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# **ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT**

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

**2015**



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

BW	BiWeekly
C	Control
CNS	Catawba Nuclear Station
ERA	Environmental Resource Associates
GEL	General Engineering Laboratory
GI-LLI	Gastrointestinal – Lower Large Intestine
GPS	Global Positioning System
ISFSI	Independent Spent Fuel Storage Installation
LLD	Lower Limit of Detection
M	Monthly
MDA	Minimum Detectable Activity
mrem	Millirem
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
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
SLCs	Selected Licensee Commitments
SM	Semimonthly
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 2015.

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 thirty-four samples were analyzed comprising 1,060 test results in order to compile data for the 2015 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 2015 for station related radionuclides were generally within the ranges of concentrations observed in the past. Inspection of data showed that radioactivity concentrations in surface water, broadleaf vegetation, fish, and shoreline sediment 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 2.05E-1 mrem for 2015. 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 LEVEL OF DETECTION AND MINIMUM DETECTABLE ACTIVITY**

The Lower Level 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

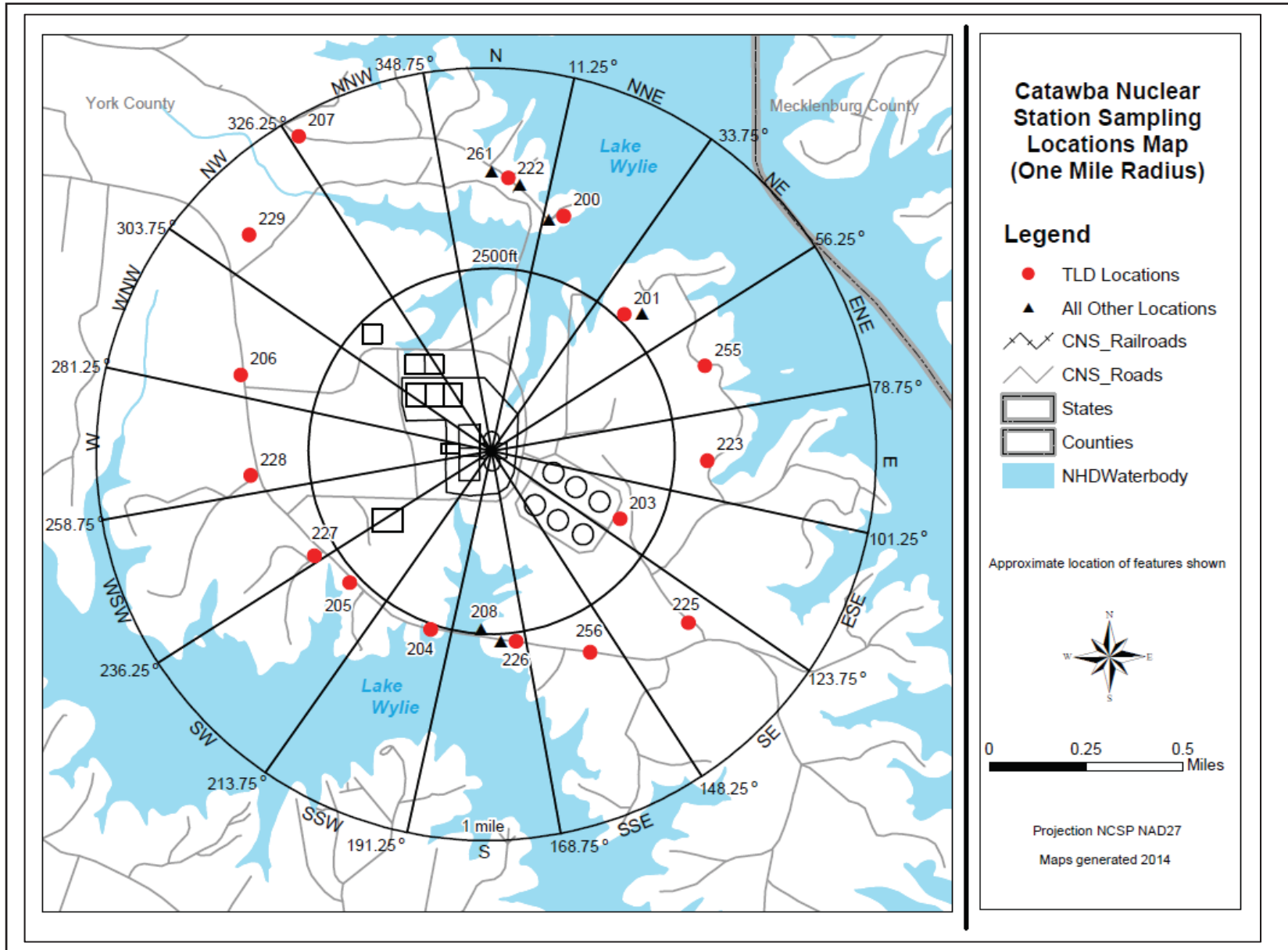
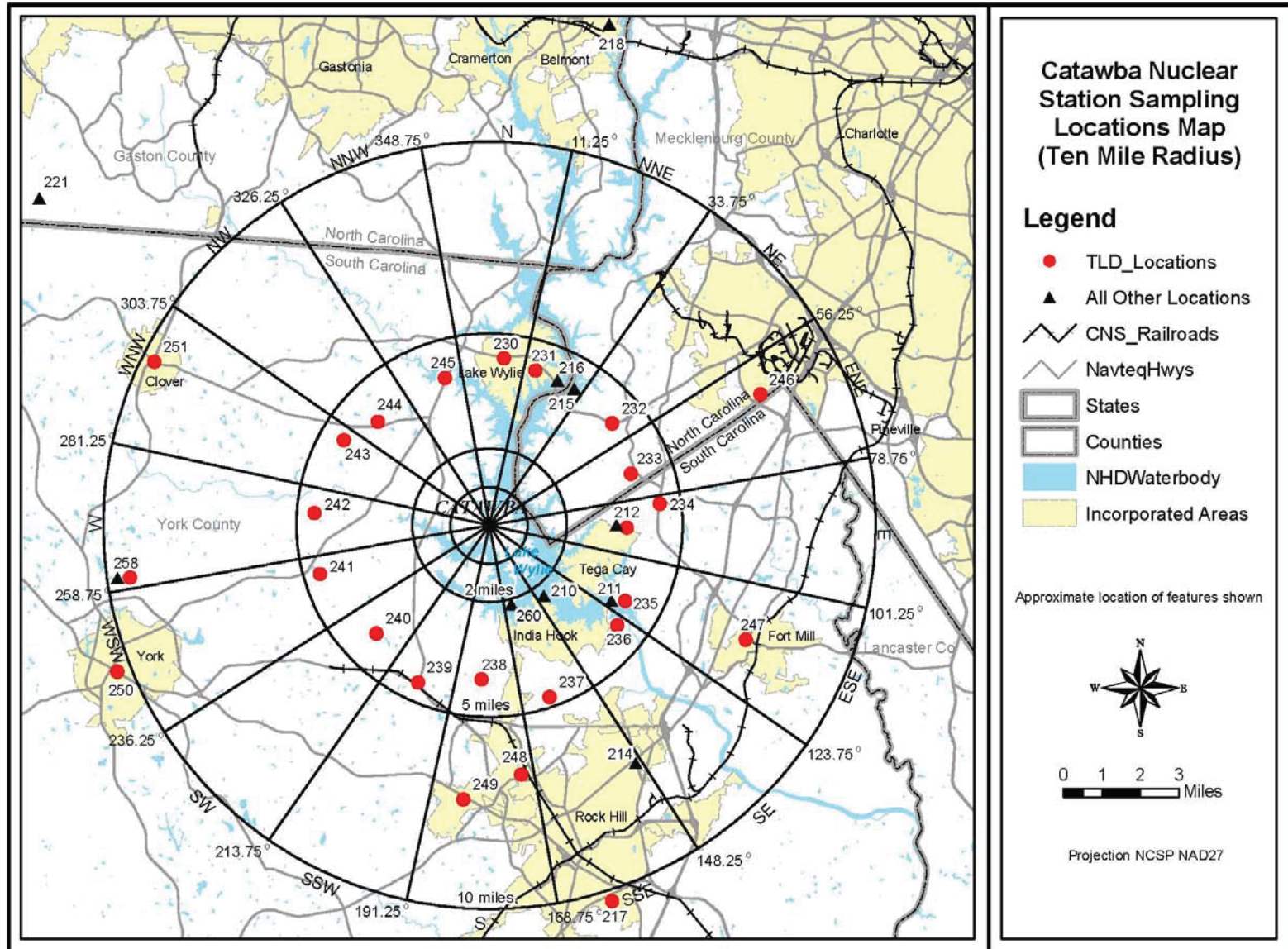


Figure 2.1-2



**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	KINGSBURRY 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 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 2015 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 2015 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 2015. Summary tables containing 2015 information required by Technical Specification Administrative Control 5.6.2 are located in Appendix B. REMP results for 2015 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 2015 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 2015 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 2015 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 2015, 312 radioiodine and particulate samples were analyzed, 260 from five indicator locations and 52 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). Radioiodine samples received a weekly gamma analysis.

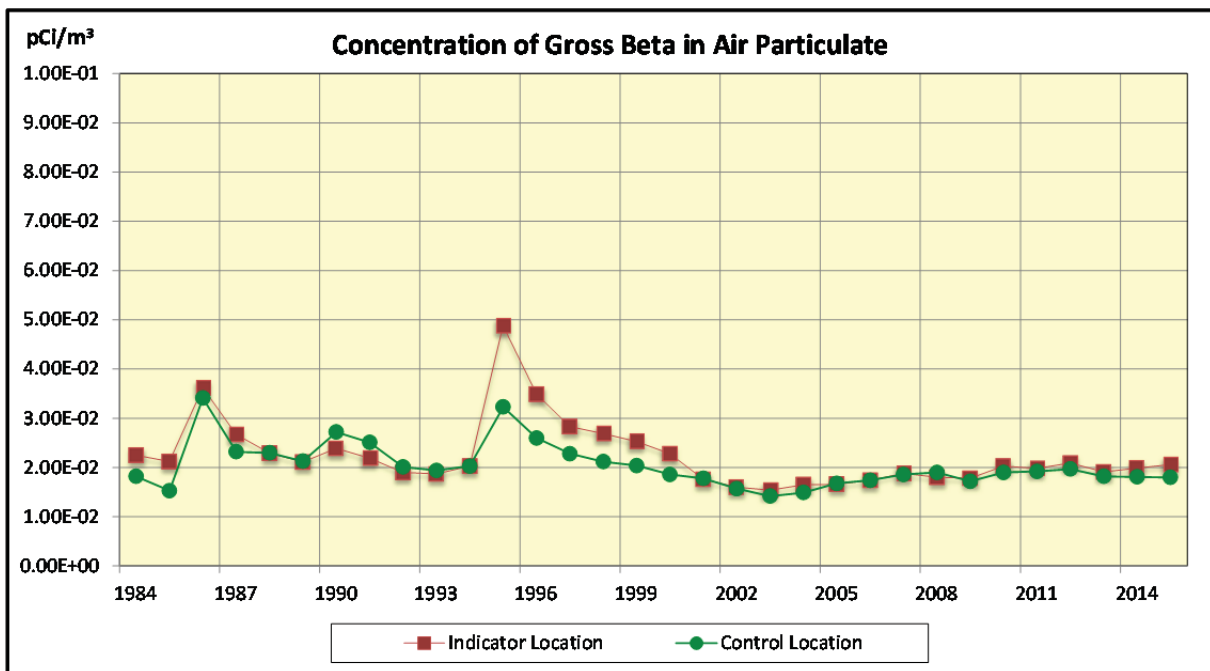
Figure 3.1 shows individual sample gross beta results for the indicator location with highest annual mean and the control location samples during 2015. The two sample locations' results are similar in concentration and have varied negligibly since preoperational periods.

There were no detectable gamma emitters identified for particulate filters analyzed during 2015. 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 2015. 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
<b>Average (2005 - 2014)</b>	<b>1.89E-2</b>	<b>1.83E-2</b>
2015	2.06E-2	1.80E-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

0.00E0 indicates no detectable measurements

(1) 2011 concentration affected by Fukushima Daiichi

(2) 2014 – Gamma spectroscopy system change

### 3.2 DRINKING WATER

Gross beta and gamma spectroscopy were performed on 26 drinking water samples. The samples were composited to create 8 quarterly samples that were analyzed for tritium. One indicator location was sampled, along with one control location.

No gamma emitting radionuclides attributable to plant operations were identified in 2015 drinking water samples. There have been no gamma emitting radionuclides identified in drinking water samples since 1988.

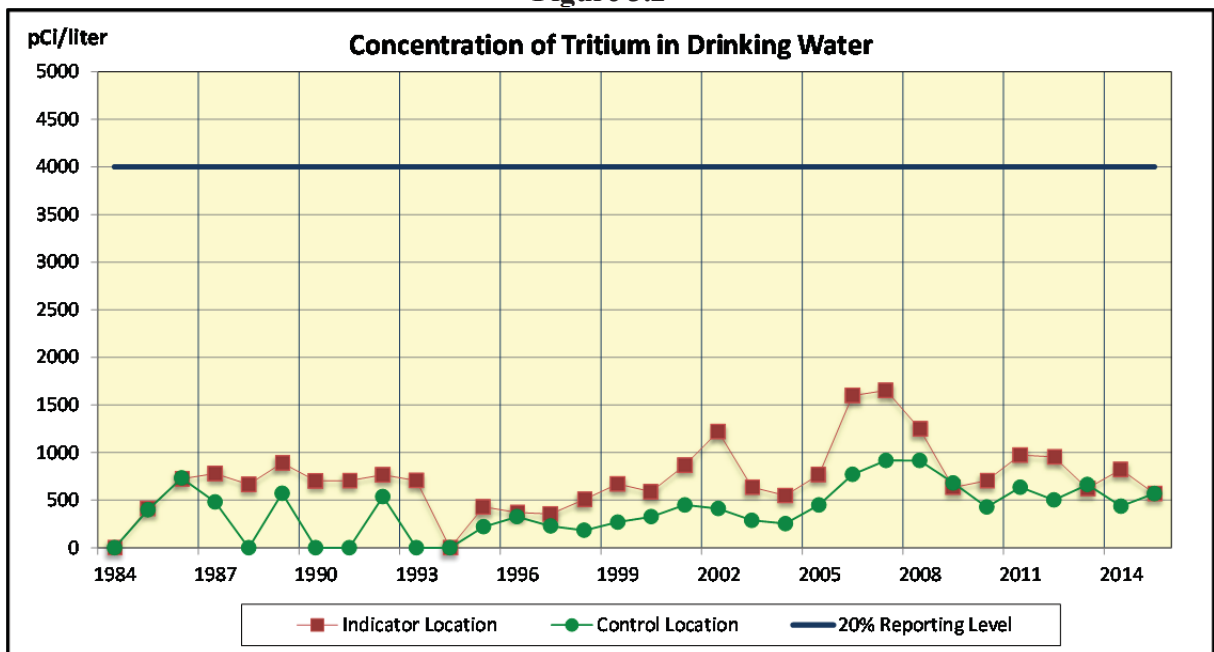
Table 3.2 shows highest annual mean gross beta concentrations for the indicator location and control location since preoperation. The indicator location (downstream of the plant effluent release point) average concentration was 2.48 pCi/l in 2015 and the control location concentration was 2.07 pCi/l. The table shows that current gross beta levels are not statistically different from preoperational concentrations.

Tritium was detected in the four indicator samples and in three of the four control samples during 2015. The mean indicator tritium concentration for 2015 was 570 pCi/l, 2.85% of reporting level. The mean control tritium concentration for 2015 was also 570 pCi/l, 2.85% of reporting level. Figure 3.2 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 2015; therefore low-level iodine analysis is not required.

Figure 3.2



**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

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

### **3.3 SURFACE WATER**

A total of 39 monthly surface water samples were analyzed for gamma emitting radionuclides. The samples were composited to create 12 quarterly samples for tritium analysis. Two indicator locations and one control location were sampled. One indicator location (208) is located near the liquid effluent discharge point.

All 2015 indicator location samples contained tritium with an average concentration of 2,570 pCi/l. Indicator Location 208 (Discharge Canal) showed a range of activities from 3,430 to 6,160 pCi/l which had the highest mean concentration of 4,608 pCi/l. Tritium was detected in all four control samples during 2015 with an average concentration of 414 pCi/l.

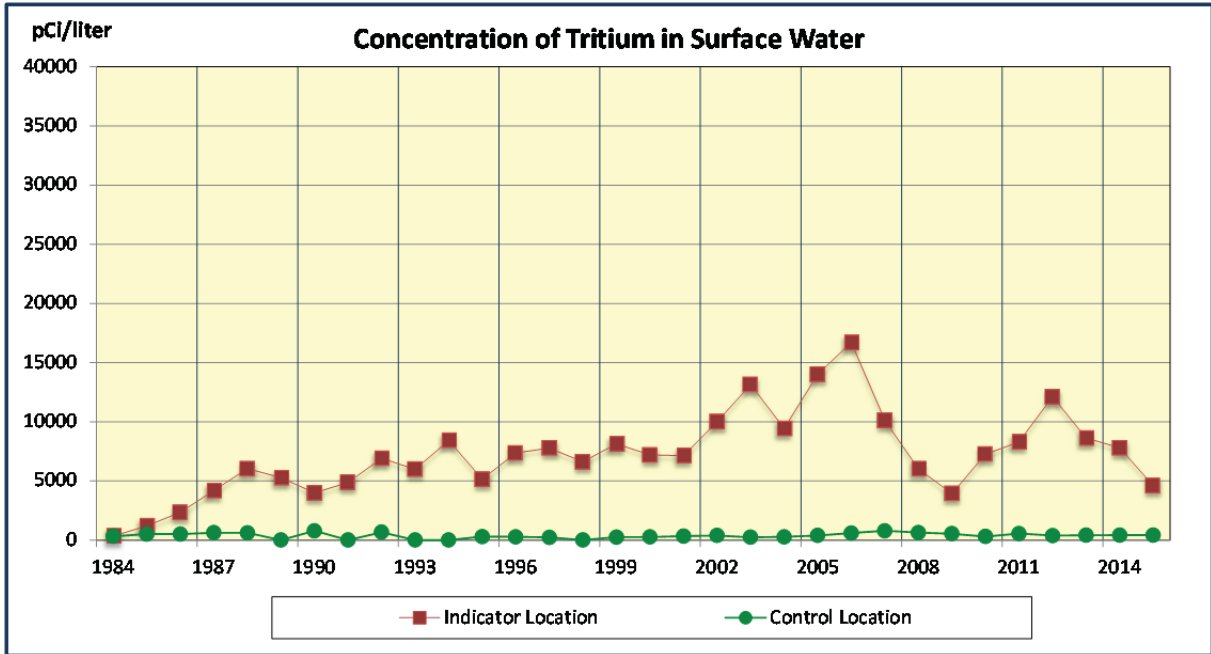
Gamma spectroscopy analysis detected Co-58 and Co-60 in one indicator surface water sample during 2015 (NCR # 01934713). Co-58 was detected at location 208 with a mean concentration of 11.5 pCi/l which represents 1.15% of the reporting level and Co-60 was detected at location 208 with a mean concentration of 1.07 pCi/l which represents 0.36% of the reporting level. 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

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 change

### 3.4 MILK

A total of 26 milk samples was analyzed by gamma spectroscopy and low level iodine during 2015. There was one control location sampled. No indicator dairies were identified by the 2015 land use census.

There were no gamma emitting radionuclides attributable to plant operations identified in milk samples in 2015. 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 2015.



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

<b>YEAR</b>	<b>Cs-137 Indicator (pCi/l)</b>	<b>Cs-137 Control (pCi/l)</b>
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

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 change

### 3.5 BROADLEAF VEGETATION

Gamma spectroscopy was performed on 60 broadleaf vegetation samples during 2015. Four indicator locations and one control location were sampled.

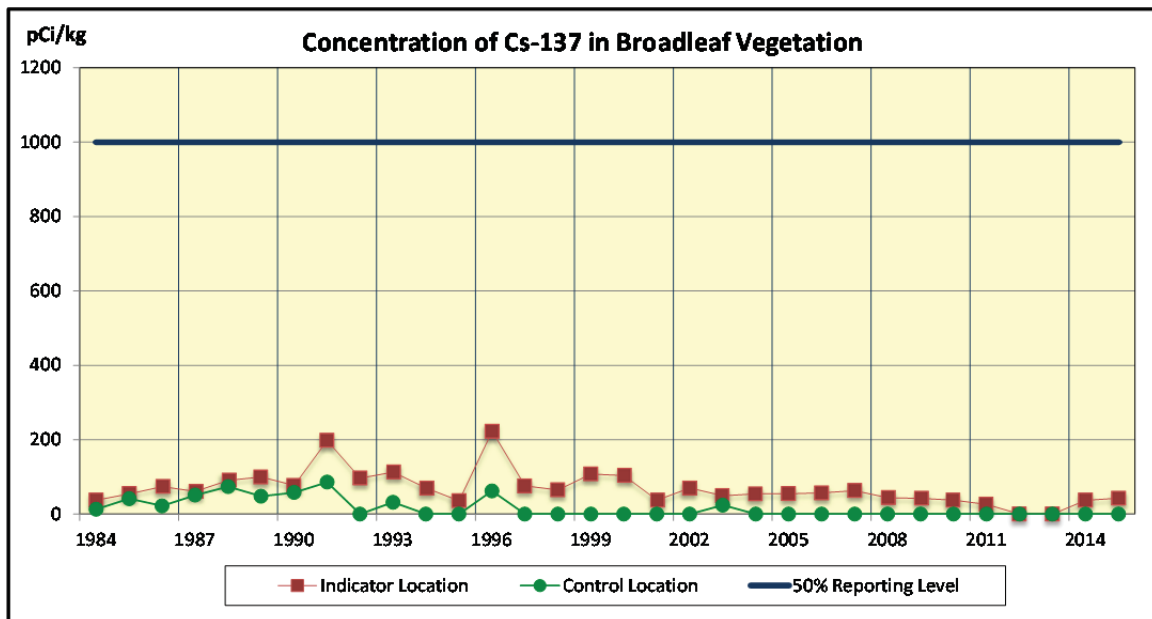
Two of the forty-eight samples collected at indicator locations contained detectable Cs-137 activity. The two indicator samples with detectable Cs-137 were collected at location 201. The highest Cs-137 concentration detected at location 201 was 48.3 pCi/kg which is 2.42% of the reporting level. Cs-137 was not detected in the control location samples.

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 2015 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 2015.

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

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 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 2015 growing season eleven samples were collected and analyzed for gamma radionuclides. There were no gamma emitting radionuclides attributable to plant operations identified in food product samples in 2015. 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 2015.

**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

0.00E0 indicates no detectable measurements  
There is no control location for Food Products.

(1) 2014 – Gamma spectroscopy system change

### 3.7 FISH

Gamma spectroscopy was performed on 12 fish samples collected during 2015. 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 2015.

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 2015.

Figure 3.7-1

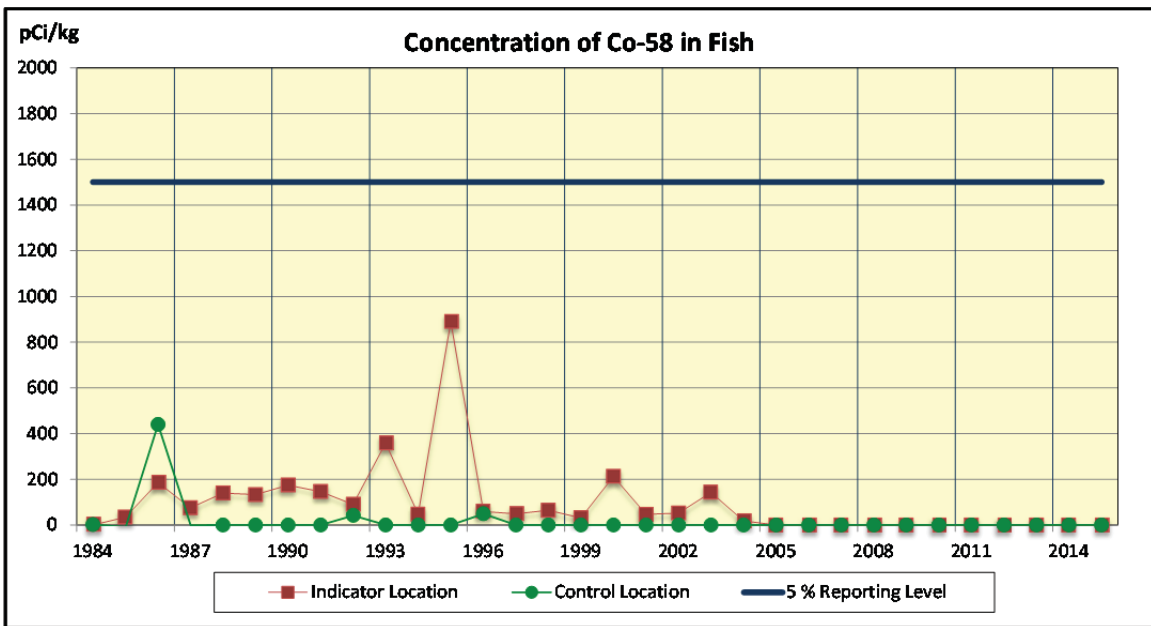


Figure 3.7-2

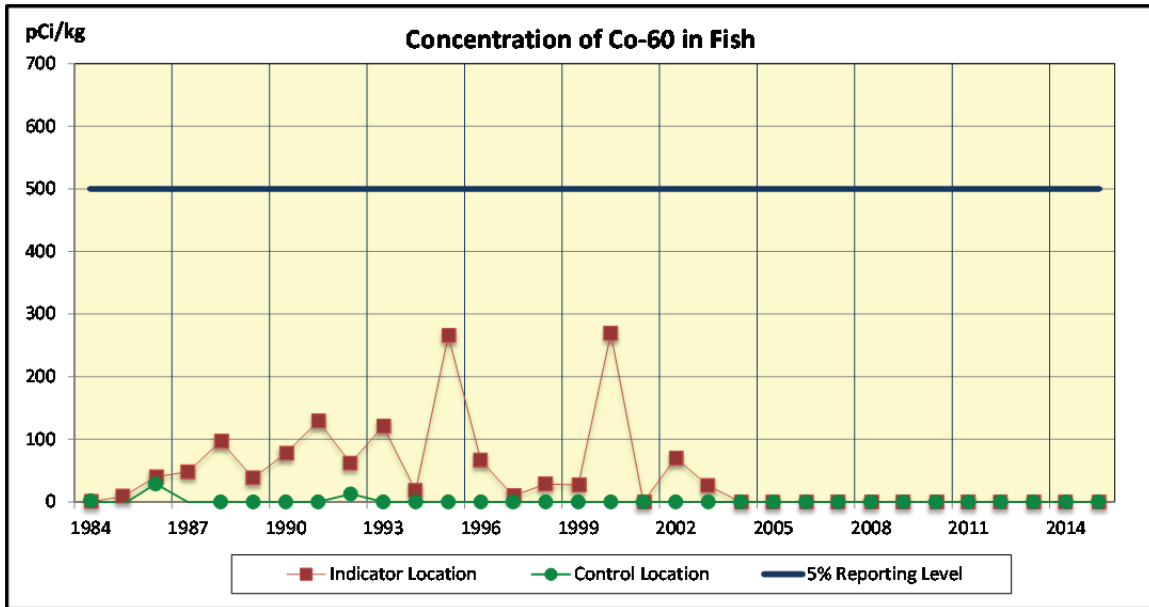
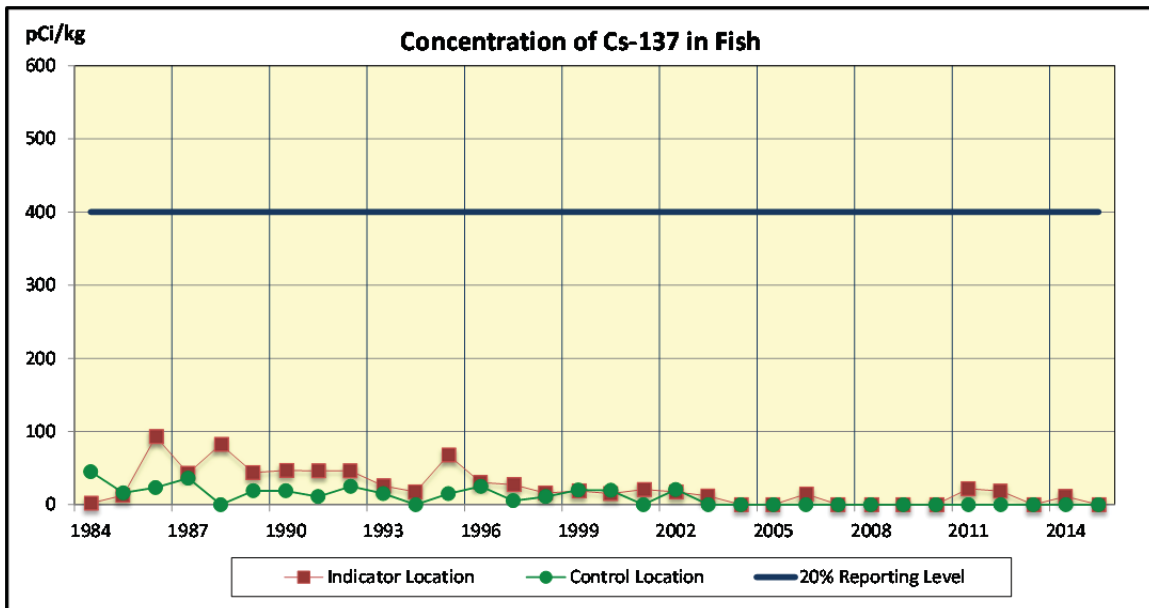


Figure 3.7-3



**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

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 change

### **3.8 SHORELINE SEDIMENT**

During 2015, 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. Co-58, Co-60, and Cs-137 were identified in indicator samples collected from location 208 (Discharge Canal), which is the closest location to the plant's liquid effluent release point. Co-58 was identified with an annual mean concentration of 67.3 pCi/kg, Co-60 was identified with an annual mean concentration of 161 pCi/kg, and Cs-137 was identified with an annual mean concentration of 8.75 pCi/kg. There were no gamma emitting radionuclides attributable to plant operations identified in samples from the other indicator location (210). Cs-137 was identified in one control location sample.

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).

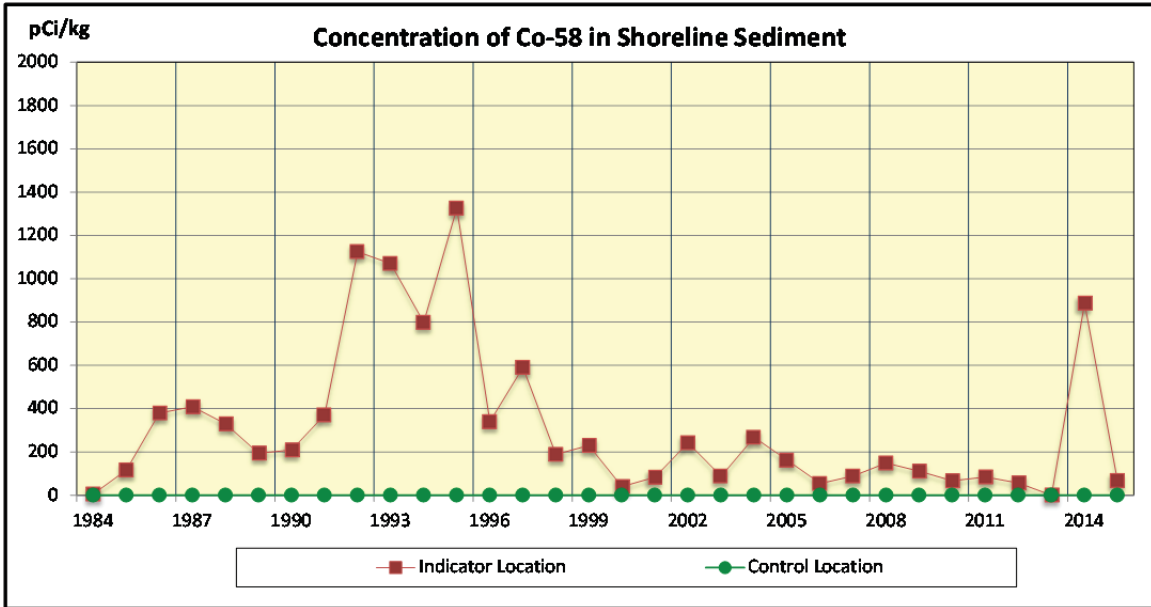
Table 3.9 lists highest indicator location annual mean since 1984. Included in the table are radionuclides that have been identified in shoreline sediment samples since 1988.

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 2015.

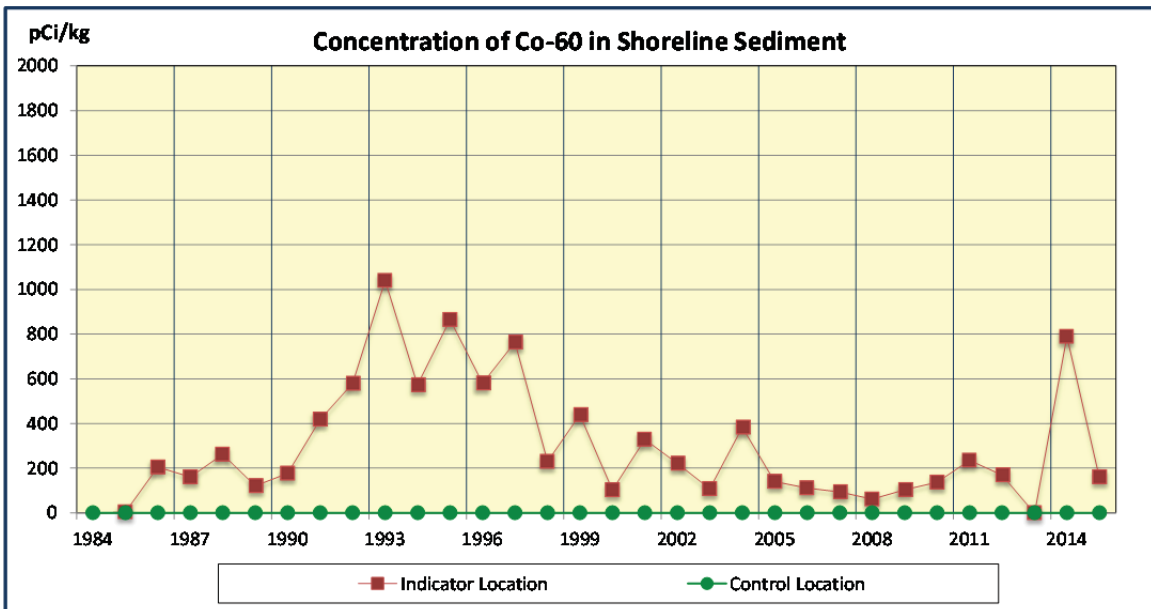


Figure 3.8-1



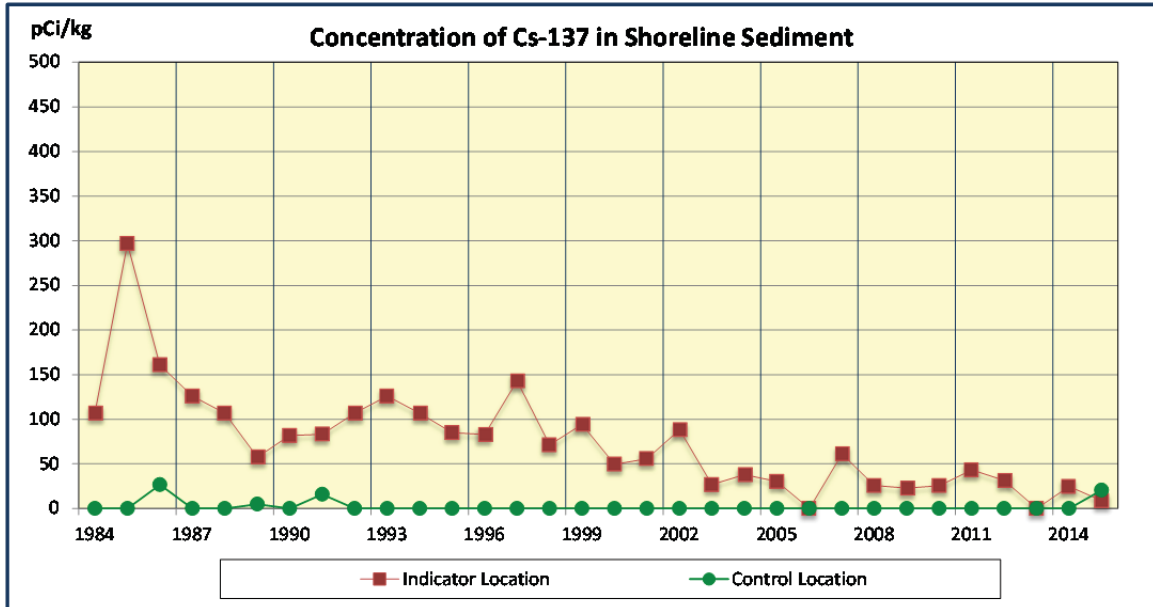
*There is no reporting level for Co-58 in Shoreline Sediment*

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

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 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 2015, 160 total TLDs were analyzed, 149 at indicator locations and 11 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 93.4 mrem at indicator location 237, 4.75 miles SSE 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 2015 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 2015 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 2015, 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.

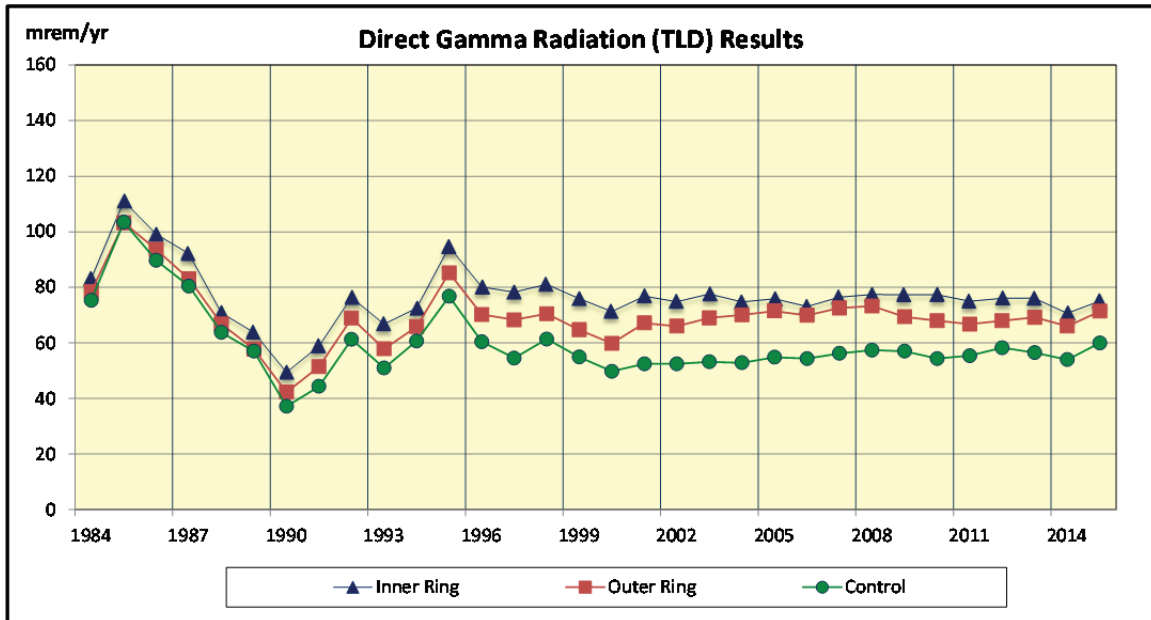
A TLD intercomparison program is conducted as part of the quality assurance program. Results of this program are included in section 5.7.

### 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>**

<b>Year</b>	<b>Inner Ring Average (mrem/yr)</b>	<b>Outer Ring Average (mrem/yr)</b>	<b>Control Average (mrem/yr)</b>
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

\* Preoperational Data

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



Note: Data may be omitted after investigation considering the following:

- Other TLD locations' data from upwind, downwind, and adjacent sectors
- Review of documentation on location's characteristics, geography, topography, etc.
- Comparison with other radiological data (i.e. gaseous effluent releases, direct radiation reports, surveys, dose calculations, Area TLDs, etc.)

**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 2015 Annual Land Use Census was conducted July 8, and July 9, 2015 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 2015 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 2015 land use census.

