nuclide	Activity
				mR/Std Qtr	23.41

Sample ID:	445038	Sample Dates:	3/16/2017 - 6/15/2017	Nuclide	Activity
				mR/Std Qtr	19.49

Sample ID:	452069	Sample Dates:	6/15/2017 - 9/14/2017	Nuclide	Activity
				mR/Std Qtr	17.65

Sample ID:	464451	Sample Dates:	9/14/2017 - 12/14/2017	Nuclide	Activity
				mR/Std Qtr	21.27

Sample Point 245 [ INDICATOR - NNW @ 4.01 miles ]

TLD RING TLD\_OUTER

Sample ID:	437141	Sample Dates:	12/15/2016 - 3/16/2017	Nuclide	Activity
				mR/Std Qtr	18.02

Sample ID:	445039	Sample Dates:	3/16/2017 - 6/15/2017	Nuclide	Activity
				mR/Std Qtr	14.74

Sample ID:	452070	Sample Dates:	6/15/2017 - 9/14/2017	Nuclide	Activity
				mR/Std Qtr	13.41

Sample ID:	464452	Sample Dates:	9/14/2017 - 12/14/2017	Nuclide	Activity
				mR/Std Qtr	14.74

Sample Point 246 [ INDICATOR - ENE @ 7.87 miles ]

TLD RING TLD\_SPEC

Sample ID:	437142	Sample Dates:	12/15/2016 - 3/16/2017	Nuclide	Activity
				mR/Std Qtr	15.70

Sample ID:	445040	Sample Dates:	3/16/2017 - 6/15/2017	Nuclide	Activity
				mR/Std Qtr	12.44

Sample ID:	452071	Sample Dates:	6/15/2017 - 9/14/2017	Nuclide	Activity
				mR/Std Qtr	12.98

Sample ID:	464453	Sample Dates:	9/14/2017 - 12/14/2017	Nuclide	Activity
				mR/Std Qtr	14.71

Sample Point 247 [ CONTROL - ESE @ 7.33 miles ]

TLD RING TLD\_CTRL

Sample ID:	437143	Sample Dates:	12/15/2016 - 3/16/2017	Nuclide	Activity
				mR/Std Qtr	15.98

Sample ID:	445041	Sample Dates:	3/16/2017 - 6/15/2017	Nuclide	Activity
				mR/Std Qtr	12.27

Sample ID:	452072	Sample Dates:	6/15/2017 - 9/14/2017	Nuclide	Activity
				mR/Std Qtr	12.15





**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 247 [ CONTROL - ESE @ 7.33 miles ]

TLD RING TLD\_CTRL

Sample ID: 464454	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	13.53

Sample Point 248 [ INDICATOR - S @ 6.54 miles ]

TLD RING TLD\_SPEC

Sample ID: 437144	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	16.65

Sample ID: 445042	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	14.41

Sample ID: 452073	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	12.07

Sample ID: 464455	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	14.37

Sample Point 249 [ INDICATOR - S @ 7.17 miles ]

TLD RING TLD\_SPEC

Sample ID: 437145	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	19.13

Sample ID: 445043	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	15.15

Sample ID: 452074	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	14.49

Sample ID: 464456	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	16.98

Sample Point 250 [ INDICATOR - WSW @ 10.4 miles ]

TLD RING TLD\_SPEC

Sample ID: 437146	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	18.15

Sample ID: 445044	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	17.05

Sample ID: 452075	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	15.11

Sample ID: 464457	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	15.60

Sample Point 251 [ CONTROL - WNW @ 9.72 miles ]

TLD RING TLD\_CTRL

Sample ID: 437147	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	17.33

Sample ID: 445045	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	14.75

Sample ID: 452076	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	15.09

Sample ID: 464458	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	16.11

Sample Point 255 [ INDICATOR - ENE @ 0.61 miles ]

TLD RING TLD\_INNER

Sample ID: 437148	Sample Dates: 12/15/2016 - 3/16/2017	Nuclide	Activity
		mR/Std Qtr	22.87

Sample ID: 445046	Sample Dates: 3/16/2017 - 6/15/2017	Nuclide	Activity
		mR/Std Qtr	17.60

Sample ID: 452077	Sample Dates: 6/15/2017 - 9/14/2017	Nuclide	Activity
		mR/Std Qtr	19.58

Sample ID: 464459	Sample Dates: 9/14/2017 - 12/14/2017	Nuclide	Activity
		mR/Std Qtr	21.28



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 256 [ INDICATOR - SSE @ 0.58 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
437149	12/15/2016 - 3/16/2017	mR/Std Qtr	22.62
445047	3/16/2017 - 6/15/2017	mR/Std Qtr	19.59
452078	6/15/2017 - 9/14/2017	mR/Std Qtr	18.93
464460	9/14/2017 - 12/14/2017	mR/Std Qtr	21.8

Sample Point 258 [ INDICATOR - W @ 9.84 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
437150	12/15/2016 - 3/16/2017	mR/Std Qtr	20.10
445048	3/16/2017 - 6/15/2017	mR/Std Qtr	16.80
452079	6/15/2017 - 9/14/2017	mR/Std Qtr	15.92
464461	9/14/2017 - 12/14/2017	mR/Std Qtr	18.71