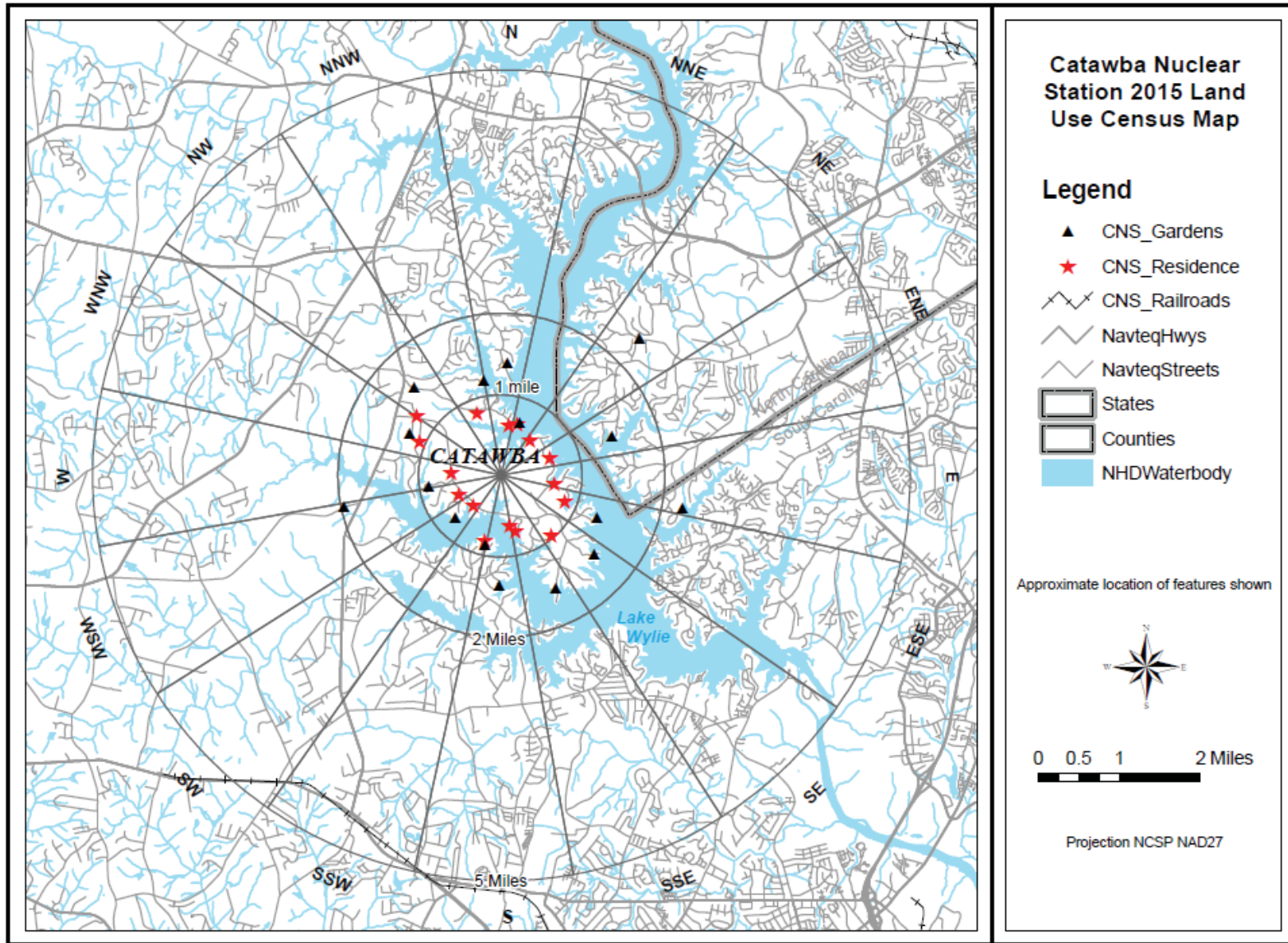
**Table 3.10 Catawba 2015 Land Use Census Results**

<b>Sector</b>		<b>Distance (Miles)</b>	<b>Sector</b>		<b>Distance (Miles)</b>
<b>N</b>	Nearest Residence	0.63	<b>S</b>	Nearest Residence	0.63
	Nearest Garden	1.38		Nearest Garden	1.25
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>NNE</b>	Nearest Residence	0.66	<b>SSW</b>	Nearest Residence	0.83
	Nearest Garden	0.69		Nearest Garden	0.89
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>NE</b>	Nearest Residence	0.56	<b>SW</b>	Nearest Residence	0.63
	Nearest Garden (Irr.)	2.39		Nearest Garden (Irr.)	0.78
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>ENE</b>	Nearest Residence	0.61	<b>WSW</b>	Nearest Residence	0.57
	Nearest Garden (Irr.)	1.44		Nearest Garden	1.98
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>E</b>	Nearest Residence	0.65	<b>W</b>	Nearest Residence	0.68
	Nearest Garden (Irr.)	2.26		Nearest Garden	0.96
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>ESE</b>	Nearest Residence	0.84	<b>WNW</b>	Nearest Residence	1.10
	Nearest Garden	1.29		Nearest Garden	1.18
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>SE</b>	Nearest Residence	0.97	<b>NW</b>	Nearest Residence	1.27
	Nearest Garden (Irr.)	1.50		Nearest Garden	1.54
	Nearest Milk Animal	-		Nearest Milk Animal	-
<b>SSE</b>	Nearest Residence	0.74	<b>NNW</b>	Nearest Residence	0.86
	Nearest Garden	1.64		Nearest Garden	1.19
	Nearest Milk Animal	-		Nearest Milk Animal	-

“-” indicates no occurrences within the 5 mile radius

“(Irr.)” indicates irrigated garden

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 2015 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 fish and shoreline sediment 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 2015 was 3.65E-1 mrem to the child bone from consuming vegetation.

### 4.2 ESTIMATED DOSE FROM RELEASES

Throughout the year, dose estimates were calculated based on actual 2015 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 fish and shoreline sediment 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 2015 environmental sample results was 8.63E-3 mrem to the child total body. The maximum total organ dose of 6.61E-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 environmental and effluent data. The maximum total organ dose based on 2015 environmental sample results was 3.65E-1 mrem to the child bone. The maximum total organ dose for gaseous effluent estimates was 5.55E0 mrem to the child bone, with C-14 being the primary does contributor.

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  
2015 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	Teen	Shoreline Sediment	208 (0.45 mi S)	2.04E-03
Skin	Effluent	Teen	Shoreline Sediment	Discharge Pt.	3.56E-03
Bone	Environmental	-	-	-	0.00E+00
Bone	Effluent	Child	Fresh Water Fish	Discharge Pt.	2.25E-02
Liver	Environmental	Adult	Fish	208 (0.45 mi S)	8.32E-03
Liver	Effluent	Child	Drinking Water	7.30 mi SSE	6.61E-02
T. Body	Environmental	Adult	Fish	208 (0.45 mi S)	8.63E-03
T. Body	Effluent	Child	Drinking Water	7.30 mi SSE	6.47E-02
Thyroid	Environmental	Adult	Fish	208 (0.45 mi S)	8.32E-03
Thyroid	Effluent	Child	Drinking Water	7.30 mi SSE	6.32E-02
Kidney	Environmental	Adult	Fish	208 (0.45 mi S)	8.32E-03
Kidney	Effluent	Child	Drinking Water	7.30 mi SSE	6.37E-02
Lung	Environmental	Adult	Fish	208 (0.45 mi S)	8.32E-03
Lung	Effluent	Child	Drinking Water	7.30 mi SSE	6.35E-02
GI-LLI	Environmental	Adult	Fish	208 (0.45 mi S)	8.32E-03
GI-LLI	Effluent	Child	Drinking Water	7.30 mi SSE	6.43E-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	-	-	-	0.00E+00
Skin	Effluent	All	Ground Plane	0.5 mi NNE	4.43E-06
Bone	Environmental	Child	Vegetation	201 (0.53 mi NE)	3.65E-01
Bone	Effluent	Child	Vegetation	0.5 mi NNE	5.55E+00
Liver	Environmental	Child	Vegetation	201 (0.53 mi NE)	3.49E-01
Liver	Effluent	Child	Vegetation	0.5 mi NNE	2.34E+00
T. Body	Environmental	Adult	Vegetation	201 (0.53 mi NE)	1.96E-01
T. Body	Effluent	Child	Vegetation	0.5 mi NNE	2.34E+00
Thyroid	Environmental	-	-	-	0.00E+00
Thyroid	Effluent	Child	Vegetation	0.5 mi NNE	2.35E+00
Kidney	Environmental	Child	Vegetation	201 (0.53 mi NE)	1.14E-01
Kidney	Effluent	Child	Vegetation	0.5 mi NNE	2.34E+00
Lung	Environmental	Child	Vegetation	201 (0.53 mi NE)	4.09E-02
Lung	Effluent	Child	Vegetation	0.5 mi NNE	2.34E+00
GI-LLI	Environmental	Adult	Vegetation	201 (0.53 mi NE)	5.79E-03
GI-LLI	Effluent	Child	Vegetation	0.5 mi NNE	2.34E+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 2015 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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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
	<u>TOTAL</u>	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	3.65E-01	3.49E-01	5.15E-02	0.00E+00	1.14E-01	4.09E-02	2.19E-03	0.00E+00
	Fish	0.00E+00	5.29E-03	5.29E-03	5.29E-03	5.29E-03	5.29E-03	5.29E-03	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	3.63E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.27E-04
	<u>TOTAL</u>	3.65E-01	3.54E-01	5.72E-02	5.29E-03	1.19E-01	4.62E-02	7.48E-03	4.27E-04
<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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	2.02E-01	2.68E-01	9.35E-02	0.00E+00	9.14E-02	3.55E-02	3.82E-03	0.00E+00
	Fish	0.00E+00	6.40E-03	6.40E-03	6.40E-03	6.40E-03	6.40E-03	6.40E-03	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	1.74E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.04E-03
	<u>TOTAL</u>	2.02E-01	2.74E-01	1.02E-01	6.40E-03	9.78E-02	4.19E-02	1.02E-02	2.04E-03
<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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	2.19E-01	2.99E-01	1.96E-01	0.00E+00	1.02E-01	3.38E-02	5.79E-03	0.00E+00
	Fish	0.00E+00	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	3.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.66E-04
	<u>TOTAL</u>	2.19E-01	3.07E-01	2.05E-01	8.32E-03	1.10E-01	4.21E-02	1.41E-02	3.66E-04

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

**Catawba Nuclear Station**  
**Dose from Broadleaf Vegetation Pathway for 2015 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	42.9	3.65E-01	3.49E-01	5.15E-02	0.00E+00	1.14E-01	4.09E-02	2.19E-03
Dose Commitment (mrem) =										3.65E-01	3.49E-01	5.15E-02	0.00E+00	1.14E-01	4.09E-02	2.19E-03



**Catawba Nuclear Station**  
**Dose from Fish Pathway for 2015 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 = 4194 pCi/l x 0.9 = 3775 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
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
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	0.0	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	3775	0.00E+00	5.29E-03	5.29E-03	5.29E-03	5.29E-03	5.29E-03	5.29E-03
Dose Commitment (mrem) =										0.00E+00	5.29E-03	5.29E-03	5.29E-03	5.29E-03	5.29E-03	5.29E-03

***Catawba Nuclear Station***  
***Dose from Shoreline Sediment Pathway for 2015 Data***  
***Maximum Exposed Child***

Shoreline Recreation = 14 hr (in one year)  
 Shore Width Factor = 0.2  
 Sediment Surface Mass = 40 kg/m<sup>2</sup>

Child Dose from Shoreline Sediment Pathway (mrem) = Shoreline Recreation (hr) x External Dose Factor (mrem/hr per pCi/m<sup>2</sup>) x Shore Width Factor x Sediment Surface Mass (kg/m<sup>2</sup>) x Sediment Concentration (pCi/kg)

Radionuclide	<u>External Dose Factor Standing on Contaminated Ground</u>		Indicator Location	Sediment (pCi/kg)	<u>Highest Annual Net Mean Concentration</u>		<u>Dose</u>	
	(mrem/hr per pCi/m <sup>2</sup> )				(mrem)			
	T. Body	Skin			T. Body	Skin		
Mn-54	5.80E-09	6.80E-09	ALL	0.0	0.00E+00	0.00E+00		
Co-58	7.00E-09	8.20E-09	208	67.3	5.28E-05	6.18E-05		
Co-60	1.70E-08	2.00E-08	208	161	3.07E-04	3.61E-04		
Cs-134	1.20E-08	1.40E-08	ALL	0.00	0.00E+00	0.00E+00		
Cs-137	4.20E-09	4.90E-09	208	8.75	4.12E-06	4.80E-06		
							Dose Commitment (mrem) =	
					3.63E-04	4.27E-04		

**Catawba Nuclear Station**  
**Dose from Broadleaf Vegetation Pathway for 2015 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	42.9	2.02E-01	2.68E-01	9.35E-02	0.00E+00	9.14E-02	3.55E-02	3.82E-03
Dose Commitment (mrem) =										2.02E-01	2.68E-01	9.35E-02	0.00E+00	9.14E-02	3.55E-02	3.82E-03

**Catawba Nuclear Station**  
**Dose from Fish Pathway for 2015 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 = 4194 pCi/l x 0.9 = 3775 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	3775	0.00E+00	6.40E-03	6.40E-03	6.40E-03	6.40E-03	6.40E-03	6.40E-03
Dose Commitment (mrem) =										0.00E+00	6.40E-03	6.40E-03	6.40E-03	6.40E-03	6.40E-03	6.40E-03

***Catawba Nuclear Station***  
***Dose from Shoreline Sediment Pathway for 2015 Data***  
***Maximum Exposed Teen***

Shoreline Recreation = 67 hr (in one year)  
 Shore Width Factor = 0.2  
 Sediment Surface Mass = 40 kg/m<sup>2</sup>

Teen Dose from Shoreline Sediment Pathway (mrem) = Shoreline Recreation (hr) x External Dose Factor (mrem/hr per pCi/m<sup>2</sup>) x Shore Width Factor x Sediment Surface Mass (kg/m<sup>2</sup>) x Sediment Concentration (pCi/kg)

Radionuclide	External Dose Factor Standing on Contaminated Ground		Indicator Location	Highest Annual Net Mean Concentration Sediment (pCi/kg)	Dose	
	(mrem/hr per pCi/m <sup>2</sup> )				(mrem)	
	T. Body	Skin			T. Body	Skin
Mn-54	5.80E-09	6.80E-09	ALL	0.00	0.00E+00	0.00E+00
Co-58	7.00E-09	8.20E-09	208	67.3	2.53E-04	2.96E-04
Co-60	1.70E-08	2.00E-08	208	161	1.47E-03	1.73E-03
Cs-134	1.20E-08	1.40E-08	ALL	0.00	0.00E+00	0.00E+00
Cs-137	4.20E-09	4.90E-09	208	8.75	1.97E-05	2.30E-05
Dose Commitment (mrem) =					1.74E-03	2.04E-03

***Catawba Nuclear Station  
Dose from Broadleaf Vegetation Pathway for 2015 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	42.9	2.19E-01	2.99E-01	1.96E-01	0.00E+00	1.02E-01	3.38E-02	5.79E-03
Dose Commitment (mrem) =										2.19E-01	2.99E-01	1.96E-01	0.00E+00	1.02E-01	3.38E-02	5.79E-03

**Catawba Nuclear Station**  
**Dose from Fish Pathway for 2015 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 = 4194 pCi/l x 0.9 = 3775 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	3775	0.00E+00	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03
Dose Commitment (mrem) =										0.00E+00	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03	8.32E-03

***Catawba Nuclear Station***  
***Dose from Shoreline Sediment Pathway for 2015 Data***  
***Maximum Exposed Adult***

Shoreline Recreation = 12 hr (in one year)  
 Shore Width Factor = 0.2  
 Sediment Surface Mass = 40 kg/m<sup>2</sup>

Adult Dose from Shoreline Sediment Pathway (mrem) = Shoreline Recreation (hr) x External Dose Factor (mrem/hr per pCi/m<sup>2</sup>) x Shore Width Factor x Sediment Surface Mass (kg/m<sup>2</sup>) x Sediment Concentration (pCi/kg)

Radionuclide	External Dose Factor Standing on Contaminated Ground (mrem/hr per pCi/m <sup>2</sup> )		Highest Annual Net Mean Concentration		Dose (mrem)	
	T. Body	Skin	Indicator Location	Sediment (pCi/kg)	T. Body	Skin
Mn-54	5.80E-09	6.80E-09	ALL	0.00	0.00E+00	0.00E+00
Co-58	7.00E-09	8.20E-09	208	67.3	4.52E-05	5.30E-05
Co-60	1.70E-08	2.00E-08	208	161	2.63E-04	3.09E-04
Cs-134	1.20E-08	1.40E-08	ALL	0.00	0.00E+00	0.00E+00
Cs-137	4.20E-09	4.90E-09	208	8.75	3.53E-06	4.12E-06
Dose Commitment (mrem) =					3.12E-04	3.66E-04



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# 5.0 QUALITY ASSURANCE

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## 5.1 SAMPLE COLLECTION

EnRad Laboratories, Fisheries and Aquatic Ecology 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. During 2015, a vendor laboratory, General Engineering Laboratory, LLC (GEL), performed some environmental sample analyses as specified by approved analysis procedures.

## 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 2015 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. In addition, EnRad Laboratory participated in the Environmental Resource Associates (ERA) RadChem™ Proficiency Testing program to satisfy the North Carolina state drinking water radiochemistry certification requirements.

EnRad Laboratory participated in three interlaboratory programs: Eckert & Ziegler Analytics (EZA), ERA, and Fleet Scientific Services (FSS). EZA results were evaluated against IP 84750 acceptance criteria stated in EnRad procedure 515, Cross Check Program Administration. ERA evaluated the results reported by EnRad based on the National Environmental Laboratory Accreditation Conference (NELAC) Field of Proficiency Testing criteria. FSS results were evaluated as prescribed in the Duke Energy Nuclear Generation Procedure SRPMP 9-2.

Low-level Iodine-131 analysis of drinking water was not required during 2015 since the dose calculated for the consumption of the water was not greater than 1 mrem per year in any supported program. This dose was calculated monthly during 2015 to ensure that low-level Iodine-131 analysis of drinking water samples was not required.

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

EnRad Laboratories participated in the Duke Energy Fleet Scientific Services (FSS) Interlaboratory Program during 2015. Interlaboratory cross check samples including mixed gamma in water (Marinelli beakers), low-level I-131 in water, gross beta in water, and tritium in water samples were analyzed during 2015. A summary of the EnRad Laboratory program results for 2015 is documented in Table 5.0-A.

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

EnRad Laboratories participated in the Eckert & Ziegler Analytics Cross Check Program during 2015. Cross check samples including air filters (single and composites), air cartridges, gross beta in water, various mixed gamma samples in Marinelli beakers (soil, vegetation, milk, and water), tritium in water, and Iodine in milk and water samples were analyzed at various times of the year. A summary of the EnRad Laboratory program results for 2015 is documented in Table 5.0-B.

Interlaboratory cross check samples from EZA were received and analyzed in all four quarters of 2015. During 2015, there were three EZA Cross Check results in non-agreement. The first non-agreement result was in the second quarter mixed gamma in vegetation sample (E11250). Agreement was achieved in seven of eight identified nuclides, with Cs-137 being the nuclide that was found in non-agreement (NCR # 01939292). Due to the non-agreement, an evaluation was conducted to track actions and resolve how to prevent recurrence. The evaluation identified a slight negative bias for all nuclides which could be attributed to three

factors: (1) mismatch between cross check geometry and calibration geometry fill-depth, (2) insufficient training of laboratory personnel regarding the importance of geometry effects, and (3) EnRad procedure # 52 when revised the procedural guidance on sample preparation to agree with calibration geometries' fill-depth was removed. How to prevent recurrence: (1) laboratory personnel were provided training to ensure an understanding of the importance of reproducing the proper geometry in all sample analyses, (2) ensure cross checks are ordered that correctly reflect calibration geometries, (3) revise EnRad procedure # 52 to address proper sample preparation to ensure proper geometry agreement, and (4) request from EZA a third quarter mixed gamma in vegetation (E11335) sample (all nuclides were in agreement and no bias was present).

The next two non-agreement results were second quarter LLI-131 in Water (E11248) and third quarter LLI-131 in Water (E11337); NCR # 01937710 and NCR # 01967544 respectively. After the second failure, the LLI-131 in Water analysis was immediately suspended at EnRad Analytical Laboratory (October 2015) and samples requiring this analysis were sent to a vendor lab (GEL). During the fourth quarter of 2015, EnRad requested and analyzed six LLI-131 in Water samples prepared by FSS and all samples were in agreement. Second quarter LLI-131 in Water (E11248) - NCR # 01937710 non-agreement was determined to have been caused by an incomplete chemical separation as the source of the cross check failure. The exact cause of the incomplete separation could not be established and given that the accompanying QC samples were acceptable, no precise cause could be attributed to the failure. In accordance with standard practice, another cross check was obtained for third quarter 2015 to validate the LLI-131 in Water methodology. The third quarter LLI-131 in Water (E11337) also yielded unacceptable results (NCR # 01967544) with result similar to the second quarter results. Immediate corrective actions included reviewing analysis package, EnRad Analytical Laboratory immediately suspended the LLI-131 in Water analysis and samples requiring this analysis were sent to a vendor lab (GEL) for analysis. Due to the second non-agreement, another evaluation was conducted to determine the cause and how to prevent recurrence. The evaluation identified the following items to help prevent recurrence: (1) revise EnRad procedure # 54 to specify method (pH) limitations of steps and to apply dechlorination steps only when needed; (2) revise EnRad procedure # 515 to address specific activity ranges, chemical matrix types, physical matrix types, or specific geometry requirements - such as I-131 cross check samples be ordered at a lower pH; (3) analyze a final set of test samples in appropriate pH to validate cause had been resolved. All FSS LLI-131 samples analyzed during fourth quarter 2015 were in agreement.

Low-Level Iodine 131 (LLI-131) activity has not been observed in water analyses at EnRad Analytical Laboratory in 2015; therefore, there is no possibility that I-131 results may have been underreported in 2015. During first quarter of 2015, EnRad Analytical Laboratory analyzed a LLI-131 in Milk (E11171) with acceptable results (Ratio: 99%). LLI-131 in Milk methodology is essentially the same as that of water and they have similar densities.

### **5.5.3 ERA PROFICIENCY TESTING**

EnRad Laboratories performed method proficiency testing through a program administered by Environmental Resource Associates (ERA) of Arvada, CO. ERA supplied requested method proficiency samples for analysis and nuclide concentration determination. ERA reported proficiency test results to the North Carolina Department of Health and Human Services, North Carolina Public Health Drinking Water Laboratory Certification Program. A summary of these proficiency test data for 2015 is documented in Table 5.0-C.

## **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 2015 Nuclear Technology Services Intercomparison Report is documented in Table 5.0-D. 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 third quarter of 2015 an environmental external TLD cross check failed and NCR # 02012855 was written to document this failure. To prevent recurrence, the TLD was pulled and visually inspected for cracks in the elements and overall integrity of the TLD - no abnormalities were found. A dose response check was performed and one of the elements fell outside the acceptable limits; therefore, the TLD was removed from service by separating it from the usable TLD population and writing OOS (out of service) over the barcode with a permanent marker to prevent future use. Fourth quarter 2015 results were all acceptable. Complete documentation of any evaluation will be available and provided to the NRC upon request.

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

Radiation Dosimetry and Records participates in a quarterly TLD intracomparison 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 2015 Internal Cross Check (Duke Energy) Program is documented in Table 5.0-D.

## **5.8 GENERAL ENGINEERING LABORATORY, LLC (GEL)**

General Engineering Laboratory, LLC (GEL) participated in various Quality Assurance Programs for Inter-laboratory, Intra-laboratory, Third Party Cross Check programs, and a number of proficiency testing programs during 2015. A summary of the GEL quality assurance program results for the sample media types sent to GEL during 2015 is documented in Table 5.0-E. GEL Quality Assurance Program results not appearing in Table 5.0-E will be supplied upon request.

# TABLE 5.0-A

## DUKE ENERGY

### INTERLABORATORY COMPARISON PROGRAM

#### 2015 EnRad Fleet Scientific Services Cross Check Performance Summary

Cross check samples were distributed by Fleet Scientific Services (FSS) in accordance with Duke Energy Nuclear Generation Procedure SRPMP 9-2. Thirteen water samples were analyzed for tritium, gross beta, and mixed gamma emitters, while two water samples were analyzed for low-level I-131. The below table lists results for specific analyses. One hundred and twenty results were reported and evaluated as prescribed in procedure SRPMP 9-2. The acceptance criteria for the program was based on the NRC Inspection Manual Procedure 84750 (IP 84750). These results passed the acceptance criteria for the program with 100% agreement.

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	GO Value	EnRad/GO Ratio	Evaluation
Water			4	pCi/L	1.13E+02	1.17E+02	0.96	Agreement
LLI-131	Q154L1W1	I-131	4	pCi/L	1.19E+02	1.17E+02	1.01	Agreement
			4	pCi/L	1.19E+02	1.17E+02	1.01	Agreement
			4	pCi/L	5.57E+01	5.71E+01	0.97	Agreement
	Q154L1W2	I-131	4	pCi/L	5.51E+01	5.71E+01	0.96	Agreement
4			pCi/L	5.41E+01	5.71E+01	0.95	Agreement	
4			pCi/L	5.41E+01	5.71E+01	0.95	Agreement	
Tritium in Water	Q151TWR1	H-3	1	pCi/L	2.22E+03	2.08E+03	1.07	Agreement
			1	pCi/L	2.14E+03	2.08E+03	1.03	Agreement
	Q151TWR2	H-3	1	pCi/L	4.74E+02	4.42E+02	1.07	Agreement
			1	pCi/L	5.20E+02	4.42E+02	1.18	Agreement
	Q151TWR3	H-3	1	pCi/L	8.35E+03	8.45E+03	0.99	Agreement
			1	pCi/L	8.44E+03	8.45E+03	1.00	Agreement
Tritium in Water	Q153TWR1	H-3	3	pCi/L	1.45E+05	1.49E+05	0.97	Agreement
			3	pCi/L	1.47E+05	1.49E+05	0.99	Agreement
			3	pCi/L	1.49E+05	1.49E+05	1.00	Agreement
	Q153TWR2	H-3	3	pCi/L	2.82E+03	2.77E+03	1.02	Agreement
			3	pCi/L	2.79E+03	2.77E+03	1.01	Agreement
			3	pCi/L	2.69E+03	2.77E+03	0.97	Agreement
	Q153TWR3	H-3	3	pCi/L	3.70E+02	3.35E+02	1.11	Agreement
			3	pCi/L	3.34E+02	3.35E+02	1.00	Agreement
			3	pCi/L	3.20E+02	3.35E+02	0.96	Agreement
			3	pCi/L	3.20E+02	3.35E+02	0.96	Agreement
Beta in Water	Q153ABW1	Cs-137	3	pCi/L	1.31E+02	1.27E+02	1.03	Agreement
			3	pCi/L	1.29E+02	1.27E+02	1.02	Agreement
			3	pCi/L	1.28E+02	1.27E+02	1.01	Agreement
	Q153ABW2	Cs-137	3	pCi/L	3.24E+02	3.26E+02	0.99	Agreement
			3	pCi/L	3.32E+02	3.26E+02	1.02	Agreement
			3	pCi/L	3.24E+02	3.26E+02	0.99	Agreement
	Q153ABW3	Cs-137	3	pCi/L	2.04E+02	1.97E+02	1.04	Agreement
			3	pCi/L	2.05E+02	1.97E+02	1.04	Agreement
			3	pCi/L	2.03E+02	1.97E+02	1.03	Agreement

## TABLE 5.0-A (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	GO Value	EnRad/GO Ratio	Evaluation
Gamma in Water	Q151GWR1 1.0 L	Mn-54	1	pCi/L	7.06E+03	6.65E+03	1.06	Agreement
			1	pCi/L	7.18E+03	6.65E+03	1.08	Agreement
			1	pCi/L	7.16E+03	6.65E+03	1.08	Agreement
		Co-57	1	pCi/L	4.84E+03	4.87E+03	0.99	Agreement
			1	pCi/L	4.93E+03	4.87E+03	1.01	Agreement
			1	pCi/L	4.88E+03	4.87E+03	1.00	Agreement
		Fe-59	1	pCi/L	7.92E+03	7.41E+03	1.07	Agreement
			1	pCi/L	8.06E+03	7.41E+03	1.09	Agreement
			1	pCi/L	8.10E+03	7.41E+03	1.09	Agreement
	Co-60	1	pCi/L	6.13E+03	6.14E+03	1.00	Agreement	
		1	pCi/L	6.25E+03	6.14E+03	1.02	Agreement	
		1	pCi/L	6.21E+03	6.14E+03	1.01	Agreement	
	Cs-134	1	pCi/L	7.53E+03	8.53E+03	0.88	Agreement	
		1	pCi/L	7.59E+03	8.53E+03	0.89	Agreement	
		1	pCi/L	7.59E+03	8.53E+03	0.89	Agreement	
	Cs-137	1	pCi/L	1.34E+04	1.32E+04	1.02	Agreement	
		1	pCi/L	1.37E+04	1.32E+04	1.04	Agreement	
		1	pCi/L	1.37E+04	1.32E+04	1.04	Agreement	
	Q151GWR1 3.5 L	Mn-54	1	pCi/L	7.38E+03	6.65E+03	1.11	Agreement
			1	pCi/L	7.32E+03	6.65E+03	1.10	Agreement
			1	pCi/L	7.40E+03	6.65E+03	1.11	Agreement
Co-57		1	pCi/L	5.14E+03	4.87E+03	1.05	Agreement	
		1	pCi/L	5.01E+03	4.87E+03	1.03	Agreement	
		1	pCi/L	5.17E+03	4.87E+03	1.06	Agreement	
Fe-59		1	pCi/L	8.12E+03	7.41E+03	1.10	Agreement	
		1	pCi/L	8.15E+03	7.41E+03	1.10	Agreement	
		1	pCi/L	8.12E+03	7.41E+03	1.10	Agreement	
Co-60		1	pCi/L	6.41E+03	6.14E+03	1.04	Agreement	
		1	pCi/L	6.42E+03	6.14E+03	1.05	Agreement	
		1	pCi/L	6.41E+03	6.14E+03	1.04	Agreement	
Cs-134		1	pCi/L	8.09E+03	8.53E+03	0.95	Agreement	
		1	pCi/L	8.01E+03	8.53E+03	0.94	Agreement	
		1	pCi/L	8.15E+03	8.53E+03	0.96	Agreement	
Cs-137		1	pCi/L	1.42E+04	1.32E+04	1.08	Agreement	
		1	pCi/L	1.41E+04	1.32E+04	1.07	Agreement	
		1	pCi/L	1.42E+04	1.32E+04	1.08	Agreement	

## TABLE 5.0-A (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	GO Value	EnRad/GO Ratio	Evaluation
Gamma in Water	Q153GWR 1.0 L	Mn-54	3	pCi/L	8.38E+03	7.79E+03	1.08	Agreement
			3	pCi/L	8.43E+03	7.79E+03	1.08	Agreement
			3	pCi/L	8.48E+03	7.79E+03	1.09	Agreement
		Co-57	3	pCi/L	1.05E+04	1.05E+04	1.00	Agreement
			3	pCi/L	1.06E+04	1.05E+04	1.01	Agreement
			3	pCi/L	1.06E+04	1.05E+04	1.01	Agreement
		Fe-59	3	pCi/L	2.65E+04	2.40E+04	1.10	Agreement
			3	pCi/L	2.69E+04	2.40E+04	1.12	Agreement
			3	pCi/L	2.69E+04	2.40E+04	1.12	Agreement
		Co-60	3	pCi/L	1.24E+04	1.22E+04	1.02	Agreement
			3	pCi/L	1.25E+04	1.22E+04	1.02	Agreement
			3	pCi/L	1.26E+04	1.22E+04	1.03	Agreement
		Zn-65	3	pCi/L	1.89E+04	1.74E+04	1.09	Agreement
			3	pCi/L	1.91E+04	1.74E+04	1.10	Agreement
			3	pCi/L	1.92E+04	1.74E+04	1.10	Agreement
		Y-88	3	pCi/L	8.62E+03	8.86E+03	0.97	Agreement
			3	pCi/L	8.81E+03	8.86E+03	0.99	Agreement
			3	pCi/L	8.89E+03	8.86E+03	1.00	Agreement
		Sn-113	3	pCi/L	1.35E+04	1.31E+04	1.03	Agreement
			3	pCi/L	1.36E+04	1.31E+04	1.04	Agreement
			3	pCi/L	1.34E+04	1.31E+04	1.03	Agreement
		Cs-134	3	pCi/L	6.29E+03	6.91E+03	0.91	Agreement
			3	pCi/L	6.29E+03	6.91E+03	0.91	Agreement
			3	pCi/L	6.37E+03	6.91E+03	0.92	Agreement
		Cs-137	3	pCi/L	1.22E+04	1.17E+04	1.05	Agreement
			3	pCi/L	1.22E+04	1.17E+04	1.05	Agreement
			3	pCi/L	1.22E+04	1.17E+04	1.05	Agreement



## TABLE 5.0-A (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	GO Value	EnRad/GO Ratio	Evaluation
Gamma in Water	Q153GWR 3.5 L	Mn-54	3	pCi/L	8.47E+03	7.79E+03	1.09	Agreement
			3	pCi/L	8.56E+03	7.79E+03	1.10	Agreement
			3	pCi/L	8.47E+03	7.79E+03	1.09	Agreement
		Co-57	3	pCi/L	1.07E+04	1.05E+04	1.02	Agreement
			3	pCi/L	1.09E+04	1.05E+04	1.04	Agreement
			3	pCi/L	1.07E+04	1.05E+04	1.02	Agreement
		Fe-59	3	pCi/L	2.66E+04	2.40E+04	1.11	Agreement
			3	pCi/L	2.67E+04	2.40E+04	1.11	Agreement
			3	pCi/L	2.66E+04	2.40E+04	1.11	Agreement
		Co-60	3	pCi/L	1.27E+04	1.22E+04	1.04	Agreement
			3	pCi/L	1.28E+04	1.22E+04	1.05	Agreement
			3	pCi/L	1.27E+04	1.22E+04	1.04	Agreement
		Zn-65	3	pCi/L	1.90E+04	1.74E+04	1.09	Agreement
			3	pCi/L	1.92E+04	1.74E+04	1.10	Agreement
			3	pCi/L	1.90E+04	1.74E+04	1.09	Agreement
		Y-88	3	pCi/L	8.93E+03	8.86E+03	1.01	Agreement
			3	pCi/L	8.96E+03	8.86E+03	1.01	Agreement
			3	pCi/L	9.00E+03	8.86E+03	1.02	Agreement
		Sn-113	3	pCi/L	1.38E+04	1.31E+04	1.06	Agreement
			3	pCi/L	1.40E+04	1.31E+04	1.07	Agreement
			3	pCi/L	1.38E+04	1.31E+04	1.06	Agreement
Cs-134	3	pCi/L	6.53E+03	6.91E+03	0.94	Agreement		
	3	pCi/L	6.58E+03	6.91E+03	0.95	Agreement		
	3	pCi/L	6.55E+03	6.91E+03	0.95	Agreement		
Cs-137	3	pCi/L	1.23E+04	1.17E+04	1.05	Agreement		
	3	pCi/L	1.24E+04	1.17E+04	1.06	Agreement		
	3	pCi/L	1.23E+04	1.17E+04	1.05	Agreement		

# TABLE 5.0-B

## ECKERT & ZIEGLER ANALYTICS

### CROSS CHECK PROGRAM

#### 2015 Cross Check Results for EnRad Laboratories

Interlaboratory Cross check samples are received, prepared, and analyzed in all four quarters of 2015. 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). Seventy-three environmental results were reported, of which 70 (95.9%) met the acceptance criteria based on IP 84750.

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Gamma in Filter	E11279	Ce-141	3	pCi	87.6	84.9	1.03	Agreement
		Cr-51	3	pCi	218	215	1.02	Agreement
		Cs-134	3	pCi	83.6	84.4	0.99	Agreement
		Cs-137	3	pCi	102	102	1.00	Agreement
		Co-58	3	pCi	108	105	1.03	Agreement
		Mn-54	3	pCi	113	116	0.98	Agreement
		Fe-59	3	pCi	93	89.9	1.03	Agreement
		Zn-65	3	pCi	141	141	1.00	Agreement
		Co-60	3	pCi	133	132	1.01	Agreement

## TABLE 5.0-B (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Gross Beta	E11281	Gross Beta	3	pCi	205	216	0.95	Agreement
Filter	E11411	Gross Beta	4	pCi	256	240	1.07	Agreement
Gross Beta	E11249	Cs-137	2	pCi/L	259	248	1.04	Agreement
in Water	E11407	Cs-137	4	pCi/L	242	247	0.98	Agreement
I-131 Charcoal	E11172	I-131	1	pCi	82.0	78.4	1.05	Agreement
Cartridge	E11278	I-131	3	pCi	81.5	81.4	1.00	Agreement
LLI-131 in	E11248	I-131	2	pCi/L	67.8	98.4	0.69	Non-Agreement*
Water	E11337	I-131	3	pCi/L	58.5	96.5	0.61	Non-Agreement**
LLI-131 in Milk	E11171	I-131	1	pCi/L	98.3	99.0	0.99	Agreement
Tritium in Water	E11252	H-3	2	pCi/L	13,100	13,000	1.01	Agreement
Gamma in Vegetation (Coffee Grounds)	E11250	Cr-51	2	pCi/g	0.430	0.474	0.91	Agreement
		Cs-134	2	pCi/g	0.230	0.279	0.82	Agreement
		Cs-137	2	pCi/g	0.170	0.215	0.79	Non-Agreement***
		Co-58	2	pCi/g	0.100	0.117	0.85	Agreement
		Mn-54	2	pCi/g	0.150	0.173	0.87	Agreement
		Fe-59	2	pCi/g	0.260	0.260	1.00	Agreement
		Zn-65	2	pCi/g	0.400	0.427	0.94	Agreement
		Co-60	2	pCi/g	0.300	0.331	0.91	Agreement
Gamma in Vegetation (Coffee Grounds)	E11335	Ce-141	3	pCi/g	0.307	0.312	0.98	Agreement
		Cr-51	3	pCi/g	0.819	0.788	1.04	Agreement
		Cs-134	3	pCi/g	0.272	0.310	0.88	Agreement
		Cs-137	3	pCi/g	0.383	0.373	1.03	Agreement
		Co-58	3	pCi/g	0.389	0.385	1.01	Agreement
		Mn-54	3	pCi/g	0.449	0.425	1.06	Agreement
		Fe-59	3	pCi/g	0.361	0.331	1.09	Agreement
		Zn-65	3	pCi/g	0.561	0.517	1.08	Agreement
		Co-60	3	pCi/g	0.493	0.483	1.02	Agreement

\* NCR # 01937710  
 \*\* NCR # 01967544  
 \*\*\* NCR # 01939292

## TABLE 5.0-B (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Gamma in Composite Filter	E11280	Ce-141	3	pCi	141	140	1.01	Agreement
		Cr-51	3	pCi	370	353	1.05	Agreement
		Cs-134	3	pCi	136	139	0.98	Agreement
		Cs-137	3	pCi	164	167	0.98	Agreement
		Co-58	3	pCi	167	172	0.97	Agreement
		Mn-54	3	pCi	195	190	1.03	Agreement
		Fe-59	3	pCi	179	148	1.21	Agreement
		Zn-65	3	pCi	224	232	0.97	Agreement
		Co-60	3	pCi	213	216	0.99	Agreement
Gamma in Water	E11282	I-131	3	pCi/L	94.6	96.7	0.98	Agreement
		Ce-141	3	pCi/L	196	199	0.99	Agreement
		Cr-51	3	pCi/L	508	502	1.01	Agreement
		Cs-134	3	pCi/L	176	198	0.89	Agreement
		Cs-137	3	pCi/L	237	238	1.00	Agreement
		Co-58	3	pCi/L	240	246	0.98	Agreement
		Mn-54	3	pCi/L	286	271	1.06	Agreement
		Fe-59	3	pCi/L	229	211	1.09	Agreement
		Zn-65	3	pCi/L	353	330	1.07	Agreement
Gamma in Milk	E11170	I-131	1	pCi/L	97.9	97.5	1.00	Agreement
		Ce-141	1	pCi/L	221	211	1.05	Agreement
		Cr-51	1	pCi/L	607	555	1.09	Agreement
		Cs-134	1	pCi/L	181	191	0.95	Agreement
		Cs-137	1	pCi/L	266	253	1.05	Agreement
		Co-58	1	pCi/L	285	272	1.05	Agreement
		Mn-54	1	pCi/L	262	240	1.09	Agreement
		Fe-59	1	pCi/L	334	295	1.13	Agreement
		Zn-65	1	pCi/L	509	453	1.12	Agreement
Gamma in Soil	E11251	Cr-51	2	pCi/g	0.460	0.482	0.95	Agreement
		Cs-134	2	pCi/g	0.260	0.284	0.91	Agreement
		Cs-137	2	pCi/g	0.270	0.298	0.91	Agreement
		Co-58	2	pCi/g	0.110	0.119	0.92	Agreement
		Mn-54	2	pCi/g	0.170	0.176	0.97	Agreement
		Fe-59	2	pCi/g	0.260	0.264	0.98	Agreement
		Zn-65	2	pCi/g	0.430	0.434	0.99	Agreement
		Co-60	2	pCi/g	0.300	0.336	0.89	Agreement

# TABLE 5.0-C

## ENVIRONMENTAL RESOURCE ASSOCIATES (ERA)

### PROFICIENCY TESTING

#### 2015 Proficiency Test Results for EnRad Laboratories

North Carolina Department of Health and Human Services Laboratory Certification

EnRad Laboratories

Proficiency test samples are received, prepared, and analyzed in second and fourth quarters of 2015. Results are reported directly to Environmental Resource Associates as described in the instruction package within the study period. Proficiency test data are reported to ERA for evaluation. The acceptance criteria for the program was based on the National Environmental Laboratory Accreditation Conference (NELAC) Field of Proficiency Testing criteria. Fourteen results were reported of which 14 (100 %) met the acceptance criteria. ERA reports proficiency test results to the North Carolina Department of Health and Human Services, North Carolina Public Drinking Water Laboratory Certification Program. This testing is to satisfy the North Carolina state drinking water radiochemistry certification requirements.

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	ERA Value	Acceptance Limits	Evaluation
Gamma Emitters in Water	Rad-101	Ba-133	2	pCi/L	75.5	82.5	69.3 - 90.8	Agreement
		Cs-134	2	pCi/L	69.0	75.7	61.8-83.3	Agreement
		Cs-137	2	pCi/L	188.0	189.0	170 - 210	Agreement
		Co-60	2	pCi/L	81.1	84.5	76.0 - 95.3	Agreement
		Zn-65	2	pCi/L	219.0	203.0	183 - 238	Agreement
Gamma Emitters in Water	Rad -103	Ba-133	4	pCi/L	29.6	32.5	25.9 - 36.7	Agreement
		Cs-134	4	pCi/L	54.0	62.3	50.6 - 68.5	Agreement
		Cs-137	4	pCi/L	160	157	141 -175	Agreement
		Co-60	4	pCi/L	71.2	71.1	64.0 - 80.7	Agreement
		Zn-65	4	pCi/L	141	126	113 -149	Agreement
Tritium in Water	Rad -101	H-3	2	pCi/L	3180	3280	2770-3620	Agreement
	Rad -103	H-3	4	pCi/L	20600	21300	18700-23400	Agreement
Iodine-131 in Water	Rad -101	I-131	2	pCi/L	23.3	23.8	19.7 - 28.3	Agreement
	Rad -103	I-131	4	pCi/L	25.4	26.3	21.9 - 31.0	Agreement

# TABLE 5.0-D

## 2015 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 the 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. Complete documentation of any evaluation will be available and provided to the NRC upon request.

1st Quarter 2015						2nd Quarter 2015					
TLD	Reported	Delivered	Bias	Pass/Fail		TLD	Reported	Delivered	Bias	Pass/Fail	
Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail	Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail
102480	75.35	70.21	7.32	<+/-15%	Pass	102723	18.37	21.52	-14.64	<+/-15%	Pass
102376	72.44	70.21	3.18	<+/-15%	Pass	103394	19.49	21.52	-9.43	<+/-15%	Pass
102444	73.21	70.21	4.27	<+/-15%	Pass	103058	19.49	21.52	-9.43	<+/-15%	Pass
103070	78.11	70.21	11.25	<+/-15%	Pass	103120	19.83	21.52	-7.85	<+/-15%	Pass
102008	77.96	70.21	11.04	<+/-15%	Pass	103419	19.34	21.52	-10.13	<+/-15%	Pass
Average Bias (B)			7.41			Average Bias (B)			-10.30		
Standard Deviation (S)			3.73			Standard Deviation (S)			2.57		
Measure Performance  B +S			11.14	<15%	Pass	Measure Performance  B +S			12.86	<15%	Pass
3rd Quarter 2015						4th Quarter 2015					
TLD	Reported	Delivered	Bias	Pass/Fail		TLD	Reported	Delivered	Bias	Pass/Fail	
Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail	Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail
103243	20.29	18.7	8.68	<+/-15%	Pass	102869	72.88	66.9	8.91	<+/-15%	Pass
103294	20.64	18.7	10.55	<+/-15%	Pass	102239	71.35	66.9	6.62	<+/-15%	Pass
100502	19.30	18.7	3.37	<+/-15%	Pass	101338	72.24	66.9	7.95	<+/-15%	Pass
100025	19.51	18.7	4.50	<+/-15%	Pass	100372	69.80	66.9	4.30	<+/-15%	Pass
102816	21.91	18.7	17.35	<+/-15%	Fail	100357	70.90	66.9	5.95	<+/-15%	Pass
Average Bias (B)			8.89			Average Bias (B)			6.75		
Standard Deviation (S)			5.57			Standard Deviation (S)			1.78		
Measure Performance  B +S			14.46	<15%	Pass	Measure Performance  B +S			8.53	<15%	Pass

Fail - refer to NCR # 02012855

# TABLE 5.0-D (Cont.)

## Internal Crosscheck (Duke Energy)

Radiation Dosimetry and Records participates in a quarterly TLD intracomparison 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.

1st Quarter 2015						2nd Quarter 2015					
TLD	Reported	Delivered	Bias	Pass/Fail		TLD	Reported	Delivered	Bias	Pass/Fail	
Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail	Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail
103012	30.82	30.0	2.73	<+/-15%	Pass	100193	22.07	21.8	1.24	<+/-15%	Pass
103524	31.64	30.0	5.47	<+/-15%	Pass	101191	21.06	21.8	-3.39	<+/-15%	Pass
102769	32.31	30.0	7.70	<+/-15%	Pass	101201	21.74	21.8	-0.28	<+/-15%	Pass
103754	31.29	30.0	4.30	<+/-15%	Pass	100158	21.94	21.8	0.64	<+/-15%	Pass
102798	30.86	30.0	2.87	<+/-15%	Pass	101319	21.99	21.8	0.87	<+/-15%	Pass
103737	31.50	30.0	5.00	<+/-15%	Pass	101183	22.46	21.8	3.03	<+/-15%	Pass
102985	32.05	30.0	6.83	<+/-15%	Pass	101330	21.40	21.8	-1.83	<+/-15%	Pass
102108	29.99	30.0	-0.03	<+/-15%	Pass	100351	22.36	21.8	2.57	<+/-15%	Pass
102867	31.00	30.0	3.33	<+/-15%	Pass	101038	22.36	21.8	2.57	<+/-15%	Pass
103500	31.61	30.0	5.37	<+/-15%	Pass		22.49	21.8	3.17	<+/-15%	Pass
Average Bias (B)			4.36			Average Bias (B)			0.86		
Standard Deviation (S)			2.24			Standard Deviation (S)			2.18		
Measure Performance  B +S			6.60	<15%	Pass	Measure Performance  B +S			3.04	<15%	Pass
3rd Quarter 2015						4th Quarter 2015					
TLD	Reported	Delivered	Bias	Pass/Fail		TLD	Reported	Delivered	Bias	Pass/Fail	
Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail	Number	(mR)	(mR)	(% diff)	Criteria	Pass/Fail
103703	48.64	43.6	11.56	<+/-15%	Pass	100057	55.76	54.5	2.31	<+/-15%	Pass
102917	46.91	43.6	7.59	<+/-15%	Pass	103022	62.04	54.5	13.83	<+/-15%	Pass
100170	44.30	43.6	1.61	<+/-15%	Pass	103254	55.74	54.5	2.28	<+/-15%	Pass
102841	46.18	43.6	5.92	<+/-15%	Pass	100154	60.56	54.5	11.12	<+/-15%	Pass
101149	43.63	43.6	0.07	<+/-15%	Pass	103256	55.71	54.5	2.22	<+/-15%	Pass
102474	44.87	43.6	2.91	<+/-15%	Pass	101225	58.10	54.5	6.61	<+/-15%	Pass
100522	46.11	43.6	5.76	<+/-15%	Pass	100799	59.79	54.5	9.71	<+/-15%	Pass
103016	48.70	43.6	11.70	<+/-15%	Pass	100417	61.06	54.5	12.04	<+/-15%	Pass
100095	46.11	43.6	5.76	<+/-15%	Pass	103683	57.37	54.5	5.27	<+/-15%	Pass
100381	42.87	43.6	-1.67	<+/-15%	Pass	102114	55.74	54.5	2.28	<+/-15%	Pass
Average Bias (B)			5.12			Average Bias (B)			6.77		
Standard Deviation (S)			4.49			Standard Deviation (S)			4.58		
Measure Performance  B +S			9.61	<15%	Pass	Measure Performance  B +S			11.34	<15%	Pass

# TABLE 5.0-E

## 2015 ANNUAL QUALITY ASSURANCE REPORT

### for the RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

#### for GEL Laboratories, LLC (GEL)

Sample	Nuclide	Quarter	Units	GEL Value	Known Value	Acceptance Range/Ratio	Evaluation
<b>HDT in Soil</b>	Fe-55	2 <sup>nd</sup>	Bq/Kg	330	205	Sens. Eval.	Agreement
MAPEP-15-MaS32							Agreement
(2Q 2015)		4 <sup>th</sup>	Bq/kg	557	555	389 - 722	Agreement
<b>MAPEP-15-MaS33</b>	Sr-90	2 <sup>nd</sup>	Bq/Kg	601.00	653	457 - 849	Agreement
(4Q 2015)		4 <sup>th</sup>	Bq/kg	403	425	298 - 553	Agreement
<b>Gamma in Soil</b>	Am-241	2 <sup>nd</sup>	Bq/Kg	97.0	68.0	68 - 126	Agreement
		4 <sup>th</sup>	Bq/Kg	61.7	49.5	34.7 - 64.4	Warning
	Co-57	2 <sup>nd</sup>	Bq/Kg	0.369	---	False Pos Test	Agreement
		4 <sup>th</sup>	Bq/Kg	1240.0	1180	826 - 1534	Agreement
MAPEP-15-MaS32	Cs-134	2 <sup>nd</sup>	Bq/Kg	639	678	475 - 881	Agreement
(2Q 2015)		4 <sup>th</sup>	Bq/Kg	933	1010	707 - 1313	Agreement
	Cs-137	2 <sup>nd</sup>	Bq/Kg	-0.279	---	False Pos Test	Agreement
		4 <sup>th</sup>	Bq/Kg	861.00	809	566 - 1052	Agreement
	Mn-54	2 <sup>nd</sup>	Bq/Kg	1280	1198	839 - 1557	Agreement
MAPEP-15-MaS33		4 <sup>th</sup>	Bq/Kg	1450	1340	938 - 1742	Agreement
(4Q 2015)	Zn-65	2 <sup>nd</sup>	Bq/Kg	1190.0	1064	745 - 1383	Agreement
		4 <sup>th</sup>	Bq/Kg	761.0	662	463 - 861	Agreement
	Co-60	2 <sup>nd</sup>	Bq/Kg	852	817	572 - 1062	Agreement
		4 <sup>th</sup>	Bq/Kg	2.45	1.30	Sens. Eval.	Agreement
	K-40	2 <sup>nd</sup>	Bq/Kg	684	622	435 - 809	Agreement
		4 <sup>th</sup>	Bq/Kg	687	599	419 - 779	Agreement

Note: \* HTD refers to Hard-to-detect radionuclides



## TABLE 5.0-E (Cont.)

Sample	Nuclide	Quarter	Units	GEL Value	Known Value	Acceptance Range/Ratio	Evaluation		
Gamma in Water	Ce-141	4 <sup>th</sup>	pCi/L	302	284	1.06	Agreement		
		1 <sup>st</sup>	pCi/L	140	139	1.01	Agreement		
EZA 4Q 2014 E11060		2 <sup>nd</sup>	pCi/L	1.24E-01	Not Pres.	---	Agreement		
		3 <sup>rd</sup>	pCi/L	205	199	1.03	Agreement		
		4 <sup>th</sup>	pCi/L	127	112	1.14	Agreement		
		Cr-51	4 <sup>th</sup>	pCi/L	543	526	1.03	Agreement	
1 <sup>st</sup>	pCi/L		395	366	1.08	Agreement			
2 <sup>nd</sup>	pCi/L		347	293	1.18	Agreement			
3 <sup>rd</sup>	pCi/L		542	502	1.08	Agreement			
EZA 1Q 2015 E11177	Cs-134	4 <sup>th</sup>	pCi/L	260	244	1.07	Agreement		
		4 <sup>th</sup>	pCi/L	190	213	0.89	Agreement		
		1 <sup>st</sup>	pCi/L	112	126	0.89	Agreement		
		2 <sup>nd</sup>	pCi/L	163	173	0.94	Agreement		
		3 <sup>rd</sup>	pCi/L	175	198	0.89	Agreement		
		4 <sup>th</sup>	pCi/L	125	139	0.90	Agreement		
		Cs-137	4 <sup>th</sup>	pCi/L	258	257	1.01	Agreement	
			1 <sup>st</sup>	pCi/L	169	167	1.01	Agreement	
EZA 2Q 2015 E11219		2 <sup>nd</sup>	pCi/L	134	133	1.01	Agreement		
		3 <sup>rd</sup>	pCi/L	240	238	1.01	Agreement		
		4 <sup>th</sup>	pCi/L	112	99.5	1.13	Agreement		
		Co-58	4 <sup>th</sup>	pCi/L	173	168	1.03	Agreement	
1 <sup>st</sup>	pCi/L		178	180	0.99	Agreement			
2 <sup>nd</sup>	pCi/L		72.1	72.6	0.99	Agreement			
3 <sup>rd</sup>	pCi/L		245	246	1.00	Agreement			
		4 <sup>th</sup>	pCi/L	97.3	95.6	1.02	Agreement		
		EZA 3Q 2015 E11313	Mn-54	4 <sup>th</sup>	pCi/L	306	292	1.05	Agreement
				1 <sup>st</sup>	pCi/L	166	159	1.05	Agreement
				2 <sup>nd</sup>	pCi/L	117	107	1.10	Agreement
3 <sup>rd</sup>	pCi/L			288	271	1.06	Agreement		
		4 <sup>th</sup>	pCi/L	141	126	1.12	Agreement		
		Fe-59	4 <sup>th</sup>	pCi/L	251	226	1.11	Agreement	
			1 <sup>st</sup>	pCi/L	214	195	1.10	Agreement	
			2 <sup>nd</sup>	pCi/L	176	161	1.09	Agreement	
3 <sup>rd</sup>	pCi/L		231	211	1.10	Agreement			
		4 <sup>th</sup>	pCi/L	111	93.4	1.19	Agreement		
		EZA 4Q 2015 E11415	Zn-65	4 <sup>th</sup>	pCi/L	420	384	1.09	Agreement
				1 <sup>st</sup>	pCi/L	325	299	1.09	Agreement
				2 <sup>nd</sup>	pCi/L	285	264	1.08	Agreement
3 <sup>rd</sup>	pCi/L			375	330	1.14	Agreement		
		4 <sup>th</sup>	pCi/L	243	215	1.13	Agreement		
		Co-60	4 <sup>th</sup>	pCi/L	324	304	1.06	Agreement	
			1 <sup>st</sup>	pCi/L	323	328	0.98	Agreement	
			2 <sup>nd</sup>	pCi/L	210	205	1.03	Agreement	
3 <sup>rd</sup>	pCi/L		311	308	1.01	Agreement			
		4 <sup>th</sup>	pCi/L	192	185	1.04	Agreement		

## TABLE 5.0-E (Cont.)

Sample	Nuclide	Quarter	Units	GEL Value	Known Value	Acceptance Range/Ratio	Evaluation
<b>Tritium in Water</b>							
MAPEP-15-GrW32 (2Q 2015)	H-3	2 <sup>nd</sup>	Bq/L	633	563	394 - 732	Agreement
MAPEP-15-M aW33 (4Q 2015)	H-3	4 <sup>th</sup>	Bq/L	212	216	151 - 281	Agreement
<b>I-131 in Water with EZA</b>							
4Q 2014 E11060	I-131	4 <sup>th</sup>	pCi/L	111	95.3	1.16	Agreement
1Q 2015 E11177	I-131	1 <sup>st</sup>	pCi/L	99.2	96.7	1.03	Agreement
2Q 2015 E11219	I-131	2 <sup>nd</sup>	pCi/L	95.3	93.4	1.02	Agreement
3Q 2015 E11313	I-131	3 <sup>rd</sup>	pCi/L	100	96.7	1.03	Agreement
4Q 2015 E11415	I-131	4 <sup>th</sup>	pCi/L	105	92.6	1.13	Agreement

Other GEL 2015 Annual Environmental Quality Assurance Report results will be supplied upon request.

**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 procedure during 2015.

### 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-weighed 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 quarterly 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**

Gross beta analysis of air particulate filters using an un-attenuated (single point) filter specific calibration in a flat bottom planchet was implemented from second quarter 2015 forward (NCR # 01938255).

REMP air sampling heads and air particulate media were changed to standardize the vendors, sampling head, and filter size across the REMP nuclear fleet (NCR # 00726335).

### **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 from 7/8 – 7/9/2015. Results are shown in Table 3.11. No changes were made to the sampling procedures during 2015 as a result of the 2015 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 2015

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 312	See Table 2.2-C	1.97E-2 (260/260) 3.86E-3 – 4.64E-2	208 (0.45 mi S)	2.06E-2 (52/52) 3.91E-3 – 4.64E-2	258 (9.84 mi W) 1.80E-2 (52/52) 4.86E-3 – 3.16E-2	0
	Gamma 24	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
Air Radioiodine (pCi/m <sup>3</sup> )	Gamma 312	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
Drinking Water (pCi/l)	Gross Beta 26	4	2.48 (12/13) 1.18 – 4.65	214 (7.30 mi SSE)	2.48 (12/13) 1.18 – 4.65	218 (13.5 mi NNE) 2.07 (12/13) 1.34 – 2.85	0
	Gamma 26	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
	Tritium 8	2000	570 (4/4) 499 - 672	214 (7.30 mi SSE)	570 (4/4) 499 - 672	218 (13.5 mi NNE) 570 (3/4) 432 – 754	0
Surface Water (pCi/l)	Gamma 39 Co-58	See Table 2.2-C	11.5 (1/26) 11.5 – 11.5	208 (0.45 mi S)	11.5 (1/13) 11.5 – 11.5	All less than LLD	0
	Co-60	See Table 2.2-C	1.07 (1/26) 1.07 – 1.07	208 (0.45 mi S)	1.07 (1/13) 1.07 – 1.07	All less than LLD	0
	Tritium 12	2000	2570 (8/8) 440 - 6160	208 (0.45 mi S)	4608 (4/4) 3430 - 6160	215 (4.21 mi NNE) 414 (4/4) 247 – 499	0

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

Catawba Nuclear Station  
York County, South Carolina

Docket Numbers 50-413, 414  
Calendar Year 2015

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>		
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
Broadleaf Vegetation (pCi/kg, wet)	Gamma 60 Cs-137	See Table 2.2-C	42.9 (2/48) 37.4 – 48.3	201 (0.53 mi NE)	42.9 (2/12) 37.4 – 48.3	All less than LLD	0
Food Products (pCi/kg, wet)	Gamma 11	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 Co-58	See Table 2.2-C	67.3 (1/4) 67.3 – 67.3	208 (0.45 mi S)	67.3 (1/2) 67.3 – 67.3	All less than LLD	0
	Co-60	See Table 2.2-C	161 (2/4) 86.5 – 236	208 (0.45 mi S)	161 (2/2) 86.5 - 236	All less than LLD	0
	Cs-137	See Table 2.2-C	8.75 (1/4) 8.75 – 8.75	208 (0.45 mi S)	8.75 (1/2) 8.75 – 8.75	215 (4.21 mi NNE) 20.5 (1/2) 20.5 – 20.5	0

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

Catawba Nuclear Station  
York County, South Carolina

Docket Numbers 50-413, 414  
Calendar Year 2015

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>		
TLD (mR per quarter) <sup>(5)</sup>	TLD Readout 160 <sup>(4)</sup>	-----	19.1 (149/149) 10.7 – 30.1	237 (4.75 mi SSE)	24.6 (4/4) 21.1 – 30.1	217 (10.3 mi SSE) 247 (7.33 mi ESE) 251 (9.72 mi WNW)  15.8 (11/11) 10.3 – 22.6	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 3.10 (Direct Gamma Radiation) are reported in mrem /yr ( $n * 0.95$ ).

**APPENDIX C**

**SAMPLING DEVIATIONS  
&  
UNAVAILABLE ANALYSES**

# APPENDIX C

## CATAWBA NUCLEAR STATION SAMPLING DEVIATIONS & UNAVAILABLE ANALYSES

DEVIATION & UNAVAILABLE REASON CODES			
BF	Blown Fuse	PS	Pump out of service / Undergoing Repair
FZ	Sample Frozen	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
PM	Preventive Maintenance	CN	Construction
PO	Power Outage		

### 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 air samplers operated for a total of 99.9% availability in 2015.

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
201	7/7/15 – 7/14/15	PI	3.22 hours downtime due to severe thunderstorm.	NCR # 01936502
208	7/7/15 – 7/14/15	PI	0.52 hours downtime due to severe thunderstorm.	NCR # 01936887
200	7/28/15 – 8/4/15	PI	1.07 hours downtime due to severe thunderstorm.	NCR # 01941746
201	7/28/15 – 8/4/15	PI	1.09 hours downtime due to severe thunderstorm.	NCR # 01941757
208	7/28/15 – 8/4/15	PO	22.3 hours downtime due to severe thunderstorm.	NCR # 01941766
261	7/28/15 – 8/4/15	PI	1.10 hours downtime due to severe thunderstorm.	NCR # 01941768

#### Drinking 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 99.7% availability in 2015.

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
214	8/18/15 – 9/15/15	OT	120 hours downtime due to ISCO sampling program interruption during preventive maintenance task. Site services preventive maintenance instructions were updated to indicate ISCO sampling programs are not to be interrupted during normal operation to prevent recurrence.	NCR # 01959421 NCR # 01960301

## C.2 UNAVAILABLE ANALYSES

### Food Products / Crops

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
260	4/7/15	SU	Seasonally unavailable – field plowed in preparation for planting. No sample available at time of collection.	NCR # 01903351

### TLD

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
245	12/18/14 – 3/19/15	CN	TLD missing due to construction.	NCR # 01903223
249	6/18/15 – 9/17/15	OT	TLD found on ground damaged/unusable.	NCR # 01956349
201	9/17/15 – 12/17/15	VN	TLD found on ground damaged/unusable.	NCR # 01969275
217	9/17/15 – 12/17/15	CN	TLD missing due to construction.	NCR # 01985660



# **APPENDIX D**

## **ANALYTICAL DEVIATIONS**

No Analytical deviations were incurred for the  
2015 Radiological Environmental Monitoring Program

**APPENDIX E**

**RADIOLOGICAL  
ENVIRONMENTAL MONITORING  
PROGRAM RESULTS**

**2015**

This appendix includes sample analysis report summaries and supportive data generated from each sample medium for 2015.

# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
364886	12/30/2014 - 1/6/2015	Beta	2.33E-02	2.86E-03	2.72E-03
365066	1/6/2015 - 1/13/2015	Beta	2.27E-02	2.92E-03	2.92E-03
365298	1/13/2015 - 1/20/2015	Beta	1.77E-02	2.50E-03	2.38E-03
366654	1/20/2015 - 1/27/2015	Beta	1.40E-02	2.35E-03	2.55E-03
367060	1/27/2015 - 2/3/2015	Beta	1.20E-02	2.29E-03	2.67E-03
367545	2/3/2015 - 2/10/2015	Beta	1.98E-02	2.74E-03	2.79E-03
368972	2/10/2015 - 2/16/2015	Beta	1.67E-02	2.88E-03	3.26E-03
369695	2/16/2015 - 2/23/2015	Beta	3.11E-02	3.14E-03	2.60E-03
370601	2/23/2015 - 3/3/2015	Beta	2.51E-02	2.65E-03	2.14E-03
371540	3/3/2015 - 3/10/2015	Beta	2.00E-02	2.73E-03	2.72E-03
371912	3/10/2015 - 3/17/2015	Beta	1.50E-02	2.37E-03	2.40E-03
372406	3/17/2015 - 3/24/2015	Beta	1.67E-02	2.51E-03	2.58E-03
373828	3/24/2015 - 3/31/2015	Beta	1.76E-02	2.63E-03	2.82E-03
373834	12/30/2014 - 3/31/2015	Cs-134	<5.63E-04	0.00E+00	5.63E-04
		Cs-137	<6.17E-04	0.00E+00	6.17E-04
		Be-7	1.42E-01	2.17E-02	1.07E-02
		K-40	<1.11E-02	0.00E+00	1.11E-02
374557	3/31/2015 - 4/7/2015	Beta	1.58E-02	2.61E-03	2.94E-03
374934	4/7/2015 - 4/14/2015	Beta	1.74E-02	2.63E-03	2.80E-03
375625	4/14/2015 - 4/21/2015	Beta	7.05E-03	2.13E-03	2.94E-03
376829	4/21/2015 - 4/28/2015	Beta	1.59E-02	2.60E-03	2.95E-03
377491	4/28/2015 - 5/5/2015	Beta	1.50E-02	2.44E-03	2.63E-03
378055	5/5/2015 - 5/12/2015	Beta	2.08E-02	2.85E-03	2.94E-03
378455	5/12/2015 - 5/19/2015	Beta	2.02E-02	2.79E-03	2.86E-03
378951	5/19/2015 - 5/27/2015	Beta	1.73E-02	2.41E-03	2.47E-03
379457	5/27/2015 - 6/2/2015	Beta	1.17E-02	2.67E-03	3.37E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
380181	6/2/2015 - 6/9/2015	Beta	1.13E-02	2.34E-03	2.85E-03
380469	6/9/2015 - 6/16/2015	Beta	2.00E-02	2.75E-03	2.84E-03
380801	6/16/2015 - 6/23/2015	Beta	2.09E-02	2.89E-03	3.06E-03
381243	6/23/2015 - 6/30/2015	Beta	2.09E-02	2.81E-03	2.82E-03
381249	3/31/2015 - 6/30/2015	Cs-134	<7.03E-04	0.00E+00	7.03E-04
		Cs-137	<4.74E-04	0.00E+00	4.75E-04
		Be-7	1.40E-01	2.28E-02	1.17E-02
		K-40	<1.29E-02	0.00E+00	1.29E-02
381598	6/30/2015 - 7/7/2015	Beta	1.90E-02	2.71E-03	2.79E-03
382161	7/7/2015 - 7/14/2015	Beta	2.68E-02	3.06E-03	2.81E-03
382587	7/14/2015 - 7/21/2015	Beta	1.68E-02	2.59E-03	2.77E-03
383517	7/21/2015 - 7/28/2015	Beta	1.96E-02	2.64E-03	2.52E-03
384092	7/28/2015 - 8/4/2015	Beta	2.16E-02	2.87E-03	2.90E-03
384639	8/4/2015 - 8/11/2015	Beta	1.90E-02	2.71E-03	2.78E-03
385407	8/11/2015 - 8/18/2015	Beta	2.26E-02	2.82E-03	2.66E-03
385926	8/18/2015 - 8/25/2015	Beta	1.36E-02	2.48E-03	2.89E-03
386824	8/25/2015 - 9/1/2015	Beta	2.63E-02	2.93E-03	2.62E-03
387413	9/1/2015 - 9/9/2015	Beta	2.84E-02	2.90E-03	2.50E-03
388741	9/9/2015 - 9/15/2015	Beta	1.68E-02	2.82E-03	3.10E-03
389406	9/15/2015 - 9/22/2015	Beta	2.59E-02	3.01E-03	2.75E-03
390010	9/22/2015 - 9/29/2015	Beta	1.02E-02	2.20E-03	2.66E-03
390625	6/30/2015 - 9/29/2015	Cs-134	<3.46E-04	0.00E+00	3.46E-04
		Cs-137	<4.85E-04	0.00E+00	4.85E-04
		Be-7	1.27E-01	2.08E-02	1.09E-02
		K-40	7.09E-03	5.03E-03	5.84E-03
390619	9/29/2015 - 10/6/2015	Beta	3.91E-03	1.83E-03	2.75E-03
391928	10/6/2015 - 10/13/2015	Beta	1.87E-02	2.64E-03	2.62E-03
392228	10/13/2015 - 10/20/2015	Beta	2.20E-02	2.83E-03	2.75E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
393430	10/20/2015 - 10/27/2015	Beta	2.62E-02	3.12E-03	3.05E-03
393833	10/27/2015 - 11/3/2015	Beta	1.84E-02	2.60E-03	2.57E-03
394833	11/3/2015 - 11/10/2015	Beta	1.23E-02	2.36E-03	2.78E-03
395301	11/10/2015 - 11/17/2015	Beta	2.18E-02	2.82E-03	2.71E-03
395629	11/17/2015 - 11/24/2015	Beta	1.99E-02	2.78E-03	2.89E-03
396127	11/24/2015 - 12/1/2015	Beta	1.63E-02	2.62E-03	2.93E-03
396635	12/1/2015 - 12/8/2015	Beta	3.32E-02	3.28E-03	2.65E-03
397172	12/8/2015 - 12/15/2015	Beta	2.86E-02	3.13E-03	2.77E-03
397894	12/15/2015 - 12/22/2015	Beta	1.93E-02	2.72E-03	2.77E-03
398288	12/22/2015 - 12/29/2015	Beta	5.27E-03	1.88E-03	2.67E-03
398672	9/29/2015 - 12/29/2015	Cs-134	<6.32E-04	0.00E+00	6.32E-04
		Cs-137	<5.82E-04	0.00E+00	5.82E-04
		Be-7	1.15E-01	2.11E-02	1.16E-02
		K-40	1.04E-02	7.20E-03	9.48E-03

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	LLD
364887	12/30/2014 - 1/6/2015	Beta	2.71E-02	3.03E-03	2.74E-03
365067	1/6/2015 - 1/13/2015	Beta	2.56E-02	3.04E-03	2.91E-03
365299	1/13/2015 - 1/20/2015	Beta	2.12E-02	2.68E-03	2.38E-03
366655	1/20/2015 - 1/27/2015	Beta	1.64E-02	2.48E-03	2.56E-03
367061	1/27/2015 - 2/3/2015	Beta	1.51E-02	2.46E-03	2.67E-03
367546	2/3/2015 - 2/10/2015	Beta	2.09E-02	2.79E-03	2.78E-03
368973	2/10/2015 - 2/16/2015	Beta	1.78E-02	2.93E-03	3.26E-03
369696	2/16/2015 - 2/23/2015	Beta	3.36E-02	3.23E-03	2.60E-03
370602	2/23/2015 - 3/3/2015	Beta	2.43E-02	2.61E-03	2.14E-03
371541	3/3/2015 - 3/10/2015	Beta	2.04E-02	2.75E-03	2.72E-03
371913	3/10/2015 - 3/17/2015	Beta	1.42E-02	2.33E-03	2.40E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
372407	3/17/2015 - 3/24/2015	Beta	1.90E-02	2.62E-03	2.58E-03
373829	3/24/2015 - 3/31/2015	Beta	1.73E-02	2.63E-03	2.84E-03
373835	12/30/2014 - 3/31/2015	Cs-134	<5.22E-04	0.00E+00	5.22E-04
		Cs-137	<4.60E-04	0.00E+00	4.60E-04
		Be-7	1.66E-01	2.44E-02	1.04E-02
		K-40	<1.14E-02	0.00E+00	1.14E-02
374558	3/31/2015 - 4/7/2015	Beta	1.75E-02	2.69E-03	2.92E-03
374935	4/7/2015 - 4/14/2015	Beta	1.91E-02	2.71E-03	2.79E-03
375626	4/14/2015 - 4/21/2015	Beta	7.22E-03	2.14E-03	2.95E-03
376830	4/21/2015 - 4/28/2015	Beta	1.58E-02	2.60E-03	2.95E-03
377492	4/28/2015 - 5/5/2015	Beta	1.45E-02	2.42E-03	2.65E-03
378056	5/5/2015 - 5/12/2015	Beta	2.40E-02	2.98E-03	2.92E-03
378456	5/12/2015 - 5/19/2015	Beta	2.30E-02	2.92E-03	2.86E-03
378952	5/19/2015 - 5/27/2015	Beta	1.80E-02	2.45E-03	2.48E-03
379458	5/27/2015 - 6/2/2015	Beta	1.30E-02	2.73E-03	3.35E-03
380182	6/2/2015 - 6/9/2015	Beta	1.39E-02	2.47E-03	2.84E-03
380470	6/9/2015 - 6/16/2015	Beta	2.44E-02	2.96E-03	2.86E-03
380802	6/16/2015 - 6/23/2015	Beta	1.64E-02	2.68E-03	3.05E-03
381244	6/23/2015 - 6/30/2015	Beta	2.07E-02	2.78E-03	2.81E-03
381250	3/31/2015 - 6/30/2015	Cs-134	<5.22E-04	0.00E+00	5.22E-04
		Cs-137	<4.60E-04	0.00E+00	4.60E-04
		Be-7	1.61E-01	2.38E-02	9.57E-03
		K-40	<1.42E-02	0.00E+00	1.42E-02
381599	6/30/2015 - 7/7/2015	Beta	1.83E-02	2.68E-03	2.79E-03
382162	7/7/2015 - 7/14/2015	Beta	2.26E-02	2.91E-03	2.87E-03
382588	7/14/2015 - 7/21/2015	Beta	1.60E-02	2.56E-03	2.78E-03
383518	7/21/2015 - 7/28/2015	Beta	2.32E-02	2.81E-03	2.52E-03
384093	7/28/2015 - 8/4/2015	Beta	2.46E-02	3.00E-03	2.90E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
384640	8/4/2015 - 8/11/2015	Beta	2.13E-02	2.81E-03	2.77E-03
385408	8/11/2015 - 8/18/2015	Beta	2.57E-02	2.96E-03	2.67E-03
385927	8/18/2015 - 8/25/2015	Beta	1.58E-02	2.58E-03	2.88E-03
386825	8/25/2015 - 9/1/2015	Beta	2.75E-02	3.08E-03	2.76E-03
387414	9/1/2015 - 9/9/2015	Beta	3.33E-02	3.09E-03	2.50E-03
388742	9/9/2015 - 9/15/2015	Beta	1.95E-02	2.97E-03	3.11E-03
389407	9/15/2015 - 9/22/2015	Beta	2.73E-02	3.06E-03	2.75E-03
390011	9/22/2015 - 9/29/2015	Beta	1.03E-02	2.20E-03	2.65E-03
390626	6/30/2015 - 9/29/2015	Cs-134	<4.88E-04	0.00E+00	4.88E-04
		Cs-137	<5.42E-04	0.00E+00	5.42E-04
		Be-7	1.49E-01	2.46E-02	1.38E-02
		K-40	<1.20E-02	0.00E+00	1.20E-02
390620	9/29/2015 - 10/6/2015	Beta	5.53E-03	1.94E-03	2.75E-03
391929	10/6/2015 - 10/13/2015	Beta	1.98E-02	2.69E-03	2.63E-03
392229	10/13/2015 - 10/20/2015	Beta	2.73E-02	3.06E-03	2.75E-03
393431	10/20/2015 - 10/27/2015	Beta	2.89E-02	3.23E-03	3.05E-03
393834	10/27/2015 - 11/3/2015	Beta	1.98E-02	2.67E-03	2.57E-03
394834	11/3/2015 - 11/10/2015	Beta	1.48E-02	2.59E-03	2.93E-03
395302	11/10/2015 - 11/17/2015	Beta	2.23E-02	2.85E-03	2.71E-03
395630	11/17/2015 - 11/24/2015	Beta	1.82E-02	2.70E-03	2.89E-03
396128	11/24/2015 - 12/1/2015	Beta	1.92E-02	2.77E-03	2.93E-03
396636	12/1/2015 - 12/8/2015	Beta	2.99E-02	3.11E-03	2.61E-03
397173	12/8/2015 - 12/15/2015	Beta	3.04E-02	3.19E-03	2.75E-03
397895	12/15/2015 - 12/22/2015	Beta	2.03E-02	2.77E-03	2.77E-03
398289	12/22/2015 - 12/29/2015	Beta	6.31E-03	1.95E-03	2.67E-03
398673	9/29/2015 - 12/29/2015	Cs-134	<5.73E-04	0.00E+00	5.73E-04
		Cs-137	<2.75E-04	0.00E+00	2.75E-04



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
398673	9/29/2015 - 12/29/2015	Be-7	1.17E-01	2.07E-02	1.18E-02
		K-40	<1.05E-02	0.00E+00	1.05E-02

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
364888	12/30/2014 - 1/6/2015	Beta	2.56E-02	2.96E-03	2.73E-03
365068	1/6/2015 - 1/13/2015	Beta	2.49E-02	3.01E-03	2.91E-03
365300	1/13/2015 - 1/20/2015	Beta	1.91E-02	2.57E-03	2.38E-03
366656	1/20/2015 - 1/27/2015	Beta	1.71E-02	2.52E-03	2.56E-03
367062	1/27/2015 - 2/3/2015	Beta	1.29E-02	2.35E-03	2.67E-03
367547	2/3/2015 - 2/10/2015	Beta	2.33E-02	2.91E-03	2.78E-03
368974	2/10/2015 - 2/16/2015	Beta	1.91E-02	3.00E-03	3.26E-03
369697	2/16/2015 - 2/23/2015	Beta	3.31E-02	3.21E-03	2.60E-03
370603	2/23/2015 - 3/3/2015	Beta	2.69E-02	2.73E-03	2.14E-03
371542	3/3/2015 - 3/10/2015	Beta	2.09E-02	2.77E-03	2.71E-03
371914	3/10/2015 - 3/17/2015	Beta	1.54E-02	2.39E-03	2.40E-03
372408	3/17/2015 - 3/24/2015	Beta	1.83E-02	2.59E-03	2.58E-03
373830	3/24/2015 - 3/31/2015	Beta	1.78E-02	2.65E-03	2.84E-03
373836	12/30/2014 - 3/31/2015	Cs-134	<3.57E-04	0.00E+00	3.57E-04
		Cs-137	<6.07E-04	0.00E+00	6.07E-04
		Be-7	1.50E-01	2.29E-02	1.08E-02
		K-40	9.96E-03	5.93E-03	6.23E-03
374559	3/31/2015 - 4/7/2015	Beta	1.39E-02	2.51E-03	2.92E-03
374936	4/7/2015 - 4/14/2015	Beta	1.49E-02	2.49E-03	2.79E-03
375627	4/14/2015 - 4/21/2015	Beta	9.57E-03	2.27E-03	2.94E-03
376831	4/21/2015 - 4/28/2015	Beta	1.57E-02	2.60E-03	2.95E-03
377493	4/28/2015 - 5/5/2015	Beta	1.47E-02	2.43E-03	2.64E-03
378057	5/5/2015 - 5/12/2015	Beta	1.90E-02	2.75E-03	2.93E-03
378457	5/12/2015 - 5/19/2015	Beta	1.97E-02	2.77E-03	2.86E-03





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
378953	5/19/2015 - 5/27/2015	Beta	1.71E-02	2.41E-03	2.48E-03
379459	5/27/2015 - 6/2/2015	Beta	1.15E-02	2.65E-03	3.35E-03
380183	6/2/2015 - 6/9/2015	Beta	1.20E-02	2.37E-03	2.85E-03
380471	6/9/2015 - 6/16/2015	Beta	2.33E-02	2.91E-03	2.86E-03
380803	6/16/2015 - 6/23/2015	Beta	2.06E-02	2.88E-03	3.05E-03
381245	6/23/2015 - 6/30/2015	Beta	2.26E-02	2.87E-03	2.81E-03
381251	3/31/2015 - 6/30/2015	Cs-134	<6.26E-04	0.00E+00	6.26E-04
		Cs-137	<5.41E-04	0.00E+00	5.41E-04
		Be-7	1.40E-01	2.33E-02	1.44E-02
		K-40	<1.14E-02	0.00E+00	1.14E-02
381600	6/30/2015 - 7/7/2015	Beta	1.95E-02	2.74E-03	2.79E-03
382163	7/7/2015 - 7/14/2015	Beta	2.66E-02	3.05E-03	2.81E-03
382589	7/14/2015 - 7/21/2015	Beta	1.97E-02	2.74E-03	2.78E-03
383519	7/21/2015 - 7/28/2015	Beta	2.57E-02	2.92E-03	2.52E-03
384094	7/28/2015 - 8/3/2015	Beta	4.64E-02	6.43E-03	6.64E-03
384641	8/4/2015 - 8/11/2015	Beta	2.20E-02	2.85E-03	2.77E-03
385409	8/11/2015 - 8/18/2015	Beta	2.23E-02	2.81E-03	2.67E-03
385928	8/18/2015 - 8/25/2015	Beta	1.45E-02	2.51E-03	2.88E-03
386826	8/25/2015 - 9/1/2015	Beta	2.72E-02	3.06E-03	2.76E-03
387415	9/1/2015 - 9/9/2015	Beta	3.06E-02	2.99E-03	2.50E-03
388743	9/9/2015 - 9/15/2015	Beta	1.90E-02	2.94E-03	3.11E-03
389408	9/15/2015 - 9/22/2015	Beta	2.83E-02	3.11E-03	2.75E-03
390012	9/22/2015 - 9/29/2015	Beta	1.02E-02	2.20E-03	2.65E-03
390627	6/30/2015 - 9/29/2015	Cs-134	<5.94E-04	0.00E+00	5.94E-04
		Cs-137	<5.09E-04	0.00E+00	5.09E-04
		Be-7	1.60E-01	2.42E-02	9.57E-03
		K-40	1.06E-02	6.43E-03	7.27E-03
390621	9/29/2015 - 10/6/2015	Beta	3.91E-03	1.83E-03	2.75E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
391930	10/6/2015 - 10/13/2015	Beta	2.24E-02	2.82E-03	2.63E-03
392230	10/13/2015 - 10/20/2015	Beta	2.88E-02	3.12E-03	2.75E-03
393432	10/20/2015 - 10/27/2015	Beta	3.08E-02	3.25E-03	2.97E-03
393835	10/27/2015 - 11/3/2015	Beta	2.04E-02	2.66E-03	2.51E-03
394835	11/3/2015 - 11/10/2015	Beta	1.28E-02	2.40E-03	2.79E-03
395303	11/10/2015 - 11/17/2015	Beta	2.09E-02	2.78E-03	2.70E-03
395631	11/17/2015 - 11/24/2015	Beta	2.10E-02	2.83E-03	2.89E-03
396129	11/24/2015 - 12/1/2015	Beta	1.65E-02	2.64E-03	2.93E-03
396637	12/1/2015 - 12/8/2015	Beta	3.35E-02	3.30E-03	2.68E-03
397174	12/8/2015 - 12/15/2015	Beta	3.34E-02	3.31E-03	2.75E-03
397896	12/15/2015 - 12/22/2015	Beta	2.01E-02	2.76E-03	2.77E-03
398290	12/22/2015 - 12/29/2015	Beta	6.37E-03	1.95E-03	2.67E-03
398674	9/29/2015 - 12/29/2015	Cs-134	<4.63E-04	0.00E+00	4.63E-04
		Cs-137	<4.69E-04	0.00E+00	4.69E-04
		Be-7	1.45E-01	2.36E-02	1.06E-02
		K-40	<1.30E-02	0.00E+00	1.30E-02