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430844	1/4/2017 - 1/4/2017	MIXEDBLV	Mn-54	<3.03E+01	0.00E+00	3.03E+01
			Co-58	<2.59E+01	0.00E+00	2.59E+01
			Fe-59	<5.37E+01	0.00E+00	5.37E+01
			Co-60	<2.88E+01	0.00E+00	2.88E+01
			Zn-65	<6.65E+01	0.00E+00	6.65E+01
			Zr-95	<4.84E+01	0.00E+00	4.84E+01
			Nb-95	<2.27E+01	0.00E+00	2.27E+01
			I-131	<2.84E+01	0.00E+00	2.84E+01
			Cs-134	<2.82E+01	0.00E+00	2.82E+01
			Cs-137	<2.54E+01	0.00E+00	2.54E+01
			BaLa-140	<3.91E+01	0.00E+00	3.91E+01
			Be-7	1.83E+03	3.46E+02	2.95E+02
			K-40	3.51E+03	6.69E+02	4.54E+02
434992	2/7/2017 - 2/7/2017	MIXEDBLV	Mn-54	<3.17E+01	0.00E+00	3.17E+01
			Co-58	<2.32E+01	0.00E+00	2.32E+01
			Fe-59	<5.23E+01	0.00E+00	5.23E+01
			Co-60	<2.33E+01	0.00E+00	2.33E+01
			Zn-65	<5.96E+01	0.00E+00	5.96E+01
			Zr-95	<4.58E+01	0.00E+00	4.58E+01
			Nb-95	<2.71E+01	0.00E+00	2.71E+01
			I-131	<2.57E+01	0.00E+00	2.57E+01
			Cs-134	<3.66E+01	0.00E+00	3.66E+01
			Cs-137	<3.32E+01	0.00E+00	3.32E+01
			BaLa-140	<1.92E+01	0.00E+00	1.92E+01
			Be-7	1.15E+03	2.90E+02	3.18E+02
			K-40	3.08E+03	6.19E+02	4.42E+02
437511	3/7/2017 - 3/7/2017	MIXEDBLV	Mn-54	<1.97E+01	0.00E+00	1.97E+01
			Co-58	<2.47E+01	0.00E+00	2.47E+01
			Fe-59	<3.65E+01	0.00E+00	3.65E+01
			Co-60	<2.36E+01	0.00E+00	2.36E+01
			Zn-65	<4.72E+01	0.00E+00	4.72E+01
			Zr-95	<3.54E+01	0.00E+00	3.54E+01
			Nb-95	<2.22E+01	0.00E+00	2.22E+01
			I-131	<1.57E+01	0.00E+00	1.57E+01
			Cs-134	<3.21E+01	0.00E+00	3.21E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
437511	3/7/2017 - 3/7/2017	MIXEDBLV	Cs-137	<2.27E+01	0.00E+00	2.27E+01
			BaLa-140	<1.67E+01	0.00E+00	1.67E+01
			Be-7	7.46E+02	2.03E+02	2.17E+02
			K-40	4.02E+03	6.39E+02	2.39E+02
439941	4/4/2017 - 4/4/2017	MIXEDBLV	Mn-54	<1.73E+01	0.00E+00	1.73E+01
			Co-58	<2.27E+01	0.00E+00	2.27E+01
			Fe-59	<4.45E+01	0.00E+00	4.45E+01
			Co-60	<3.04E+01	0.00E+00	3.04E+01
			Zn-65	<4.38E+01	0.00E+00	4.38E+01
			Zr-95	<4.25E+01	0.00E+00	4.25E+01
			Nb-95	<2.81E+01	0.00E+00	2.81E+01
			I-131	<2.55E+01	0.00E+00	2.55E+01
			Cs-134	<2.69E+01	0.00E+00	2.69E+01
			Cs-137	<1.81E+01	0.00E+00	1.81E+01
			BaLa-140	<2.60E+01	0.00E+00	2.60E+01
			Be-7	1.25E+03	2.97E+02	3.35E+02
			K-40	4.36E+03	7.06E+02	3.77E+02
442278	5/2/2017 - 5/2/2017	MIXEDBLV	Mn-54	<2.19E+01	0.00E+00	2.19E+01
			Co-58	<2.17E+01	0.00E+00	2.17E+01
			Fe-59	<4.50E+01	0.00E+00	4.50E+01
			Co-60	<1.97E+01	0.00E+00	1.97E+01
			Zn-65	<4.50E+01	0.00E+00	4.50E+01
			Zr-95	<4.35E+01	0.00E+00	4.35E+01
			Nb-95	<2.26E+01	0.00E+00	2.26E+01
			I-131	<1.75E+01	0.00E+00	1.75E+01
			Cs-134	<2.25E+01	0.00E+00	2.25E+01
			Cs-137	<2.30E+01	0.00E+00	2.30E+01
			BaLa-140	<2.17E+01	0.00E+00	2.17E+01
			Be-7	2.59E+02	1.71E+02	2.57E+02
			K-40	4.41E+03	6.87E+02	3.04E+02
444680	6/6/2017 - 6/6/2017	MIXEDBLV	Mn-54	<2.03E+01	0.00E+00	2.03E+01
			Co-58	<2.01E+01	0.00E+00	2.01E+01
			Fe-59	<5.05E+01	0.00E+00	5.05E+01
			Co-60	<2.77E+01	0.00E+00	2.77E+01
			Zn-65	<5.70E+01	0.00E+00	5.70E+01
			Zr-95	<3.26E+01	0.00E+00	3.26E+01
			Nb-95	<3.02E+01	0.00E+00	3.02E+01
			I-131	<2.22E+01	0.00E+00	2.22E+01
			Cs-134	<2.86E+01	0.00E+00	2.86E+01
			Cs-137	<3.01E+01	0.00E+00	3.01E+01
			BaLa-140	<3.26E+01	0.00E+00	3.26E+01
			Be-7	5.62E+02	2.04E+02	2.60E+02
			K-40	3.45E+03	6.35E+02	4.34E+02
447422	7/3/2017 - 7/3/2017	MIXEDBLV	Mn-54	<1.65E+01	0.00E+00	1.65E+01
			Co-58	<1.43E+01	0.00E+00	1.43E+01
			Fe-59	<2.32E+01	0.00E+00	2.32E+01
			Co-60	<2.25E+01	0.00E+00	2.25E+01
			Zn-65	<3.34E+01	0.00E+00	3.34E+01
			Zr-95	<3.00E+01	0.00E+00	3.00E+01
			Nb-95	<2.06E+01	0.00E+00	2.06E+01
			I-131	<1.79E+01	0.00E+00	1.79E+01
			Cs-134	<2.23E+01	0.00E+00	2.23E+01
			Cs-137	<1.85E+01	0.00E+00	1.85E+01
			BaLa-140	<1.97E+01	0.00E+00	1.97E+01
			Be-7	7.25E+02	1.95E+02	2.13E+02
			K-40	3.27E+03	5.80E+02	4.31E+02
449827	8/1/2017 - 8/1/2017	MIXEDBLV	Mn-54	<3.00E+01	0.00E+00	3.00E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA			
449827	8/1/2017 - 8/1/2017	MIXEDBLV	Co-58	<2.54E+01	0.00E+00	2.54E+01			
			Fe-59	<7.76E+01	0.00E+00	7.76E+01			
			Co-60	<3.91E+01	0.00E+00	3.91E+01			
			Zn-65	<7.08E+01	0.00E+00	7.08E+01			
			Zr-95	<4.60E+01	0.00E+00	4.60E+01			
			Nb-95	<2.85E+01	0.00E+00	2.85E+01			
			I-131	<2.26E+01	0.00E+00	2.26E+01			
			Cs-134	<3.98E+01	0.00E+00	3.98E+01			
			Cs-137	<2.82E+01	0.00E+00	2.82E+01			
			BaLa-140	<3.41E+01	0.00E+00	3.41E+01			
			Be-7	8.54E+02	2.82E+02	3.59E+02			
			K-40	5.96E+03	8.75E+02	6.11E+01			
			451474	9/5/2017 - 9/5/2017	MIXEDBLV	Mn-54	<3.25E+01	0.00E+00	3.25E+01
						Co-58	<1.72E+01	0.00E+00	1.72E+01
Fe-59	<5.44E+01	0.00E+00				5.44E+01			
Co-60	<1.73E+01	0.00E+00				1.73E+01			
Zn-65	<8.71E+01	0.00E+00				8.71E+01			
Zr-95	<5.38E+01	0.00E+00				5.38E+01			
Nb-95	<3.18E+01	0.00E+00				3.18E+01			
I-131	<2.84E+01	0.00E+00				2.84E+01			
Cs-134	<3.41E+01	0.00E+00				3.41E+01			
Cs-137	<3.43E+01	0.00E+00				3.43E+01			
BaLa-140	<2.75E+01	0.00E+00				2.75E+01			
Be-7	7.30E+02	2.53E+02				3.17E+02			
K-40	3.90E+03	7.29E+02				4.88E+02			
454134	10/3/2017 - 10/3/2017	MIXEDBLV				Mn-54	<3.37E+01	0.00E+00	3.37E+01
			Co-58	<2.63E+01	0.00E+00	2.63E+01			
			Fe-59	<5.31E+01	0.00E+00	5.31E+01			
			Co-60	<2.92E+01	0.00E+00	2.92E+01			
			Zn-65	<7.98E+01	0.00E+00	7.98E+01			
			Zr-95	<4.55E+01	0.00E+00	4.55E+01			
			Nb-95	<2.25E+01	0.00E+00	2.25E+01			
			I-131	<2.65E+01	0.00E+00	2.65E+01			
			Cs-134	<3.90E+01	0.00E+00	3.90E+01			
			Cs-137	<3.37E+01	0.00E+00	3.37E+01			
			BaLa-140	<2.87E+01	0.00E+00	2.87E+01			
			Be-7	1.30E+03	3.19E+02	3.37E+02			
			K-40	4.16E+03	7.43E+02	3.64E+02			
			461371	11/7/2017 - 11/7/2017	MIXEDBLV	Mn-54	<2.64E+01	0.00E+00	2.64E+01
Co-58	<2.55E+01	0.00E+00				2.55E+01			
Fe-59	<5.81E+01	0.00E+00				5.81E+01			
Co-60	<2.81E+01	0.00E+00				2.81E+01			
Zn-65	<5.63E+01	0.00E+00				5.63E+01			
Zr-95	<5.50E+01	0.00E+00				5.50E+01			
Nb-95	<3.29E+01	0.00E+00				3.29E+01			
I-131	<4.34E+01	0.00E+00				4.34E+01			
Cs-134	<2.75E+01	0.00E+00				2.75E+01			
Cs-137	<2.46E+01	0.00E+00				2.46E+01			
BaLa-140	<5.04E+01	0.00E+00				5.04E+01			
Be-7	1.05E+03	2.34E+02				2.86E+02			
K-40	3.77E+03	5.55E+02				4.42E+02			
463494	12/5/2017 - 12/5/2017	MIXEDBLV				Mn-54	<3.37E+01	0.00E+00	3.37E+01
			Co-58	<2.91E+01	0.00E+00	2.91E+01			
			Fe-59	<6.82E+01	0.00E+00	6.82E+01			
			Co-60	<3.62E+01	0.00E+00	3.62E+01			
			Zn-65	<6.62E+01	0.00E+00	6.62E+01			
			Zr-95	<5.90E+01	0.00E+00	5.90E+01			
			Nb-95	<3.94E+01	0.00E+00	3.94E+01			
			I-131	<4.80E+01	0.00E+00	4.80E+01			