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	LLD
364889	12/30/2014 - 1/6/2015	Beta	2.65E-02	2.98E-03	2.70E-03
365069	1/6/2015 - 1/13/2015	Beta	2.24E-02	2.92E-03	2.94E-03
365301	1/13/2015 - 1/20/2015	Beta	1.80E-02	2.52E-03	2.38E-03
366657	1/20/2015 - 1/27/2015	Beta	1.65E-02	2.48E-03	2.55E-03
367063	1/27/2015 - 2/3/2015	Beta	1.40E-02	2.35E-03	2.58E-03
367548	2/3/2015 - 2/10/2015	Beta	2.10E-02	2.82E-03	2.81E-03
368975	2/10/2015 - 2/16/2015	Beta	1.92E-02	3.00E-03	3.26E-03
369698	2/16/2015 - 2/23/2015	Beta	2.82E-02	3.02E-03	2.60E-03
370604	2/23/2015 - 3/3/2015	Beta	2.47E-02	2.62E-03	2.12E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
371543	3/3/2015 - 3/10/2015	Beta	1.87E-02	2.69E-03	2.75E-03
371915	3/10/2015 - 3/17/2015	Beta	1.24E-02	2.23E-03	2.40E-03
372409	3/17/2015 - 3/24/2015	Beta	1.72E-02	2.54E-03	2.58E-03
373831	3/24/2015 - 3/31/2015	Beta	1.55E-02	2.52E-03	2.80E-03
373837	12/30/2014 - 3/31/2015	Cs-134	<5.79E-04	0.00E+00	5.79E-04
		Cs-137	<5.38E-04	0.00E+00	5.38E-04
		Be-7	1.14E-01	2.04E-02	1.62E-02
		K-40	<1.38E-02	0.00E+00	1.38E-02
374560	3/31/2015 - 4/7/2015	Beta	1.60E-02	2.62E-03	2.94E-03
374937	4/7/2015 - 4/14/2015	Beta	1.90E-02	2.71E-03	2.82E-03
375628	4/14/2015 - 4/21/2015	Beta	8.59E-03	2.22E-03	2.94E-03
376832	4/21/2015 - 4/28/2015	Beta	1.28E-02	2.43E-03	2.92E-03
377494	4/28/2015 - 5/5/2015	Beta	1.40E-02	2.39E-03	2.64E-03
378058	5/5/2015 - 5/12/2015	Beta	2.24E-02	2.93E-03	2.96E-03
378458	5/12/2015 - 5/19/2015	Beta	2.02E-02	2.79E-03	2.86E-03
378954	5/19/2015 - 5/27/2015	Beta	1.96E-02	2.50E-03	2.45E-03
379460	5/27/2015 - 6/2/2015	Beta	1.36E-02	2.78E-03	3.38E-03
380184	6/2/2015 - 6/9/2015	Beta	1.38E-02	2.47E-03	2.87E-03
380472	6/9/2015 - 6/16/2015	Beta	2.27E-02	2.86E-03	2.83E-03
380804	6/16/2015 - 6/23/2015	Beta	2.19E-02	2.94E-03	3.05E-03
381246	6/23/2015 - 6/30/2015	Beta	2.15E-02	2.84E-03	2.84E-03
381252	3/31/2015 - 6/30/2015	Cs-134	<6.86E-04	0.00E+00	6.86E-04
		Cs-137	<2.80E-04	0.00E+00	2.80E-04
		Be-7	1.71E-01	2.59E-02	1.07E-02
		K-40	<1.08E-02	0.00E+00	1.08E-02
381601	6/30/2015 - 7/7/2015	Beta	1.70E-02	2.61E-03	2.79E-03
382164	7/7/2015 - 7/14/2015	Beta	2.45E-02	2.96E-03	2.82E-03
382590	7/14/2015 - 7/21/2015	Beta	1.81E-02	2.64E-03	2.74E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
383520	7/21/2015 - 7/28/2015	Beta	2.41E-02	2.87E-03	2.54E-03
384095	7/28/2015 - 8/4/2015	Beta	2.13E-02	2.84E-03	2.88E-03
384642	8/4/2015 - 8/11/2015	Beta	2.09E-02	2.81E-03	2.78E-03
385410	8/11/2015 - 8/18/2015	Beta	2.63E-02	2.97E-03	2.64E-03
385929	8/18/2015 - 8/25/2015	Beta	1.55E-02	2.59E-03	2.92E-03
386827	8/25/2015 - 9/1/2015	Beta	2.46E-02	2.95E-03	2.75E-03
387416	9/1/2015 - 9/9/2015	Beta	2.72E-02	2.86E-03	2.51E-03
388744	9/9/2015 - 9/15/2015	Beta	1.67E-02	2.80E-03	3.09E-03
389409	9/15/2015 - 9/22/2015	Beta	2.60E-02	3.01E-03	2.75E-03
390013	9/22/2015 - 9/29/2015	Beta	9.93E-03	2.19E-03	2.67E-03
390628	6/30/2015 - 9/29/2015	Cs-134	<7.74E-04	0.00E+00	7.74E-04
		Cs-137	<4.60E-04	0.00E+00	4.60E-04
		Be-7	1.44E-01	2.31E-02	1.24E-02
		K-40	<1.29E-02	0.00E+00	1.29E-02
390622	9/29/2015 - 10/6/2015	Beta	3.86E-03	1.82E-03	2.75E-03
391931	10/6/2015 - 10/13/2015	Beta	1.84E-02	2.61E-03	2.60E-03
392231	10/13/2015 - 10/20/2015	Beta	2.47E-02	2.97E-03	2.78E-03
393433	10/20/2015 - 10/27/2015	Beta	2.59E-02	3.10E-03	3.04E-03
393836	10/27/2015 - 11/3/2015	Beta	1.96E-02	2.66E-03	2.56E-03
394836	11/3/2015 - 11/10/2015	Beta	1.24E-02	2.37E-03	2.78E-03
395304	11/10/2015 - 11/17/2015	Beta	2.28E-02	2.88E-03	2.72E-03
395632	11/17/2015 - 11/24/2015	Beta	1.81E-02	2.69E-03	2.89E-03
396130	11/24/2015 - 12/1/2015	Beta	1.84E-02	2.72E-03	2.92E-03
396638	12/1/2015 - 12/8/2015	Beta	2.99E-02	3.12E-03	2.62E-03
397175	12/8/2015 - 12/15/2015	Beta	2.75E-02	3.11E-03	2.81E-03
397897	12/15/2015 - 12/22/2015	Beta	2.01E-02	2.76E-03	2.76E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
398291	12/22/2015 - 12/29/2015	Beta	5.37E-03	1.89E-03	2.67E-03
398675	9/29/2015 - 12/29/2015	Cs-134	<6.90E-04	0.00E+00	6.90E-04
		Cs-137	<5.41E-04	0.00E+00	5.41E-04
		Be-7	1.02E-01	2.05E-02	1.52E-02
		K-40	1.22E-02	6.02E-03	1.94E-03
<b>Sample Point 258 [ CONTROL - W @ 9.84 miles ]</b>					
364890	12/30/2014 - 1/6/2015	Beta	2.29E-02	2.86E-03	2.74E-03
365070	1/6/2015 - 1/13/2015	Beta	2.54E-02	3.02E-03	2.89E-03
365302	1/13/2015 - 1/20/2015	Beta	1.71E-02	2.47E-03	2.38E-03
366658	1/20/2015 - 1/27/2015	Beta	1.37E-02	2.34E-03	2.56E-03
367064	1/27/2015 - 2/3/2015	Beta	1.52E-02	2.47E-03	2.67E-03
367549	2/3/2015 - 2/10/2015	Beta	1.91E-02	2.70E-03	2.77E-03
368976	2/10/2015 - 2/16/2015	Beta	2.06E-02	3.07E-03	3.26E-03
369699	2/16/2015 - 2/23/2015	Beta	2.84E-02	3.04E-03	2.61E-03
370605	2/23/2015 - 3/3/2015	Beta	2.19E-02	2.53E-03	2.15E-03
371544	3/3/2015 - 3/10/2015	Beta	1.74E-02	2.58E-03	2.68E-03
371916	3/10/2015 - 3/17/2015	Beta	1.24E-02	2.23E-03	2.40E-03
372410	3/17/2015 - 3/24/2015	Beta	1.49E-02	2.42E-03	2.58E-03
373832	3/24/2015 - 3/31/2015	Beta	1.71E-02	2.62E-03	2.85E-03
373838	12/30/2014 - 3/31/2015	Cs-134	<6.16E-04	0.00E+00	6.16E-04
		Cs-137	<4.45E-04	0.00E+00	4.45E-04
		Be-7	1.31E-01	2.07E-02	1.02E-02
		K-40	<1.34E-02	0.00E+00	1.34E-02
374561	3/31/2015 - 4/7/2015	Beta	1.28E-02	2.45E-03	2.92E-03
374938	4/7/2015 - 4/14/2015	Beta	1.75E-02	2.62E-03	2.78E-03
375629	4/14/2015 - 4/21/2015	Beta	7.20E-03	2.13E-03	2.94E-03
376833	4/21/2015 - 4/28/2015	Beta	1.41E-02	2.51E-03	2.95E-03
377495	4/28/2015 - 5/5/2015	Beta	1.17E-02	2.28E-03	2.65E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
378059	5/5/2015 - 5/12/2015	Beta	1.84E-02	2.72E-03	2.92E-03
378459	5/12/2015 - 5/19/2015	Beta	2.01E-02	2.78E-03	2.85E-03
378955	5/19/2015 - 5/27/2015	Beta	1.60E-02	2.35E-03	2.48E-03
379461	5/27/2015 - 6/2/2015	Beta	1.16E-02	2.66E-03	3.36E-03
380185	6/2/2015 - 6/9/2015	Beta	1.14E-02	2.33E-03	2.84E-03
380473	6/9/2015 - 6/16/2015	Beta	1.92E-02	2.73E-03	2.86E-03
380805	6/16/2015 - 6/23/2015	Beta	2.14E-02	2.97E-03	3.14E-03
381247	6/23/2015 - 6/30/2015	Beta	2.00E-02	2.75E-03	2.80E-03
381253	3/31/2015 - 6/30/2015	Cs-134	<5.38E-04	0.00E+00	5.38E-04
		Cs-137	<2.91E-04	0.00E+00	2.91E-04
		Be-7	1.35E-01	2.26E-02	1.33E-02
		K-40	<1.09E-02	0.00E+00	1.09E-02
381602	6/30/2015 - 7/7/2015	Beta	1.74E-02	2.64E-03	2.80E-03
382165	7/7/2015 - 7/14/2015	Beta	2.32E-02	2.90E-03	2.80E-03
382591	7/14/2015 - 7/21/2015	Beta	1.51E-02	2.51E-03	2.78E-03
383521	7/21/2015 - 7/28/2015	Beta	2.33E-02	2.81E-03	2.51E-03
384096	7/28/2015 - 8/4/2015	Beta	2.06E-02	2.82E-03	2.90E-03
384643	8/4/2015 - 8/11/2015	Beta	1.93E-02	2.72E-03	2.76E-03
385411	8/11/2015 - 8/18/2015	Beta	1.84E-02	2.63E-03	2.67E-03
385930	8/18/2015 - 8/25/2015	Beta	1.24E-02	2.40E-03	2.88E-03
386828	8/25/2015 - 9/1/2015	Beta	2.36E-02	2.92E-03	2.77E-03
387417	9/1/2015 - 9/9/2015	Beta	2.55E-02	2.78E-03	2.49E-03
388745	9/9/2015 - 9/15/2015	Beta	1.65E-02	2.81E-03	3.11E-03
389410	9/15/2015 - 9/22/2015	Beta	2.51E-02	2.98E-03	2.76E-03
390014	9/22/2015 - 9/29/2015	Beta	9.34E-03	2.14E-03	2.64E-03
390629	6/30/2015 - 9/29/2015	Cs-134	<6.30E-04	0.00E+00	6.30E-04
		Cs-137	<5.41E-04	0.00E+00	5.41E-04



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
390629	6/30/2015 - 9/29/2015	Be-7	1.16E-01	2.07E-02	1.09E-02
		K-40	<1.31E-02	0.00E+00	1.31E-02
390623	9/29/2015 - 10/6/2015	Beta	4.86E-03	1.90E-03	2.76E-03
391932	10/6/2015 - 10/13/2015	Beta	1.73E-02	2.57E-03	2.62E-03
392232	10/13/2015 - 10/20/2015	Beta	2.19E-02	2.82E-03	2.75E-03
393434	10/20/2015 - 10/27/2015	Beta	2.72E-02	3.17E-03	3.05E-03
393837	10/27/2015 - 11/3/2015	Beta	1.75E-02	2.53E-03	2.52E-03
394837	11/3/2015 - 11/10/2015	Beta	1.11E-02	2.29E-03	2.77E-03
395305	11/10/2015 - 11/17/2015	Beta	2.12E-02	2.79E-03	2.70E-03
395633	11/17/2015 - 11/24/2015	Beta	2.05E-02	2.80E-03	2.89E-03
396131	11/24/2015 - 12/1/2015	Beta	1.53E-02	2.58E-03	2.94E-03
396639	12/1/2015 - 12/8/2015	Beta	2.87E-02	3.10E-03	2.67E-03
397176	12/8/2015 - 12/15/2015	Beta	3.16E-02	3.23E-03	2.74E-03
397898	12/15/2015 - 12/22/2015	Beta	1.99E-02	2.75E-03	2.77E-03
398292	12/22/2015 - 12/29/2015	Beta	6.53E-03	1.96E-03	2.67E-03
398676	9/29/2015 - 12/29/2015	Cs-134	<5.12E-04	0.00E+00	5.12E-04
		Cs-137	<5.25E-04	0.00E+00	5.25E-04
		Be-7	1.15E-01	2.05E-02	1.19E-02
		K-40	<1.05E-02	0.00E+00	1.05E-02

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

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	LLD
364891	12/30/2014 - 1/6/2015	Beta	2.73E-02	3.03E-03	2.72E-03
365071	1/6/2015 - 1/13/2015	Beta	2.42E-02	2.98E-03	2.91E-03
365303	1/13/2015 - 1/20/2015	Beta	1.94E-02	2.59E-03	2.38E-03
366659	1/20/2015 - 1/27/2015	Beta	1.63E-02	2.48E-03	2.56E-03
367065	1/27/2015 - 2/3/2015	Beta	1.31E-02	2.35E-03	2.66E-03
367550	2/3/2015 - 2/10/2015	Beta	1.97E-02	2.74E-03	2.79E-03
368977	2/10/2015 - 2/16/2015	Beta	1.91E-02	3.00E-03	3.26E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
369700	2/16/2015 - 2/23/2015	Beta	3.08E-02	3.13E-03	2.59E-03
370606	2/23/2015 - 3/3/2015	Beta	2.62E-02	2.71E-03	2.16E-03
371545	3/3/2015 - 3/10/2015	Beta	2.05E-02	2.73E-03	2.69E-03
371917	3/10/2015 - 3/17/2015	Beta	1.42E-02	2.33E-03	2.40E-03
372411	3/17/2015 - 3/24/2015	Beta	1.77E-02	2.57E-03	2.58E-03
373833	3/24/2015 - 3/31/2015	Beta	1.54E-02	2.52E-03	2.82E-03
373839	12/30/2014 - 3/31/2015	Cs-134	<6.82E-04	0.00E+00	6.82E-04
		Cs-137	<5.01E-04	0.00E+00	5.01E-04
		Be-7	1.35E-01	2.14E-02	1.11E-02
		K-40	<1.24E-02	0.00E+00	1.24E-02
374562	3/31/2015 - 4/7/2015	Beta	1.46E-02	2.56E-03	2.94E-03
374939	4/7/2015 - 4/14/2015	Beta	1.71E-02	2.61E-03	2.80E-03
375630	4/14/2015 - 4/21/2015	Beta	8.39E-03	2.20E-03	2.94E-03
376834	4/21/2015 - 4/28/2015	Beta	1.39E-02	2.51E-03	2.95E-03
377496	4/28/2015 - 5/5/2015	Beta	1.36E-02	2.36E-03	2.63E-03
378060	5/5/2015 - 5/12/2015	Beta	2.25E-02	2.92E-03	2.94E-03
378460	5/12/2015 - 5/19/2015	Beta	2.11E-02	2.83E-03	2.86E-03
378956	5/19/2015 - 5/27/2015	Beta	1.81E-02	2.45E-03	2.47E-03
379462	5/27/2015 - 6/2/2015	Beta	1.16E-02	2.66E-03	3.37E-03
380186	6/2/2015 - 6/9/2015	Beta	1.27E-02	2.41E-03	2.85E-03
380474	6/9/2015 - 6/16/2015	Beta	1.94E-02	2.72E-03	2.84E-03
380806	6/16/2015 - 6/23/2015	Beta	2.03E-02	2.87E-03	3.06E-03
381248	6/23/2015 - 6/30/2015	Beta	1.84E-02	2.69E-03	2.82E-03
381254	3/31/2015 - 6/30/2015	Cs-134	<5.23E-04	0.00E+00	5.23E-04
		Cs-137	<3.56E-04	0.00E+00	3.56E-04
		Be-7	1.42E-01	2.25E-02	1.23E-02
		K-40	6.55E-03	5.05E-03	6.28E-03
381603	6/30/2015 - 7/7/2015	Beta	1.64E-02	2.59E-03	2.79E-03





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
382166	7/7/2015 - 7/14/2015	Beta	2.82E-02	3.12E-03	2.81E-03
382592	7/14/2015 - 7/21/2015	Beta	1.96E-02	2.73E-03	2.77E-03
383522	7/21/2015 - 7/28/2015	Beta	2.44E-02	2.86E-03	2.52E-03
384097	7/28/2015 - 8/4/2015	Beta	1.88E-02	2.73E-03	2.90E-03
384644	8/4/2015 - 8/11/2015	Beta	2.33E-02	2.91E-03	2.78E-03
385412	8/11/2015 - 8/18/2015	Beta	2.68E-02	3.00E-03	2.66E-03
385931	8/18/2015 - 8/25/2015	Beta	1.62E-02	2.61E-03	2.89E-03
386829	8/25/2015 - 9/1/2015	Beta	2.61E-02	3.02E-03	2.75E-03
387418	9/1/2015 - 9/9/2015	Beta	2.94E-02	2.94E-03	2.50E-03
388746	9/9/2015 - 9/15/2015	Beta	1.86E-02	2.91E-03	3.10E-03
389411	9/15/2015 - 9/22/2015	Beta	2.57E-02	3.00E-03	2.75E-03
390015	9/22/2015 - 9/29/2015	Beta	9.24E-03	2.14E-03	2.66E-03
390630	6/30/2015 - 9/29/2015	Cs-134	<5.98E-04	0.00E+00	5.98E-04
		Cs-137	<4.22E-04	0.00E+00	4.22E-04
		Be-7	1.27E-01	2.12E-02	1.01E-02
		K-40	<1.21E-02	0.00E+00	1.21E-02
390624	9/29/2015 - 10/6/2015	Beta	4.57E-03	1.88E-03	2.75E-03
391933	10/6/2015 - 10/13/2015	Beta	2.01E-02	2.71E-03	2.63E-03
392233	10/13/2015 - 10/20/2015	Beta	2.13E-02	2.80E-03	2.75E-03
393435	10/20/2015 - 10/27/2015	Beta	3.04E-02	3.29E-03	3.05E-03
393838	10/27/2015 - 11/3/2015	Beta	2.02E-02	2.69E-03	2.57E-03
394838	11/3/2015 - 11/10/2015	Beta	1.50E-02	2.51E-03	2.78E-03
395306	11/10/2015 - 11/17/2015	Beta	2.33E-02	2.89E-03	2.71E-03
395634	11/17/2015 - 11/24/2015	Beta	1.92E-02	2.74E-03	2.89E-03
396132	11/24/2015 - 12/1/2015	Beta	1.63E-02	2.62E-03	2.93E-03
396640	12/1/2015 - 12/8/2015	Beta	3.06E-02	3.17E-03	2.66E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
397177	12/8/2015 - 12/15/2015	Beta	2.87E-02	3.13E-03	2.77E-03
397899	12/15/2015 - 12/22/2015	Beta	1.86E-02	2.68E-03	2.76E-03
398293	12/22/2015 - 12/29/2015	Beta	7.92E-03	2.05E-03	2.67E-03
398677	9/29/2015 - 12/29/2015	Cs-134	<4.65E-04	0.00E+00	4.65E-04
		Cs-137	<5.89E-04	0.00E+00	5.89E-04
		Be-7	1.28E-01	2.23E-02	1.31E-02
		K-40	<1.10E-02	0.00E+00	1.10E-02

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	LLD
364892	12/30/2014 - 1/6/2015	I-131	<1.21E-02	0.00E+00	1.21E-02
		Cs-134	<1.39E-02	0.00E+00	1.39E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<9.97E-02	0.00E+00	9.97E-02
		K-40	5.55E-01	2.25E-01	2.09E-01
365072	1/6/2015 - 1/13/2015	I-131	<1.36E-02	0.00E+00	1.36E-02
		Cs-134	<1.17E-02	0.00E+00	1.17E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<8.59E-02	0.00E+00	8.59E-02
		K-40	7.23E-01	2.47E-01	1.71E-01
365304	1/13/2015 - 1/20/2015	I-131	<8.83E-03	0.00E+00	8.83E-03
		Cs-134	<4.67E-03	0.00E+00	4.67E-03
		Cs-137	<4.61E-03	0.00E+00	4.61E-03
		Be-7	<4.76E-02	0.00E+00	4.76E-02
		K-40	4.07E-01	1.57E-01	1.60E-01
366660	1/20/2015 - 1/27/2015	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<1.15E-02	0.00E+00	1.15E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	5.05E-01	2.31E-01	2.58E-01
367066	1/27/2015 - 2/3/2015	I-131	<1.76E-02	0.00E+00	1.76E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<7.66E-02	0.00E+00	7.66E-02
		K-40	4.59E-01	1.84E-01	4.78E-02
367551	2/3/2015 - 2/10/2015	I-131	<2.02E-02	0.00E+00	2.02E-02
		Cs-134	<9.25E-03	0.00E+00	9.25E-03
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	<6.42E-01	0.00E+00	6.42E-01
368978	2/10/2015 - 2/16/2015	I-131	<2.65E-02	0.00E+00	2.65E-02
		Cs-134	<1.56E-02	0.00E+00	1.56E-02
		Cs-137	<1.96E-02	0.00E+00	1.96E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	7.03E-01	3.32E-01	3.09E-01
369701	2/16/2015 - 2/23/2015	I-131	<9.05E-03	0.00E+00	9.05E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
369701	2/16/2015 - 2/23/2015	Cs-134	<3.59E-03	0.00E+00	3.59E-03
		Cs-137	<5.65E-03	0.00E+00	5.65E-03
		Be-7	<3.60E-02	0.00E+00	3.60E-02
		K-40	4.80E-01	1.53E-01	1.06E-01
370607	2/23/2015 - 3/3/2015	I-131	<8.75E-03	0.00E+00	8.75E-03
		Cs-134	<6.71E-03	0.00E+00	6.71E-03
		Cs-137	<7.89E-03	0.00E+00	7.89E-03
		Be-7	<5.12E-02	0.00E+00	5.12E-02
		K-40	3.68E-01	1.29E-01	1.04E-01
371546	3/3/2015 - 3/10/2015	I-131	<1.36E-02	0.00E+00	1.36E-02
		Cs-134	<9.66E-03	0.00E+00	9.66E-03
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	6.09E-01	2.49E-01	2.55E-01
371918	3/10/2015 - 3/17/2015	I-131	<1.01E-02	0.00E+00	1.01E-02
		Cs-134	<5.44E-03	0.00E+00	5.44E-03
		Cs-137	<7.56E-03	0.00E+00	7.56E-03
		Be-7	<3.72E-02	0.00E+00	3.72E-02
		K-40	3.64E-01	1.34E-01	9.59E-02
372412	3/17/2015 - 3/24/2015	I-131	<8.69E-03	0.00E+00	8.69E-03
		Cs-134	<7.05E-03	0.00E+00	7.05E-03
		Cs-137	<6.70E-03	0.00E+00	6.70E-03
		Be-7	<3.65E-02	0.00E+00	3.65E-02
		K-40	4.14E-01	1.67E-01	1.89E-01
373840	3/24/2015 - 3/31/2015	I-131	<1.50E-02	0.00E+00	1.50E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	4.86E-01	2.17E-01	2.23E-01
374563	3/31/2015 - 4/7/2015	I-131	<1.05E-02	0.00E+00	1.05E-02
		Cs-134	<1.07E-02	0.00E+00	1.07E-02
		Cs-137	<1.03E-02	0.00E+00	1.03E-02
		Be-7	<8.77E-02	0.00E+00	8.77E-02
		K-40	4.22E-01	2.07E-01	2.24E-01
374940	4/7/2015 - 4/14/2015	I-131	<1.53E-02	0.00E+00	1.53E-02
		Cs-134	<1.62E-02	0.00E+00	1.62E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<9.40E-02	0.00E+00	9.40E-02
		K-40	5.10E-01	2.05E-01	1.53E-01
375631	4/14/2015 - 4/21/2015	I-131	<6.75E-03	0.00E+00	6.75E-03
		Cs-134	<7.59E-03	0.00E+00	7.59E-03
		Cs-137	<7.79E-03	0.00E+00	7.79E-03
		Be-7	<4.58E-02	0.00E+00	4.58E-02
		K-40	3.43E-01	1.28E-01	8.86E-02
376835	4/21/2015 - 4/28/2015	I-131	<6.66E-03	0.00E+00	6.66E-03
		Cs-134	<6.28E-03	0.00E+00	6.28E-03
		Cs-137	<8.93E-03	0.00E+00	8.93E-03
		Be-7	<5.44E-02	0.00E+00	5.44E-02
		K-40	4.69E-01	1.45E-01	2.76E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
377497	4/28/2015 - 5/5/2015	I-131	<1.64E-02	0.00E+00	1.64E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	5.21E-01	2.36E-01	2.62E-01
378061	5/5/2015 - 5/12/2015	I-131	<6.02E-03	0.00E+00	6.02E-03
		Cs-134	<7.12E-03	0.00E+00	7.12E-03
		Cs-137	<4.62E-03	0.00E+00	4.62E-03
		Be-7	<6.03E-02	0.00E+00	6.03E-02
		K-40	4.66E-01	1.64E-01	1.51E-01
378461	5/12/2015 - 5/19/2015	I-131	<1.52E-02	0.00E+00	1.52E-02
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<8.50E-02	0.00E+00	8.50E-02
		K-40	<4.76E-01	0.00E+00	4.76E-01
378957	5/19/2015 - 5/27/2015	I-131	<1.62E-02	0.00E+00	1.62E-02
		Cs-134	<1.09E-02	0.00E+00	1.09E-02
		Cs-137	<1.34E-02	0.00E+00	1.34E-02
		Be-7	<9.91E-02	0.00E+00	9.91E-02
		K-40	4.61E-01	1.89E-01	1.69E-01
379463	5/27/2015 - 6/2/2015	I-131	<9.39E-03	0.00E+00	9.39E-03
		Cs-134	<8.32E-03	0.00E+00	8.32E-03
		Cs-137	<1.04E-02	0.00E+00	1.04E-02
		Be-7	<6.98E-02	0.00E+00	6.98E-02
		K-40	4.96E-01	1.71E-01	1.23E-01
380187	6/2/2015 - 6/9/2015	I-131	<8.44E-03	0.00E+00	8.44E-03
		Cs-134	<8.00E-03	0.00E+00	8.00E-03
		Cs-137	<8.22E-03	0.00E+00	8.22E-03
		Be-7	<6.69E-02	0.00E+00	6.69E-02
		K-40	3.76E-01	1.47E-01	1.40E-01
380475	6/9/2015 - 6/16/2015	I-131	<6.54E-03	0.00E+00	6.54E-03
		Cs-134	<8.62E-03	0.00E+00	8.62E-03
		Cs-137	<4.35E-03	0.00E+00	4.35E-03
		Be-7	<6.91E-02	0.00E+00	6.91E-02
		K-40	3.76E-01	1.37E-01	1.08E-01
380807	6/16/2015 - 6/23/2015	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	3.84E-01	1.99E-01	2.25E-01
381255	6/23/2015 - 6/30/2015	I-131	<7.82E-03	0.00E+00	7.82E-03
		Cs-134	<5.78E-03	0.00E+00	5.78E-03
		Cs-137	<6.44E-03	0.00E+00	6.44E-03
		Be-7	<5.41E-02	0.00E+00	5.41E-02
		K-40	3.02E-01	1.22E-01	9.66E-02
381604	6/30/2015 - 7/7/2015	I-131	<6.31E-03	0.00E+00	6.31E-03
		Cs-134	<7.96E-03	0.00E+00	7.96E-03
		Cs-137	<5.80E-03	0.00E+00	5.80E-03
		Be-7	<5.93E-02	0.00E+00	5.93E-02
		K-40	<2.82E-01	0.00E+00	2.82E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
382167	7/7/2015 - 7/14/2015	I-131	<1.45E-02	0.00E+00	1.45E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<7.66E-02	0.00E+00	7.66E-02
		K-40	<4.94E-01	0.00E+00	4.94E-01
382593	7/14/2015 - 7/21/2015	I-131	<1.44E-02	0.00E+00	1.44E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<5.24E-02	0.00E+00	5.24E-02
		K-40	3.87E-01	1.68E-01	4.77E-02
383523	7/21/2015 - 7/28/2015	I-131	<8.99E-03	0.00E+00	8.99E-03
		Cs-134	<6.44E-03	0.00E+00	6.44E-03
		Cs-137	<7.17E-03	0.00E+00	7.17E-03
		Be-7	<4.60E-02	0.00E+00	4.60E-02
		K-40	4.71E-01	1.51E-01	3.04E-02
384098	7/28/2015 - 8/4/2015	I-131	<1.28E-02	0.00E+00	1.28E-02
		Cs-134	<7.35E-03	0.00E+00	7.35E-03
		Cs-137	<6.52E-03	0.00E+00	6.52E-03
		Be-7	<6.94E-02	0.00E+00	6.94E-02
		K-40	4.15E-01	1.58E-01	1.60E-01
384645	8/4/2015 - 8/11/2015	I-131	<1.26E-02	0.00E+00	1.26E-02
		Cs-134	<1.07E-02	0.00E+00	1.07E-02
		Cs-137	<1.45E-02	0.00E+00	1.45E-02
		Be-7	<6.63E-02	0.00E+00	6.63E-02
		K-40	4.89E-01	2.23E-01	2.38E-01
385413	8/11/2015 - 8/18/2015	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<8.04E-03	0.00E+00	8.04E-03
		Be-7	<9.36E-02	0.00E+00	9.36E-02
		K-40	3.29E-01	1.87E-01	2.21E-01
385932	8/18/2015 - 8/25/2015	I-131	<1.58E-02	0.00E+00	1.58E-02
		Cs-134	<1.07E-02	0.00E+00	1.07E-02
		Cs-137	<1.03E-02	0.00E+00	1.03E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	4.46E-01	1.82E-01	4.83E-02
386830	8/25/2015 - 9/1/2015	I-131	<9.77E-03	0.00E+00	9.77E-03
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.12E-02	0.00E+00	1.12E-02
		Be-7	<7.22E-02	0.00E+00	7.22E-02
		K-40	4.38E-01	1.92E-01	1.75E-01
387419	9/1/2015 - 9/9/2015	I-131	<7.13E-03	0.00E+00	7.13E-03
		Cs-134	<5.06E-03	0.00E+00	5.06E-03
		Cs-137	<1.02E-02	0.00E+00	1.02E-02
		Be-7	<6.13E-02	0.00E+00	6.13E-02
		K-40	3.56E-01	1.27E-01	1.05E-01
388747	9/9/2015 - 9/15/2015	I-131	<1.08E-02	0.00E+00	1.08E-02
		Cs-134	<5.38E-03	0.00E+00	5.38E-03
		Cs-137	<1.08E-02	0.00E+00	1.08E-02
		Be-7	<6.56E-02	0.00E+00	6.56E-02
		K-40	4.63E-01	1.67E-01	1.30E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
389412	9/15/2015 - 9/22/2015	I-131	<7.72E-03	0.00E+00	7.72E-03
		Cs-134	<1.30E-03	0.00E+00	1.30E-03
		Cs-137	<6.40E-03	0.00E+00	6.40E-03
		Be-7	<4.62E-02	0.00E+00	4.62E-02
		K-40	3.46E-01	1.33E-01	1.10E-01
390016	9/22/2015 - 9/29/2015	I-131	<1.27E-02	0.00E+00	1.27E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.76E-02	0.00E+00	1.76E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	6.19E-01	2.39E-01	2.14E-01
390631	9/29/2015 - 10/6/2015	I-131	<1.32E-02	0.00E+00	1.32E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	3.89E-01	1.88E-01	1.84E-01
391934	10/6/2015 - 10/13/2015	I-131	<1.25E-02	0.00E+00	1.25E-02
		Cs-134	<1.88E-02	0.00E+00	1.88E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<8.59E-02	0.00E+00	8.59E-02
		K-40	7.36E-01	2.56E-01	2.10E-01
392234	10/13/2015 - 10/20/2015	I-131	<1.62E-02	0.00E+00	1.62E-02
		Cs-134	<1.34E-02	0.00E+00	1.34E-02
		Cs-137	<2.99E-03	0.00E+00	2.99E-03
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	3.99E-01	1.95E-01	1.99E-01
393436	10/20/2015 - 10/27/2015	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.07E-02	0.00E+00	1.07E-02
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<6.59E-02	0.00E+00	6.59E-02
		K-40	5.35E-01	2.16E-01	1.83E-01
393839	10/27/2015 - 11/3/2015	I-131	<6.62E-03	0.00E+00	6.62E-03
		Cs-134	<6.97E-03	0.00E+00	6.97E-03
		Cs-137	<7.38E-03	0.00E+00	7.38E-03
		Be-7	<7.40E-02	0.00E+00	7.40E-02
		K-40	3.49E-01	1.40E-01	1.36E-01
394839	11/3/2015 - 11/10/2015	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<8.65E-02	0.00E+00	8.65E-02
		K-40	5.64E-01	2.45E-01	2.67E-01
395307	11/10/2015 - 11/17/2015	I-131	<1.69E-02	0.00E+00	1.69E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<7.68E-02	0.00E+00	7.68E-02
		K-40	4.98E-01	2.13E-01	1.97E-01
395635	11/17/2015 - 11/24/2015	I-131	<1.40E-02	0.00E+00	1.40E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	5.39E-01	2.13E-01	1.66E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
396133	11/24/2015 - 12/1/2015	I-131	<8.71E-03	0.00E+00	8.71E-03
		Cs-134	<6.26E-03	0.00E+00	6.26E-03
		Cs-137	<9.40E-03	0.00E+00	9.40E-03
		Be-7	<5.76E-02	0.00E+00	5.76E-02
		K-40	4.97E-01	1.49E-01	2.75E-02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
396641	12/1/2015 - 12/8/2015	I-131	<1.86E-02	0.00E+00	1.86E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	5.17E-01	2.08E-01	1.67E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
397178	12/8/2015 - 12/15/2015	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.27E-02	0.00E+00	1.27E-02
		Cs-137	<1.46E-02	0.00E+00	1.46E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	4.37E-01	2.15E-01	2.41E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
397900	12/15/2015 - 12/22/2015	I-131	<6.38E-03	0.00E+00	6.38E-03
		Cs-134	<6.58E-03	0.00E+00	6.58E-03
		Cs-137	<9.90E-03	0.00E+00	9.90E-03
		Be-7	<7.19E-02	0.00E+00	7.19E-02
		K-40	3.58E-01	1.41E-01	1.28E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
398294	12/22/2015 - 12/29/2015	I-131	<8.93E-03	0.00E+00	8.93E-03
		Cs-134	<5.70E-03	0.00E+00	5.70E-03
		Cs-137	<9.89E-03	0.00E+00	9.89E-03
		Be-7	<5.91E-02	0.00E+00	5.91E-02
		K-40	5.76E-01	1.68E-01	3.00E-02

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

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
364893	12/30/2014 - 1/6/2015	I-131	<1.51E-02	0.00E+00	1.51E-02
		Cs-134	<1.47E-02	0.00E+00	1.47E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	4.76E-02	5.76E-02	9.19E-02
		K-40	5.01E-01	2.68E-01	3.56E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
365073	1/6/2015 - 1/13/2015	I-131	<1.34E-02	0.00E+00	1.34E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.45E-02	0.00E+00	1.45E-02
		Be-7	<7.66E-02	0.00E+00	7.66E-02
		K-40	5.45E-01	2.75E-01	3.55E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
365305	1/13/2015 - 1/20/2015	I-131	<2.22E-02	0.00E+00	2.22E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.15E-02	0.00E+00	1.15E-02
		Be-7	<1.03E-01	0.00E+00	1.03E-01
		K-40	6.82E-01	3.02E-01	2.70E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
366661	1/20/2015 - 1/27/2015	I-131	<1.51E-02	0.00E+00	1.51E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.17E-02	0.00E+00	1.17E-02
		Be-7	<9.99E-02	0.00E+00	9.99E-02
		K-40	8.26E-01	2.65E-01	1.89E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
367067	1/27/2015 - 2/3/2015	I-131	<1.90E-02	0.00E+00	1.90E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.02E-02	0.00E+00	1.02E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
367067	1/27/2015 - 2/3/2015	Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	6.87E-01	2.88E-01	3.39E-01
367552	2/3/2015 - 2/10/2015	I-131	<9.88E-03	0.00E+00	9.88E-03
		Cs-134	<6.08E-03	0.00E+00	6.08E-03
		Cs-137	<4.63E-03	0.00E+00	4.63E-03
		Be-7	<5.75E-02	0.00E+00	5.75E-02
		K-40	2.94E-01	1.19E-01	8.31E-02
368979	2/10/2015 - 2/16/2015	I-131	<1.77E-02	0.00E+00	1.77E-02
		Cs-134	<1.56E-02	0.00E+00	1.56E-02
		Cs-137	<1.96E-02	0.00E+00	1.96E-02
		Be-7	<1.68E-01	0.00E+00	1.68E-01
		K-40	<7.25E-01	0.00E+00	7.25E-01
369702	2/16/2015 - 2/23/2015	I-131	<1.89E-02	0.00E+00	1.89E-02
		Cs-134	<1.45E-02	0.00E+00	1.45E-02
		Cs-137	<1.12E-02	0.00E+00	1.12E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	<5.60E-01	0.00E+00	5.60E-01
370608	2/23/2015 - 3/3/2015	I-131	<8.52E-03	0.00E+00	8.52E-03
		Cs-134	<7.64E-03	0.00E+00	7.64E-03
		Cs-137	<7.69E-03	0.00E+00	7.69E-03
		Be-7	<3.78E-02	0.00E+00	3.78E-02
		K-40	3.92E-01	1.36E-01	1.13E-01
371547	3/3/2015 - 3/10/2015	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<5.27E-02	0.00E+00	5.27E-02
		K-40	4.38E-01	1.95E-01	1.69E-01
371919	3/10/2015 - 3/17/2015	I-131	<9.73E-03	0.00E+00	9.73E-03
		Cs-134	<8.56E-03	0.00E+00	8.56E-03
		Cs-137	<7.33E-03	0.00E+00	7.33E-03
		Be-7	<3.66E-02	0.00E+00	3.66E-02
		K-40	4.37E-01	1.56E-01	1.37E-01
372413	3/17/2015 - 3/24/2015	I-131	<7.82E-03	0.00E+00	7.82E-03
		Cs-134	<6.85E-03	0.00E+00	6.85E-03
		Cs-137	<7.25E-03	0.00E+00	7.25E-03
		Be-7	<4.64E-02	0.00E+00	4.64E-02
		K-40	3.24E-01	1.33E-01	1.23E-01
373841	3/24/2015 - 3/31/2015	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	4.51E-01	2.29E-01	2.76E-01
374564	3/31/2015 - 4/7/2015	I-131	<1.58E-02	0.00E+00	1.58E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<8.73E-02	0.00E+00	8.73E-02
		K-40	5.86E-01	2.10E-01	4.81E-02
374941	4/7/2015 - 4/14/2015	I-131	<1.76E-02	0.00E+00	1.76E-02