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [ INDICATOR - NNE @ 0.63 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
463494	12/5/2017 - 12/5/2017		Cs-134	<3.75E+01	0.00E+00	3.75E+01
			Cs-137	<3.78E+01	0.00E+00	3.78E+01
			BaLa-140	<5.35E+01	0.00E+00	5.35E+01
			Be-7	8.60E+02	2.91E+02	4.19E+02
			K-40	4.39E+03	7.08E+02	6.70E+02

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430845	1/4/2017 - 1/4/2017		Mn-54	<3.28E+01	0.00E+00	3.28E+01
			Co-58	<3.66E+01	0.00E+00	3.66E+01
			Fe-59	<5.81E+01	0.00E+00	5.81E+01
			Co-60	<3.77E+01	0.00E+00	3.77E+01
			Zn-65	<6.55E+01	0.00E+00	6.55E+01
			Zr-95	<4.04E+01	0.00E+00	4.04E+01
			Nb-95	<2.01E+01	0.00E+00	2.01E+01
			I-131	<2.96E+01	0.00E+00	2.96E+01
			Cs-134	<4.71E+01	0.00E+00	4.71E+01
			Cs-137	<3.46E+01	0.00E+00	3.46E+01
			BaLa-140	<5.13E+01	0.00E+00	5.13E+01
			Be-7	1.44E+03	3.50E+02	3.48E+02
			K-40	2.74E+03	7.15E+02	7.03E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
434993	2/7/2017 - 2/7/2017		Mn-54	<3.41E+01	0.00E+00	3.41E+01
			Co-58	<1.96E+01	0.00E+00	1.96E+01
			Fe-59	<4.43E+01	0.00E+00	4.43E+01
			Co-60	<2.39E+01	0.00E+00	2.39E+01
			Zn-65	<5.78E+01	0.00E+00	5.78E+01
			Zr-95	<4.10E+01	0.00E+00	4.10E+01
			Nb-95	<2.68E+01	0.00E+00	2.68E+01
			I-131	<1.83E+01	0.00E+00	1.83E+01
			Cs-134	<2.97E+01	0.00E+00	2.97E+01
			Cs-137	<3.06E+01	0.00E+00	3.06E+01
			BaLa-140	<3.24E+01	0.00E+00	3.24E+01
			Be-7	1.27E+03	2.99E+02	3.07E+02
			K-40	3.03E+03	5.75E+02	6.04E+01

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
437512	3/7/2017 - 3/7/2017		Mn-54	<1.92E+01	0.00E+00	1.92E+01
			Co-58	<2.84E+01	0.00E+00	2.84E+01
			Fe-59	<5.01E+01	0.00E+00	5.01E+01
			Co-60	<3.11E+01	0.00E+00	3.11E+01
			Zn-65	<5.14E+01	0.00E+00	5.14E+01
			Zr-95	<4.26E+01	0.00E+00	4.26E+01
			Nb-95	<2.59E+01	0.00E+00	2.59E+01
			I-131	<2.03E+01	0.00E+00	2.03E+01
			Cs-134	<2.60E+01	0.00E+00	2.60E+01
			Cs-137	<2.79E+01	0.00E+00	2.79E+01
			BaLa-140	<1.74E+01	0.00E+00	1.74E+01
			Be-7	1.25E+03	2.52E+02	2.02E+02
			K-40	3.39E+03	6.04E+02	3.63E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
439942	4/4/2017 - 4/4/2017		Mn-54	<1.53E+01	0.00E+00	1.53E+01
			Co-58	<1.68E+01	0.00E+00	1.68E+01
			Fe-59	<3.01E+01	0.00E+00	3.01E+01
			Co-60	<1.61E+01	0.00E+00	1.61E+01
			Zn-65	<4.11E+01	0.00E+00	4.11E+01
			Zr-95	<3.05E+01	0.00E+00	3.05E+01
			Nb-95	<2.13E+01	0.00E+00	2.13E+01
			I-131	<1.58E+01	0.00E+00	1.58E+01
			Cs-134	<1.91E+01	0.00E+00	1.91E+01
			Cs-137	<1.65E+01	0.00E+00	1.65E+01
			BaLa-140	<2.47E+01	0.00E+00	2.47E+01
			Be-7	4.48E+02	1.75E+02	2.37E+02
			K-40	3.34E+03	5.47E+02	3.08E+02



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
442279	5/2/2017 - 5/2/2017	MIXEDBLV	Mn-54	<2.15E+01	0.00E+00	2.15E+01
			Co-58	<1.53E+01	0.00E+00	1.53E+01
			Fe-59	<2.70E+01	0.00E+00	2.70E+01
			Co-60	<2.65E+01	0.00E+00	2.65E+01
			Zn-65	<5.44E+01	0.00E+00	5.44E+01
			Zr-95	<2.66E+01	0.00E+00	2.66E+01
			Nb-95	<2.40E+01	0.00E+00	2.40E+01
			I-131	<2.03E+01	0.00E+00	2.03E+01
			Cs-134	<2.17E+01	0.00E+00	2.17E+01
			Cs-137	<3.47E+01	0.00E+00	3.47E+01
			BaLa-140	<2.58E+01	0.00E+00	2.58E+01
			Be-7	4.50E+02	1.82E+02	2.37E+02
			K-40	3.28E+03	5.73E+02	2.36E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
444681	6/6/2017 - 6/6/2017	MIXEDBLV	Mn-54	<2.21E+01	0.00E+00	2.21E+01
			Co-58	<1.48E+01	0.00E+00	1.48E+01
			Fe-59	<4.41E+01	0.00E+00	4.41E+01
			Co-60	<1.49E+01	0.00E+00	1.49E+01
			Zn-65	<5.59E+01	0.00E+00	5.59E+01
			Zr-95	<3.98E+01	0.00E+00	3.98E+01
			Nb-95	<1.99E+01	0.00E+00	1.99E+01
			I-131	<2.05E+01	0.00E+00	2.05E+01
			Cs-134	<2.48E+01	0.00E+00	2.48E+01
			Cs-137	<3.26E+01	0.00E+00	3.26E+01
			BaLa-140	<1.90E+01	0.00E+00	1.90E+01
			Be-7	5.99E+02	1.96E+02	2.23E+02
			K-40	2.82E+03	5.44E+02	2.51E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
447423	7/3/2017 - 7/3/2017	MIXEDBLV	Mn-54	<1.95E+01	0.00E+00	1.95E+01
			Co-58	<2.35E+01	0.00E+00	2.35E+01
			Fe-59	<4.45E+01	0.00E+00	4.45E+01
			Co-60	<2.80E+01	0.00E+00	2.80E+01
			Zn-65	<5.76E+01	0.00E+00	5.76E+01
			Zr-95	<3.91E+01	0.00E+00	3.91E+01
			Nb-95	<2.28E+01	0.00E+00	2.28E+01
			I-131	<2.23E+01	0.00E+00	2.23E+01
			Cs-134	<2.31E+01	0.00E+00	2.31E+01
			Cs-137	1.43E+01	1.89E+01	3.11E+01
			BaLa-140	<3.56E+01	0.00E+00	3.56E+01
			Be-7	1.45E+03	3.15E+02	3.34E+02
			K-40	2.66E+03	5.30E+02	3.41E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
449828	8/1/2017 - 8/1/2017	MIXEDBLV	Mn-54	<3.34E+01	0.00E+00	3.34E+01
			Co-58	<3.01E+01	0.00E+00	3.01E+01
			Fe-59	<6.10E+01	0.00E+00	6.10E+01
			Co-60	<4.46E+01	0.00E+00	4.46E+01
			Zn-65	<7.74E+01	0.00E+00	7.74E+01
			Zr-95	<5.47E+01	0.00E+00	5.47E+01
			Nb-95	<3.43E+01	0.00E+00	3.43E+01
			I-131	<3.12E+01	0.00E+00	3.12E+01
			Cs-134	<4.20E+01	0.00E+00	4.20E+01
			Cs-137	<3.86E+01	0.00E+00	3.86E+01
			BaLa-140	<3.30E+01	0.00E+00	3.30E+01
			Be-7	8.83E+02	2.89E+02	3.44E+02
			K-40	2.64E+03	6.11E+02	3.58E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
451475	9/5/2017 - 9/5/2017	MIXEDBLV	Mn-54	<3.40E+01	0.00E+00	3.40E+01
			Co-58	<1.70E+01	0.00E+00	1.70E+01
			Fe-59	<3.33E+01	0.00E+00	3.33E+01
			Co-60	<2.50E+01	0.00E+00	2.50E+01
			Zn-65	<4.85E+01	0.00E+00	4.85E+01
			Zr-95	<4.34E+01	0.00E+00	4.34E+01
			Nb-95	<2.86E+01	0.00E+00	2.86E+01



**CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)**

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
451475	9/5/2017 - 9/5/2017		I-131	<2.84E+01	0.00E+00	2.84E+01
			Cs-134	<2.99E+01	0.00E+00	2.99E+01
			Cs-137	<3.65E+01	0.00E+00	3.65E+01
			BaLa-140	<3.55E+01	0.00E+00	3.55E+01
			Be-7	1.78E+03	3.29E+02	2.09E+02
			K-40	3.20E+03	6.13E+02	2.34E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
454135	10/3/2017 - 10/3/2017		Mn-54	<2.79E+01	0.00E+00	2.79E+01
			Co-58	<2.55E+01	0.00E+00	2.55E+01
			Fe-59	<5.25E+01	0.00E+00	5.25E+01
			Co-60	<2.65E+01	0.00E+00	2.65E+01
			Zn-65	<5.57E+01	0.00E+00	5.57E+01
			Zr-95	<4.22E+01	0.00E+00	4.22E+01
			Nb-95	<3.08E+01	0.00E+00	3.08E+01
			I-131	<2.40E+01	0.00E+00	2.40E+01
			Cs-134	<2.82E+01	0.00E+00	2.82E+01
			Cs-137	<3.21E+01	0.00E+00	3.21E+01
			BaLa-140	<3.08E+01	0.00E+00	3.08E+01
			Be-7	2.06E+03	3.72E+02	3.82E+02
			K-40	4.36E+03	7.01E+02	5.39E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
461372	11/7/2017 - 11/7/2017		Mn-54	<3.43E+01	0.00E+00	3.43E+01
			Co-58	<3.19E+01	0.00E+00	3.19E+01
			Fe-59	<6.34E+01	0.00E+00	6.34E+01
			Co-60	<4.58E+01	0.00E+00	4.58E+01
			Zn-65	<6.72E+01	0.00E+00	6.72E+01
			Zr-95	<6.14E+01	0.00E+00	6.14E+01
			Nb-95	<4.21E+01	0.00E+00	4.21E+01
			I-131	<4.76E+01	0.00E+00	4.76E+01
			Cs-134	<3.54E+01	0.00E+00	3.54E+01
			Cs-137	<2.94E+01	0.00E+00	2.94E+01
			BaLa-140	<5.42E+01	0.00E+00	5.42E+01
			Be-7	6.96E+02	2.95E+02	4.41E+02
			K-40	3.50E+03	5.79E+02	4.52E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
463495	12/5/2017 - 12/5/2017		Mn-54	<4.46E+01	0.00E+00	4.46E+01
			Co-58	<3.98E+01	0.00E+00	3.98E+01
			Fe-59	<7.59E+01	0.00E+00	7.59E+01
			Co-60	<3.17E+01	0.00E+00	3.17E+01
			Zn-65	<7.60E+01	0.00E+00	7.60E+01
			Zr-95	<6.52E+01	0.00E+00	6.52E+01
			Nb-95	<3.53E+01	0.00E+00	3.53E+01
			I-131	<3.65E+01	0.00E+00	3.65E+01
			Cs-134	<3.87E+01	0.00E+00	3.87E+01
			Cs-137	<3.69E+01	0.00E+00	3.69E+01
			BaLa-140	<4.77E+01	0.00E+00	4.77E+01
			Be-7	1.31E+03	3.56E+02	4.71E+02
			K-40	4.73E+03	7.76E+02	6.18E+02

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430846	1/4/2017 - 1/4/2017		Mn-54	<3.53E+01	0.00E+00	3.53E+01
			Co-58	<3.80E+01	0.00E+00	3.80E+01
			Fe-59	<6.70E+01	0.00E+00	6.70E+01
			Co-60	<4.35E+01	0.00E+00	4.35E+01
			Zn-65	<5.77E+01	0.00E+00	5.77E+01
			Zr-95	<3.90E+01	0.00E+00	3.90E+01
			Nb-95	<4.04E+01	0.00E+00	4.04E+01
			I-131	<2.35E+01	0.00E+00	2.35E+01
			Cs-134	<3.57E+01	0.00E+00	3.57E+01
			Cs-137	<3.26E+01	0.00E+00	3.26E+01
			BaLa-140	<3.60E+01	0.00E+00	3.60E+01
			Be-7	3.81E+02	2.40E+02	3.51E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430846	1/4/2017 - 1/4/2017		K-40	1.48E+03	5.40E+02	5.89E+02
434994	2/7/2017 - 2/7/2017		Mn-54	<4.34E+01	0.00E+00	4.34E+01
			Co-58	<5.01E+01	0.00E+00	5.01E+01
			Fe-59	<6.96E+01	0.00E+00	6.96E+01
			Co-60	<4.91E+01	0.00E+00	4.91E+01
			Zn-65	<7.94E+01	0.00E+00	7.94E+01
			Zr-95	<5.33E+01	0.00E+00	5.33E+01
			Nb-95	<3.90E+01	0.00E+00	3.90E+01
			I-131	<3.59E+01	0.00E+00	3.59E+01
			Cs-134	<3.53E+01	0.00E+00	3.53E+01
			Cs-137	<5.22E+01	0.00E+00	5.22E+01
			BaLa-140	<4.54E+01	0.00E+00	4.54E+01
			Be-7	7.38E+02	4.76E+02	3.90E+02
			K-40	3.04E+03	7.19E+02	3.94E+02
437513	3/7/2017 - 3/7/2017		Mn-54	<2.43E+01	0.00E+00	2.43E+01
			Co-58	<2.04E+01	0.00E+00	2.04E+01
			Fe-59	<3.61E+01	0.00E+00	3.61E+01
			Co-60	<2.89E+01	0.00E+00	2.89E+01
			Zn-65	<5.43E+01	0.00E+00	5.43E+01
			Zr-95	<4.88E+01	0.00E+00	4.88E+01
			Nb-95	<2.49E+01	0.00E+00	2.49E+01
			I-131	<2.03E+01	0.00E+00	2.03E+01
			Cs-134	<2.73E+01	0.00E+00	2.73E+01
			Cs-137	<2.22E+01	0.00E+00	2.22E+01
			BaLa-140	<3.17E+01	0.00E+00	3.17E+01
			Be-7	5.05E+02	1.98E+02	2.68E+02
			K-40	2.67E+03	5.16E+02	3.82E+02
439943	4/4/2017 - 4/4/2017		Mn-54	<3.22E+01	0.00E+00	3.22E+01
			Co-58	<2.17E+01	0.00E+00	2.17E+01
			Fe-59	<6.07E+01	0.00E+00	6.07E+01
			Co-60	<3.19E+01	0.00E+00	3.19E+01
			Zn-65	<4.73E+01	0.00E+00	4.73E+01
			Zr-95	<5.18E+01	0.00E+00	5.18E+01
			Nb-95	<2.08E+01	0.00E+00	2.08E+01
			I-131	<2.43E+01	0.00E+00	2.43E+01
			Cs-134	<3.29E+01	0.00E+00	3.29E+01
			Cs-137	<3.55E+01	0.00E+00	3.55E+01
			BaLa-140	<3.41E+01	0.00E+00	3.41E+01
			Be-7	1.76E+03	3.52E+02	3.23E+02
			K-40	6.90E+03	9.82E+02	3.68E+02
442280	5/2/2017 - 5/2/2017		Mn-54	<2.21E+01	0.00E+00	2.21E+01
			Co-58	<2.11E+01	0.00E+00	2.11E+01
			Fe-59	<5.55E+01	0.00E+00	5.55E+01
			Co-60	<2.70E+01	0.00E+00	2.70E+01
			Zn-65	<6.51E+01	0.00E+00	6.51E+01
			Zr-95	<5.04E+01	0.00E+00	5.04E+01
			Nb-95	<2.25E+01	0.00E+00	2.25E+01
			I-131	<2.51E+01	0.00E+00	2.51E+01
			Cs-134	<2.89E+01	0.00E+00	2.89E+01
			Cs-137	<2.59E+01	0.00E+00	2.59E+01
			BaLa-140	<3.71E+01	0.00E+00	3.71E+01
			Be-7	3.39E+02	1.96E+02	0.00E+00
			K-40	3.48E+03	6.49E+02	0.00E+00
			Cr-51	<1.85E+02	0.00E+00	1.85E+02
			Co-57	<2.00E+01	0.00E+00	2.00E+01
			Y-88	<3.14E+01	0.00E+00	3.14E+01
			Ru-103	<1.78E+01	0.00E+00	1.78E+01
			Cd-109	<5.21E+02	0.00E+00	5.21E+02
			Ag-110M	<2.22E+01	0.00E+00	2.22E+01