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
374941	4/7/2015 - 4/14/2015	Cs-134	<6.53E-03	0.00E+00	6.53E-03
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	5.09E-01	2.22E-01	2.24E-01
375632	4/14/2015 - 4/21/2015	I-131	<6.30E-03	0.00E+00	6.30E-03
		Cs-134	<7.07E-03	0.00E+00	7.07E-03
		Cs-137	<5.80E-03	0.00E+00	5.80E-03
		Be-7	<4.25E-02	0.00E+00	4.25E-02
		K-40	4.71E-01	1.46E-01	2.84E-02
376836	4/21/2015 - 4/28/2015	I-131	<1.08E-02	0.00E+00	1.08E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	4.19E-01	2.05E-01	2.22E-01
377498	4/28/2015 - 5/5/2015	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<6.64E-02	0.00E+00	6.64E-02
		K-40	4.59E-01	1.84E-01	4.78E-02
378062	5/5/2015 - 5/12/2015	I-131	<7.31E-03	0.00E+00	7.31E-03
		Cs-134	<8.16E-03	0.00E+00	8.16E-03
		Cs-137	<9.13E-03	0.00E+00	9.13E-03
		Be-7	<6.22E-02	0.00E+00	6.22E-02
		K-40	<2.47E-01	0.00E+00	2.47E-01
378462	5/12/2015 - 5/19/2015	I-131	<7.43E-03	0.00E+00	7.43E-03
		Cs-134	<5.36E-03	0.00E+00	5.36E-03
		Cs-137	<8.12E-03	0.00E+00	8.12E-03
		Be-7	<6.24E-02	0.00E+00	6.24E-02
		K-40	3.46E-01	1.34E-01	1.12E-01
378958	5/19/2015 - 5/27/2015	I-131	<1.55E-02	0.00E+00	1.55E-02
		Cs-134	<1.23E-02	0.00E+00	1.23E-02
		Cs-137	<1.26E-02	0.00E+00	1.26E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	5.25E-01	2.14E-01	2.18E-01
379464	5/27/2015 - 6/2/2015	I-131	<9.35E-03	0.00E+00	9.35E-03
		Cs-134	<8.03E-03	0.00E+00	8.03E-03
		Cs-137	<8.51E-03	0.00E+00	8.51E-03
		Be-7	<4.89E-02	0.00E+00	4.89E-02
		K-40	5.64E-01	1.82E-01	1.21E-01
380188	6/2/2015 - 6/9/2015	I-131	<7.83E-03	0.00E+00	7.83E-03
		Cs-134	<8.05E-03	0.00E+00	8.05E-03
		Cs-137	<6.45E-03	0.00E+00	6.45E-03
		Be-7	<4.66E-02	0.00E+00	4.66E-02
		K-40	4.62E-01	1.44E-01	2.78E-02
380476	6/9/2015 - 6/16/2015	I-131	<6.64E-03	0.00E+00	6.64E-03
		Cs-134	<6.28E-03	0.00E+00	6.28E-03
		Cs-137	<4.38E-03	0.00E+00	4.38E-03
		Be-7	<6.10E-02	0.00E+00	6.10E-02
		K-40	3.88E-01	1.43E-01	1.24E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
380808	6/16/2015 - 6/23/2015	I-131	<1.96E-02	0.00E+00	1.96E-02
		Cs-134	<1.54E-02	0.00E+00	1.54E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.17E-01	2.11E-01	1.79E-01
381256	6/23/2015 - 6/30/2015	I-131	<8.00E-03	0.00E+00	8.00E-03
		Cs-134	<3.94E-03	0.00E+00	3.94E-03
		Cs-137	<9.99E-03	0.00E+00	9.99E-03
		Be-7	<6.35E-02	0.00E+00	6.35E-02
		K-40	3.72E-01	1.42E-01	1.12E-01
381605	6/30/2015 - 7/7/2015	I-131	<7.46E-03	0.00E+00	7.46E-03
		Cs-134	<8.36E-03	0.00E+00	8.36E-03
		Cs-137	<7.51E-03	0.00E+00	7.51E-03
		Be-7	<4.26E-02	0.00E+00	4.26E-02
		K-40	<2.57E-01	0.00E+00	2.57E-01
382168	7/7/2015 - 7/14/2015	I-131	<1.70E-02	0.00E+00	1.70E-02
		Cs-134	<1.58E-02	0.00E+00	1.58E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<8.70E-02	0.00E+00	8.70E-02
		K-40	4.89E-01	1.93E-01	4.91E-02
382594	7/14/2015 - 7/21/2015	I-131	<1.34E-02	0.00E+00	1.34E-02
		Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.18E-02	0.00E+00	1.18E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	5.83E-01	2.09E-01	4.79E-02
383524	7/21/2015 - 7/28/2015	I-131	<7.84E-03	0.00E+00	7.84E-03
		Cs-134	<5.25E-03	0.00E+00	5.25E-03
		Cs-137	<6.53E-03	0.00E+00	6.53E-03
		Be-7	<4.21E-02	0.00E+00	4.21E-02
		K-40	2.37E-01	1.39E-01	1.85E-01
384099	7/28/2015 - 8/4/2015	I-131	<1.20E-02	0.00E+00	1.20E-02
		Cs-134	<5.21E-03	0.00E+00	5.21E-03
		Cs-137	<8.99E-03	0.00E+00	8.99E-03
		Be-7	<7.18E-02	0.00E+00	7.18E-02
		K-40	2.84E-01	1.27E-01	1.29E-01
384646	8/4/2015 - 8/11/2015	I-131	<5.38E-03	0.00E+00	5.38E-03
		Cs-134	<4.55E-03	0.00E+00	4.55E-03
		Cs-137	<6.23E-03	0.00E+00	6.23E-03
		Be-7	<3.51E-02	0.00E+00	3.51E-02
		K-40	3.54E-01	9.93E-02	7.79E-02
385414	8/11/2015 - 8/18/2015	I-131	<1.64E-02	0.00E+00	1.64E-02
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<8.07E-03	0.00E+00	8.07E-03
		Be-7	<6.65E-02	0.00E+00	6.65E-02
		K-40	5.20E-01	2.10E-01	1.70E-01
385933	8/18/2015 - 8/25/2015	I-131	<1.51E-02	0.00E+00	1.51E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.99E-02	0.00E+00	1.99E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	5.27E-01	2.26E-01	2.26E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
386831	8/25/2015 - 9/1/2015	I-131	<8.82E-03	0.00E+00	8.82E-03
		Cs-134	<1.47E-02	0.00E+00	1.47E-02
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	4.64E-01	2.18E-01	2.36E-01
387420	9/1/2015 - 9/9/2015	I-131	<6.22E-03	0.00E+00	6.22E-03
		Cs-134	<6.15E-03	0.00E+00	6.15E-03
		Cs-137	<6.28E-03	0.00E+00	6.28E-03
		Be-7	<6.23E-02	0.00E+00	6.23E-02
		K-40	3.86E-01	1.35E-01	9.55E-02
388748	9/9/2015 - 9/15/2015	I-131	<1.13E-02	0.00E+00	1.13E-02
		Cs-134	<8.38E-03	0.00E+00	8.38E-03
		Cs-137	<9.08E-03	0.00E+00	9.08E-03
		Be-7	<4.87E-02	0.00E+00	4.87E-02
		K-40	4.35E-01	1.63E-01	1.42E-01
389413	9/15/2015 - 9/22/2015	I-131	<9.50E-03	0.00E+00	9.50E-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	<4.58E-02	0.00E+00	4.58E-02
		K-40	4.12E-01	1.51E-01	1.23E-01
390017	9/22/2015 - 9/29/2015	I-131	<1.45E-02	0.00E+00	1.45E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	<5.11E-01	0.00E+00	5.11E-01
390632	9/29/2015 - 10/6/2015	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	<3.20E-01	0.00E+00	3.20E-01
391935	10/6/2015 - 10/13/2015	I-131	<1.56E-02	0.00E+00	1.56E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.02E-02	0.00E+00	1.02E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	<5.28E-01	0.00E+00	5.28E-01
392235	10/13/2015 - 10/20/2015	I-131	<1.61E-02	0.00E+00	1.61E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	4.16E-01	2.12E-01	2.44E-01
393437	10/20/2015 - 10/27/2015	I-131	<1.35E-02	0.00E+00	1.35E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<8.52E-02	0.00E+00	8.52E-02
		K-40	5.35E-01	2.16E-01	1.85E-01
393840	10/27/2015 - 11/3/2015	I-131	<1.64E-02	0.00E+00	1.64E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	6.14E-01	2.14E-01	4.76E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
394840	11/3/2015 - 11/10/2015	I-131	<1.31E-02	0.00E+00	1.31E-02
		Cs-134	<1.56E-02	0.00E+00	1.56E-02
		Cs-137	<1.25E-02	0.00E+00	1.25E-02
		Be-7	<9.92E-02	0.00E+00	9.92E-02
		K-40	6.36E-01	2.24E-01	5.07E-02
395308	11/10/2015 - 11/17/2015	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	4.64E-01	2.23E-01	2.52E-01
395636	11/17/2015 - 11/24/2015	I-131	<8.10E-03	0.00E+00	8.10E-03
		Cs-134	<5.90E-03	0.00E+00	5.90E-03
		Cs-137	<4.72E-03	0.00E+00	4.72E-03
		Be-7	<3.88E-02	0.00E+00	3.88E-02
		K-40	4.58E-01	1.05E-01	1.38E-02
396134	11/24/2015 - 12/1/2015	I-131	<1.09E-02	0.00E+00	1.09E-02
		Cs-134	<4.95E-03	0.00E+00	4.95E-03
		Cs-137	<7.96E-03	0.00E+00	7.96E-03
		Be-7	<5.58E-02	0.00E+00	5.58E-02
		K-40	4.13E-01	1.41E-01	3.02E-02
396642	12/1/2015 - 12/8/2015	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<6.37E-03	0.00E+00	6.37E-03
		Cs-137	<1.40E-02	0.00E+00	1.40E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	5.17E-01	2.18E-01	2.13E-01
397179	12/8/2015 - 12/15/2015	I-131	<1.52E-02	0.00E+00	1.52E-02
		Cs-134	<1.49E-02	0.00E+00	1.49E-02
		Cs-137	<1.56E-02	0.00E+00	1.56E-02
		Be-7	<8.55E-02	0.00E+00	8.55E-02
		K-40	8.73E-01	2.60E-01	4.83E-02
397901	12/15/2015 - 12/22/2015	I-131	<6.89E-03	0.00E+00	6.89E-03
		Cs-134	<7.23E-03	0.00E+00	7.23E-03
		Cs-137	<8.43E-03	0.00E+00	8.43E-03
		Be-7	<6.69E-02	0.00E+00	6.69E-02
		K-40	4.40E-01	1.40E-01	2.78E-02
398295	12/22/2015 - 12/29/2015	I-131	<1.50E-02	0.00E+00	1.50E-02
		Cs-134	<1.39E-02	0.00E+00	1.39E-02
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<9.20E-02	0.00E+00	9.20E-02
		K-40	5.10E-01	2.48E-01	3.03E-01

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

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
364894	12/30/2014 - 1/6/2015	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<5.22E-02	0.00E+00	5.22E-02
		K-40	5.53E-01	2.21E-01	1.92E-01
365074	1/6/2015 - 1/13/2015	I-131	<1.51E-02	0.00E+00	1.51E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.84E-02	0.00E+00	1.84E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
365074	1/6/2015 - 1/13/2015	Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	3.24E-01	2.09E-01	2.81E-01
365306	1/13/2015 - 1/20/2015	I-131	<1.71E-02	0.00E+00	1.71E-02
		Cs-134	<1.19E-02	0.00E+00	1.19E-02
		Cs-137	<1.29E-02	0.00E+00	1.29E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	4.87E-01	2.22E-01	6.60E-02
366662	1/20/2015 - 1/27/2015	I-131	<1.82E-02	0.00E+00	1.82E-02
		Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	4.39E-01	1.79E-01	4.76E-02
367068	1/27/2015 - 2/3/2015	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<8.54E-02	0.00E+00	8.54E-02
		K-40	5.11E-01	1.95E-01	4.78E-02
367553	2/3/2015 - 2/10/2015	I-131	<2.39E-02	0.00E+00	2.39E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.46E-02	0.00E+00	1.46E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	9.71E-01	3.66E-01	3.19E-01
368980	2/10/2015 - 2/16/2015	I-131	<1.03E-02	0.00E+00	1.03E-02
		Cs-134	<8.82E-03	0.00E+00	8.82E-03
		Cs-137	<1.23E-02	0.00E+00	1.23E-02
		Be-7	<7.89E-02	0.00E+00	7.89E-02
		K-40	5.76E-01	1.81E-01	3.55E-02
369703	2/16/2015 - 2/23/2015	I-131	<9.50E-03	0.00E+00	9.50E-03
		Cs-134	<7.34E-03	0.00E+00	7.34E-03
		Cs-137	<4.48E-03	0.00E+00	4.48E-03
		Be-7	<6.16E-02	0.00E+00	6.16E-02
		K-40	4.01E-01	1.48E-01	1.36E-01
370609	2/23/2015 - 3/3/2015	I-131	<6.08E-03	0.00E+00	6.08E-03
		Cs-134	<7.04E-03	0.00E+00	7.04E-03
		Cs-137	<8.32E-03	0.00E+00	8.32E-03
		Be-7	<4.82E-02	0.00E+00	4.82E-02
		K-40	3.25E-01	1.42E-01	1.69E-01
371548	3/3/2015 - 3/10/2015	I-131	<1.03E-02	0.00E+00	1.03E-02
		Cs-134	<1.49E-02	0.00E+00	1.49E-02
		Cs-137	<2.01E-02	0.00E+00	2.01E-02
		Be-7	<8.57E-02	0.00E+00	8.57E-02
		K-40	5.95E-01	2.41E-01	2.39E-01
371920	3/10/2015 - 3/17/2015	I-131	<5.93E-03	0.00E+00	5.93E-03
		Cs-134	<5.83E-03	0.00E+00	5.83E-03
		Cs-137	<4.44E-03	0.00E+00	4.44E-03
		Be-7	<7.31E-02	0.00E+00	7.31E-02
		K-40	4.03E-01	1.45E-01	1.16E-01
372414	3/17/2015 - 3/24/2015	I-131	<7.39E-03	0.00E+00	7.39E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
372414	3/17/2015 - 3/24/2015	Cs-134	<3.92E-03	0.00E+00	3.92E-03
		Cs-137	<7.96E-03	0.00E+00	7.96E-03
		Be-7	<4.54E-02	0.00E+00	4.54E-02
		K-40	3.50E-01	1.47E-01	1.49E-01
373842	3/24/2015 - 3/31/2015	I-131	<1.42E-02	0.00E+00	1.42E-02
		Cs-134	<1.47E-02	0.00E+00	1.47E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	4.55E-01	2.25E-01	2.63E-01
374565	3/31/2015 - 4/7/2015	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<8.72E-02	0.00E+00	8.72E-02
		K-40	4.88E-01	2.02E-01	1.61E-01
374942	4/7/2015 - 4/14/2015	I-131	<1.09E-02	0.00E+00	1.09E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<9.38E-02	0.00E+00	9.38E-02
		K-40	6.28E-01	2.29E-01	1.68E-01
375633	4/14/2015 - 4/21/2015	I-131	<6.83E-03	0.00E+00	6.83E-03
		Cs-134	<5.84E-03	0.00E+00	5.84E-03
		Cs-137	<9.08E-03	0.00E+00	9.08E-03
		Be-7	<5.07E-02	0.00E+00	5.07E-02
		K-40	2.27E-01	1.46E-01	2.04E-01
376837	4/21/2015 - 4/28/2015	I-131	<1.90E-02	0.00E+00	1.90E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<8.59E-02	0.00E+00	8.59E-02
		K-40	5.05E-01	2.06E-01	1.64E-01
377499	4/28/2015 - 5/5/2015	I-131	<1.11E-02	0.00E+00	1.11E-02
		Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	5.21E-01	2.08E-01	1.61E-01
378063	5/5/2015 - 5/12/2015	I-131	<5.93E-03	0.00E+00	5.93E-03
		Cs-134	<6.31E-03	0.00E+00	6.31E-03
		Cs-137	<8.43E-03	0.00E+00	8.43E-03
		Be-7	<6.74E-02	0.00E+00	6.74E-02
		K-40	3.40E-01	1.31E-01	1.06E-01
378463	5/12/2015 - 5/19/2015	I-131	<7.32E-03	0.00E+00	7.32E-03
		Cs-134	<8.99E-03	0.00E+00	8.99E-03
		Cs-137	<6.39E-03	0.00E+00	6.39E-03
		Be-7	<6.64E-02	0.00E+00	6.64E-02
		K-40	3.66E-01	1.45E-01	1.44E-01
378959	5/19/2015 - 5/27/2015	I-131	<1.55E-02	0.00E+00	1.55E-02
		Cs-134	<1.29E-02	0.00E+00	1.29E-02
		Cs-137	<1.15E-02	0.00E+00	1.15E-02
		Be-7	<6.76E-02	0.00E+00	6.76E-02
		K-40	4.08E-01	2.06E-01	2.50E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
379465	5/27/2015 - 6/2/2015	I-131	<8.20E-03	0.00E+00	8.20E-03
		Cs-134	<7.65E-03	0.00E+00	7.65E-03
		Cs-137	<1.96E-03	0.00E+00	1.96E-03
		Be-7	<6.52E-02	0.00E+00	6.52E-02
		K-40	5.27E-01	1.68E-01	3.32E-02
380189	6/2/2015 - 6/9/2015	I-131	<7.93E-03	0.00E+00	7.93E-03
		Cs-134	<8.10E-03	0.00E+00	8.10E-03
		Cs-137	<7.22E-03	0.00E+00	7.22E-03
		Be-7	<3.17E-02	0.00E+00	3.17E-02
		K-40	4.40E-01	1.46E-01	3.06E-02
380477	6/9/2015 - 6/16/2015	I-131	<8.80E-03	0.00E+00	8.80E-03
		Cs-134	<8.65E-03	0.00E+00	8.65E-03
		Cs-137	<9.39E-03	0.00E+00	9.39E-03
		Be-7	<2.83E-02	0.00E+00	2.83E-02
		K-40	3.38E-01	1.38E-01	1.36E-01
380809	6/16/2015 - 6/23/2015	I-131	<1.60E-02	0.00E+00	1.60E-02
		Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<9.33E-02	0.00E+00	9.33E-02
		K-40	6.36E-01	2.18E-01	4.79E-02
381257	6/23/2015 - 6/30/2015	I-131	<3.88E-03	0.00E+00	3.88E-03
		Cs-134	<6.03E-03	0.00E+00	6.03E-03
		Cs-137	<7.51E-03	0.00E+00	7.51E-03
		Be-7	<5.19E-02	0.00E+00	5.19E-02
		K-40	3.35E-01	1.33E-01	1.15E-01
381606	6/30/2015 - 7/7/2015	I-131	<9.89E-03	0.00E+00	9.89E-03
		Cs-134	<7.73E-03	0.00E+00	7.73E-03
		Cs-137	<4.46E-03	0.00E+00	4.46E-03
		Be-7	<5.08E-02	0.00E+00	5.08E-02
		K-40	3.31E-01	1.34E-01	1.23E-01
382169	7/7/2015 - 7/14/2015	I-131	<1.36E-02	0.00E+00	1.36E-02
		Cs-134	<5.82E-03	0.00E+00	5.82E-03
		Cs-137	<8.99E-03	0.00E+00	8.99E-03
		Be-7	<7.51E-02	0.00E+00	7.51E-02
		K-40	3.98E-01	1.52E-01	1.50E-01
382595	7/14/2015 - 7/21/2015	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	6.54E-01	2.38E-01	1.89E-01
383525	7/21/2015 - 7/28/2015	I-131	<8.88E-03	0.00E+00	8.88E-03
		Cs-134	<7.94E-03	0.00E+00	7.94E-03
		Cs-137	<8.15E-03	0.00E+00	8.15E-03
		Be-7	<6.32E-02	0.00E+00	6.32E-02
		K-40	4.33E-01	1.48E-01	1.06E-01
384100	7/28/2015 - 8/3/2015	I-131	<2.47E-02	0.00E+00	2.47E-02
		Cs-134	<1.62E-02	0.00E+00	1.62E-02
		Cs-137	<1.71E-02	0.00E+00	1.71E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	8.65E-01	2.99E-01	6.51E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
384647	8/4/2015 - 8/11/2015	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	6.78E-01	2.27E-01	4.83E-02
385415	8/11/2015 - 8/18/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<8.60E-02	0.00E+00	8.60E-02
		K-40	4.60E-01	1.85E-01	4.80E-02
385934	8/18/2015 - 8/25/2015	I-131	<8.62E-03	0.00E+00	8.62E-03
		Cs-134	<5.19E-03	0.00E+00	5.19E-03
		Cs-137	<4.41E-03	0.00E+00	4.41E-03
		Be-7	<5.75E-02	0.00E+00	5.75E-02
		K-40	4.01E-01	1.34E-01	2.79E-02
386832	8/25/2015 - 9/1/2015	I-131	<1.51E-02	0.00E+00	1.51E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	6.88E-01	2.43E-01	1.88E-01
387421	9/1/2015 - 9/9/2015	I-131	<6.69E-03	0.00E+00	6.69E-03
		Cs-134	<4.55E-03	0.00E+00	4.55E-03
		Cs-137	<6.31E-03	0.00E+00	6.31E-03
		Be-7	<4.77E-02	0.00E+00	4.77E-02
		K-40	4.06E-01	1.27E-01	2.44E-02
388749	9/9/2015 - 9/15/2015	I-131	<1.17E-02	0.00E+00	1.17E-02
		Cs-134	<5.78E-03	0.00E+00	5.78E-03
		Cs-137	<8.33E-03	0.00E+00	8.33E-03
		Be-7	<6.01E-02	0.00E+00	6.01E-02
		K-40	2.70E-01	1.57E-01	2.01E-01
389414	9/15/2015 - 9/22/2015	I-131	<4.08E-03	0.00E+00	4.08E-03
		Cs-134	<5.23E-03	0.00E+00	5.23E-03
		Cs-137	<7.92E-03	0.00E+00	7.92E-03
		Be-7	<6.79E-02	0.00E+00	6.79E-02
		K-40	3.63E-01	1.38E-01	1.18E-01
390018	9/22/2015 - 9/29/2015	I-131	<1.45E-02	0.00E+00	1.45E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<8.56E-02	0.00E+00	8.56E-02
		K-40	<4.88E-01	0.00E+00	4.88E-01
390633	9/29/2015 - 10/6/2015	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.24E-02	0.00E+00	1.24E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<9.30E-02	0.00E+00	9.30E-02
		K-40	5.45E-01	2.37E-01	2.55E-01
391936	10/6/2015 - 10/13/2015	I-131	<1.36E-02	0.00E+00	1.36E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-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	6.39E-01	2.34E-01	1.83E-01





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
392236	10/13/2015 - 10/20/2015	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<1.34E-02	0.00E+00	1.34E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<7.67E-02	0.00E+00	7.67E-02
		K-40	6.23E-01	2.50E-01	2.52E-01
393438	10/20/2015 - 10/27/2015	I-131	<1.48E-02	0.00E+00	1.48E-02
		Cs-134	<1.04E-02	0.00E+00	1.04E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	4.49E-01	2.00E-01	1.91E-01
393841	10/27/2015 - 11/3/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.39E-02	0.00E+00	1.39E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	6.50E-01	2.18E-01	4.64E-02
394841	11/3/2015 - 11/10/2015	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<1.02E-01	0.00E+00	1.02E-01
		K-40	4.71E-01	2.00E-01	1.66E-01
395309	11/10/2015 - 11/17/2015	I-131	<1.16E-02	0.00E+00	1.16E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	<5.02E-01	0.00E+00	5.02E-01
395637	11/17/2015 - 11/24/2015	I-131	<1.64E-02	0.00E+00	1.64E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	7.18E-01	2.55E-01	2.17E-01
396135	11/24/2015 - 12/1/2015	I-131	<7.29E-03	0.00E+00	7.29E-03
		Cs-134	<5.23E-03	0.00E+00	5.23E-03
		Cs-137	<7.91E-03	0.00E+00	7.91E-03
		Be-7	<6.78E-02	0.00E+00	6.78E-02
		K-40	3.22E-01	1.39E-01	1.47E-01
396643	12/1/2015 - 12/8/2015	I-131	<1.87E-02	0.00E+00	1.87E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	4.55E-01	2.48E-01	3.23E-01
397180	12/8/2015 - 12/15/2015	I-131	<1.26E-02	0.00E+00	1.26E-02
		Cs-134	<1.49E-02	0.00E+00	1.49E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	5.88E-01	2.10E-01	4.83E-02
397902	12/15/2015 - 12/22/2015	I-131	<8.08E-03	0.00E+00	8.08E-03
		Cs-134	<7.57E-03	0.00E+00	7.57E-03
		Cs-137	<8.76E-03	0.00E+00	8.76E-03
		Be-7	<5.58E-02	0.00E+00	5.58E-02
		K-40	<2.87E-01	0.00E+00	2.87E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
398296	12/22/2015 - 12/29/2015	I-131	<1.42E-02	0.00E+00	1.42E-02
		Cs-134	<9.45E-03	0.00E+00	9.45E-03
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	4.51E-01	2.59E-01	3.52E-01

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
364895	12/30/2014 - 1/6/2015	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.31E-02	0.00E+00	1.31E-02
		Cs-137	<1.41E-02	0.00E+00	1.41E-02
		Be-7	<9.19E-02	0.00E+00	9.19E-02
		K-40	5.91E-01	2.09E-01	4.71E-02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
365075	1/6/2015 - 1/13/2015	I-131	<1.44E-02	0.00E+00	1.44E-02
		Cs-134	<1.50E-02	0.00E+00	1.50E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<8.64E-02	0.00E+00	8.64E-02
		K-40	8.43E-01	2.74E-01	2.08E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
365307	1/13/2015 - 1/20/2015	I-131	<1.12E-02	0.00E+00	1.12E-02
		Cs-134	<7.50E-03	0.00E+00	7.50E-03
		Cs-137	<1.13E-02	0.00E+00	1.13E-02
		Be-7	<8.74E-02	0.00E+00	8.74E-02
		K-40	5.08E-01	1.75E-01	1.32E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
366663	1/20/2015 - 1/27/2015	I-131	<1.20E-02	0.00E+00	1.20E-02
		Cs-134	<1.15E-02	0.00E+00	1.15E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<8.46E-02	0.00E+00	8.46E-02
		K-40	4.71E-01	2.06E-01	1.93E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
367069	1/27/2015 - 2/3/2015	I-131	<1.17E-02	0.00E+00	1.17E-02
		Cs-134	<1.29E-02	0.00E+00	1.29E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.03E-01	0.00E+00	1.03E-01
		K-40	5.33E-01	2.11E-01	1.75E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
367554	2/3/2015 - 2/10/2015	I-131	<9.94E-03	0.00E+00	9.94E-03
		Cs-134	<6.72E-03	0.00E+00	6.72E-03
		Cs-137	<4.69E-03	0.00E+00	4.69E-03
		Be-7	<3.83E-02	0.00E+00	3.83E-02
		K-40	4.27E-01	1.40E-01	2.89E-02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
368981	2/10/2015 - 2/16/2015	I-131	<2.44E-02	0.00E+00	2.44E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.34E-02	0.00E+00	1.34E-02
		Be-7	<1.47E-01	0.00E+00	1.47E-01
		K-40	<6.34E-01	0.00E+00	6.34E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
369704	2/16/2015 - 2/23/2015	I-131	<1.64E-02	0.00E+00	1.64E-02
		Cs-134	<1.30E-02	0.00E+00	1.30E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	<5.89E-01	0.00E+00	5.89E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
370610	2/23/2015 - 3/3/2015	I-131	<9.02E-03	0.00E+00	9.02E-03
		Cs-134	<6.11E-03	0.00E+00	6.11E-03
		Cs-137	<8.17E-03	0.00E+00	8.17E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
370610	2/23/2015 - 3/3/2015	Be-7	<2.75E-02	0.00E+00	2.75E-02
		K-40	3.61E-01	1.23E-01	2.64E-02
371549	3/3/2015 - 3/10/2015	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.09E-01	0.00E+00	1.09E-01
		K-40	4.93E-01	2.10E-01	1.85E-01
371921	3/10/2015 - 3/17/2015	I-131	<8.38E-03	0.00E+00	8.38E-03
		Cs-134	<5.41E-03	0.00E+00	5.41E-03
		Cs-137	<7.51E-03	0.00E+00	7.51E-03
		Be-7	<5.25E-02	0.00E+00	5.25E-02
		K-40	4.23E-01	1.49E-01	1.14E-01
372415	3/17/2015 - 3/24/2015	I-131	<1.41E-03	0.00E+00	1.41E-03
		Cs-134	<7.48E-03	0.00E+00	7.48E-03
		Cs-137	<8.12E-03	0.00E+00	8.12E-03
		Be-7	<5.15E-02	0.00E+00	5.15E-02
		K-40	3.79E-01	1.39E-01	1.07E-01
373843	3/24/2015 - 3/31/2015	I-131	<1.56E-02	0.00E+00	1.56E-02
		Cs-134	<1.31E-02	0.00E+00	1.31E-02
		Cs-137	<1.16E-02	0.00E+00	1.16E-02
		Be-7	<7.53E-02	0.00E+00	7.53E-02
		K-40	6.26E-01	2.48E-01	2.50E-01
374566	3/31/2015 - 4/7/2015	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.56E-02	0.00E+00	1.56E-02
		Be-7	<1.03E-01	0.00E+00	1.03E-01
		K-40	5.27E-01	2.10E-01	1.62E-01
374943	4/7/2015 - 4/14/2015	I-131	<1.77E-02	0.00E+00	1.77E-02
		Cs-134	<9.65E-03	0.00E+00	9.65E-03
		Cs-137	<1.76E-02	0.00E+00	1.76E-02
		Be-7	<9.45E-02	0.00E+00	9.45E-02
		K-40	4.51E-01	2.27E-01	2.68E-01
375634	4/14/2015 - 4/21/2015	I-131	<1.13E-02	0.00E+00	1.13E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<7.60E-02	0.00E+00	7.60E-02
		K-40	4.33E-01	2.12E-01	2.36E-01
376838	4/21/2015 - 4/28/2015	I-131	<1.66E-02	0.00E+00	1.66E-02
		Cs-134	<1.24E-02	0.00E+00	1.24E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<9.97E-02	0.00E+00	9.97E-02
		K-40	4.39E-01	1.79E-01	4.76E-02
377500	4/28/2015 - 5/5/2015	I-131	<1.23E-02	0.00E+00	1.23E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	4.82E-01	2.22E-01	2.42E-01
378064	5/5/2015 - 5/12/2015	I-131	<9.56E-03	0.00E+00	9.56E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
378064	5/5/2015 - 5/12/2015	Cs-134	<7.13E-03	0.00E+00	7.13E-03
		Cs-137	<7.27E-03	0.00E+00	7.27E-03
		Be-7	<4.66E-02	0.00E+00	4.66E-02
		K-40	3.64E-01	1.44E-01	1.23E-01
378464	5/12/2015 - 5/19/2015	I-131	<7.40E-03	0.00E+00	7.40E-03
		Cs-134	<8.46E-03	0.00E+00	8.46E-03
		Cs-137	<1.15E-02	0.00E+00	1.16E-02
		Be-7	<5.07E-02	0.00E+00	5.07E-02
		K-40	4.08E-01	1.46E-01	1.01E-01
378960	5/19/2015 - 5/27/2015	I-131	<1.45E-02	0.00E+00	1.45E-02
		Cs-134	<9.18E-03	0.00E+00	9.18E-03
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<5.75E-02	0.00E+00	5.75E-02
		K-40	6.26E-01	2.28E-01	2.16E-01
379466	5/27/2015 - 6/2/2015	I-131	<9.39E-03	0.00E+00	9.39E-03
		Cs-134	<8.35E-03	0.00E+00	8.35E-03
		Cs-137	<8.85E-03	0.00E+00	8.85E-03
		Be-7	<8.13E-02	0.00E+00	8.13E-02
		K-40	4.16E-01	1.76E-01	1.91E-01
380190	6/2/2015 - 6/9/2015	I-131	<7.38E-03	0.00E+00	7.38E-03
		Cs-134	<7.18E-03	0.00E+00	7.18E-03
		Cs-137	<8.31E-03	0.00E+00	8.31E-03
		Be-7	<6.07E-02	0.00E+00	6.07E-02
		K-40	3.83E-01	1.32E-01	2.88E-02
380478	6/9/2015 - 6/16/2015	I-131	<8.14E-03	0.00E+00	8.14E-03
		Cs-134	<7.10E-03	0.00E+00	7.10E-03
		Cs-137	<6.32E-03	0.00E+00	6.32E-03
		Be-7	<6.01E-02	0.00E+00	6.01E-02
		K-40	4.30E-01	1.49E-01	1.22E-01
380810	6/16/2015 - 6/23/2015	I-131	<1.41E-02	0.00E+00	1.41E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	3.98E-01	2.21E-01	2.79E-01
381258	6/23/2015 - 6/30/2015	I-131	<1.60E-02	0.00E+00	1.60E-02
		Cs-134	<9.68E-03	0.00E+00	9.68E-03
		Cs-137	<1.20E-02	0.00E+00	1.20E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.39E-01	2.02E-01	4.87E-02
381607	6/30/2015 - 7/7/2015	I-131	<6.21E-03	0.00E+00	6.21E-03
		Cs-134	<6.30E-03	0.00E+00	6.30E-03
		Cs-137	<8.43E-03	0.00E+00	8.43E-03
		Be-7	<5.38E-02	0.00E+00	5.38E-02
		K-40	3.75E-01	1.42E-01	1.26E-01
382170	7/7/2015 - 7/14/2015	I-131	<1.67E-02	0.00E+00	1.67E-02
		Cs-134	<1.07E-02	0.00E+00	1.07E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	3.94E-01	1.90E-01	1.87E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
382596	7/14/2015 - 7/21/2015	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<1.58E-02	0.00E+00	1.58E-02
		Cs-137	<1.96E-02	0.00E+00	1.96E-02
		Be-7	<1.28E-01	0.00E+00	1.28E-01
		K-40	5.34E-01	2.24E-01	2.21E-01
383526	7/21/2015 - 7/28/2015	I-131	<7.79E-03	0.00E+00	7.79E-03
		Cs-134	<8.08E-03	0.00E+00	8.08E-03
		Cs-137	<1.17E-02	0.00E+00	1.17E-02
		Be-7	<5.85E-02	0.00E+00	5.85E-02
		K-40	4.06E-01	1.41E-01	1.00E-01
384101	7/28/2015 - 8/4/2015	I-131	<6.16E-03	0.00E+00	6.16E-03
		Cs-134	<7.95E-03	0.00E+00	7.95E-03
		Cs-137	<8.32E-03	0.00E+00	8.32E-03
		Be-7	<5.34E-02	0.00E+00	5.34E-02
		K-40	3.75E-01	1.36E-01	1.05E-01
384648	8/4/2015 - 8/11/2015	I-131	<1.59E-02	0.00E+00	1.59E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<6.64E-02	0.00E+00	6.64E-02
		K-40	5.25E-01	2.48E-01	2.92E-01
385416	8/11/2015 - 8/18/2015	I-131	<1.98E-02	0.00E+00	1.98E-02
		Cs-134	<1.24E-02	0.00E+00	1.24E-02
		Cs-137	<1.72E-02	0.00E+00	1.72E-02
		Be-7	<9.27E-02	0.00E+00	9.27E-02
		K-40	5.91E-01	2.29E-01	2.03E-01
385935	8/18/2015 - 8/25/2015	I-131	<6.93E-03	0.00E+00	6.93E-03
		Cs-134	<7.14E-03	0.00E+00	7.14E-03
		Cs-137	<5.85E-03	0.00E+00	5.85E-03
		Be-7	<4.30E-02	0.00E+00	4.30E-02
		K-40	3.17E-01	1.36E-01	1.34E-01
386833	8/25/2015 - 9/1/2015	I-131	<1.90E-02	0.00E+00	1.90E-02
		Cs-134	<1.46E-02	0.00E+00	1.46E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<9.20E-02	0.00E+00	9.20E-02
		K-40	5.84E-01	2.22E-01	1.75E-01
387422	9/1/2015 - 9/9/2015	I-131	<7.98E-03	0.00E+00	7.98E-03
		Cs-134	<8.36E-03	0.00E+00	8.36E-03
		Cs-137	<4.95E-03	0.00E+00	4.95E-03
		Be-7	<3.18E-02	0.00E+00	3.18E-02
		K-40	3.40E-01	1.16E-01	2.49E-02
388750	9/9/2015 - 9/15/2015	I-131	<1.07E-02	0.00E+00	1.07E-02
		Cs-134	<8.92E-03	0.00E+00	8.92E-03
		Cs-137	<8.39E-03	0.00E+00	8.39E-03
		Be-7	<5.45E-02	0.00E+00	5.45E-02
		K-40	4.45E-01	1.63E-01	1.32E-01
389415	9/15/2015 - 9/22/2015	I-131	<6.53E-03	0.00E+00	6.53E-03
		Cs-134	<8.36E-03	0.00E+00	8.36E-03
		Cs-137	<7.17E-03	0.00E+00	7.17E-03
		Be-7	<7.97E-02	0.00E+00	7.97E-02
		K-40	3.58E-01	1.36E-01	1.15E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
390019	9/22/2015 - 9/29/2015	I-131	<1.69E-02	0.00E+00	1.69E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.86E-02	0.00E+00	1.86E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.93E-01	2.12E-01	4.87E-02
390634	9/29/2015 - 10/6/2015	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<8.17E-03	0.00E+00	8.17E-03
		Cs-137	<1.17E-02	0.00E+00	1.17E-02
		Be-7	<9.28E-02	0.00E+00	9.28E-02
		K-40	3.72E-01	2.26E-01	3.03E-01
391937	10/6/2015 - 10/13/2015	I-131	<1.70E-02	0.00E+00	1.70E-02
		Cs-134	<1.23E-02	0.00E+00	1.23E-02
		Cs-137	<1.42E-02	0.00E+00	1.42E-02
		Be-7	<7.60E-02	0.00E+00	7.60E-02
		K-40	6.11E-01	2.45E-01	2.47E-01
392237	10/13/2015 - 10/20/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	4.52E-01	2.26E-01	2.64E-01
393439	10/20/2015 - 10/27/2015	I-131	<1.02E-02	0.00E+00	1.02E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<9.96E-02	0.00E+00	9.96E-02
		K-40	7.43E-01	2.67E-01	2.51E-01
393842	10/27/2015 - 11/3/2015	I-131	<1.49E-02	0.00E+00	1.49E-02
		Cs-134	<1.39E-02	0.00E+00	1.39E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<9.86E-02	0.00E+00	9.86E-02
		K-40	5.09E-01	2.29E-01	2.48E-01
394842	11/3/2015 - 11/10/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.34E-02	0.00E+00	1.34E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<9.43E-02	0.00E+00	9.43E-02
		K-40	<4.79E-01	0.00E+00	4.79E-01
395310	11/10/2015 - 11/17/2015	I-131	<1.53E-02	0.00E+00	1.53E-02
		Cs-134	<1.17E-02	0.00E+00	1.17E-02
		Cs-137	<1.56E-02	0.00E+00	1.56E-02
		Be-7	<1.25E-01	0.00E+00	1.25E-01
		K-40	4.35E-01	2.31E-01	2.87E-01
395638	11/17/2015 - 11/24/2015	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<7.66E-02	0.00E+00	7.66E-02
		K-40	<4.69E-01	0.00E+00	4.69E-01
396136	11/24/2015 - 12/1/2015	I-131	<1.65E-03	0.00E+00	1.65E-03
		Cs-134	<8.16E-03	0.00E+00	8.16E-03
		Cs-137	<8.10E-03	0.00E+00	8.10E-03
		Be-7	<5.69E-02	0.00E+00	5.69E-02
		K-40	5.11E-01	1.78E-01	1.67E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
396644	12/1/2015 - 12/8/2015	I-131	<1.59E-02	0.00E+00	1.59E-02
		Cs-134	<1.05E-02	0.00E+00	1.05E-02
		Cs-137	<1.79E-02	0.00E+00	1.79E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.58E-01	1.94E-01	2.25E-01
397181	12/8/2015 - 12/15/2015	I-131	<1.76E-02	0.00E+00	1.76E-02
		Cs-134	<1.45E-02	0.00E+00	1.45E-02
		Cs-137	<1.35E-02	0.00E+00	1.35E-02
		Be-7	<7.82E-02	0.00E+00	7.82E-02
		K-40	3.30E-01	1.87E-01	2.17E-01
397903	12/15/2015 - 12/22/2015	I-131	<5.68E-03	0.00E+00	5.68E-03
		Cs-134	<4.54E-03	0.00E+00	4.54E-03
		Cs-137	<7.30E-03	0.00E+00	7.30E-03
		Be-7	<6.77E-02	0.00E+00	6.77E-02
		K-40	<3.17E-01	0.00E+00	3.17E-01
398297	12/22/2015 - 12/29/2015	I-131	<1.58E-02	0.00E+00	1.58E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	5.10E-01	1.94E-01	4.76E-02

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

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
364896	12/30/2014 - 1/6/2015	I-131	<1.70E-02	0.00E+00	1.70E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	4.89E-01	2.00E-01	1.52E-01
365076	1/6/2015 - 1/13/2015	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	7.10E-01	2.32E-01	4.81E-02
365308	1/13/2015 - 1/20/2015	I-131	<1.20E-02	0.00E+00	1.20E-02
		Cs-134	<1.15E-02	0.00E+00	1.15E-02
		Cs-137	<1.21E-02	0.00E+00	1.21E-02
		Be-7	<8.14E-02	0.00E+00	8.14E-02
		K-40	4.55E-01	1.82E-01	1.61E-01
366664	1/20/2015 - 1/27/2015	I-131	<1.52E-02	0.00E+00	1.52E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	6.97E-01	2.38E-01	1.54E-01
367070	1/27/2015 - 2/3/2015	I-131	<1.44E-02	0.00E+00	1.44E-02
		Cs-134	<9.54E-03	0.00E+00	9.54E-03
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	5.61E-01	2.46E-01	2.72E-01
367555	2/3/2015 - 2/10/2015	I-131	<2.16E-02	0.00E+00	2.16E-02
		Cs-134	<1.64E-02	0.00E+00	1.64E-02
		Cs-137	<2.05E-02	0.00E+00	2.05E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
367555	2/3/2015 - 2/10/2015	Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	5.68E-01	2.52E-01	7.32E-02
368982	2/10/2015 - 2/16/2015	I-131	<1.09E-02	0.00E+00	1.09E-02
		Cs-134	<1.18E-02	0.00E+00	1.18E-02
		Cs-137	<1.10E-02	0.00E+00	1.10E-02
		Be-7	<7.89E-02	0.00E+00	7.89E-02
		K-40	4.87E-01	1.75E-01	1.32E-01
369705	2/16/2015 - 2/23/2015	I-131	<8.62E-03	0.00E+00	8.62E-03
		Cs-134	<9.13E-03	0.00E+00	9.13E-03
		Cs-137	<8.74E-03	0.00E+00	8.74E-03
		Be-7	<4.95E-02	0.00E+00	4.95E-02
		K-40	3.49E-01	1.32E-01	1.10E-01
370611	2/23/2015 - 3/3/2015	I-131	<7.22E-03	0.00E+00	7.22E-03
		Cs-134	<5.12E-03	0.00E+00	5.12E-03
		Cs-137	<7.95E-03	0.00E+00	7.95E-03
		Be-7	<6.24E-02	0.00E+00	6.24E-02
		K-40	3.36E-01	1.15E-01	2.46E-02
371550	3/3/2015 - 3/10/2015	I-131	<1.43E-02	0.00E+00	1.43E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<9.97E-02	0.00E+00	9.97E-02
		K-40	5.30E-01	1.99E-01	4.79E-02
371922	3/10/2015 - 3/17/2015	I-131	<6.67E-03	0.00E+00	6.67E-03
		Cs-134	<5.81E-03	0.00E+00	5.81E-03
		Cs-137	<8.47E-03	0.00E+00	8.47E-03
		Be-7	<5.84E-02	0.00E+00	5.84E-02
		K-40	3.60E-01	1.36E-01	1.14E-01
372416	3/17/2015 - 3/24/2015	I-131	<6.85E-03	0.00E+00	6.85E-03
		Cs-134	<6.36E-03	0.00E+00	6.36E-03
		Cs-137	<8.51E-03	0.00E+00	8.51E-03
		Be-7	<5.44E-02	0.00E+00	5.44E-02
		K-40	4.16E-01	1.37E-01	2.82E-02
373844	3/24/2015 - 3/31/2015	I-131	<1.92E-02	0.00E+00	1.92E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<6.65E-02	0.00E+00	6.65E-02
		K-40	5.37E-01	2.15E-01	1.76E-01
374567	3/31/2015 - 4/7/2015	I-131	<2.28E-02	0.00E+00	2.28E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.02E-02	0.00E+00	1.02E-02
		Be-7	<9.52E-02	0.00E+00	9.52E-02
		K-40	<4.52E-01	0.00E+00	4.52E-01
374944	4/7/2015 - 4/14/2015	I-131	<1.61E-02	0.00E+00	1.61E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<8.58E-02	0.00E+00	8.58E-02
		K-40	<4.77E-01	0.00E+00	4.77E-01
375635	4/14/2015 - 4/21/2015	I-131	<1.34E-02	0.00E+00	1.34E-02





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
375635	4/14/2015 - 4/21/2015	Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	<4.60E-01	0.00E+00	4.60E-01
376839	4/21/2015 - 4/28/2015	I-131	<1.52E-02	0.00E+00	1.52E-02
		Cs-134	<1.78E-02	0.00E+00	1.78E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	7.61E-01	2.41E-01	4.80E-02
377501	4/28/2015 - 5/5/2015	I-131	<1.82E-02	0.00E+00	1.82E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.31E-01	1.99E-01	4.80E-02
378065	5/5/2015 - 5/12/2015	I-131	<6.02E-03	0.00E+00	6.02E-03
		Cs-134	<5.42E-03	0.00E+00	5.42E-03
		Cs-137	<4.61E-03	0.00E+00	4.61E-03
		Be-7	<6.00E-02	0.00E+00	6.00E-02
		K-40	3.99E-01	1.34E-01	2.85E-02
378465	5/12/2015 - 5/19/2015	I-131	<6.33E-03	0.00E+00	6.33E-03
		Cs-134	<4.64E-03	0.00E+00	4.64E-03
		Cs-137	<9.34E-03	0.00E+00	9.34E-03
		Be-7	<4.24E-02	0.00E+00	4.24E-02
		K-40	4.27E-01	1.56E-01	1.48E-01
378961	5/19/2015 - 5/27/2015	I-131	<1.63E-02	0.00E+00	1.63E-02
		Cs-134	<1.09E-02	0.00E+00	1.09E-02
		Cs-137	<1.15E-02	0.00E+00	1.15E-02
		Be-7	<8.86E-02	0.00E+00	8.86E-02
		K-40	5.87E-01	1.97E-01	4.19E-02
379467	5/27/2015 - 6/2/2015	I-131	<8.85E-03	0.00E+00	8.85E-03
		Cs-134	<9.07E-03	0.00E+00	9.07E-03
		Cs-137	<1.00E-02	0.00E+00	1.00E-02
		Be-7	<7.23E-02	0.00E+00	7.23E-02
		K-40	3.09E-01	1.37E-01	1.23E-01
380191	6/2/2015 - 6/9/2015	I-131	<7.47E-03	0.00E+00	7.47E-03
		Cs-134	<7.09E-03	0.00E+00	7.09E-03
		Cs-137	<8.19E-03	0.00E+00	8.19E-03
		Be-7	<6.02E-02	0.00E+00	6.02E-02
		K-40	2.29E-01	1.30E-01	1.63E-01
380479	6/9/2015 - 6/16/2015	I-131	<8.43E-03	0.00E+00	8.43E-03
		Cs-134	<1.00E-02	0.00E+00	1.00E-02
		Cs-137	<5.59E-03	0.00E+00	5.59E-03
		Be-7	<6.18E-02	0.00E+00	6.18E-02
		K-40	3.94E-01	1.33E-01	2.81E-02
380811	6/16/2015 - 6/23/2015	I-131	<2.16E-02	0.00E+00	2.16E-02
		Cs-134	<8.45E-03	0.00E+00	8.45E-03
		Cs-137	<1.05E-02	0.00E+00	1.05E-02
		Be-7	<9.61E-02	0.00E+00	9.61E-02
		K-40	6.72E-01	2.61E-01	2.59E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
381259	6/23/2015 - 6/30/2015	I-131	<1.52E-02	0.00E+00	1.52E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	5.31E-01	2.34E-01	2.50E-01
381608	6/30/2015 - 7/7/2015	I-131	<8.45E-03	0.00E+00	8.45E-03
		Cs-134	<6.58E-03	0.00E+00	6.58E-03
		Cs-137	<7.49E-03	0.00E+00	7.49E-03
		Be-7	<6.29E-02	0.00E+00	6.29E-02
		K-40	3.14E-01	1.31E-01	1.21E-01
382171	7/7/2015 - 7/14/2015	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<9.29E-02	0.00E+00	9.29E-02
		K-40	5.08E-01	2.22E-01	2.23E-01
382597	7/14/2015 - 7/21/2015	I-131	<1.55E-02	0.00E+00	1.55E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<8.60E-02	0.00E+00	8.60E-02
		K-40	6.59E-01	2.37E-01	1.79E-01
383527	7/21/2015 - 7/28/2015	I-131	<7.22E-03	0.00E+00	7.22E-03
		Cs-134	<8.46E-03	0.00E+00	8.46E-03
		Cs-137	<8.69E-03	0.00E+00	8.69E-03
		Be-7	<6.76E-02	0.00E+00	6.76E-02
		K-40	5.09E-01	1.80E-01	1.74E-01
384102	7/28/2015 - 8/4/2015	I-131	<1.31E-02	0.00E+00	1.31E-02
		Cs-134	<6.44E-03	0.00E+00	6.44E-03
		Cs-137	<9.36E-03	0.00E+00	9.36E-03
		Be-7	<5.46E-02	0.00E+00	5.46E-02
		K-40	4.69E-01	1.51E-01	3.03E-02
384649	8/4/2015 - 8/11/2015	I-131	<1.25E-02	0.00E+00	1.25E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<8.52E-02	0.00E+00	8.52E-02
		K-40	6.39E-01	2.52E-01	2.51E-01
385417	8/11/2015 - 8/18/2015	I-131	<1.37E-02	0.00E+00	1.37E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<8.08E-03	0.00E+00	8.08E-03
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	7.03E-01	2.51E-01	2.12E-01
385936	8/18/2015 - 8/25/2015	I-131	<6.24E-03	0.00E+00	6.24E-03
		Cs-134	<6.28E-03	0.00E+00	6.28E-03
		Cs-137	<8.40E-03	0.00E+00	8.40E-03
		Be-7	<2.81E-02	0.00E+00	2.81E-02
		K-40	3.67E-01	1.27E-01	2.77E-02
386834	8/25/2015 - 9/1/2015	I-131	<1.60E-02	0.00E+00	1.60E-02
		Cs-134	<1.54E-02	0.00E+00	1.54E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	6.55E-01	2.54E-01	2.51E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
387423	9/1/2015 - 9/9/2015	I-131	<7.56E-03	0.00E+00	7.56E-03
		Cs-134	<7.31E-03	0.00E+00	7.31E-03
		Cs-137	<6.83E-03	0.00E+00	6.83E-03
		Be-7	<4.75E-02	0.00E+00	4.75E-02
		K-40	2.93E-01	1.16E-01	1.02E-01
388751	9/9/2015 - 9/15/2015	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.72E-02	0.00E+00	1.72E-02
		Cs-137	<1.80E-02	0.00E+00	1.80E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	8.24E-01	2.69E-01	5.58E-02
389416	9/15/2015 - 9/22/2015	I-131	<9.78E-03	0.00E+00	9.78E-03
		Cs-134	<7.06E-03	0.00E+00	7.06E-03
		Cs-137	<8.77E-03	0.00E+00	8.77E-03
		Be-7	<6.94E-02	0.00E+00	6.94E-02
		K-40	3.92E-01	1.49E-01	1.40E-01
390020	9/22/2015 - 9/29/2015	I-131	<1.61E-02	0.00E+00	1.61E-02
		Cs-134	<1.34E-02	0.00E+00	1.34E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<7.66E-02	0.00E+00	7.66E-02
		K-40	4.67E-01	2.22E-01	2.46E-01
390635	9/29/2015 - 10/6/2015	I-131	<1.68E-02	0.00E+00	1.68E-02
		Cs-134	<9.50E-03	0.00E+00	9.50E-03
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	5.81E-01	2.08E-01	4.78E-02
391938	10/6/2015 - 10/13/2015	I-131	<1.47E-02	0.00E+00	1.47E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	5.29E-01	2.33E-01	2.50E-01
392238	10/13/2015 - 10/20/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.34E-02	0.00E+00	1.34E-02
		Cs-137	<1.45E-02	0.00E+00	1.45E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	5.22E-01	2.29E-01	2.38E-01
393440	10/20/2015 - 10/27/2015	I-131	<1.16E-02	0.00E+00	1.16E-02
		Cs-134	<1.07E-02	0.00E+00	1.07E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	6.82E-01	2.39E-01	1.71E-01
393843	10/27/2015 - 11/3/2015	I-131	<1.22E-02	0.00E+00	1.22E-02
		Cs-134	<1.03E-02	0.00E+00	1.03E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.03E-01	0.00E+00	1.03E-01
		K-40	4.99E-01	1.90E-01	4.66E-02
394843	11/3/2015 - 11/10/2015	I-131	<1.81E-02	0.00E+00	1.81E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.36E-01	2.31E-01	2.40E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
395311	11/10/2015 - 11/17/2015	I-131	<1.76E-02	0.00E+00	1.76E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	<6.61E-02	0.00E+00	6.61E-02
		K-40	4.97E-01	2.48E-01	3.07E-01
395639	11/17/2015 - 11/24/2015	I-131	<1.87E-02	0.00E+00	1.87E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	5.54E-01	2.17E-01	1.74E-01
396137	11/24/2015 - 12/1/2015	I-131	<7.94E-03	0.00E+00	7.94E-03
		Cs-134	<7.51E-03	0.00E+00	7.51E-03
		Cs-137	<9.33E-03	0.00E+00	9.33E-03
		Be-7	<5.62E-02	0.00E+00	5.62E-02
		K-40	3.31E-01	1.28E-01	9.39E-02
396645	12/1/2015 - 12/8/2015	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<5.27E-02	0.00E+00	5.27E-02
		K-40	<4.43E-01	0.00E+00	4.43E-01
397182	12/8/2015 - 12/15/2015	I-131	<1.68E-02	0.00E+00	1.68E-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	<8.55E-02	0.00E+00	8.55E-02
		K-40	5.08E-01	2.38E-01	2.75E-01
397904	12/15/2015 - 12/22/2015	I-131	<1.03E-02	0.00E+00	1.03E-02
		Cs-134	<7.19E-03	0.00E+00	7.19E-03
		Cs-137	<1.14E-02	0.00E+00	1.14E-02
		Be-7	<5.71E-02	0.00E+00	5.71E-02
		K-40	4.37E-01	1.46E-01	3.12E-02
398298	12/22/2015 - 12/29/2015	I-131	<1.35E-02	0.00E+00	1.35E-02
		Cs-134	<1.46E-02	0.00E+00	1.46E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<6.52E-02	0.00E+00	6.52E-02
		K-40	4.19E-01	2.19E-01	2.63E-01
<b>Sample Point 261 [ INDICATOR - N @ 0.72 miles ]</b>					
364897	12/30/2014 - 1/6/2015	I-131	<1.68E-02	0.00E+00	1.68E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.30E-02	0.00E+00	1.30E-02
		Be-7	<7.61E-02	0.00E+00	7.61E-02
		K-40	4.09E-01	2.06E-01	2.34E-01
365077	1/6/2015 - 1/13/2015	I-131	<1.67E-02	0.00E+00	1.67E-02
		Cs-134	<1.69E-02	0.00E+00	1.69E-02
		Cs-137	<1.93E-02	0.00E+00	1.93E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	5.46E-01	2.14E-01	1.64E-01
365309	1/13/2015 - 1/20/2015	I-131	<6.86E-03	0.00E+00	6.86E-03
		Cs-134	<1.45E-03	0.00E+00	1.45E-03
		Cs-137	<8.02E-03	0.00E+00	8.02E-03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
365309	1/13/2015 - 1/20/2015	Be-7	<5.10E-02	0.00E+00	5.10E-02
		K-40	2.87E-01	1.37E-01	1.49E-01
366665	1/20/2015 - 1/27/2015	I-131	<1.21E-02	0.00E+00	1.21E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<9.28E-02	0.00E+00	9.28E-02
		K-40	3.57E-01	1.98E-01	2.37E-01
367071	1/27/2015 - 2/3/2015	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<1.16E-02	0.00E+00	1.16E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<8.54E-02	0.00E+00	8.54E-02
		K-40	<5.33E-01	0.00E+00	5.33E-01
367556	2/3/2015 - 2/10/2015	I-131	<1.01E-02	0.00E+00	1.01E-02
		Cs-134	<5.03E-03	0.00E+00	5.03E-03
		Cs-137	<8.08E-03	0.00E+00	8.08E-03
		Be-7	<5.27E-02	0.00E+00	5.27E-02
		K-40	4.98E-01	1.56E-01	3.07E-02
368983	2/10/2015 - 2/16/2015	I-131	<2.34E-02	0.00E+00	2.34E-02
		Cs-134	<1.90E-02	0.00E+00	1.90E-02
		Cs-137	<2.57E-02	0.00E+00	2.57E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	7.87E-01	3.58E-01	3.46E-01
369706	2/16/2015 - 2/23/2015	I-131	<8.09E-03	0.00E+00	8.09E-03
		Cs-134	<6.12E-03	0.00E+00	6.12E-03
		Cs-137	<8.17E-03	0.00E+00	8.17E-03
		Be-7	<5.96E-02	0.00E+00	5.96E-02
		K-40	3.96E-01	1.40E-01	1.12E-01
370612	2/23/2015 - 3/3/2015	I-131	<7.33E-03	0.00E+00	7.33E-03
		Cs-134	<7.40E-03	0.00E+00	7.40E-03
		Cs-137	<7.78E-03	0.00E+00	7.78E-03
		Be-7	<5.93E-02	0.00E+00	5.93E-02
		K-40	3.78E-01	1.35E-01	1.17E-01
371551	3/3/2015 - 3/10/2015	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<1.41E-02	0.00E+00	1.41E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	4.67E-01	2.00E-01	1.69E-01
371923	3/10/2015 - 3/17/2015	I-131	<9.04E-03	0.00E+00	9.04E-03
		Cs-134	<9.77E-03	0.00E+00	9.77E-03
		Cs-137	<6.22E-03	0.00E+00	6.22E-03
		Be-7	<6.06E-02	0.00E+00	6.06E-02
		K-40	3.62E-01	1.56E-01	1.67E-01
372417	3/17/2015 - 3/24/2015	I-131	<9.85E-03	0.00E+00	9.85E-03
		Cs-134	<6.56E-03	0.00E+00	6.56E-03
		Cs-137	<8.16E-03	0.00E+00	8.16E-03
		Be-7	<5.16E-02	0.00E+00	5.16E-02
		K-40	4.00E-01	1.41E-01	1.03E-01
373845	3/24/2015 - 3/31/2015	I-131	<1.88E-02	0.00E+00	1.88E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
373845	3/24/2015 - 3/31/2015	Cs-134	<1.05E-02	0.00E+00	1.05E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<9.26E-02	0.00E+00	9.26E-02
		K-40	<4.72E-01	0.00E+00	4.72E-01
374568	3/31/2015 - 4/7/2015	I-131	<1.89E-02	0.00E+00	1.89E-02
		Cs-134	<1.17E-02	0.00E+00	1.17E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	6.60E-01	2.24E-01	4.83E-02
374945	4/7/2015 - 4/14/2015	I-131	<1.84E-02	0.00E+00	1.84E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	<4.79E-01	0.00E+00	4.79E-01
375636	4/14/2015 - 4/21/2015	I-131	<1.65E-02	0.00E+00	1.65E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	4.18E-01	1.87E-01	1.57E-01
376840	4/21/2015 - 4/28/2015	I-131	<9.39E-03	0.00E+00	9.39E-03
		Cs-134	<6.53E-03	0.00E+00	6.53E-03
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<9.36E-02	0.00E+00	9.36E-02
		K-40	5.84E-01	2.42E-01	2.50E-01
377502	4/28/2015 - 5/5/2015	I-131	<1.55E-02	0.00E+00	1.55E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<6.61E-02	0.00E+00	6.61E-02
		K-40	5.10E-01	1.94E-01	4.76E-02
378066	5/5/2015 - 5/12/2015	I-131	<4.10E-03	0.00E+00	4.10E-03
		Cs-134	<6.95E-03	0.00E+00	6.95E-03
		Cs-137	<4.50E-03	0.00E+00	4.50E-03
		Be-7	<5.56E-02	0.00E+00	5.56E-02
		K-40	3.56E-01	1.39E-01	1.22E-01
378466	5/12/2015 - 5/19/2015	I-131	<7.87E-03	0.00E+00	7.87E-03
		Cs-134	<6.37E-03	0.00E+00	6.37E-03
		Cs-137	<5.61E-03	0.00E+00	5.61E-03
		Be-7	<4.16E-02	0.00E+00	4.16E-02
		K-40	3.87E-01	1.40E-01	1.05E-01
378962	5/19/2015 - 5/27/2015	I-131	<1.31E-02	0.00E+00	1.31E-02
		Cs-134	<1.22E-02	0.00E+00	1.22E-02
		Cs-137	<1.51E-02	0.00E+00	1.51E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	4.54E-01	2.36E-01	3.09E-01
379468	5/27/2015 - 6/2/2015	I-131	<1.13E-02	0.00E+00	1.13E-02
		Cs-134	<6.77E-03	0.00E+00	6.77E-03
		Cs-137	<1.24E-02	0.00E+00	1.24E-02
		Be-7	<8.68E-02	0.00E+00	8.68E-02
		K-40	5.84E-01	1.91E-01	1.27E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
380192	6/2/2015 - 6/9/2015	I-131	<8.42E-03	0.00E+00	8.42E-03
		Cs-134	<7.27E-03	0.00E+00	7.27E-03
		Cs-137	<8.47E-03	0.00E+00	8.47E-03
		Be-7	<5.85E-02	0.00E+00	5.85E-02
		K-40	4.13E-01	1.44E-01	1.06E-01
380480	6/9/2015 - 6/16/2015	I-131	<6.69E-03	0.00E+00	6.69E-03
		Cs-134	<6.47E-03	0.00E+00	6.47E-03
		Cs-137	<8.04E-03	0.00E+00	8.04E-03
		Be-7	<4.23E-02	0.00E+00	4.23E-02
		K-40	3.93E-01	1.52E-01	1.51E-01
380812	6/16/2015 - 6/23/2015	I-131	<1.84E-02	0.00E+00	1.84E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<9.38E-02	0.00E+00	9.38E-02
		K-40	4.83E-01	2.12E-01	2.05E-01
381260	6/23/2015 - 6/30/2015	I-131	<1.26E-02	0.00E+00	1.26E-02
		Cs-134	<1.17E-02	0.00E+00	1.17E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	3.52E-01	2.17E-01	2.89E-01
381609	6/30/2015 - 7/7/2015	I-131	<7.34E-03	0.00E+00	7.34E-03
		Cs-134	<6.28E-03	0.00E+00	6.28E-03
		Cs-137	<5.52E-03	0.00E+00	5.52E-03
		Be-7	<6.93E-02	0.00E+00	6.93E-02
		K-40	4.00E-01	1.40E-01	1.01E-01
382172	7/7/2015 - 7/14/2015	I-131	<1.26E-02	0.00E+00	1.26E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	6.93E-01	2.29E-01	4.82E-02
382598	7/14/2015 - 7/21/2015	I-131	<9.50E-03	0.00E+00	9.50E-03
		Cs-134	<1.54E-02	0.00E+00	1.54E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<8.55E-02	0.00E+00	8.55E-02
		K-40	5.29E-01	2.57E-01	3.16E-01
383528	7/21/2015 - 7/28/2015	I-131	<7.30E-03	0.00E+00	7.30E-03
		Cs-134	<6.41E-03	0.00E+00	6.41E-03
		Cs-137	<1.01E-02	0.00E+00	1.01E-02
		Be-7	<4.22E-02	0.00E+00	4.22E-02
		K-40	4.71E-01	1.47E-01	2.84E-02
384103	7/28/2015 - 8/4/2015	I-131	<1.61E-02	0.00E+00	1.61E-02
		Cs-134	<6.89E-03	0.00E+00	6.89E-03
		Cs-137	<9.08E-03	0.00E+00	9.08E-03
		Be-7	<6.25E-02	0.00E+00	6.25E-02
		K-40	3.88E-01	1.48E-01	1.39E-01
384650	8/4/2015 - 8/11/2015	I-131	<1.87E-02	0.00E+00	1.87E-02
		Cs-134	<1.42E-02	0.00E+00	1.42E-02
		Cs-137	<1.45E-02	0.00E+00	1.45E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	6.19E-01	2.70E-01	3.14E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
385418	8/11/2015 - 8/18/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<8.58E-02	0.00E+00	8.58E-02
		K-40	5.29E-01	1.98E-01	4.78E-02
385937	8/18/2015 - 8/25/2015	I-131	<6.09E-03	0.00E+00	6.09E-03
		Cs-134	<7.58E-03	0.00E+00	7.58E-03
		Cs-137	<7.20E-03	0.00E+00	7.20E-03
		Be-7	<4.57E-02	0.00E+00	4.57E-02
		K-40	3.67E-01	1.39E-01	9.80E-02
386835	8/25/2015 - 9/1/2015	I-131	<1.34E-02	0.00E+00	1.34E-02
		Cs-134	<1.40E-02	0.00E+00	1.40E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<8.45E-02	0.00E+00	8.45E-02
		K-40	<4.23E-01	0.00E+00	4.23E-01
387424	9/1/2015 - 9/9/2015	I-131	<8.23E-03	0.00E+00	8.23E-03
		Cs-134	<5.06E-03	0.00E+00	5.06E-03
		Cs-137	<6.29E-03	0.00E+00	6.29E-03
		Be-7	<4.49E-02	0.00E+00	4.49E-02
		K-40	4.58E-01	1.45E-01	8.77E-02
388752	9/9/2015 - 9/15/2015	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<1.11E-02	0.00E+00	1.11E-02
		Cs-137	<1.67E-02	0.00E+00	1.67E-02
		Be-7	<6.14E-02	0.00E+00	6.14E-02
		K-40	<5.44E-01	0.00E+00	5.44E-01
389417	9/15/2015 - 9/22/2015	I-131	<9.16E-03	0.00E+00	9.16E-03
		Cs-134	<6.75E-03	0.00E+00	6.75E-03
		Cs-137	<5.52E-03	0.00E+00	5.52E-03
		Be-7	<5.43E-02	0.00E+00	5.43E-02
		K-40	4.58E-01	1.43E-01	2.76E-02
390021	9/22/2015 - 9/29/2015	I-131	<1.46E-02	0.00E+00	1.46E-02
		Cs-134	<6.58E-03	0.00E+00	6.58E-03
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<1.30E-01	0.00E+00	1.30E-01
		K-40	5.37E-01	2.44E-01	2.76E-01
390636	9/29/2015 - 10/6/2015	I-131	<1.20E-02	0.00E+00	1.20E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	5.25E-01	2.50E-01	3.00E-01
391939	10/6/2015 - 10/13/2015	I-131	<1.65E-02	0.00E+00	1.65E-02
		Cs-134	<1.54E-02	0.00E+00	1.54E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	5.12E-01	2.30E-01	2.50E-01
392239	10/13/2015 - 10/20/2015	I-131	<1.54E-02	0.00E+00	1.54E-02
		Cs-134	<9.61E-03	0.00E+00	9.61E-03
		Cs-137	<1.45E-02	0.00E+00	1.45E-02
		Be-7	<9.36E-02	0.00E+00	9.36E-02
		K-40	6.09E-01	2.47E-01	2.48E-01





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
393441	10/20/2015 - 10/27/2015	I-131	<1.60E-02	0.00E+00	1.60E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<9.30E-02	0.00E+00	9.30E-02
		K-40	3.80E-01	1.91E-01	1.99E-01
393844	10/27/2015 - 11/3/2015	I-131	<1.50E-02	0.00E+00	1.50E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.30E-02	0.00E+00	1.30E-02
		Be-7	<9.19E-02	0.00E+00	9.19E-02
		K-40	6.66E-01	2.39E-01	1.88E-01
394844	11/3/2015 - 11/10/2015	I-131	<1.65E-02	0.00E+00	1.65E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	<6.68E-02	0.00E+00	6.68E-02
		K-40	6.02E-01	2.49E-01	2.60E-01
395312	11/10/2015 - 11/17/2015	I-131	<1.89E-02	0.00E+00	1.89E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	5.09E-01	2.39E-01	2.75E-01
395640	11/17/2015 - 11/24/2015	I-131	<1.49E-02	0.00E+00	1.49E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	6.73E-01	2.25E-01	4.80E-02
396138	11/24/2015 - 12/1/2015	I-131	<7.33E-03	0.00E+00	7.33E-03
		Cs-134	<7.02E-03	0.00E+00	7.02E-03
		Cs-137	<5.74E-03	0.00E+00	5.74E-03
		Be-7	<6.91E-02	0.00E+00	6.91E-02
		K-40	4.22E-01	1.62E-01	1.69E-01
396646	12/1/2015 - 12/8/2015	I-131	<1.54E-02	0.00E+00	1.54E-02
		Cs-134	<1.24E-02	0.00E+00	1.24E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<9.33E-02	0.00E+00	9.33E-02
		K-40	6.15E-01	2.14E-01	4.76E-02
397183	12/8/2015 - 12/15/2015	I-131	<1.54E-02	0.00E+00	1.54E-02
		Cs-134	<1.50E-02	0.00E+00	1.50E-02
		Cs-137	<1.20E-02	0.00E+00	1.20E-02
		Be-7	<9.42E-02	0.00E+00	9.42E-02
		K-40	5.80E-01	2.24E-01	1.77E-01
397905	12/15/2015 - 12/22/2015	I-131	<8.45E-03	0.00E+00	8.45E-03
		Cs-134	<9.09E-03	0.00E+00	9.09E-03
		Cs-137	<9.36E-03	0.00E+00	9.36E-03
		Be-7	<4.76E-02	0.00E+00	4.76E-02
		K-40	3.89E-01	1.44E-01	1.19E-01
398299	12/22/2015 - 12/29/2015	I-131	<1.01E-02	0.00E+00	1.01E-02
		Cs-134	<7.09E-03	0.00E+00	7.09E-03
		Cs-137	<7.23E-03	0.00E+00	7.23E-03
		Be-7	<4.65E-02	0.00E+00	4.65E-02
		K-40	4.53E-01	1.48E-01	3.07E-02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
365083	1/6/2015 - 1/6/2015	MIXEDCROPS	I-131	<1.64E+01	0.00E+00	1.64E+01
			Cs-134	<2.15E+01	0.00E+00	2.15E+01
			Cs-137	<1.97E+01	0.00E+00	1.97E+01
			Be-7	1.70E+02	1.28E+02	1.98E+02
			K-40	3.62E+03	5.55E+02	3.45E+02
367562	2/3/2015 - 2/3/2015	MIXEDCROPS	I-131	<4.11E+01	0.00E+00	4.11E+01
			Cs-134	<1.03E+01	0.00E+00	1.03E+01
			Cs-137	<1.09E+01	0.00E+00	1.09E+01
			Be-7	3.86E+02	1.03E+02	1.22E+02
			K-40	4.88E+03	5.15E+02	1.17E+02
371557	3/3/2015 - 3/3/2015	MIXEDCROPS	I-131	<1.07E+01	0.00E+00	1.07E+01
			Cs-134	<1.93E+01	0.00E+00	1.93E+01
			Cs-137	<1.40E+01	0.00E+00	1.40E+01
			Be-7	3.09E+02	1.14E+02	1.41E+02
			K-40	3.88E+03	5.28E+02	1.91E+02
378072	5/5/2015 - 5/5/2015	MIXEDCROPS	I-131	<1.63E+01	0.00E+00	1.63E+01
			Cs-134	<2.71E+01	0.00E+00	2.71E+01
			Cs-137	<2.09E+01	0.00E+00	2.09E+01
			Be-7	<2.46E+02	0.00E+00	2.46E+02
			K-40	5.23E+03	7.72E+02	3.09E+02
380198	6/2/2015 - 6/2/2015	MIXEDCROPS	I-131	<7.72E+00	0.00E+00	7.72E+00
			Cs-134	<1.34E+01	0.00E+00	1.34E+01
			Cs-137	<1.22E+01	0.00E+00	1.22E+01
			Be-7	<5.49E+01	0.00E+00	5.49E+01
			K-40	2.37E+03	3.56E+02	1.42E+02
382178	7/7/2015 - 7/7/2015	MIXEDCROPS	I-131	<3.77E+00	0.00E+00	3.77E+00
			Cs-134	<6.06E+00	0.00E+00	6.06E+00
			Cs-137	<4.16E+00	0.00E+00	4.16E+00
			Be-7	<3.15E+01	0.00E+00	3.15E+01
			K-40	1.81E+03	2.03E+02	6.34E+01
384656	8/4/2015 - 8/4/2015	MIXEDCROPS	I-131	<8.52E+00	0.00E+00	8.52E+00
			Cs-134	<5.31E+00	0.00E+00	5.31E+00
			Cs-137	<7.07E+00	0.00E+00	7.07E+00
			Be-7	<5.45E+01	0.00E+00	5.45E+01
			K-40	1.98E+03	2.65E+02	9.61E+01
388289	9/1/2015 - 9/1/2015	MIXEDCROPS	I-131	<4.97E+00	0.00E+00	4.97E+00
			Cs-134	<8.03E+00	0.00E+00	8.03E+00
			Cs-137	<8.00E+00	0.00E+00	8.00E+00
			Be-7	<6.51E+01	0.00E+00	6.51E+01
			K-40	2.36E+03	3.08E+02	1.16E+02
391249	10/6/2015 - 10/6/2015	MIXEDCROPS	I-131	<8.20E+00	0.00E+00	8.20E+00
			Cs-134	<1.03E+01	0.00E+00	1.03E+01
			Cs-137	<1.09E+01	0.00E+00	1.09E+01
			Be-7	7.58E+01	6.72E+01	1.06E+02
			K-40	2.15E+03	3.20E+02	1.46E+02
394637	11/3/2015 - 11/3/2015	MIXEDCROPS	I-131	<6.43E+00	0.00E+00	6.43E+00
			Cs-134	<1.05E+01	0.00E+00	1.05E+01
			Cs-137	<8.78E+00	0.00E+00	8.78E+00
			Be-7	1.30E+02	7.91E+01	1.19E+02
			K-40	2.86E+03	3.74E+02	9.19E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 260 [ INDICATOR - SSE @ 2 miles ]

Sample ID:	396592	Sample Dates:	12/1/2015 - 12/1/2015	MIXEDCROPS	Nuclide	Activity	2 Sigma Error	LLD
					I-131	<1.28E+01	0.00E+00	1.28E+01
					Cs-134	<1.49E+01	0.00E+00	1.49E+01
					Cs-137	<1.54E+01	0.00E+00	1.54E+01
					Be-7	4.01E+02	1.30E+02	1.56E+02
					K-40	3.29E+03	5.05E+02	2.87E+02

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

Sample Point 214 [ INDICATOR - SSE @ 7.3 miles ]

Sample ID:	364780	Sample Dates:	12/9/2014 - 1/6/2015		Nuclide	Activity	2 Sigma Error	LLD
					Beta	2.49E+00	8.10E-01	1.22E+00
					Mn-54	<3.42E+00	0.00E+00	3.42E+00
					Co-58	<2.75E+00	0.00E+00	2.75E+00
					Fe-59	<6.98E+00	0.00E+00	6.98E+00
					Co-60	<3.32E+00	0.00E+00	3.32E+00
					Zn-65	<3.19E+00	0.00E+00	3.19E+00
					Zr-95	<6.27E+00	0.00E+00	6.27E+00
					Nb-95	<3.47E+00	0.00E+00	3.47E+00
					I-131	<1.20E+01	0.00E+00	1.20E+01
					Cs-134	<2.75E+00	0.00E+00	2.75E+00
					Cs-137	<3.31E+00	0.00E+00	3.31E+00
					BaLa-140	<6.08E+00	0.00E+00	6.08E+00
					Be-7	<3.06E+01	0.00E+00	3.06E+01
					K-40	4.42E+01	2.68E+01	3.44E+01

Sample ID:	366877	Sample Dates:	1/6/2015 - 2/3/2015		Nuclide	Activity	2 Sigma Error	LLD
					Beta	1.25E+00	7.71E-01	1.24E+00
					Mn-54	<3.45E+00	0.00E+00	3.45E+00
					Co-58	<4.33E+00	0.00E+00	4.33E+00
					Fe-59	<6.58E+00	0.00E+00	6.58E+00
					Co-60	<4.63E+00	0.00E+00	4.63E+00
					Zn-65	<7.20E+00	0.00E+00	7.20E+00
					Zr-95	<7.94E+00	0.00E+00	7.94E+00
					Nb-95	<4.86E+00	0.00E+00	4.86E+00
					I-131	<1.19E+01	0.00E+00	1.19E+01
					Cs-134	<3.82E+00	0.00E+00	3.82E+00
					Cs-137	<3.63E+00	0.00E+00	3.63E+00
					BaLa-140	<1.02E+01	0.00E+00	1.02E+01
					Be-7	<3.87E+01	0.00E+00	3.87E+01
					K-40	<5.54E+01	0.00E+00	5.54E+01

Sample ID:	369978	Sample Dates:	2/3/2015 - 3/3/2015		Nuclide	Activity	2 Sigma Error	LLD
					Beta	2.49E+00	7.70E-01	1.12E+00
					Mn-54	<3.66E+00	0.00E+00	3.66E+00
					Co-58	<3.04E+00	0.00E+00	3.04E+00
					Fe-59	<7.76E+00	0.00E+00	7.76E+00
					Co-60	<3.04E+00	0.00E+00	3.04E+00
					Zn-65	<6.23E+00	0.00E+00	6.23E+00
					Zr-95	<8.51E+00	0.00E+00	8.51E+00
					Nb-95	<4.30E+00	0.00E+00	4.30E+00
					I-131	<1.19E+01	0.00E+00	1.19E+01
					Cs-134	<3.89E+00	0.00E+00	3.89E+00
					Cs-137	<3.23E+00	0.00E+00	3.23E+00
					BaLa-140	<5.49E+00	0.00E+00	5.49E+00
					Be-7	<3.47E+01	0.00E+00	3.47E+01
					K-40	<6.29E+01	0.00E+00	6.29E+01

Sample ID:	372361	Sample Dates:	12/9/2014 - 3/3/2015		Nuclide	Activity	2 Sigma Error	LLD
					H3DW	5.74E+02	1.23E+02	1.85E+02

Sample ID:	372743	Sample Dates:	3/3/2015 - 3/31/2015		Nuclide	Activity	2 Sigma Error	LLD
					Beta	2.62E+00	8.06E-01	1.19E+00
					Mn-54	<3.16E+00	0.00E+00	3.16E+00
					Co-58	<3.24E+00	0.00E+00	3.24E+00
					Fe-59	<7.68E+00	0.00E+00	7.68E+00
					Co-60	<3.24E+00	0.00E+00	3.24E+00
					Zn-65	<6.64E+00	0.00E+00	6.64E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
372743	3/3/2015 - 3/31/2015	Zr-95	<7.28E+00	0.00E+00	7.28E+00
		Nb-95	<3.60E+00	0.00E+00	3.60E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<2.98E+00	0.00E+00	2.98E+00
		Cs-137	<3.94E+00	0.00E+00	3.94E+00
		BaLa-140	<7.36E+00	0.00E+00	7.36E+00
		Be-7	<3.59E+01	0.00E+00	3.59E+01
		K-40	4.28E+01	3.86E+01	5.94E+01
375836	3/31/2015 - 4/28/2015	Beta	1.86E+00	7.82E-01	1.21E+00
		Mn-54	<4.59E+00	0.00E+00	4.59E+00
		Co-58	<4.42E+00	0.00E+00	4.42E+00
		Fe-59	<9.93E+00	0.00E+00	9.93E+00
		Co-60	<3.16E+00	0.00E+00	3.16E+00
		Zn-65	<8.18E+00	0.00E+00	8.18E+00
		Zr-95	<8.23E+00	0.00E+00	8.23E+00
		Nb-95	<5.40E+00	0.00E+00	5.40E+00
		I-131	<1.13E+01	0.00E+00	1.13E+01
		Cs-134	<3.96E+00	0.00E+00	3.96E+00
		Cs-137	<3.68E+00	0.00E+00	3.68E+00
		BaLa-140	<6.60E+00	0.00E+00	6.60E+00
		Be-7	<4.04E+01	0.00E+00	4.04E+01
		K-40	<6.79E+01	0.00E+00	6.79E+01
		378807	4/28/2015 - 5/27/2015	Beta	2.38E+00
Mn-54	<1.96E+00			0.00E+00	1.96E+00
Co-58	<2.25E+00			0.00E+00	2.25E+00
Fe-59	<5.50E+00			0.00E+00	5.50E+00
Co-60	<2.16E+00			0.00E+00	2.16E+00
Zn-65	<4.31E+00			0.00E+00	4.31E+00
Zr-95	<4.00E+00			0.00E+00	4.00E+00
Nb-95	<3.29E+00			0.00E+00	3.29E+00
I-131	<1.19E+01			0.00E+00	1.19E+01
Cs-134	<2.65E+00			0.00E+00	2.65E+00
Cs-137	<2.38E+00			0.00E+00	2.38E+00
BaLa-140	<7.00E+00			0.00E+00	7.00E+00
Be-7	<2.12E+01			0.00E+00	2.12E+01
K-40	2.84E+01			2.09E+01	3.16E+01
380199	3/3/2015 - 5/27/2015			Nuclide	Activity
		H3DW	5.36E+02	1.32E+02	1.98E+02
380684	5/27/2015 - 6/23/2015	Beta	1.18E+00	7.81E-01	1.27E+00
		Mn-54	<2.84E+00	0.00E+00	2.84E+00
		Co-58	<2.34E+00	0.00E+00	2.34E+00
		Fe-59	<5.90E+00	0.00E+00	5.90E+00
		Co-60	<1.89E+00	0.00E+00	1.89E+00
		Zn-65	<5.60E+00	0.00E+00	5.60E+00
		Zr-95	<5.33E+00	0.00E+00	5.33E+00
		Nb-95	<3.81E+00	0.00E+00	3.81E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<3.04E+00	0.00E+00	3.04E+00
		Cs-137	<3.21E+00	0.00E+00	3.21E+00
		BaLa-140	<5.63E+00	0.00E+00	5.63E+00
		Be-7	<2.79E+01	0.00E+00	2.79E+01
		K-40	1.94E+01	2.84E+01	4.74E+01
		382375	6/23/2015 - 7/21/2015	Nuclide	Activity
Beta	4.65E+00			8.75E-01	1.16E+00
Mn-54	<3.38E+00			0.00E+00	3.38E+00
Co-58	<4.22E+00			0.00E+00	4.22E+00
Fe-59	<8.32E+00			0.00E+00	8.32E+00
Co-60	<2.99E+00			0.00E+00	2.99E+00
Zn-65	<7.11E+00			0.00E+00	7.11E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
382375	6/23/2015 - 7/21/2015	Zr-95	<5.67E+00	0.00E+00	5.67E+00
		Nb-95	<4.98E+00	0.00E+00	4.98E+00
		I-131	<1.07E+01	0.00E+00	1.07E+01
		Cs-134	<4.22E+00	0.00E+00	4.22E+00
		Cs-137	<3.87E+00	0.00E+00	3.87E+00
		BaLa-140	<1.07E+01	0.00E+00	1.07E+01
		Be-7	<4.40E+01	0.00E+00	4.40E+01
		K-40	<6.80E+01	0.00E+00	6.80E+01
		384910	7/21/2015 - 8/18/2015	Beta	2.47E+00
Mn-54	<3.13E+00			0.00E+00	3.13E+00
Co-58	<3.75E+00			0.00E+00	3.75E+00
Fe-59	<5.90E+00			0.00E+00	5.90E+00
Co-60	<2.34E+00			0.00E+00	2.34E+00
Zn-65	<5.56E+00			0.00E+00	5.56E+00
Zr-95	<7.82E+00			0.00E+00	7.82E+00
Nb-95	<3.66E+00			0.00E+00	3.66E+00
I-131	<1.08E+01			0.00E+00	1.08E+01
Cs-134	<3.78E+00			0.00E+00	3.78E+00
Cs-137	<3.66E+00			0.00E+00	3.66E+00
BaLa-140	<1.12E+01			0.00E+00	1.12E+01
Be-7	<3.26E+01			0.00E+00	3.26E+01
K-40	3.18E+01			3.30E+01	5.24E+01
388112	5/27/2015 - 8/18/2015			H3DW	4.99E+02
388168	8/18/2015 - 9/10/2015	Beta	3.05E+00	8.16E-01	1.17E+00
		Mn-54	<1.87E+00	0.00E+00	1.87E+00
		Co-58	<1.77E+00	0.00E+00	1.77E+00
		Fe-59	<4.17E+00	0.00E+00	4.17E+00
		Co-60	<1.94E+00	0.00E+00	1.94E+00
		Zn-65	<3.74E+00	0.00E+00	3.74E+00
		Zr-95	<3.17E+00	0.00E+00	3.17E+00
		Nb-95	<2.75E+00	0.00E+00	2.75E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<2.32E+00	0.00E+00	2.32E+00
		Cs-137	<1.93E+00	0.00E+00	1.93E+00
		BaLa-140	<6.76E+00	0.00E+00	6.76E+00
		Be-7	<2.01E+01	0.00E+00	2.01E+01
		K-40	3.78E+01	1.70E+01	2.19E+01
		391250	9/15/2015 - 10/13/2015	Beta	2.74E+00
Mn-54	<3.58E+00			0.00E+00	3.58E+00
Co-58	<4.60E+00			0.00E+00	4.60E+00
Fe-59	<6.78E+00			0.00E+00	6.78E+00
Co-60	<4.20E+00			0.00E+00	4.20E+00
Zn-65	<8.30E+00			0.00E+00	8.30E+00
Zr-95	<6.60E+00			0.00E+00	6.60E+00
Nb-95	<4.18E+00			0.00E+00	4.18E+00
I-131	<1.20E+01			0.00E+00	1.20E+01
Cs-134	<3.46E+00			0.00E+00	3.46E+00
Cs-137	<3.84E+00			0.00E+00	3.84E+00
BaLa-140	<1.15E+01			0.00E+00	1.15E+01
Be-7	<3.24E+01			0.00E+00	3.24E+01
K-40	2.30E+01			3.95E+01	6.73E+01
394433	10/13/2015 - 11/10/2015			Beta	<6.84E-01
		Mn-54	<4.65E+00	0.00E+00	4.65E+00
		Co-58	<4.15E+00	0.00E+00	4.15E+00
		Fe-59	<9.16E+00	0.00E+00	9.16E+00
		Co-60	<4.30E+00	0.00E+00	4.30E+00
		Zn-65	<7.90E+00	0.00E+00	7.90E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
394433	10/13/2015 - 11/10/2015	Zr-95	<7.84E+00	0.00E+00	7.84E+00
		Nb-95	<4.63E+00	0.00E+00	4.63E+00
		I-131	<1.01E+01	0.00E+00	1.01E+01
		Cs-134	<6.14E+00	0.00E+00	6.14E+00
		Cs-137	<4.51E+00	0.00E+00	4.51E+00
		BaLa-140	<1.02E+01	0.00E+00	1.02E+01
		Be-7	<4.16E+01	0.00E+00	4.16E+01
		K-40	<5.64E+01	0.00E+00	5.64E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
396349	11/10/2015 - 12/8/2015	Beta	2.55E+00	8.32E-01	1.24E+00
		Mn-54	<2.59E+00	0.00E+00	2.59E+00
		Co-58	<3.53E+00	0.00E+00	3.53E+00
		Fe-59	<9.04E+00	0.00E+00	9.04E+00
		Co-60	<2.29E+00	0.00E+00	2.29E+00
		Zn-65	<6.81E+00	0.00E+00	6.81E+00
		Zr-95	<5.70E+00	0.00E+00	5.70E+00
		Nb-95	<3.93E+00	0.00E+00	3.93E+00
		I-131	<1.07E+01	0.00E+00	1.07E+01
		Cs-134	<3.40E+00	0.00E+00	3.40E+00
		Cs-137	<2.97E+00	0.00E+00	2.97E+00
		BaLa-140	<6.02E+00	0.00E+00	6.02E+00
		Be-7	<2.47E+01	0.00E+00	2.47E+01
		K-40	3.41E+01	2.44E+01	3.29E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
397087	8/18/2015 - 12/8/2015	H3DW	6.72E+02	1.36E+02	2.04E+02