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
442280	5/2/2017 - 5/2/2017	MIXEDBLV	Sn-113	<2.96E+01	0.00E+00	2.96E+01
			Cd-115	<1.18E+03	0.00E+00	1.18E+03
			Sb-122	<3.72E+01	0.00E+00	3.72E+01
			Sb-124	<2.26E+01	0.00E+00	2.26E+01
			Sb-125	<7.17E+01	0.00E+00	7.17E+01
			Ba-133	<2.28E+01	0.00E+00	2.28E+01
			I-133	<4.40E+01	0.00E+00	4.40E+01
			Ce-139	<1.90E+01	0.00E+00	1.90E+01
			Ce-141	<3.69E+01	0.00E+00	3.69E+01
			Ce-144	<1.40E+02	0.00E+00	1.40E+02
			Hg-203	<2.36E+01	0.00E+00	2.36E+01
			Am-241	<8.32E+01	0.00E+00	8.32E+01
			Te-123M	<1.98E+01	0.00E+00	1.98E+01
			444682	6/6/2017 - 6/6/2017	MIXEDBLV	Mn-54
Co-58	<3.39E+01	0.00E+00				3.39E+01
Fe-59	<6.18E+01	0.00E+00				6.18E+01
Co-60	<2.59E+01	0.00E+00				2.59E+01
Zn-65	<6.97E+01	0.00E+00				6.97E+01
Zr-95	<4.93E+01	0.00E+00				4.93E+01
Nb-95	<2.06E+01	0.00E+00				2.06E+01
I-131	<2.47E+01	0.00E+00				2.47E+01
Cs-134	<2.95E+01	0.00E+00				2.95E+01
Cs-137	<3.33E+01	0.00E+00				3.33E+01
BaLa-140	<3.65E+01	0.00E+00				3.65E+01
Be-7	7.13E+02	2.57E+02				3.26E+02
K-40	2.64E+03	5.65E+02				2.98E+02
447424	7/3/2017 - 7/3/2017	MIXEDBLV				Mn-54
			Co-58	<3.57E+01	0.00E+00	3.57E+01
			Fe-59	<6.50E+01	0.00E+00	6.50E+01
			Co-60	<2.98E+01	0.00E+00	2.98E+01
			Zn-65	<7.66E+01	0.00E+00	7.66E+01
			Zr-95	<5.73E+01	0.00E+00	5.73E+01
			Nb-95	<3.34E+01	0.00E+00	3.34E+01
			I-131	<3.92E+01	0.00E+00	3.92E+01
			Cs-134	<4.30E+01	0.00E+00	4.30E+01
			Cs-137	<3.71E+01	0.00E+00	3.71E+01
			BaLa-140	<4.40E+01	0.00E+00	4.40E+01
			Be-7	8.43E+02	2.79E+02	3.28E+02
			K-40	3.01E+03	6.99E+02	5.85E+02
			449829	8/1/2017 - 8/1/2017	MIXEDBLV	Mn-54
Co-58	<2.80E+01	0.00E+00				2.80E+01
Fe-59	<5.98E+01	0.00E+00				5.98E+01
Co-60	<4.36E+01	0.00E+00				4.36E+01
Zn-65	<7.59E+01	0.00E+00				7.59E+01
Zr-95	<5.13E+01	0.00E+00				5.13E+01
Nb-95	<2.85E+01	0.00E+00				2.85E+01
I-131	<3.19E+01	0.00E+00				3.19E+01
Cs-134	<4.13E+01	0.00E+00				4.13E+01
Cs-137	<3.20E+01	0.00E+00				3.20E+01
BaLa-140	<2.55E+01	0.00E+00				2.55E+01
Be-7	1.60E+03	3.57E+02				3.35E+02
K-40	3.09E+03	6.76E+02				4.62E+02
451476	9/5/2017 - 9/5/2017	MIXEDBLV				Mn-54
			Co-58	<2.08E+01	0.00E+00	2.08E+01
			Fe-59	<2.33E+01	0.00E+00	2.33E+01
			Co-60	<2.86E+01	0.00E+00	2.86E+01
			Zn-65	<4.99E+01	0.00E+00	4.99E+01
			Zr-95	<3.39E+01	0.00E+00	3.39E+01
			Nb-95	<2.62E+01	0.00E+00	2.62E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
451476	9/5/2017 - 9/5/2017		I-131	<2.09E+01	0.00E+00	2.09E+01
			Cs-134	<3.15E+01	0.00E+00	3.15E+01
			Cs-137	<2.36E+01	0.00E+00	2.36E+01
			BaLa-140	<2.48E+01	0.00E+00	2.48E+01
			Be-7	5.27E+02	1.94E+02	2.39E+02
			K-40	3.28E+03	5.92E+02	2.14E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
454136	10/3/2017 - 10/3/2017		Mn-54	<2.86E+01	0.00E+00	2.86E+01
			Co-58	<2.20E+01	0.00E+00	2.20E+01
			Fe-59	<5.12E+01	0.00E+00	5.12E+01
			Co-60	<2.40E+01	0.00E+00	2.40E+01
			Zn-65	<6.14E+01	0.00E+00	6.14E+01
			Zr-95	<3.89E+01	0.00E+00	3.89E+01
			Nb-95	<2.40E+01	0.00E+00	2.40E+01
			I-131	<2.45E+01	0.00E+00	2.45E+01
			Cs-134	<3.13E+01	0.00E+00	3.13E+01
			Cs-137	<2.89E+01	0.00E+00	2.89E+01
			BaLa-140	<2.60E+01	0.00E+00	2.60E+01
			Be-7	1.05E+03	2.72E+02	3.45E+02
			K-40	4.13E+03	6.21E+02	3.27E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
461373	11/7/2017 - 11/7/2017		Mn-54	<3.05E+01	0.00E+00	3.05E+01
			Co-58	<2.58E+01	0.00E+00	2.58E+01
			Fe-59	<5.11E+01	0.00E+00	5.11E+01
			Co-60	<2.57E+01	0.00E+00	2.57E+01
			Zn-65	<5.75E+01	0.00E+00	5.75E+01
			Zr-95	<5.11E+01	0.00E+00	5.11E+01
			Nb-95	<3.01E+01	0.00E+00	3.01E+01
			I-131	<4.40E+01	0.00E+00	4.40E+01
			Cs-134	<3.47E+01	0.00E+00	3.47E+01
			Cs-137	<2.68E+01	0.00E+00	2.68E+01
			BaLa-140	<3.78E+01	0.00E+00	3.78E+01
			Be-7	7.40E+02	2.60E+02	3.90E+02
			K-40	5.31E+03	6.58E+02	4.66E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
463496	12/5/2017 - 12/5/2017		Mn-54	<3.59E+01	0.00E+00	3.59E+01
			Co-58	<3.53E+01	0.00E+00	3.53E+01
			Fe-59	<7.22E+01	0.00E+00	7.22E+01
			Co-60	<3.86E+01	0.00E+00	3.86E+01
			Zn-65	<7.66E+01	0.00E+00	7.66E+01
			Zr-95	<5.26E+01	0.00E+00	5.26E+01
			Nb-95	<4.12E+01	0.00E+00	4.12E+01
			I-131	<3.54E+01	0.00E+00	3.54E+01
			Cs-134	<3.58E+01	0.00E+00	3.58E+01
			Cs-137	<4.18E+01	0.00E+00	4.18E+01
			BaLa-140	<4.00E+01	0.00E+00	4.00E+01
			Be-7	3.68E+02	3.06E+02	4.92E+02
			K-40	2.93E+03	6.12E+02	6.19E+02