Sample Point 218 [ CONTROL - NNE @ 13.5 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
364781	12/9/2014 - 1/6/2015	Beta	1.83E+00	7.76E-01	1.21E+00
		Mn-54	<3.16E+00	0.00E+00	3.16E+00
		Co-58	<1.83E+00	0.00E+00	1.83E+00
		Fe-59	<6.38E+00	0.00E+00	6.38E+00
		Co-60	<3.04E+00	0.00E+00	3.04E+00
		Zn-65	<6.23E+00	0.00E+00	6.23E+00
		Zr-95	<4.52E+00	0.00E+00	4.52E+00
		Nb-95	<3.33E+00	0.00E+00	3.33E+00
		I-131	<1.11E+01	0.00E+00	1.11E+01
		Cs-134	<3.29E+00	0.00E+00	3.29E+00
		Cs-137	<2.47E+00	0.00E+00	2.47E+00
		BaLa-140	<5.28E+00	0.00E+00	5.28E+00
		Be-7	<2.94E+01	0.00E+00	2.94E+01
		K-40	<3.91E+01	0.00E+00	3.91E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
366878	1/6/2015 - 2/3/2015	Beta	1.44E+00	7.80E-01	1.25E+00
		Mn-54	<2.34E+00	0.00E+00	2.34E+00
		Co-58	<2.50E+00	0.00E+00	2.50E+00
		Fe-59	<5.45E+00	0.00E+00	5.45E+00
		Co-60	<2.75E+00	0.00E+00	2.75E+00
		Zn-65	<5.55E+00	0.00E+00	5.55E+00
		Zr-95	<5.85E+00	0.00E+00	5.85E+00
		Nb-95	<3.05E+00	0.00E+00	3.05E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<2.96E+00	0.00E+00	2.96E+00
		Cs-137	<2.87E+00	0.00E+00	2.87E+00
		BaLa-140	<4.53E+00	0.00E+00	4.53E+00
		Be-7	<2.72E+01	0.00E+00	2.72E+01
		K-40	5.48E+01	7.67E+00	3.16E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
369979	2/3/2015 - 3/3/2015	Beta	2.29E+00	7.57E-01	1.12E+00
		Mn-54	<4.56E+00	0.00E+00	4.56E+00
		Co-58	<4.23E+00	0.00E+00	4.23E+00
		Fe-59	<7.00E+00	0.00E+00	7.00E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
369979	2/3/2015 - 3/3/2015	Co-60	<3.28E+00	0.00E+00	3.28E+00
		Zn-65	<6.57E+00	0.00E+00	6.57E+00
		Zr-95	<6.93E+00	0.00E+00	6.93E+00
		Nb-95	<3.54E+00	0.00E+00	3.54E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.75E+00	0.00E+00	3.75E+00
		Cs-137	<4.19E+00	0.00E+00	4.19E+00
		BaLa-140	<8.85E+00	0.00E+00	8.85E+00
		Be-7	<3.06E+01	0.00E+00	3.06E+01
		K-40	<6.78E+01	0.00E+00	6.78E+01
372362	12/9/2014 - 3/3/2015	H3DW	5.24E+02	1.22E+02	1.85E+02
372744	3/3/2015 - 3/31/2015	Beta	2.85E+00	8.13E-01	1.18E+00
		Mn-54	<4.21E+00	0.00E+00	4.21E+00
		Co-58	<3.62E+00	0.00E+00	3.62E+00
		Fe-59	<7.99E+00	0.00E+00	7.99E+00
		Co-60	<4.09E+00	0.00E+00	4.09E+00
		Zn-65	<7.50E+00	0.00E+00	7.50E+00
		Zr-95	<5.96E+00	0.00E+00	5.96E+00
		Nb-95	<4.04E+00	0.00E+00	4.04E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<3.86E+00	0.00E+00	3.86E+00
		Cs-137	<3.92E+00	0.00E+00	3.92E+00
		BaLa-140	<1.18E+01	0.00E+00	1.18E+01
		Be-7	<3.83E+01	0.00E+00	3.83E+01
		K-40	<4.05E+01	0.00E+00	4.05E+01
375837	3/31/2015 - 4/28/2015	Beta	2.26E+00	7.98E-01	1.20E+00
		Mn-54	<4.07E+00	0.00E+00	4.07E+00
		Co-58	<3.80E+00	0.00E+00	3.80E+00
		Fe-59	<8.41E+00	0.00E+00	8.41E+00
		Co-60	<3.53E+00	0.00E+00	3.53E+00
		Zn-65	<9.05E+00	0.00E+00	9.05E+00
		Zr-95	<7.58E+00	0.00E+00	7.58E+00
		Nb-95	<4.52E+00	0.00E+00	4.52E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<3.82E+00	0.00E+00	3.82E+00
		Cs-137	<4.28E+00	0.00E+00	4.28E+00
		BaLa-140	<6.51E+00	0.00E+00	6.51E+00
		Be-7	<3.14E+01	0.00E+00	3.14E+01
		K-40	<5.17E+01	0.00E+00	5.17E+01
378808	4/28/2015 - 5/27/2015	Beta	1.53E+00	7.62E-01	1.21E+00
		Mn-54	<1.76E+00	0.00E+00	1.76E+00
		Co-58	<3.16E+00	0.00E+00	3.16E+00
		Fe-59	<5.95E+00	0.00E+00	5.95E+00
		Co-60	<2.35E+00	0.00E+00	2.35E+00
		Zn-65	<5.84E+00	0.00E+00	5.84E+00
		Zr-95	<5.62E+00	0.00E+00	5.62E+00
		Nb-95	<3.06E+00	0.00E+00	3.06E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<2.60E+00	0.00E+00	2.60E+00
		Cs-137	<2.76E+00	0.00E+00	2.76E+00
		BaLa-140	<9.75E+00	0.00E+00	9.75E+00
		Be-7	<2.20E+01	0.00E+00	2.20E+01
		K-40	<3.64E+01	0.00E+00	3.64E+01
380200	3/3/2015 - 5/27/2015	H3DW	4.32E+02	1.27E+02	1.96E+02
		Beta	1.34E+00	7.79E-01	1.25E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
380685	5/27/2015 - 6/23/2015	Mn-54	<4.16E+00	0.00E+00	4.16E+00
		Co-58	<4.17E+00	0.00E+00	4.17E+00
		Fe-59	<6.70E+00	0.00E+00	6.70E+00
		Co-60	<4.53E+00	0.00E+00	4.53E+00
		Zn-65	<7.72E+00	0.00E+00	7.72E+00
		Zr-95	<7.38E+00	0.00E+00	7.38E+00
		Nb-95	<4.62E+00	0.00E+00	4.62E+00
		I-131	<1.10E+01	0.00E+00	1.10E+01
		Cs-134	<5.16E+00	0.00E+00	5.16E+00
		Cs-137	<3.67E+00	0.00E+00	3.67E+00
		BaLa-140	<1.18E+01	0.00E+00	1.18E+01
		Be-7	<3.59E+01	0.00E+00	3.59E+01
		K-40	<5.77E+01	0.00E+00	5.77E+01
382376	6/23/2015 - 7/21/2015	Beta	2.62E+00	7.82E-01	1.15E+00
		Mn-54	<4.05E+00	0.00E+00	4.05E+00
		Co-58	<4.88E+00	0.00E+00	4.88E+00
		Fe-59	<9.60E+00	0.00E+00	9.60E+00
		Co-60	<4.62E+00	0.00E+00	4.62E+00
		Zn-65	<9.54E+00	0.00E+00	9.54E+00
		Zr-95	<7.55E+00	0.00E+00	7.55E+00
		Nb-95	<4.50E+00	0.00E+00	4.50E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<3.24E+00	0.00E+00	3.24E+00
		Cs-137	<3.32E+00	0.00E+00	3.32E+00
		BaLa-140	<1.05E+01	0.00E+00	1.05E+01
		Be-7	<2.82E+01	0.00E+00	2.82E+01
K-40	2.14E+01	3.49E+01	5.91E+01		
384911	7/21/2015 - 8/18/2015	Beta	1.87E+00	7.23E-01	1.09E+00
		Mn-54	<2.98E+00	0.00E+00	2.98E+00
		Co-58	<2.88E+00	0.00E+00	2.88E+00
		Fe-59	<6.84E+00	0.00E+00	6.84E+00
		Co-60	<3.51E+00	0.00E+00	3.51E+00
		Zn-65	<6.91E+00	0.00E+00	6.91E+00
		Zr-95	<5.85E+00	0.00E+00	5.85E+00
		Nb-95	<4.45E+00	0.00E+00	4.45E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<3.50E+00	0.00E+00	3.50E+00
		Cs-137	<3.75E+00	0.00E+00	3.75E+00
		BaLa-140	<6.75E+00	0.00E+00	6.75E+00
		Be-7	<3.85E+01	0.00E+00	3.85E+01
K-40	<5.51E+01	0.00E+00	5.51E+01		
388113	5/27/2015 - 8/18/2015	Nuclide	Activity	2 Sigma Error	LLD
		H3DW	<1.60E+02	0.00E+00	1.95E+02
388169	8/18/2015 - 9/15/2015	Beta	2.28E+00	7.75E-01	1.16E+00
		Mn-54	<3.29E+00	0.00E+00	3.29E+00
		Co-58	<3.85E+00	0.00E+00	3.85E+00
		Fe-59	<6.62E+00	0.00E+00	6.62E+00
		Co-60	<3.34E+00	0.00E+00	3.34E+00
		Zn-65	<5.51E+00	0.00E+00	5.51E+00
		Zr-95	<6.82E+00	0.00E+00	6.82E+00
		Nb-95	<4.33E+00	0.00E+00	4.33E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.65E+00	0.00E+00	3.65E+00
		Cs-137	<3.64E+00	0.00E+00	3.64E+00
		BaLa-140	<8.45E+00	0.00E+00	8.45E+00
		Be-7	<3.56E+01	0.00E+00	3.56E+01
K-40	2.59E+01	2.69E+01	4.18E+01		
391251	9/15/2015 - 10/13/2015	Nuclide	Activity	2 Sigma Error	LLD
		Beta	2.68E+00	8.19E-01	1.22E+00





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
391251	9/15/2015 - 10/13/2015	Mn-54	<3.77E+00	0.00E+00	3.77E+00
		Co-58	<4.42E+00	0.00E+00	4.42E+00
		Fe-59	<5.79E+00	0.00E+00	5.79E+00
		Co-60	<3.20E+00	0.00E+00	3.20E+00
		Zn-65	<6.74E+00	0.00E+00	6.74E+00
		Zr-95	<5.97E+00	0.00E+00	5.97E+00
		Nb-95	<4.57E+00	0.00E+00	4.57E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<3.82E+00	0.00E+00	3.82E+00
		Cs-137	<3.06E+00	0.00E+00	3.06E+00
		BaLa-140	<8.20E+00	0.00E+00	8.20E+00
		Be-7	<3.02E+01	0.00E+00	3.02E+01
		K-40	8.01E+01	3.68E+01	4.48E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
394434	10/13/2015 - 11/10/2015	Beta	<6.58E-01	0.00E+00	1.49E+00
		Mn-54	<2.84E+00	0.00E+00	2.84E+00
		Co-58	<3.67E+00	0.00E+00	3.67E+00
		Fe-59	<6.32E+00	0.00E+00	6.32E+00
		Co-60	<3.00E+00	0.00E+00	3.00E+00
		Zn-65	<5.93E+00	0.00E+00	5.93E+00
		Zr-95	<5.30E+00	0.00E+00	5.30E+00
		Nb-95	<2.86E+00	0.00E+00	2.86E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<4.14E+00	0.00E+00	4.14E+00
		Cs-137	<4.21E+00	0.00E+00	4.21E+00
		BaLa-140	<9.83E+00	0.00E+00	9.83E+00
		Be-7	<2.39E+01	0.00E+00	2.39E+01
		K-40	<5.80E+01	0.00E+00	5.80E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
396350	11/10/2015 - 12/8/2015	Beta	1.86E+00	7.96E-01	1.24E+00
		Mn-54	<4.29E+00	0.00E+00	4.29E+00
		Co-58	<3.30E+00	0.00E+00	3.30E+00
		Fe-59	<7.85E+00	0.00E+00	7.85E+00
		Co-60	<4.02E+00	0.00E+00	4.02E+00
		Zn-65	<6.06E+00	0.00E+00	6.06E+00
		Zr-95	<8.09E+00	0.00E+00	8.09E+00
		Nb-95	<4.22E+00	0.00E+00	4.22E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.59E+00	0.00E+00	4.59E+00
		Cs-137	<3.68E+00	0.00E+00	3.68E+00
		BaLa-140	<7.64E+00	0.00E+00	7.64E+00
		Be-7	<4.73E+01	0.00E+00	4.73E+01
		K-40	<5.07E+01	0.00E+00	5.07E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
397088	8/18/2015 - 12/8/2015	H3DW	7.54E+02	1.39E+02	2.07E+02

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	LLD
374839	4/6/2015 - 4/6/2015		Mn-54	<1.42E+01	0.00E+00	1.42E+01
			Co-58	<1.31E+01	0.00E+00	1.31E+01
			Fe-59	<2.99E+01	0.00E+00	2.99E+01
			Co-60	<1.57E+01	0.00E+00	1.57E+01
			Zn-65	<3.33E+01	0.00E+00	3.33E+01
			Nb-95	<1.37E+01	0.00E+00	1.37E+01
			I-131	<9.94E+00	0.00E+00	9.94E+00
			Cs-134	<1.48E+01	0.00E+00	1.48E+01
			Cs-137	<1.17E+01	0.00E+00	1.17E+01
			Be-7	<9.47E+01	0.00E+00	9.47E+01
			K-40	2.65E+03	4.68E+02	2.65E+02
			Ag-110M	<1.14E+01	0.00E+00	1.14E+01
			Sb-122	<1.78E+01	0.00E+00	1.78E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
374839	4/6/2015 - 4/6/2015	PREDATOR	Sb-125	<3.01E+01	0.00E+00	3.01E+01
374840	4/6/2015 - 4/6/2015	FORAGER	Mn-54	<2.15E+01	0.00E+00	2.15E+01
			Co-58	<1.53E+01	0.00E+00	1.53E+01
			Fe-59	<3.51E+01	0.00E+00	3.51E+01
			Co-60	<2.25E+01	0.00E+00	2.25E+01
			Zn-65	<5.13E+01	0.00E+00	5.13E+01
			Nb-95	<1.95E+01	0.00E+00	1.95E+01
			I-131	<1.98E+01	0.00E+00	1.98E+01
			Cs-134	<2.26E+01	0.00E+00	2.26E+01
			Cs-137	<2.08E+01	0.00E+00	2.08E+01
			Be-7	<8.35E+01	0.00E+00	8.35E+01
			K-40	2.67E+03	5.85E+02	4.94E+02
			Ag-110M	<1.85E+01	0.00E+00	1.85E+01
			Sb-122	<2.21E+01	0.00E+00	2.21E+01
			Sb-125	<4.53E+01	0.00E+00	4.53E+01
374841	4/6/2015 - 4/6/2015	BOTMFEEDER	Mn-54	<1.24E+01	0.00E+00	1.24E+01
			Co-58	<1.07E+01	0.00E+00	1.07E+01
			Fe-59	<3.45E+01	0.00E+00	3.45E+01
			Co-60	<2.38E+01	0.00E+00	2.38E+01
			Zn-65	<3.16E+01	0.00E+00	3.16E+01
			Nb-95	<1.46E+01	0.00E+00	1.46E+01
			I-131	<1.05E+01	0.00E+00	1.05E+01
			Cs-134	<1.95E+01	0.00E+00	1.95E+01
			Cs-137	<1.77E+01	0.00E+00	1.77E+01
			Be-7	<1.02E+02	0.00E+00	1.02E+02
			K-40	2.93E+03	5.07E+02	4.59E+01
			Ag-110M	<1.58E+01	0.00E+00	1.58E+01
			Sb-122	<2.67E+01	0.00E+00	2.67E+01
			Sb-125	<3.02E+01	0.00E+00	3.02E+01
391463	10/6/2015 - 10/6/2015	PREDATOR	Mn-54	<1.54E+01	0.00E+00	1.54E+01
			Co-58	<1.04E+01	0.00E+00	1.04E+01
			Fe-59	<3.71E+01	0.00E+00	3.71E+01
			Co-60	<1.71E+01	0.00E+00	1.71E+01
			Zn-65	<3.00E+01	0.00E+00	3.00E+01
			Nb-95	<1.70E+01	0.00E+00	1.70E+01
			I-131	<1.53E+01	0.00E+00	1.53E+01
			Cs-134	<2.30E+01	0.00E+00	2.30E+01
			Cs-137	<1.38E+01	0.00E+00	1.38E+01
			Be-7	<1.14E+02	0.00E+00	1.14E+02
			K-40	3.08E+03	5.36E+02	3.20E+02
			Ag-110M	<1.24E+01	0.00E+00	1.24E+01
			Sb-122	<9.45E+01	0.00E+00	9.45E+01
			Sb-125	<2.61E+01	0.00E+00	2.61E+01
391464	10/6/2015 - 10/6/2015	FORAGER	Mn-54	<1.62E+01	0.00E+00	1.62E+01
			Co-58	<2.31E+01	0.00E+00	2.31E+01
			Fe-59	<4.26E+01	0.00E+00	4.26E+01
			Co-60	<2.57E+01	0.00E+00	2.57E+01
			Zn-65	<3.71E+01	0.00E+00	3.71E+01
			Nb-95	<1.83E+01	0.00E+00	1.83E+01
			I-131	<2.51E+01	0.00E+00	2.51E+01
			Cs-134	<1.81E+01	0.00E+00	1.81E+01
			Cs-137	<2.26E+01	0.00E+00	2.26E+01
			Be-7	<8.23E+01	0.00E+00	8.23E+01
			K-40	2.79E+03	5.21E+02	5.32E+01
			Ag-110M	<1.53E+01	0.00E+00	1.53E+01
			Sb-122	<9.30E+01	0.00E+00	9.30E+01
			Sb-125	<3.78E+01	0.00E+00	3.78E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 208 [ INDICATOR - S @ 0.45 miles ]

Sample ID:	391465	Sample Dates:	10/6/2015 - 10/6/2015	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<2.52E+01	0.00E+00	2.52E+01
					Co-58	<1.27E+01	0.00E+00	1.27E+01
					Fe-59	<6.39E+01	0.00E+00	6.39E+01
					Co-60	<2.60E+01	0.00E+00	2.60E+01
					Zn-65	<4.59E+01	0.00E+00	4.59E+01
					Nb-95	<2.76E+01	0.00E+00	2.76E+01
					I-131	<3.23E+01	0.00E+00	3.23E+01
					Cs-134	<3.27E+01	0.00E+00	3.27E+01
					Cs-137	<2.27E+01	0.00E+00	2.27E+01
					Be-7	<1.18E+02	0.00E+00	1.18E+02
					K-40	3.40E+03	6.63E+02	3.80E+02
					Ag-110M	<2.18E+01	0.00E+00	2.18E+01
					Sb-122	<9.34E+01	0.00E+00	9.34E+01
					Sb-125	<5.26E+01	0.00E+00	5.26E+01

Sample Point 216 [ CONTROL - NNE @ 4.19 miles ]

Sample ID:	374842	Sample Dates:	4/6/2015 - 4/6/2015	PREDATOR	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<1.02E+01	0.00E+00	1.02E+01
					Co-58	<7.70E+00	0.00E+00	7.70E+00
					Fe-59	<1.34E+01	0.00E+00	1.34E+01
					Co-60	<1.10E+01	0.00E+00	1.10E+01
					Zn-65	<2.67E+01	0.00E+00	2.67E+01
					Nb-95	<6.70E+00	0.00E+00	6.70E+00
					I-131	<9.80E+00	0.00E+00	9.80E+00
					Cs-134	<1.09E+01	0.00E+00	1.09E+01
					Cs-137	<1.23E+01	0.00E+00	1.23E+01
					Be-7	<6.89E+01	0.00E+00	6.89E+01
					K-40	3.25E+03	4.37E+02	1.44E+02
					Ag-110M	<6.04E+00	0.00E+00	6.04E+00
					Sb-122	<2.05E+01	0.00E+00	2.05E+01
					Sb-125	<1.58E+01	0.00E+00	1.58E+01

Sample ID:	374843	Sample Dates:	4/6/2015 - 4/6/2015	FORAGER	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<1.02E+01	0.00E+00	1.02E+01
					Co-58	<1.27E+01	0.00E+00	1.27E+01
					Fe-59	<2.86E+01	0.00E+00	2.86E+01
					Co-60	<8.93E+00	0.00E+00	8.93E+00
					Zn-65	<3.37E+01	0.00E+00	3.37E+01
					Nb-95	<1.30E+01	0.00E+00	1.30E+01
					I-131	<9.92E+00	0.00E+00	9.92E+00
					Cs-134	<1.51E+01	0.00E+00	1.51E+01
					Cs-137	<1.09E+01	0.00E+00	1.09E+01
					Be-7	<8.16E+01	0.00E+00	8.16E+01
					K-40	2.79E+03	4.44E+02	1.75E+02
					Ag-110M	<7.95E+00	0.00E+00	7.95E+00
					Sb-122	<1.33E+01	0.00E+00	1.33E+01
					Sb-125	<2.60E+01	0.00E+00	2.60E+01

Sample ID:	374844	Sample Dates:	4/6/2015 - 4/6/2015	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<9.23E+00	0.00E+00	9.23E+00
					Co-58	<1.15E+01	0.00E+00	1.15E+01
					Fe-59	<2.07E+01	0.00E+00	2.07E+01
					Co-60	<1.54E+01	0.00E+00	1.54E+01
					Zn-65	<2.71E+01	0.00E+00	2.71E+01
					Nb-95	<8.95E+00	0.00E+00	8.95E+00
					I-131	<9.49E+00	0.00E+00	9.49E+00
					Cs-134	<1.13E+01	0.00E+00	1.13E+01
					Cs-137	<1.06E+01	0.00E+00	1.06E+01
					Be-7	<8.21E+01	0.00E+00	8.21E+01
					K-40	2.90E+03	4.38E+02	1.88E+02
					Ag-110M	<7.21E+00	0.00E+00	7.21E+00
					Sb-122	<2.35E+01	0.00E+00	2.35E+01
					Sb-125	<2.21E+01	0.00E+00	2.21E+01

Sample ID:	391466	Sample Dates:	10/6/2015 - 10/6/2015	PREDATOR	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<9.80E+00	0.00E+00	9.80E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 216 [ CONTROL - NNE @ 4.19 miles ]

Sample ID:	391466	Sample Dates:	10/6/2015 - 10/6/2015	PREDATOR	Nuclide	Activity	2 Sigma Error	LLD
					Co-58	<1.33E+01	0.00E+00	1.33E+01
					Fe-59	<2.74E+01	0.00E+00	2.74E+01
					Co-60	<1.63E+01	0.00E+00	1.63E+01
					Zn-65	<3.57E+01	0.00E+00	3.57E+01
					Nb-95	<1.20E+01	0.00E+00	1.20E+01
					I-131	<1.35E+01	0.00E+00	1.35E+01
					Cs-134	<1.10E+01	0.00E+00	1.10E+01
					Cs-137	<1.43E+01	0.00E+00	1.43E+01
					Be-7	<8.68E+01	0.00E+00	8.68E+01
					K-40	2.94E+03	4.54E+02	1.94E+02
					Ag-110M	<9.34E+00	0.00E+00	9.34E+00
					Sb-122	<5.16E+01	0.00E+00	5.16E+01
					Sb-125	<2.62E+01	0.00E+00	2.62E+01

Sample ID:	391467	Sample Dates:	10/6/2015 - 10/6/2015	FORAGER	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<1.44E+01	0.00E+00	1.44E+01
					Co-58	<1.26E+01	0.00E+00	1.26E+01
					Fe-59	<2.61E+01	0.00E+00	2.61E+01
					Co-60	<1.55E+01	0.00E+00	1.55E+01
					Zn-65	<3.85E+01	0.00E+00	3.85E+01
					Nb-95	<1.69E+01	0.00E+00	1.69E+01
					I-131	<1.79E+01	0.00E+00	1.79E+01
					Cs-134	<1.61E+01	0.00E+00	1.61E+01
					Cs-137	<1.30E+01	0.00E+00	1.30E+01
					Be-7	<1.34E+02	0.00E+00	1.34E+02
					K-40	3.00E+03	4.83E+02	3.90E+01
					Ag-110M	<8.30E+00	0.00E+00	8.30E+00
					Sb-122	<7.42E+01	0.00E+00	7.42E+01
					Sb-125	<2.92E+01	0.00E+00	2.92E+01

Sample ID:	391468	Sample Dates:	10/6/2015 - 10/6/2015	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<1.42E+01	0.00E+00	1.42E+01
					Co-58	<8.19E+00	0.00E+00	8.19E+00
					Fe-59	<3.61E+01	0.00E+00	3.61E+01
					Co-60	<2.00E+01	0.00E+00	2.00E+01
					Zn-65	<1.99E+01	0.00E+00	1.99E+01
					Nb-95	<1.96E+01	0.00E+00	1.97E+01
					I-131	<2.08E+01	0.00E+00	2.08E+01
					Cs-134	<1.92E+01	0.00E+00	1.92E+01
					Cs-137	<1.83E+01	0.00E+00	1.83E+01
					Be-7	<1.21E+02	0.00E+00	1.21E+02
					K-40	2.84E+03	4.93E+02	2.51E+02
					Ag-110M	<1.24E+01	0.00E+00	1.24E+01
					Sb-122	<7.89E+01	0.00E+00	7.89E+01
					Sb-125	<3.29E+01	0.00E+00	3.29E+01

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

Sample Point 221 [ CONTROL - NW @ 14.5 miles ]

Sample ID:	365310	Sample Dates:	1/13/2015 - 1/13/2015		Nuclide	Activity	2 Sigma Error	LLD
					LLI-131	<6.42E-01	0.00E+00	6.42E-01
					I-131	<8.98E+00	0.00E+00	8.98E+00
					Cs-134	<9.34E+00	0.00E+00	9.34E+00
					Cs-137	<1.18E+01	0.00E+00	1.18E+01
					BaLa-140	<8.96E+00	0.00E+00	8.96E+00
					Be-7	<8.28E+01	0.00E+00	8.28E+01
					K-40	1.27E+03	2.76E+02	2.29E+02

Sample ID:	367072	Sample Dates:	1/27/2015 - 1/27/2015		Nuclide	Activity	2 Sigma Error	LLD
					LLI-131	<4.97E-01	0.00E+00	4.97E-01
					I-131	<5.54E+00	0.00E+00	5.54E+00
					Cs-134	<7.44E+00	0.00E+00	7.44E+00
					Cs-137	<8.57E+00	0.00E+00	8.57E+00
					BaLa-140	<5.93E+00	0.00E+00	5.93E+00
					Be-7	<4.31E+01	0.00E+00	4.31E+01
					K-40	1.43E+03	2.08E+02	1.29E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
368984	2/10/2015 - 2/10/2015	LLI-131	<6.39E-01	0.00E+00	6.39E-01
		I-131	<7.87E+00	0.00E+00	7.87E+00
		Cs-134	<6.48E+00	0.00E+00	6.48E+00
		Cs-137	<6.74E+00	0.00E+00	6.74E+00
		BaLa-140	<1.03E+01	0.00E+00	1.03E+01
		Be-7	<5.86E+01	0.00E+00	5.86E+01
		K-40	1.62E+03	2.48E+02	1.07E+02
370613	2/23/2015 - 2/23/2015	LLI-131	<5.97E-01	0.00E+00	5.97E-01
		I-131	<9.57E+00	0.00E+00	9.57E+00
		Cs-134	<1.13E+01	0.00E+00	1.13E+01
		Cs-137	<1.08E+01	0.00E+00	1.08E+01
		BaLa-140	<1.06E+01	0.00E+00	1.06E+01
		Be-7	<8.13E+01	0.00E+00	8.13E+01
		K-40	1.72E+03	2.90E+02	1.11E+02
371924	3/10/2015 - 3/10/2015	LLI-131	<4.99E-01	0.00E+00	4.99E-01
		I-131	<4.29E+00	0.00E+00	4.29E+00
		Cs-134	<4.76E+00	0.00E+00	4.76E+00
		Cs-137	<4.52E+00	0.00E+00	4.52E+00
		BaLa-140	<4.28E+00	0.00E+00	4.28E+00
		Be-7	<3.62E+01	0.00E+00	3.62E+01
		K-40	1.56E+03	1.92E+02	6.18E+01
373846	3/24/2015 - 3/24/2015	LLI-131	<5.98E-01	0.00E+00	5.98E-01
		I-131	<7.31E+00	0.00E+00	7.31E+00
		Cs-134	<8.79E+00	0.00E+00	8.79E+00
		Cs-137	<9.86E+00	0.00E+00	9.86E+00
		BaLa-140	<7.53E+00	0.00E+00	7.53E+00
		Be-7	<2.99E+01	0.00E+00	2.99E+01
		K-40	1.67E+03	2.52E+02	1.83E+01
374952	4/7/2015 - 4/7/2015	LLI-131	<6.40E-01	0.00E+00	6.40E-01
		I-131	<7.04E+00	0.00E+00	7.04E+00
		Cs-134	<7.54E+00	0.00E+00	7.54E+00
		Cs-137	<7.08E+00	0.00E+00	7.08E+00
		BaLa-140	<2.20E+00	0.00E+00	2.20E+00
		Be-7	<4.96E+01	0.00E+00	4.96E+01
		K-40	1.49E+03	2.32E+02	6.73E+01
376841	4/21/2015 - 4/21/2015	LLI-131	<4.73E-01	0.00E+00	4.73E-01
		I-131	<3.79E+00	0.00E+00	3.79E+00
		Cs-134	<4.36E+00	0.00E+00	4.36E+00
		Cs-137	<4.65E+00	0.00E+00	4.65E+00
		BaLa-140	<3.54E+00	0.00E+00	3.54E+00
		Be-7	<3.75E+01	0.00E+00	3.75E+01
		K-40	1.56E+03	1.92E+02	6.80E+01
378073	5/5/2015 - 5/5/2015	LLI-131	<6.46E-01	0.00E+00	6.46E-01
		I-131	<6.42E+00	0.00E+00	6.42E+00
		Cs-134	<6.29E+00	0.00E+00	6.29E+00
		Cs-137	<5.56E+00	0.00E+00	5.56E+00
		BaLa-140	<8.68E+00	0.00E+00	8.68E+00
		Be-7	<5.61E+01	0.00E+00	5.61E+01
		K-40	1.82E+03	2.63E+02	7.50E+01
378963	5/19/2015 - 5/19/2015	LLI-131	<5.13E-01	0.00E+00	5.13E-01
		I-131	<5.96E+00	0.00E+00	5.96E+00
		Cs-134	<7.38E+00	0.00E+00	7.38E+00
		Cs-137	<7.71E+00	0.00E+00	7.71E+00
		BaLa-140	<5.82E+00	0.00E+00	5.82E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
378963	5/19/2015 - 5/19/2015	Be-7	<4.04E+01	0.00E+00	4.04E+01
		K-40	1.55E+03	2.40E+02	1.05E+02
380201	6/2/2015 - 6/2/2015	LLI-131	<5.01E-01	0.00E+00	5.01E-01
		I-131	<6.48E+00	0.00E+00	6.48E+00
		Cs-134	<8.30E+00	0.00E+00	8.30E+00
		Cs-137	<6.07E+00	0.00E+00	6.07E+00
		BaLa-140	<5.82E+00	0.00E+00	5.82E+00
		Be-7	<4.63E+01	0.00E+00	4.63E+01
		K-40	1.67E+03	2.55E+02	1.29E+02
380813	6/16/2015 - 6/16/2015	LLI-131	<6.47E-01	0.00E+00	6.47E-01
		I-131	<6.94E+00	0.00E+00	6.94E+00
		Cs-134	<8.98E+00	0.00E+00	8.98E+00
		Cs-137	<7.96E+00	0.00E+00	7.96E+00
		BaLa-140	<1.06E+01	0.00E+00	1.06E+01
		Be-7	<3.83E+01	0.00E+00	3.83E+01
		K-40	1.44E+03	2.29E+02	9.69E+01
381610	6/30/2015 - 6/30/2015	LLI-131	<6.03E-01	0.00E+00	6.03E-01
		I-131	<6.12E+00	0.00E+00	6.12E+00
		Cs-134	<8.73E+00	0.00E+00	8.73E+00
		Cs-137	<7.73E+00	0.00E+00	7.73E+00
		BaLa-140	<5.65E+00	0.00E+00	5.65E+00
		Be-7	<5.54E+01	0.00E+00	5.54E+01
		K-40	1.48E+03	2.29E+02	1.73E+01
382599	7/14/2015 - 7/14/2015	LLI-131	<6.04E-01	0.00E+00	6.04E-01
		I-131	<6.23E+00	0.00E+00	6.23E+00
		Cs-134	<7.87E+00	0.00E+00	7.87E+00
		Cs-137	<8.73E+00	0.00E+00	8.73E+00
		BaLa-140	<7.39E+00	0.00E+00	7.39E+00
		Be-7	<5.81E+01	0.00E+00	5.81E+01
		K-40	1.63E+03	2.53E+02	1.33E+02
384104	7/28/2015 - 7/28/2015	LLI-131	<4.52E-01	0.00E+00	4.52E-01
		I-131	<5.41E+00	0.00E+00	5.41E+00
		Cs-134	<6.95E+00	0.00E+00	6.95E+00
		Cs-137	<8.51E+00	0.00E+00	8.51E+00
		BaLa-140	<5.98E+00	0.00E+00	5.98E+00
		Be-7	<2.89E+01	0.00E+00	2.89E+01
		K-40	1.60E+03	2.45E+02	8.71E+01
385419	8/11/2015 - 8/11/2015	LLI-131	<5.76E-01	0.00E+00	5.76E-01
		I-131	<5.62E+00	0.00E+00	5.62E+00
		Cs-134	<6.28E+00	0.00E+00	6.28E+00
		Cs-137	<7.71E+00	0.00E+00	7.71E+00
		BaLa-140	<2.06E+00	0.00E+00	2.06E+00
		Be-7	<3.67E+01	0.00E+00	3.67E+01
		K-40	1.51E+03	2.34E+02	8.25E+01
386836	8/25/2015 - 8/25/2015	LLI-131	<4.79E-01	0.00E+00	4.79E-01
		I-131	<5.92E+00	0.00E+00	5.92E+00
		Cs-134	<6.41E+00	0.00E+00	6.41E+00
		Cs-137	<6.18E+00	0.00E+00	6.18E+00
		BaLa-140	<8.42E+00	0.00E+00	8.42E+00
		Be-7	<4.91E+01	0.00E+00	4.91E+01
		K-40	1.65E+03	2.57E+02	1.44E+02
388753	9/9/2015 - 9/9/2015	LLI-131	<5.02E-01	0.00E+00	5.02E-01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
388753	9/9/2015 - 9/9/2015	I-131	<6.34E+00	0.00E+00	6.34E+00
		Cs-134	<7.37E+00	0.00E+00	7.37E+00
		Cs-137	<8.39E+00	0.00E+00	8.39E+00
		BaLa-140	<5.61E+00	0.00E+00	5.61E+00
		Be-7	<5.09E+01	0.00E+00	5.09E+01
		K-40	1.67E+03	2.45E+02	1.72E+01
390022	9/22/2015 - 9/22/2015	LLI-131	<5.72E-01	0.00E+00	5.72E-01
		I-131	<6.23E+00	0.00E+00	6.23E+00
		Cs-134	<5.65E+00	0.00E+00	5.65E+00
		Cs-137	<7.73E+00	0.00E+00	7.73E+00
		BaLa-140	<7.39E+00	0.00E+00	7.39E+00
		Be-7	<6.01E+01	0.00E+00	6.01E+01
391940	10/6/2015 - 10/6/2015	K-40	1.42E+03	2.29E+02	1.05E+02
		LLI-131	<6.25E-01	0.00E+00	6.25E-01
		I-131	<7.96E+00	0.00E+00	7.96E+00
		Cs-134	<8.80E+00	0.00E+00	8.80E+00
		Cs-137	<8.54E+00	0.00E+00	8.54E+00
		BaLa-140	<6.18E+00	0.00E+00	6.18E+00
393442	10/20/2015 - 10/20/2015	Be-7	<5.41E+01	0.00E+00	5.41E+01
		K-40	1.65E+03	2.56E+02	1.01E+02
		LLI-131	<3.94E-01	0.00E+00	3.94E-01
		I-131	<5.37E+00	0.00E+00	5.37E+00
		Cs-134	<6.85E+00	0.00E+00	6.85E+00
		Cs-137	<8.71E+00	0.00E+00	8.71E+00
394845	11/3/2015 - 11/3/2015	BaLa-140	<2.07E+00	0.00E+00	2.07E+00
		Be-7	<3.67E+01	0.00E+00	3.67E+01
		K-40	1.62E+03	2.45E+02	8.58E+01
		LLI-131	<5.70E-01	0.00E+00	5.70E-01
		I-131	<6.84E+00	0.00E+00	6.84E+00
		Cs-134	<7.48E+00	0.00E+00	7.48E+00
395641	11/17/2015 - 11/17/2015	Cs-137	<7.04E+00	0.00E+00	7.04E+00
		BaLa-140	<5.77E+00	0.00E+00	5.77E+00
		Be-7	<4.05E+01	0.00E+00	4.05E+01
		K-40	1.62E+03	2.63E+02	1.80E+02
		LLI-131	<4.64E-01	0.00E+00	4.64E-01
		I-131	<3.66E+00	0.00E+00	3.66E+00
396647	12/1/2015 - 12/1/2015	Cs-134	<5.71E+00	0.00E+00	5.71E+00
		Cs-137	<8.17E+00	0.00E+00	8.17E+00
		BaLa-140	<9.41E+00	0.00E+00	9.41E+00
		Be-7	<5.38E+01	0.00E+00	5.38E+01
		K-40	1.63E+03	2.44E+02	1.76E+01
		LLI-131	<4.47E-01	0.00E+00	4.47E-01
397906	12/15/2015 - 12/15/2015	I-131	<6.30E+00	0.00E+00	6.30E+00
		Cs-134	<6.95E+00	0.00E+00	6.95E+00
		Cs-137	<8.17E+00	0.00E+00	8.17E+00
		BaLa-140	<6.00E+00	0.00E+00	6.00E+00
		Be-7	<5.19E+01	0.00E+00	5.19E+01
		K-40	1.49E+03	2.31E+02	1.76E+01
397906	12/15/2015 - 12/15/2015	LLI-131	<6.39E-01	0.00E+00	6.39E-01
		I-131	<5.66E+00	0.00E+00	5.66E+00
		Cs-134	<1.06E+01	0.00E+00	1.06E+01
		Cs-137	<9.39E+00	0.00E+00	9.39E+00
		BaLa-140	<7.93E+00	0.00E+00	7.93E+00
		Be-7	<3.67E+01	0.00E+00	3.67E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
397906	12/15/2015 - 12/15/2015	K-40	1.57E+03	2.48E+02	8.56E+01
398684	12/29/2015 - 12/29/2015	LLI-131	<5.93E-01	0.00E+00	5.93E-01
		I-131	<5.37E+00	0.00E+00	5.37E+00
		Cs-134	<6.85E+00	0.00E+00	6.85E+00
		Cs-137	<7.34E+00	0.00E+00	7.34E+00
		BaLa-140	<2.07E+00	0.00E+00	2.07E+00
		Be-7	<4.85E+01	0.00E+00	4.85E+01
		K-40	1.45E+03	2.38E+02	1.45E+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	LLD
374854	3/31/2015 - 3/31/2015	Mn-54	<2.37E+01	0.00E+00	2.37E+01
		Co-58	<2.35E+01	0.00E+00	2.35E+01
		Fe-59	<4.52E+01	0.00E+00	4.52E+01
		Co-60	8.65E+01	2.23E+01	2.04E+01
		Zn-65	<4.90E+01	0.00E+00	4.90E+01
		Zr-95	<3.17E+01	0.00E+00	3.17E+01
		Nb-95	<1.77E+01	0.00E+00	1.77E+01
		I-131	<2.72E+01	0.00E+00	2.72E+01
		Cs-134	<2.74E+01	0.00E+00	2.74E+01
		Cs-137	<1.97E+01	0.00E+00	1.97E+01
		Be-7	1.10E+02	1.55E+02	2.57E+02
		K-40	1.58E+04	1.50E+03	2.15E+02
		Co-57	<1.53E+01	0.00E+00	1.53E+01
		Mo-99	<8.37E+02	0.00E+00	8.37E+02
		Ag-110M	<1.43E+01	0.00E+00	1.43E+01
		Sb-122	<1.34E+02	0.00E+00	1.34E+02
		Sb-125	<3.64E+01	0.00E+00	3.64E+01
390122	9/22/2015 - 9/22/2015	Mn-54	<1.68E+01	0.00E+00	1.68E+01
		Co-58	6.73E+01	1.53E+01	1.97E+01
		Fe-59	<3.22E+01	0.00E+00	3.22E+01
		Co-60	2.36E+02	2.92E+01	2.37E+01
		Zn-65	<3.15E+01	0.00E+00	3.15E+01
		Zr-95	<2.45E+01	0.00E+00	2.45E+01
		Nb-95	<1.51E+01	0.00E+00	1.51E+01
		I-131	<3.65E+01	0.00E+00	3.65E+01
		Cs-134	<1.91E+01	0.00E+00	1.91E+01
		Cs-137	8.75E+00	1.12E+01	1.84E+01
		Be-7	2.39E+02	1.12E+02	1.75E+02
		K-40	1.79E+04	1.54E+03	1.86E+02
		Co-57	<9.48E+00	0.00E+00	9.48E+00
		Mo-99	<4.51E+03	0.00E+00	4.51E+03
		Ag-110M	<1.12E+01	0.00E+00	1.12E+01
		Sb-122	<7.84E+02	0.00E+00	7.84E+02
		Sb-125	<2.57E+01	0.00E+00	2.57E+01