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430847	1/4/2017 - 1/4/2017		Mn-54	<2.20E+01	0.00E+00	2.20E+01
			Co-58	<1.74E+01	0.00E+00	1.74E+01
			Fe-59	<4.94E+01	0.00E+00	4.94E+01
			Co-60	<1.58E+01	0.00E+00	1.58E+01
			Zn-65	<4.44E+01	0.00E+00	4.44E+01
			Zr-95	<3.77E+01	0.00E+00	3.77E+01
			Nb-95	<2.09E+01	0.00E+00	2.09E+01
			I-131	<2.00E+01	0.00E+00	2.00E+01
			Cs-134	<2.29E+01	0.00E+00	2.29E+01
			Cs-137	<2.35E+01	0.00E+00	2.35E+01
			BaLa-140	<2.57E+01	0.00E+00	2.57E+01
			Be-7	7.63E+02	2.12E+02	2.42E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430847	1/4/2017 - 1/4/2017		K-40	3.72E+03	6.18E+02	3.72E+02
434995	2/7/2017 - 2/7/2017		Mn-54	<2.02E+01	0.00E+00	2.02E+01
			Co-58	<2.06E+01	0.00E+00	2.06E+01
			Fe-59	<4.13E+01	0.00E+00	4.13E+01
			Co-60	<2.14E+01	0.00E+00	2.14E+01
			Zn-65	<5.50E+01	0.00E+00	5.50E+01
			Zr-95	<3.68E+01	0.00E+00	3.68E+01
			Nb-95	<1.89E+01	0.00E+00	1.89E+01
			I-131	<1.53E+01	0.00E+00	1.53E+01
			Cs-134	<2.18E+01	0.00E+00	2.18E+01
			Cs-137	<2.48E+01	0.00E+00	2.48E+01
			BaLa-140	<2.79E+01	0.00E+00	2.79E+01
			Be-7	1.04E+03	2.29E+02	2.24E+02
			K-40	5.45E+03	7.56E+02	2.58E+02
437514	3/7/2017 - 3/7/2017		Mn-54	<1.78E+01	0.00E+00	1.78E+01
			Co-58	<1.83E+01	0.00E+00	1.83E+01
			Fe-59	<4.02E+01	0.00E+00	4.02E+01
			Co-60	<2.71E+01	0.00E+00	2.71E+01
			Zn-65	<4.53E+01	0.00E+00	4.53E+01
			Zr-95	<2.02E+01	0.00E+00	2.02E+01
			Nb-95	<1.99E+01	0.00E+00	1.99E+01
			I-131	<1.74E+01	0.00E+00	1.74E+01
			Cs-134	<1.66E+01	0.00E+00	1.66E+01
			Cs-137	<1.86E+01	0.00E+00	1.86E+01
			BaLa-140	<1.96E+01	0.00E+00	1.96E+01
			Be-7	3.02E+02	1.35E+02	1.82E+02
			K-40	5.67E+03	7.36E+02	3.92E+01
439944	4/4/2017 - 4/4/2017		Mn-54	<2.60E+01	0.00E+00	2.60E+01
			Co-58	<1.66E+01	0.00E+00	1.66E+01
			Fe-59	<5.56E+01	0.00E+00	5.56E+01
			Co-60	<2.73E+01	0.00E+00	2.73E+01
			Zn-65	<7.45E+01	0.00E+00	7.45E+01
			Zr-95	<3.21E+01	0.00E+00	3.21E+01
			Nb-95	<2.09E+01	0.00E+00	2.09E+01
			I-131	<2.05E+01	0.00E+00	2.05E+01
			Cs-134	<3.42E+01	0.00E+00	3.42E+01
			Cs-137	<2.64E+01	0.00E+00	2.64E+01
			BaLa-140	<3.09E+01	0.00E+00	3.09E+01
			Be-7	6.21E+02	2.18E+02	2.63E+02
			K-40	5.74E+03	8.98E+02	4.48E+02
442281	5/2/2017 - 5/2/2017		Mn-54	<1.97E+01	0.00E+00	1.97E+01
			Co-58	<2.07E+01	0.00E+00	2.07E+01
			Fe-59	<4.95E+01	0.00E+00	4.95E+01
			Co-60	<2.89E+01	0.00E+00	2.89E+01
			Zn-65	<3.60E+01	0.00E+00	3.60E+01
			Zr-95	<3.75E+01	0.00E+00	3.75E+01
			Nb-95	<1.99E+01	0.00E+00	1.99E+01
			I-131	<2.12E+01	0.00E+00	2.12E+01
			Cs-134	<2.78E+01	0.00E+00	2.78E+01
			Cs-137	<2.64E+01	0.00E+00	2.64E+01
			BaLa-140	<6.66E+00	0.00E+00	6.66E+00
			Be-7	6.94E+02	2.15E+02	2.54E+02
			K-40	5.23E+03	7.99E+02	4.29E+02
444683	6/6/2017 - 6/6/2017		Mn-54	<2.77E+01	0.00E+00	2.77E+01
			Co-58	<2.40E+01	0.00E+00	2.40E+01
			Fe-59	<5.72E+01	0.00E+00	5.72E+01
			Co-60	<3.53E+01	0.00E+00	3.53E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
444683	6/6/2017 - 6/6/2017	MIXEDBLV	Zn-65	<5.46E+01	0.00E+00	5.46E+01
			Zr-95	<2.81E+01	0.00E+00	2.81E+01
			Nb-95	<1.74E+01	0.00E+00	1.74E+01
			I-131	<2.74E+01	0.00E+00	2.74E+01
			Cs-134	<3.55E+01	0.00E+00	3.55E+01
			Cs-137	<2.47E+01	0.00E+00	2.47E+01
			BaLa-140	<3.97E+01	0.00E+00	3.97E+01
			Be-7	2.46E+03	4.07E+02	2.93E+02
			K-40	2.43E+03	5.63E+02	4.62E+02
			447425	7/3/2017 - 7/3/2017	MIXEDBLV	Mn-54
Co-58	<1.94E+01	0.00E+00				1.94E+01
Fe-59	<5.88E+01	0.00E+00				5.88E+01
Co-60	<2.82E+01	0.00E+00				2.82E+01
Zn-65	<6.55E+01	0.00E+00				6.55E+01
Zr-95	<4.82E+01	0.00E+00				4.82E+01
Nb-95	<2.02E+01	0.00E+00				2.02E+01
I-131	<2.70E+01	0.00E+00				2.70E+01
Cs-134	<3.02E+01	0.00E+00				3.02E+01
Cs-137	<2.98E+01	0.00E+00				2.98E+01
BaLa-140	<2.65E+01	0.00E+00				2.65E+01
Be-7	6.37E+02	2.27E+02				2.84E+02
K-40	5.19E+03	7.99E+02				2.72E+02
449830	8/1/2017 - 8/1/2017	MIXEDBLV				Mn-54
			Co-58	<2.47E+01	0.00E+00	2.47E+01
			Fe-59	<4.05E+01	0.00E+00	4.05E+01
			Co-60	<2.62E+01	0.00E+00	2.62E+01
			Zn-65	<8.10E+01	0.00E+00	8.10E+01
			Zr-95	<4.28E+01	0.00E+00	4.28E+01
			Nb-95	<2.59E+01	0.00E+00	2.59E+01
			I-131	<2.24E+01	0.00E+00	2.24E+01
			Cs-134	<3.69E+01	0.00E+00	3.69E+01
			Cs-137	<2.93E+01	0.00E+00	2.93E+01
			BaLa-140	<2.96E+01	0.00E+00	2.96E+01
			Be-7	8.36E+02	2.43E+02	2.72E+02
			K-40	4.56E+03	7.58E+02	3.97E+02
			451477	9/5/2017 - 9/5/2017	MIXEDBLV	Mn-54
Co-58	<2.00E+01	0.00E+00				2.00E+01
Fe-59	<5.28E+01	0.00E+00				5.28E+01
Co-60	<2.36E+01	0.00E+00				2.36E+01
Zn-65	<5.90E+01	0.00E+00				5.90E+01
Zr-95	<4.42E+01	0.00E+00				4.42E+01
Nb-95	<2.16E+01	0.00E+00				2.16E+01
I-131	<2.12E+01	0.00E+00				2.12E+01
Cs-134	<2.80E+01	0.00E+00				2.80E+01
Cs-137	<2.49E+01	0.00E+00				2.49E+01
BaLa-140	<2.19E+01	0.00E+00				2.19E+01
Be-7	6.44E+02	1.90E+02				2.09E+02
K-40	5.37E+03	7.72E+02				3.03E+02
454137	10/3/2017 - 10/3/2017	MIXEDBLV				Mn-54
			Co-58	<2.66E+01	0.00E+00	2.66E+01
			Fe-59	<6.38E+01	0.00E+00	6.38E+01
			Co-60	<3.50E+01	0.00E+00	3.50E+01
			Zn-65	<6.08E+01	0.00E+00	6.08E+01
			Zr-95	<5.47E+01	0.00E+00	5.47E+01
			Nb-95	<2.81E+01	0.00E+00	2.81E+01
			I-131	<2.51E+01	0.00E+00	2.51E+01
			Cs-134	<3.95E+01	0.00E+00	3.95E+01
			Cs-137	<2.61E+01	0.00E+00	2.61E+01
			BaLa-140	<8.56E+00	0.00E+00	8.56E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
454137	10/3/2017 - 10/3/2017	MIXEDBLV	Be-7	5.54E+02	2.19E+02	2.74E+02
			K-40	6.24E+03	9.51E+02	3.07E+02
461374	11/7/2017 - 11/7/2017	MIXEDBLV	Mn-54	<2.67E+01	0.00E+00	2.67E+01
			Co-58	<2.72E+01	0.00E+00	2.72E+01
			Fe-59	<5.87E+01	0.00E+00	5.87E+01
			Co-60	<2.89E+01	0.00E+00	2.89E+01
			Zn-65	<5.86E+01	0.00E+00	5.86E+01
			Zr-95	<5.10E+01	0.00E+00	5.10E+01
			Nb-95	<2.64E+01	0.00E+00	2.64E+01
			I-131	<4.80E+01	0.00E+00	4.80E+01
			Cs-134	<3.34E+01	0.00E+00	3.34E+01
			Cs-137	<2.73E+01	0.00E+00	2.73E+01
			BaLa-140	<4.08E+01	0.00E+00	4.08E+01
			Be-7	6.82E+02	2.49E+02	3.73E+02
			K-40	8.03E+03	8.91E+02	4.93E+02
			463497	12/5/2017 - 12/5/2017	MIXEDBLV	Mn-54
Co-58	<3.07E+01	0.00E+00				3.07E+01
Fe-59	<6.08E+01	0.00E+00				6.08E+01
Co-60	<3.06E+01	0.00E+00				3.06E+01
Zn-65	<6.48E+01	0.00E+00				6.48E+01
Zr-95	<5.36E+01	0.00E+00				5.36E+01
Nb-95	<3.26E+01	0.00E+00				3.26E+01
I-131	<3.01E+01	0.00E+00				3.01E+01
Cs-134	<3.61E+01	0.00E+00				3.61E+01
Cs-137	<3.14E+01	0.00E+00				3.14E+01
BaLa-140	<3.18E+01	0.00E+00				3.18E+01
Be-7	6.32E+02	2.44E+02				3.54E+02
K-40	6.33E+03	8.23E+02				4.46E+02

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
430848	1/4/2017 - 1/4/2017	MIXEDBLV	Mn-54	<3.21E+01	0.00E+00	3.21E+01
			Co-58	<2.53E+01	0.00E+00	2.53E+01
			Fe-59	<6.38E+01	0.00E+00	6.38E+01
			Co-60	<2.98E+01	0.00E+00	2.98E+01
			Zn-65	<6.85E+01	0.00E+00	6.85E+01
			Zr-95	<4.63E+01	0.00E+00	4.63E+01
			Nb-95	<2.70E+01	0.00E+00	2.70E+01
			I-131	<3.27E+01	0.00E+00	3.27E+01
			Cs-134	<2.87E+01	0.00E+00	2.87E+01
			Cs-137	<2.62E+01	0.00E+00	2.62E+01
			BaLa-140	<4.72E+01	0.00E+00	4.72E+01
			Be-7	1.26E+03	3.12E+02	3.24E+02
			K-40	3.67E+03	7.26E+02	5.04E+02
			434996	2/7/2017 - 2/7/2017	MIXEDBLV	Mn-54
Co-58	<3.33E+01	0.00E+00				3.33E+01
Fe-59	<5.30E+01	0.00E+00				5.30E+01
Co-60	<2.78E+01	0.00E+00				2.78E+01
Zn-65	<6.70E+01	0.00E+00				6.70E+01
Zr-95	<4.71E+01	0.00E+00				4.71E+01
Nb-95	<3.00E+01	0.00E+00				3.00E+01
I-131	<2.42E+01	0.00E+00				2.42E+01
Cs-134	<3.59E+01	0.00E+00				3.59E+01
Cs-137	<3.20E+01	0.00E+00				3.20E+01
BaLa-140	<3.38E+01	0.00E+00				3.38E+01
Be-7	1.15E+03	2.91E+02				3.13E+02
K-40	4.61E+03	7.79E+02				4.08E+02
437515	3/7/2017 - 3/7/2017	MIXEDBLV				Mn-54



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID	Sample Dates	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA			
437515	3/7/2017 - 3/7/2017	MIXEDBLV	Co-58	<2.45E+01	0.00E+00	2.45E+01			
			Fe-59	<2.45E+01	0.00E+00	2.45E+01			
			Co-60	<2.33E+01	0.00E+00	2.33E+01			
			Zn-65	<6.27E+01	0.00E+00	6.27E+01			
			Zr-95	<4.78E+01	0.00E+00	4.78E+01			
			Nb-95	<2.12E+01	0.00E+00	2.12E+01			
			I-131	<2.05E+01	0.00E+00	2.05E+01			
			Cs-134	<3.14E+01	0.00E+00	3.14E+01			
			Cs-137	<2.51E+01	0.00E+00	2.51E+01			
			BaLa-140	<2.54E+01	0.00E+00	2.54E+01			
			Be-7	1.84E+02	2.10E+02	3.42E+02			
			K-40	4.33E+03	7.31E+02	3.88E+02			
			439945	4/4/2017 - 4/4/2017	MIXEDBLV	Mn-54	<2.50E+01	0.00E+00	2.50E+01
						Co-58	<1.86E+01	0.00E+00	1.86E+01
Fe-59	<4.96E+01	0.00E+00				4.96E+01			
Co-60	<2.46E+01	0.00E+00				2.46E+01			
Zn-65	<5.20E+01	0.00E+00				5.20E+01			
Zr-95	<4.03E+01	0.00E+00				4.03E+01			
Nb-95	<3.00E+01	0.00E+00				3.00E+01			
I-131	<2.50E+01	0.00E+00				2.50E+01			
Cs-134	<3.32E+01	0.00E+00				3.32E+01			
Cs-137	<2.15E+01	0.00E+00				2.15E+01			
BaLa-140	<2.69E+01	0.00E+00				2.69E+01			
Be-7	1.08E+03	2.95E+02				3.38E+02			
K-40	4.40E+03	7.63E+02				4.47E+02			
442282	5/2/2017 - 5/2/2017	MIXEDBLV				Mn-54	<2.48E+01	0.00E+00	2.48E+01
			Co-58	<1.91E+01	0.00E+00	1.91E+01			
			Fe-59	<4.35E+01	0.00E+00	4.35E+01			
			Co-60	<2.39E+01	0.00E+00	2.39E+01			
			Zn-65	<3.22E+01	0.00E+00	3.22E+01			
			Zr-95	<4.25E+01	0.00E+00	4.25E+01			
			Nb-95	<2.37E+01	0.00E+00	2.37E+01			
			I-131	<1.79E+01	0.00E+00	1.79E+01			
			Cs-134	<3.27E+01	0.00E+00	3.27E+01			
			Cs-137	<2.83E+01	0.00E+00	2.83E+01			
			BaLa-140	<2.75E+01	0.00E+00	2.75E+01			
			Be-7	6.80E+02	2.16E+02	2.56E+02			
			K-40	3.48E+03	6.22E+02	3.31E+02			
			444684	6/6/2017 - 6/6/2017	MIXEDBLV	Mn-54	<2.07E+01	0.00E+00	2.07E+01
Co-58	<2.05E+01	0.00E+00				2.05E+01			
Fe-59	<3.95E+01	0.00E+00				3.95E+01			
Co-60	<1.69E+01	0.00E+00				1.69E+01			
Zn-65	<5.26E+01	0.00E+00				5.26E+01			
Zr-95	<3.55E+01	0.00E+00				3.55E+01			
Nb-95	<2.15E+01	0.00E+00				2.15E+01			
I-131	<1.95E+01	0.00E+00				1.95E+01			
Cs-134	<2.43E+01	0.00E+00				2.43E+01			
Cs-137	<2.10E+01	0.00E+00				2.10E+01			
BaLa-140	<2.49E+01	0.00E+00				2.49E+01			
Be-7	6.90E+02	2.33E+02				3.02E+02			
K-40	4.44E+03	6.81E+02				2.12E+02			
447426	7/3/2017 - 7/3/2017	MIXEDBLV				Mn-54	<3.69E+01	0.00E+00	3.69E+01
			Co-58	<2.93E+01	0.00E+00	2.93E+01			
			Fe-59	<7.07E+01	0.00E+00	7.07E+01			
			Co-60	<4.28E+01	0.00E+00	4.28E+01			
			Zn-65	<7.46E+01	0.00E+00	7.46E+01			
			Zr-95	<6.37E+01	0.00E+00	6.37E+01			
			Nb-95	<3.01E+01	0.00E+00	3.01E+01			
			I-131	<3.01E+01	0.00E+00	3.01E+01			



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
447426	7/3/2017 - 7/3/2017	MIXEDBLV	Cs-134	<3.83E+01	0.00E+00	3.83E+01
			Cs-137	<4.05E+01	0.00E+00	4.05E+01
			BaLa-140	<1.02E+01	0.00E+00	1.02E+01
			Be-7	1.05E+03	3.79E+02	5.10E+02
			K-40	2.82E+03	6.90E+02	6.08E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
449831	8/1/2017 - 8/1/2017	MIXEDBLV	Mn-54	<2.82E+01	0.00E+00	2.82E+01
			Co-58	<3.09E+01	0.00E+00	3.09E+01
			Fe-59	<3.25E+01	0.00E+00	3.25E+01
			Co-60	<2.44E+01	0.00E+00	2.44E+01
			Zn-65	<5.92E+01	0.00E+00	5.92E+01
			Zr-95	<4.22E+01	0.00E+00	4.22E+01
			Nb-95	<2.35E+01	0.00E+00	2.35E+01
			I-131	<2.40E+01	0.00E+00	2.40E+01
			Cs-134	<3.40E+01	0.00E+00	3.40E+01
			Cs-137	<2.63E+01	0.00E+00	2.63E+01
			BaLa-140	<4.05E+01	0.00E+00	4.05E+01
			Be-7	1.65E+03	3.63E+02	3.83E+02
			K-40	2.47E+03	5.53E+02	3.89E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
451478	9/5/2017 - 9/5/2017	MIXEDBLV	Mn-54	<2.74E+01	0.00E+00	2.74E+01
			Co-58	<2.72E+01	0.00E+00	2.72E+01
			Fe-59	<4.67E+01	0.00E+00	4.67E+01
			Co-60	<3.22E+01	0.00E+00	3.22E+01
			Zn-65	<5.97E+01	0.00E+00	5.97E+01
			Zr-95	<5.10E+01	0.00E+00	5.10E+01
			Nb-95	<2.40E+01	0.00E+00	2.40E+01
			I-131	<2.39E+01	0.00E+00	2.39E+01
			Cs-134	<3.84E+01	0.00E+00	3.84E+01
			Cs-137	<3.16E+01	0.00E+00	3.16E+01
			BaLa-140	<3.63E+01	0.00E+00	3.63E+01
			Be-7	2.70E+03	4.46E+02	3.34E+02
			K-40	3.43E+03	6.57E+02	3.97E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
454138	10/3/2017 - 10/3/2017	MIXEDBLV	Mn-54	<3.18E+01	0.00E+00	3.18E+01
			Co-58	<3.15E+01	0.00E+00	3.15E+01
			Fe-59	<4.94E+01	0.00E+00	4.94E+01
			Co-60	<3.20E+01	0.00E+00	3.20E+01
			Zn-65	<6.52E+01	0.00E+00	6.52E+01
			Zr-95	<6.66E+01	0.00E+00	6.66E+01
			Nb-95	<2.76E+01	0.00E+00	2.76E+01
			I-131	<3.28E+01	0.00E+00	3.28E+01
			Cs-134	<3.72E+01	0.00E+00	3.72E+01
			Cs-137	<4.26E+01	0.00E+00	4.26E+01
			BaLa-140	<3.16E+01	0.00E+00	3.16E+01
			Be-7	1.39E+03	3.23E+02	2.96E+02
			K-40	3.62E+03	7.29E+02	4.69E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
461375	11/7/2017 - 11/7/2017	MIXEDBLV	Mn-54	<2.99E+01	0.00E+00	2.99E+01
			Co-58	<2.89E+01	0.00E+00	2.89E+01
			Fe-59	<6.21E+01	0.00E+00	6.21E+01
			Co-60	<3.06E+01	0.00E+00	3.06E+01
			Zn-65	<6.82E+01	0.00E+00	6.82E+01
			Zr-95	<4.95E+01	0.00E+00	4.95E+01
			Nb-95	<3.45E+01	0.00E+00	3.45E+01
			I-131	<4.70E+01	0.00E+00	4.70E+01
			Cs-134	<3.42E+01	0.00E+00	3.42E+01
			Cs-137	<3.16E+01	0.00E+00	3.16E+01
			BaLa-140	<4.64E+01	0.00E+00	4.64E+01
			Be-7	1.69E+03	3.41E+02	4.26E+02
			K-40	4.09E+03	6.09E+02	5.03E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2017 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 258 [ CONTROL - W @ 9.84 miles ]

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Sample ID:	463498	Sample Dates:	12/5/2017 - 12/5/2017	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
					Mn-54	<3.48E+01	0.00E+00	3.48E+01
					Co-58	<2.58E+01	0.00E+00	2.58E+01
					Fe-59	<5.26E+01	0.00E+00	5.26E+01
					Co-60	<2.55E+01	0.00E+00	2.55E+01
					Zn-65	<6.61E+01	0.00E+00	6.61E+01
					Zr-95	<4.90E+01	0.00E+00	4.90E+01
					Nb-95	<2.92E+01	0.00E+00	2.92E+01
					I-131	<2.62E+01	0.00E+00	2.62E+01
					Cs-134	<3.33E+01	0.00E+00	3.33E+01
					Cs-137	<2.83E+01	0.00E+00	2.83E+01
					BaLa-140	<3.13E+01	0.00E+00	3.13E+01
					Be-7	7.59E+02	2.52E+02	3.48E+02
					K-40	6.37E+03	8.56E+02	5.24E+02





**APPENDIX F**

**ERRATA TO  
PREVIOUS REPORTS**

# APPENDIX F

## ERRATA TO THE 2017 AREOR

### Catawba AREOR: 2015, 2016

During the creation of the 2017 Catawba Land Use Census (LUC) map, it was determined the sector grid was off by 1.2 degrees. The 1.2 degree variance associated with the 2017 map indicated in the Catawba 2017 AREOR (Figure 3.10) was mitigated prior to generating the 2017 map. The 1.2 degree variance did not show a clear visual representation of the nearest residences and nearest gardens on the map. The 1.2 degree variance did not cause the misidentification of the nearest residence or nearest garden in any sector, because the compass rose was used in the field to determine the proper sector. The 2015 and 2016 Catawba AREOR LUC maps did indicate the 1.2 degree variance. The land use data tables (Table 3.10) were not affected.

The visual representation of the attributes closest to the sector lines were the only way these maps were affected. The map vendor indicated the variance was attributable to the differences in some land elevations in the piedmont regions of North and South Carolina. The 1.2 degree variance was corrected on the 2015 and 2016 Catawba Land Use Census maps which are indicated (NCR # 02163443).