Sample Point 210 [ INDICATOR - SE @ 2.31 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
374855	3/31/2015 - 3/31/2015	Mn-54	<1.43E+01	0.00E+00	1.43E+01
		Co-58	<1.55E+01	0.00E+00	1.55E+01
		Fe-59	<3.69E+01	0.00E+00	3.69E+01
		Co-60	<1.65E+01	0.00E+00	1.65E+01
		Zn-65	<4.45E+01	0.00E+00	4.45E+01
		Zr-95	<2.54E+01	0.00E+00	2.54E+01
		Nb-95	<2.02E+01	0.00E+00	2.02E+01
		I-131	<2.13E+01	0.00E+00	2.13E+01
		Cs-134	<2.05E+01	0.00E+00	2.05E+01
		Cs-137	<1.51E+01	0.00E+00	1.51E+01
		Be-7	<1.48E+02	0.00E+00	1.48E+02
		K-40	9.04E+03	9.44E+02	2.34E+02





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 210 [ INDICATOR - SE @ 2.31 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
374855	3/31/2015 - 3/31/2015	Co-57	<1.21E+01	0.00E+00	1.21E+01
		Mo-99	<7.28E+02	0.00E+00	7.28E+02
		Ag-110M	<1.39E+01	0.00E+00	1.39E+01
		Sb-122	<1.30E+02	0.00E+00	1.30E+02
		Sb-125	<3.29E+01	0.00E+00	3.29E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
390123	9/22/2015 - 9/22/2015	Mn-54	<2.57E+01	0.00E+00	2.57E+01
		Co-58	<2.70E+01	0.00E+00	2.70E+01
		Fe-59	<6.65E+01	0.00E+00	6.65E+01
		Co-60	<3.12E+01	0.00E+00	3.12E+01
		Zn-65	<4.68E+01	0.00E+00	4.68E+01
		Zr-95	<4.63E+01	0.00E+00	4.63E+01
		Nb-95	<2.85E+01	0.00E+00	2.85E+01
		I-131	<3.82E+01	0.00E+00	3.82E+01
		Cs-134	<4.22E+01	0.00E+00	4.22E+01
		Cs-137	<2.78E+01	0.00E+00	2.78E+01
		Be-7	<2.43E+02	0.00E+00	2.43E+02
		K-40	1.70E+04	1.71E+03	3.45E+02
		Co-57	<1.85E+01	0.00E+00	1.85E+01
		Mo-99	<1.58E+03	0.00E+00	1.58E+03
		Ag-110M	<2.22E+01	0.00E+00	2.22E+01
		Sb-122	<2.68E+02	0.00E+00	2.68E+02
		Sb-125	<4.99E+01	0.00E+00	4.99E+01

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
374856	3/31/2015 - 3/31/2015	Mn-54	<1.21E+01	0.00E+00	1.21E+01
		Co-58	<1.60E+01	0.00E+00	1.60E+01
		Fe-59	<3.50E+01	0.00E+00	3.50E+01
		Co-60	<1.65E+01	0.00E+00	1.65E+01
		Zn-65	<3.72E+01	0.00E+00	3.72E+01
		Zr-95	<2.57E+01	0.00E+00	2.57E+01
		Nb-95	<1.69E+01	0.00E+00	1.69E+01
		I-131	<2.03E+01	0.00E+00	2.03E+01
		Cs-134	<1.99E+01	0.00E+00	1.99E+01
		Cs-137	<1.33E+01	0.00E+00	1.33E+01
		Be-7	4.19E+01	7.45E+01	1.26E+02
		K-40	1.11E+04	1.08E+03	1.78E+02
		Co-57	<1.10E+01	0.00E+00	1.10E+01
		Mo-99	<4.24E+02	0.00E+00	4.24E+02
		Ag-110M	<1.18E+01	0.00E+00	1.18E+01
		Sb-122	<5.76E+01	0.00E+00	5.76E+01
		Sb-125	<3.28E+01	0.00E+00	3.28E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
390124	9/22/2015 - 9/22/2015	Mn-54	<2.46E+01	0.00E+00	2.46E+01
		Co-58	<1.66E+01	0.00E+00	1.66E+01
		Fe-59	<3.95E+01	0.00E+00	3.95E+01
		Co-60	<1.92E+01	0.00E+00	1.92E+01
		Zn-65	<4.71E+01	0.00E+00	4.71E+01
		Zr-95	<3.53E+01	0.00E+00	3.53E+01
		Nb-95	<2.28E+01	0.00E+00	2.28E+01
		I-131	<3.24E+01	0.00E+00	3.24E+01
		Cs-134	<3.49E+01	0.00E+00	3.49E+01
		Cs-137	2.05E+01	1.73E+01	2.79E+01
		Be-7	1.16E+03	2.15E+02	2.63E+02
		K-40	2.07E+04	1.85E+03	3.30E+02
		Co-57	<1.52E+01	0.00E+00	1.52E+01
		Mo-99	<1.19E+03	0.00E+00	1.19E+03
		Ag-110M	<1.73E+01	0.00E+00	1.73E+01
		Sb-122	<2.34E+02	0.00E+00	2.34E+02
		Sb-125	<4.53E+01	0.00E+00	4.53E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
365084	12/9/2014 - 1/6/2015	Mn-54	<1.99E+00	0.00E+00	1.99E+00
		Co-58	<3.22E+00	0.00E+00	3.22E+00
		Fe-59	<7.15E+00	0.00E+00	7.15E+00
		Co-60	<2.41E+00	0.00E+00	2.41E+00
		Zn-65	<5.58E+00	0.00E+00	5.58E+00
		Zr-95	<4.57E+00	0.00E+00	4.57E+00
		Nb-95	<3.57E+00	0.00E+00	3.57E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.47E+00	0.00E+00	3.47E+00
		Cs-137	<2.07E+00	0.00E+00	2.07E+00
		BaLa-140	<6.75E+00	0.00E+00	6.75E+00
		Be-7	<2.60E+01	0.00E+00	2.60E+01
		K-40	<4.67E+01	0.00E+00	4.67E+01
367563	1/6/2015 - 2/3/2015	Mn-54	<2.87E+00	0.00E+00	2.87E+00
		Co-58	<3.35E+00	0.00E+00	3.35E+00
		Fe-59	<5.13E+00	0.00E+00	5.13E+00
		Co-60	<2.89E+00	0.00E+00	2.89E+00
		Zn-65	<6.25E+00	0.00E+00	6.25E+00
		Zr-95	<6.22E+00	0.00E+00	6.22E+00
		Nb-95	<3.77E+00	0.00E+00	3.77E+00
		I-131	<1.11E+01	0.00E+00	1.11E+01
		Cs-134	<3.34E+00	0.00E+00	3.34E+00
		Cs-137	<2.93E+00	0.00E+00	2.93E+00
		BaLa-140	<8.81E+00	0.00E+00	8.81E+00
		Be-7	<3.03E+01	0.00E+00	3.03E+01
		K-40	1.09E+01	2.76E+01	4.86E+01
371558	2/3/2015 - 3/3/2015	Mn-54	<3.40E+00	0.00E+00	3.40E+00
		Co-58	<4.17E+00	0.00E+00	4.17E+00
		Fe-59	<9.42E+00	0.00E+00	9.42E+00
		Co-60	<4.30E+00	0.00E+00	4.30E+00
		Zn-65	<5.18E+00	0.00E+00	5.18E+00
		Zr-95	<7.72E+00	0.00E+00	7.72E+00
		Nb-95	<4.19E+00	0.00E+00	4.19E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<2.70E+00	0.00E+00	2.70E+00
		Cs-137	<3.29E+00	0.00E+00	3.29E+00
		BaLa-140	<1.16E+01	0.00E+00	1.16E+01
		Be-7	<3.05E+01	0.00E+00	3.05E+01
		K-40	<6.28E+01	0.00E+00	6.28E+01
372363	12/9/2014 - 3/3/2015	H3SW	3.43E+03	1.81E+02	1.85E+02
374569	3/3/2015 - 3/31/2015	Mn-54	<3.22E+00	0.00E+00	3.22E+00
		Co-58	<3.83E+00	0.00E+00	3.83E+00
		Fe-59	<8.40E+00	0.00E+00	8.40E+00
		Co-60	<4.29E+00	0.00E+00	4.29E+00
		Zn-65	<6.48E+00	0.00E+00	6.48E+00
		Zr-95	<5.79E+00	0.00E+00	5.79E+00
		Nb-95	<4.55E+00	0.00E+00	4.55E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<4.95E+00	0.00E+00	4.95E+00
		Cs-137	<3.79E+00	0.00E+00	3.79E+00
		BaLa-140	<8.12E+00	0.00E+00	8.12E+00
		Be-7	<3.34E+01	0.00E+00	3.34E+01
		K-40	<6.31E+01	0.00E+00	6.31E+01
377503	3/31/2015 - 4/28/2015	Mn-54	<3.80E+00	0.00E+00	3.80E+00
		Co-58	<4.19E+00	0.00E+00	4.19E+00
		Fe-59	<7.96E+00	0.00E+00	7.96E+00
		Co-60	<5.40E+00	0.00E+00	5.40E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
377503	3/31/2015 - 4/28/2015	Zn-65	<9.37E+00	0.00E+00	9.37E+00
		Zr-95	<7.43E+00	0.00E+00	7.43E+00
		Nb-95	<4.07E+00	0.00E+00	4.07E+00
		I-131	<1.05E+01	0.00E+00	1.05E+01
		Cs-134	<4.46E+00	0.00E+00	4.46E+00
		Cs-137	<5.77E+00	0.00E+00	5.77E+00
		BaLa-140	<8.39E+00	0.00E+00	8.39E+00
		Be-7	<4.27E+01	0.00E+00	4.27E+01
		K-40	5.96E+01	3.52E+01	4.24E+01
		379469	4/28/2015 - 5/27/2015	Mn-54	<2.19E+00
Co-58	<2.28E+00			0.00E+00	2.28E+00
Fe-59	<5.40E+00			0.00E+00	5.40E+00
Co-60	<2.11E+00			0.00E+00	2.11E+00
Zn-65	<3.55E+00			0.00E+00	3.55E+00
Zr-95	<3.50E+00			0.00E+00	3.50E+00
Nb-95	<2.66E+00			0.00E+00	2.66E+00
I-131	<1.17E+01			0.00E+00	1.17E+01
Cs-134	<2.54E+00			0.00E+00	2.54E+00
Cs-137	<1.39E+00			0.00E+00	1.39E+00
BaLa-140	<6.22E+00			0.00E+00	6.22E+00
Be-7	<1.94E+01			0.00E+00	1.94E+01
K-40	<3.00E+01			0.00E+00	3.00E+01
380202	3/3/2015 - 5/27/2015	H3SW	5.05E+03	2.29E+02	1.97E+02
381261	5/27/2015 - 6/23/2015	Mn-54	<8.51E-01	0.00E+00	8.51E-01
		Co-58	1.15E+01	1.63E+00	1.70E+00
		Fe-59	<1.86E+00	0.00E+00	1.86E+00
		Co-60	1.07E+00	6.92E-01	1.08E+00
		Zn-65	<1.73E+00	0.00E+00	1.73E+00
		Zr-95	<1.67E+00	0.00E+00	1.67E+00
		Nb-95	<1.34E+00	0.00E+00	1.34E+00
		I-131	<5.05E+00	0.00E+00	5.05E+00
		Cs-134	<9.98E-01	0.00E+00	9.98E-01
		Cs-137	<9.11E-01	0.00E+00	9.11E-01
		BaLa-140	<2.89E+00	0.00E+00	2.89E+00
		Be-7	1.22E+01	4.71E+00	1.15E+01
		K-40	4.04E+01	1.07E+01	1.44E+01
383529	6/23/2015 - 7/21/2015	Mn-54	<2.17E+00	0.00E+00	2.17E+00
		Co-58	<3.56E+00	0.00E+00	3.56E+00
		Fe-59	<8.50E+00	0.00E+00	8.50E+00
		Co-60	<2.92E+00	0.00E+00	2.92E+00
		Zn-65	<5.37E+00	0.00E+00	5.37E+00
		Zr-95	<5.61E+00	0.00E+00	5.61E+00
		Nb-95	<3.30E+00	0.00E+00	3.30E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<3.16E+00	0.00E+00	3.16E+00
		Cs-137	<3.80E+00	0.00E+00	3.80E+00
		BaLa-140	<7.02E+00	0.00E+00	7.02E+00
		Be-7	<3.77E+01	0.00E+00	3.77E+01
		K-40	<5.74E+01	0.00E+00	5.74E+01
385938	7/21/2015 - 8/18/2015	Mn-54	<3.36E+00	0.00E+00	3.36E+00
		Co-58	<4.55E+00	0.00E+00	4.55E+00
		Fe-59	<1.02E+01	0.00E+00	1.02E+01
		Co-60	<4.50E+00	0.00E+00	4.50E+00
		Zn-65	<7.01E+00	0.00E+00	7.01E+00
		Zr-95	<5.19E+00	0.00E+00	5.19E+00
		Nb-95	<3.77E+00	0.00E+00	3.77E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
385938	7/21/2015 - 8/18/2015	Cs-134	<4.24E+00	0.00E+00	4.24E+00
		Cs-137	<3.19E+00	0.00E+00	3.19E+00
		BaLa-140	<9.30E+00	0.00E+00	9.30E+00
		Be-7	<3.14E+01	0.00E+00	3.14E+01
		K-40	6.22E+01	4.00E+01	5.84E+01
388114	5/27/2015 - 8/18/2015	H3SW	3.79E+03	2.03E+02	1.94E+02
389418	8/18/2015 - 9/15/2015	Mn-54	<1.90E+00	0.00E+00	1.90E+00
		Co-58	<2.85E+00	0.00E+00	2.85E+00
		Fe-59	<6.42E+00	0.00E+00	6.42E+00
		Co-60	<3.70E+00	0.00E+00	3.70E+00
		Zn-65	<4.94E+00	0.00E+00	4.94E+00
		Zr-95	<4.62E+00	0.00E+00	4.62E+00
		Nb-95	<3.69E+00	0.00E+00	3.69E+00
		I-131	<9.24E+00	0.00E+00	9.24E+00
		Cs-134	<2.91E+00	0.00E+00	2.91E+00
		Cs-137	<3.07E+00	0.00E+00	3.07E+00
		BaLa-140	<6.42E+00	0.00E+00	6.42E+00
		Be-7	<2.77E+01	0.00E+00	2.77E+01
		K-40	4.04E+01	2.42E+01	3.36E+01
392240	9/15/2015 - 10/13/2015	Mn-54	<2.89E+00	0.00E+00	2.89E+00
		Co-58	<3.40E+00	0.00E+00	3.40E+00
		Fe-59	<7.21E+00	0.00E+00	7.21E+00
		Co-60	<2.79E+00	0.00E+00	2.79E+00
		Zn-65	<6.24E+00	0.00E+00	6.24E+00
		Zr-95	<6.88E+00	0.00E+00	6.88E+00
		Nb-95	<4.36E+00	0.00E+00	4.36E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<3.21E+00	0.00E+00	3.21E+00
		Cs-137	<3.38E+00	0.00E+00	3.38E+00
		BaLa-140	<1.08E+01	0.00E+00	1.08E+01
		Be-7	<2.94E+01	0.00E+00	2.94E+01
		K-40	<5.89E+01	0.00E+00	5.89E+01
395313	10/13/2015 - 11/10/2015	Mn-54	<3.89E+00	0.00E+00	3.89E+00
		Co-58	<3.56E+00	0.00E+00	3.56E+00
		Fe-59	<5.23E+00	0.00E+00	5.23E+00
		Co-60	<3.47E+00	0.00E+00	3.47E+00
		Zn-65	<6.36E+00	0.00E+00	6.36E+00
		Zr-95	<7.62E+00	0.00E+00	7.62E+00
		Nb-95	<4.41E+00	0.00E+00	4.41E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<2.86E+00	0.00E+00	2.86E+00
		Cs-137	<2.93E+00	0.00E+00	2.93E+00
		BaLa-140	<1.02E+01	0.00E+00	1.02E+01
		Be-7	<2.89E+01	0.00E+00	2.89E+01
		K-40	<5.96E+01	0.00E+00	5.96E+01
397089	8/18/2015 - 12/8/2015	H3SW	6.16E+03	2.32E+02	2.06E+02
397184	11/10/2015 - 12/8/2015	Mn-54	<2.97E+00	0.00E+00	2.97E+00
		Co-58	<3.89E+00	0.00E+00	3.89E+00
		Fe-59	<7.79E+00	0.00E+00	7.79E+00
		Co-60	<4.19E+00	0.00E+00	4.19E+00
		Zn-65	<6.94E+00	0.00E+00	6.94E+00
		Zr-95	<5.81E+00	0.00E+00	5.81E+00
		Nb-95	<5.76E+00	0.00E+00	5.76E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.18E+00	0.00E+00	4.18E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
397184	11/10/2015 - 12/8/2015	Cs-137	<3.65E+00	0.00E+00	3.65E+00
		BaLa-140	<6.20E+00	0.00E+00	6.20E+00
		Be-7	<3.70E+01	0.00E+00	3.70E+01
		K-40	<3.75E+01	0.00E+00	3.75E+01

Sample Point 211 [ INDICATOR - ESE @ 4.06 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
365085	12/9/2014 - 1/6/2015	Mn-54	<1.83E+00	0.00E+00	1.83E+00
		Co-58	<2.23E+00	0.00E+00	2.23E+00
		Fe-59	<4.91E+00	0.00E+00	4.91E+00
		Co-60	<1.82E+00	0.00E+00	1.82E+00
		Zn-65	<4.07E+00	0.00E+00	4.07E+00
		Zr-95	<4.29E+00	0.00E+00	4.29E+00
		Nb-95	<2.89E+00	0.00E+00	2.89E+00
		I-131	<9.95E+00	0.00E+00	9.95E+00
		Cs-134	<2.24E+00	0.00E+00	2.24E+00
		Cs-137	<1.91E+00	0.00E+00	1.91E+00
		BaLa-140	<4.81E+00	0.00E+00	4.81E+00
		Be-7	<1.85E+01	0.00E+00	1.85E+01
		K-40	1.93E+02	3.25E+01	3.37E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
367564	1/6/2015 - 2/3/2015	Mn-54	<4.19E+00	0.00E+00	4.19E+00
		Co-58	<3.52E+00	0.00E+00	3.52E+00
		Fe-59	<7.09E+00	0.00E+00	7.09E+00
		Co-60	<3.22E+00	0.00E+00	3.22E+00
		Zn-65	<8.72E+00	0.00E+00	8.72E+00
		Zr-95	<8.54E+00	0.00E+00	8.54E+00
		Nb-95	<6.24E+00	0.00E+00	6.24E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.30E+00	0.00E+00	4.30E+00
		Cs-137	<4.06E+00	0.00E+00	4.06E+00
		BaLa-140	<1.09E+01	0.00E+00	1.09E+01
		Be-7	<3.38E+01	0.00E+00	3.38E+01
		K-40	2.37E+01	2.86E+01	4.61E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
371559	2/3/2015 - 3/3/2015	Mn-54	<4.34E+00	0.00E+00	4.34E+00
		Co-58	<4.19E+00	0.00E+00	4.19E+00
		Fe-59	<8.22E+00	0.00E+00	8.22E+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	<7.42E+00	0.00E+00	7.42E+00
		Nb-95	<4.15E+00	0.00E+00	4.15E+00
		I-131	<1.00E+01	0.00E+00	1.00E+01
		Cs-134	<3.19E+00	0.00E+00	3.19E+00
		Cs-137	<4.37E+00	0.00E+00	4.37E+00
		BaLa-140	<1.03E+01	0.00E+00	1.03E+01
		Be-7	<3.61E+01	0.00E+00	3.61E+01
		K-40	<7.16E+01	0.00E+00	7.16E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
372364	12/9/2014 - 3/3/2015	H3SW	4.71E+02	1.24E+02	1.92E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
374570	3/3/2015 - 3/31/2015	Mn-54	<3.44E+00	0.00E+00	3.44E+00
		Co-58	<2.90E+00	0.00E+00	2.90E+00
		Fe-59	<7.62E+00	0.00E+00	7.62E+00
		Co-60	<2.39E+00	0.00E+00	2.39E+00
		Zn-65	<6.44E+00	0.00E+00	6.44E+00
		Zr-95	<5.74E+00	0.00E+00	5.74E+00
		Nb-95	<5.23E+00	0.00E+00	5.23E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<4.30E+00	0.00E+00	4.30E+00
		Cs-137	<3.77E+00	0.00E+00	3.77E+00
		BaLa-140	<7.98E+00	0.00E+00	7.98E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
374570	3/3/2015 - 3/31/2015	Be-7	<3.82E+01	0.00E+00	3.82E+01
		K-40	<5.84E+01	0.00E+00	5.84E+01
377504	3/31/2015 - 4/28/2015	Mn-54	<3.11E+00	0.00E+00	3.11E+00
		Co-58	<3.29E+00	0.00E+00	3.29E+00
		Fe-59	<5.58E+00	0.00E+00	5.58E+00
		Co-60	<3.78E+00	0.00E+00	3.78E+00
		Zn-65	<3.22E+00	0.00E+00	3.22E+00
		Zr-95	<6.09E+00	0.00E+00	6.09E+00
		Nb-95	<4.13E+00	0.00E+00	4.13E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.31E+00	0.00E+00	3.31E+00
		Cs-137	<3.61E+00	0.00E+00	3.61E+00
		BaLa-140	<7.52E+00	0.00E+00	7.52E+00
		Be-7	<2.80E+01	0.00E+00	2.80E+01
		K-40	<4.75E+01	0.00E+00	4.75E+01
		379470	4/28/2015 - 5/27/2015	Mn-54	<2.45E+00
Co-58	<2.73E+00			0.00E+00	2.73E+00
Fe-59	<5.43E+00			0.00E+00	5.43E+00
Co-60	<2.71E+00			0.00E+00	2.71E+00
Zn-65	<4.83E+00			0.00E+00	4.83E+00
Zr-95	<5.35E+00			0.00E+00	5.35E+00
Nb-95	<3.58E+00			0.00E+00	3.58E+00
I-131	<1.17E+01			0.00E+00	1.17E+01
Cs-134	<2.97E+00			0.00E+00	2.97E+00
Cs-137	<2.10E+00			0.00E+00	2.10E+00
BaLa-140	<5.45E+00			0.00E+00	5.45E+00
Be-7	<2.56E+01			0.00E+00	2.56E+01
K-40	6.00E+01			2.80E+01	3.73E+01
380203	3/3/2015 - 5/27/2015			H3SW	5.07E+02
381262	5/27/2015 - 6/23/2015	Mn-54	<4.58E+00	0.00E+00	4.58E+00
		Co-58	<3.64E+00	0.00E+00	3.64E+00
		Fe-59	<8.61E+00	0.00E+00	8.61E+00
		Co-60	<2.50E+00	0.00E+00	2.50E+00
		Zn-65	<9.89E+00	0.00E+00	9.89E+00
		Zr-95	<6.93E+00	0.00E+00	6.93E+00
		Nb-95	<4.88E+00	0.00E+00	4.88E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<4.89E+00	0.00E+00	4.89E+00
		Cs-137	<3.68E+00	0.00E+00	3.68E+00
		BaLa-140	<1.05E+01	0.00E+00	1.05E+01
		Be-7	<3.37E+01	0.00E+00	3.37E+01
		K-40	<6.36E+01	0.00E+00	6.36E+01
		383530	6/23/2015 - 7/21/2015	Mn-54	<2.88E+00
Co-58	<4.00E+00			0.00E+00	4.00E+00
Fe-59	<9.53E+00			0.00E+00	9.53E+00
Co-60	<2.99E+00			0.00E+00	2.99E+00
Zn-65	<7.76E+00			0.00E+00	7.76E+00
Zr-95	<7.09E+00			0.00E+00	7.09E+00
Nb-95	<5.62E+00			0.00E+00	5.62E+00
I-131	<1.07E+01			0.00E+00	1.07E+01
Cs-134	<4.22E+00			0.00E+00	4.22E+00
Cs-137	<3.68E+00			0.00E+00	3.68E+00
BaLa-140	<9.60E+00			0.00E+00	9.60E+00
Be-7	<3.76E+01			0.00E+00	3.76E+01
K-40	<6.61E+01			0.00E+00	6.61E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
385939	7/21/2015 - 8/18/2015	Mn-54	<3.64E+00	0.00E+00	3.64E+00
		Co-58	<3.23E+00	0.00E+00	3.23E+00
		Fe-59	<1.07E+01	0.00E+00	1.07E+01
		Co-60	<3.92E+00	0.00E+00	3.92E+00
		Zn-65	<8.99E+00	0.00E+00	8.99E+00
		Zr-95	<6.73E+00	0.00E+00	6.73E+00
		Nb-95	<5.27E+00	0.00E+00	5.27E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<4.04E+00	0.00E+00	4.04E+00
		Cs-137	<4.09E+00	0.00E+00	4.09E+00
		BaLa-140	<9.82E+00	0.00E+00	9.82E+00
		Be-7	<3.68E+01	0.00E+00	3.68E+01
		K-40	<8.12E+01	0.00E+00	8.12E+01
388115	5/27/2015 - 8/18/2015	H3SW	4.40E+02	1.27E+02	1.95E+02
389419	8/18/2015 - 9/15/2015	Mn-54	<2.92E+00	0.00E+00	2.92E+00
		Co-58	<3.48E+00	0.00E+00	3.48E+00
		Fe-59	<5.12E+00	0.00E+00	5.12E+00
		Co-60	<2.84E+00	0.00E+00	2.84E+00
		Zn-65	<5.21E+00	0.00E+00	5.21E+00
		Zr-95	<5.03E+00	0.00E+00	5.03E+00
		Nb-95	<3.78E+00	0.00E+00	3.78E+00
		I-131	<1.09E+01	0.00E+00	1.09E+01
		Cs-134	<3.23E+00	0.00E+00	3.23E+00
		Cs-137	<3.41E+00	0.00E+00	3.41E+00
		BaLa-140	<9.66E+00	0.00E+00	9.66E+00
		Be-7	<3.20E+01	0.00E+00	3.20E+01
		K-40	2.50E+01	2.32E+01	3.53E+01
392241	9/15/2015 - 10/13/2015	Mn-54	<2.80E+00	0.00E+00	2.80E+00
		Co-58	<2.90E+00	0.00E+00	2.90E+00
		Fe-59	<5.49E+00	0.00E+00	5.49E+00
		Co-60	<2.40E+00	0.00E+00	2.40E+00
		Zn-65	<4.42E+00	0.00E+00	4.42E+00
		Zr-95	<5.75E+00	0.00E+00	5.75E+00
		Nb-95	<3.57E+00	0.00E+00	3.57E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<3.04E+00	0.00E+00	3.04E+00
		Cs-137	<2.52E+00	0.00E+00	2.52E+00
		BaLa-140	<6.26E+00	0.00E+00	6.26E+00
		Be-7	<2.61E+01	0.00E+00	2.61E+01
		K-40	5.18E+01	2.39E+01	2.89E+01
395314	10/13/2015 - 11/10/2015	Mn-54	<2.82E+00	0.00E+00	2.82E+00
		Co-58	<2.92E+00	0.00E+00	2.92E+00
		Fe-59	<6.93E+00	0.00E+00	6.93E+00
		Co-60	<3.56E+00	0.00E+00	3.56E+00
		Zn-65	<6.53E+00	0.00E+00	6.53E+00
		Zr-95	<5.50E+00	0.00E+00	5.50E+00
		Nb-95	<4.01E+00	0.00E+00	4.01E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<4.18E+00	0.00E+00	4.18E+00
		Cs-137	<3.29E+00	0.00E+00	3.29E+00
		BaLa-140	<1.07E+01	0.00E+00	1.07E+01
		Be-7	<2.99E+01	0.00E+00	2.99E+01
		K-40	<4.54E+01	0.00E+00	4.54E+01
397090	8/18/2015 - 12/8/2015	H3SW	7.10E+02	1.37E+02	2.05E+02
397185	11/10/2015 - 12/8/2015	Mn-54	<3.37E+00	0.00E+00	3.37E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
397185	11/10/2015 - 12/8/2015	Co-58	<3.35E+00	0.00E+00	3.35E+00
		Fe-59	<7.94E+00	0.00E+00	7.94E+00
		Co-60	<2.93E+00	0.00E+00	2.93E+00
		Zn-65	<6.55E+00	0.00E+00	6.55E+00
		Zr-95	<6.87E+00	0.00E+00	6.87E+00
		Nb-95	<5.42E+00	0.00E+00	5.42E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<3.74E+00	0.00E+00	3.74E+00
		Cs-137	<3.41E+00	0.00E+00	3.41E+00
		BaLa-140	<8.62E+00	0.00E+00	8.62E+00
		Be-7	<3.31E+01	0.00E+00	3.31E+01
		K-40	<5.26E+01	0.00E+00	5.26E+01

Sample Point 215 [ CONTROL - NNE @ 4.21 miles ]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
365086	12/9/2014 - 1/6/2015	Mn-54	<2.60E+00	0.00E+00	2.60E+00
		Co-58	<3.07E+00	0.00E+00	3.07E+00
		Fe-59	<5.85E+00	0.00E+00	5.85E+00
		Co-60	<2.78E+00	0.00E+00	2.78E+00
		Zn-65	<4.82E+00	0.00E+00	4.82E+00
		Zr-95	<5.56E+00	0.00E+00	5.56E+00
		Nb-95	<3.93E+00	0.00E+00	3.93E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<2.55E+00	0.00E+00	2.55E+00
		Cs-137	<2.59E+00	0.00E+00	2.59E+00
		BaLa-140	<6.99E+00	0.00E+00	6.99E+00
		Be-7	<2.45E+01	0.00E+00	2.45E+01
		K-40	1.98E+02	3.96E+01	3.98E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
367565	1/6/2015 - 2/3/2015	Mn-54	<2.76E+00	0.00E+00	2.76E+00
		Co-58	<2.06E+00	0.00E+00	2.06E+00
		Fe-59	<6.33E+00	0.00E+00	6.33E+00
		Co-60	<2.14E+00	0.00E+00	2.14E+00
		Zn-65	<4.79E+00	0.00E+00	4.79E+00
		Zr-95	<4.89E+00	0.00E+00	4.89E+00
		Nb-95	<2.69E+00	0.00E+00	2.69E+00
		I-131	<8.82E+00	0.00E+00	8.82E+00
		Cs-134	<2.75E+00	0.00E+00	2.75E+00
		Cs-137	<2.55E+00	0.00E+00	2.55E+00
		BaLa-140	<4.26E+00	0.00E+00	4.26E+00
		Be-7	<2.28E+01	0.00E+00	2.28E+01
		K-40	3.77E+01	1.96E+01	2.32E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
371560	2/3/2015 - 3/3/2015	Mn-54	<3.47E+00	0.00E+00	3.47E+00
		Co-58	<4.44E+00	0.00E+00	4.44E+00
		Fe-59	<8.54E+00	0.00E+00	8.54E+00
		Co-60	<4.38E+00	0.00E+00	4.38E+00
		Zn-65	<8.04E+00	0.00E+00	8.04E+00
		Zr-95	<6.36E+00	0.00E+00	6.36E+00
		Nb-95	<5.15E+00	0.00E+00	5.15E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<4.06E+00	0.00E+00	4.06E+00
		Cs-137	<3.72E+00	0.00E+00	3.72E+00
		BaLa-140	<1.17E+01	0.00E+00	1.17E+01
		Be-7	<4.09E+01	0.00E+00	4.09E+01
		K-40	<5.80E+01	0.00E+00	5.80E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
372365	12/9/2014 - 3/3/2015	H3SW	4.97E+02	1.22E+02	1.86E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	LLD
374571	3/3/2015 - 3/31/2015	Mn-54	<2.63E+00	0.00E+00	2.63E+00
		Co-58	<4.03E+00	0.00E+00	4.03E+00
		Fe-59	<6.19E+00	0.00E+00	6.19E+00





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
374571	3/3/2015 - 3/31/2015	Co-60	<3.87E+00	0.00E+00	3.87E+00
		Zn-65	<7.10E+00	0.00E+00	7.10E+00
		Zr-95	<9.14E+00	0.00E+00	9.14E+00
		Nb-95	<4.49E+00	0.00E+00	4.49E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.86E+00	0.00E+00	3.86E+00
		Cs-137	<3.70E+00	0.00E+00	3.70E+00
		BaLa-140	<9.39E+00	0.00E+00	9.39E+00
		Be-7	<3.82E+01	0.00E+00	3.82E+01
		K-40	<4.39E+01	0.00E+00	4.39E+01
		377505	3/31/2015 - 4/28/2015	Mn-54	<4.42E+00
Co-58	<4.04E+00			0.00E+00	4.04E+00
Fe-59	<9.00E+00			0.00E+00	9.00E+00
Co-60	<2.42E+00			0.00E+00	2.42E+00
Zn-65	<9.56E+00			0.00E+00	9.56E+00
Zr-95	<8.29E+00			0.00E+00	8.29E+00
Nb-95	<5.21E+00			0.00E+00	5.21E+00
I-131	<1.05E+01			0.00E+00	1.05E+01
Cs-134	<4.51E+00			0.00E+00	4.51E+00
Cs-137	<3.55E+00			0.00E+00	3.55E+00
BaLa-140	<1.04E+01			0.00E+00	1.04E+01
Be-7	<3.12E+01			0.00E+00	3.12E+01
K-40	<7.83E+01			0.00E+00	7.83E+01
379471	4/28/2015 - 5/27/2015			Mn-54	<1.82E+00
		Co-58	<2.56E+00	0.00E+00	2.56E+00
		Fe-59	<4.92E+00	0.00E+00	4.92E+00
		Co-60	<2.81E+00	0.00E+00	2.81E+00
		Zn-65	<5.64E+00	0.00E+00	5.64E+00
		Zr-95	<5.11E+00	0.00E+00	5.11E+00
		Nb-95	<3.35E+00	0.00E+00	3.35E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<2.01E+00	0.00E+00	2.01E+00
		Cs-137	<2.48E+00	0.00E+00	2.48E+00
		BaLa-140	<6.02E+00	0.00E+00	6.02E+00
		Be-7	<2.31E+01	0.00E+00	2.31E+01
		K-40	5.17E+01	2.32E+01	3.08E+01
		380204	3/3/2015 - 5/27/2015	H3SW	4.13E+02
381263	5/27/2015 - 6/23/2015	Mn-54	<3.68E+00	0.00E+00	3.68E+00
		Co-58	<4.50E+00	0.00E+00	4.50E+00
		Fe-59	<1.01E+01	0.00E+00	1.01E+01
		Co-60	<3.52E+00	0.00E+00	3.52E+00
		Zn-65	<9.03E+00	0.00E+00	9.03E+00
		Zr-95	<4.44E+00	0.00E+00	4.44E+00
		Nb-95	<4.75E+00	0.00E+00	4.75E+00
		I-131	<9.42E+00	0.00E+00	9.42E+00
		Cs-134	<4.75E+00	0.00E+00	4.75E+00
		Cs-137	<3.59E+00	0.00E+00	3.59E+00
		BaLa-140	<1.01E+01	0.00E+00	1.01E+01
		Be-7	<3.17E+01	0.00E+00	3.17E+01
		K-40	<6.10E+01	0.00E+00	6.10E+01
		383531	6/23/2015 - 7/21/2015	Mn-54	<3.88E+00
Co-58	<4.08E+00			0.00E+00	4.08E+00
Fe-59	<7.78E+00			0.00E+00	7.78E+00
Co-60	<3.54E+00			0.00E+00	3.54E+00
Zn-65	<5.61E+00			0.00E+00	5.61E+00
Zr-95	<7.22E+00			0.00E+00	7.22E+00
Nb-95	<3.99E+00			0.00E+00	3.99E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
383531	6/23/2015 - 7/21/2015	I-131	<1.04E+01	0.00E+00	1.04E+01
		Cs-134	<3.82E+00	0.00E+00	3.82E+00
		Cs-137	<4.28E+00	0.00E+00	4.28E+00
		BaLa-140	<1.10E+01	0.00E+00	1.10E+01
		Be-7	<4.15E+01	0.00E+00	4.15E+01
		K-40	<5.43E+01	0.00E+00	5.43E+01
385940	7/21/2015 - 8/18/2015	Mn-54	<1.98E+00	0.00E+00	1.98E+00
		Co-58	<2.83E+00	0.00E+00	2.83E+00
		Fe-59	<5.25E+00	0.00E+00	5.25E+00
		Co-60	<2.99E+00	0.00E+00	2.99E+00
		Zn-65	<5.21E+00	0.00E+00	5.21E+00
		Zr-95	<5.56E+00	0.00E+00	5.56E+00
		Nb-95	<4.12E+00	0.00E+00	4.12E+00
		I-131	<1.11E+01	0.00E+00	1.11E+01
		Cs-134	<2.82E+00	0.00E+00	2.82E+00
		Cs-137	<2.97E+00	0.00E+00	2.97E+00
		BaLa-140	<5.65E+00	0.00E+00	5.65E+00
		Be-7	<2.41E+01	0.00E+00	2.41E+01
		K-40	4.38E+01	2.36E+01	2.94E+01
		388116	5/27/2015 - 8/18/2015	H3SW	2.47E+02
389420	8/18/2015 - 9/15/2015	Mn-54	<3.51E+00	0.00E+00	3.51E+00
		Co-58	<3.63E+00	0.00E+00	3.63E+00
		Fe-59	<6.75E+00	0.00E+00	6.75E+00
		Co-60	<3.17E+00	0.00E+00	3.17E+00
		Zn-65	<5.84E+00	0.00E+00	5.84E+00
		Zr-95	<6.19E+00	0.00E+00	6.19E+00
		Nb-95	<4.09E+00	0.00E+00	4.09E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.48E+00	0.00E+00	3.48E+00
		Cs-137	<3.61E+00	0.00E+00	3.61E+00
		BaLa-140	<7.27E+00	0.00E+00	7.27E+00
		Be-7	<3.09E+01	0.00E+00	3.09E+01
		K-40	6.89E+01	3.20E+01	3.67E+01
		392242	9/15/2015 - 10/13/2015	Mn-54	<3.45E+00
Co-58	<5.11E+00			0.00E+00	5.11E+00
Fe-59	<6.01E+00			0.00E+00	6.01E+00
Co-60	<2.42E+00			0.00E+00	2.42E+00
Zn-65	<6.50E+00			0.00E+00	6.50E+00
Zr-95	<6.78E+00			0.00E+00	6.78E+00
Nb-95	<5.30E+00			0.00E+00	5.30E+00
I-131	<1.18E+01			0.00E+00	1.18E+01
Cs-134	<3.25E+00			0.00E+00	3.25E+00
Cs-137	<3.75E+00			0.00E+00	3.75E+00
BaLa-140	<1.09E+01			0.00E+00	1.09E+01
Be-7	<3.30E+01			0.00E+00	3.30E+01
K-40	<5.68E+01			0.00E+00	5.68E+01
395315	10/13/2015 - 11/10/2015			Mn-54	<3.68E+00
		Co-58	<2.59E+00	0.00E+00	2.59E+00
		Fe-59	<8.94E+00	0.00E+00	8.94E+00
		Co-60	<2.83E+00	0.00E+00	2.83E+00
		Zn-65	<7.25E+00	0.00E+00	7.25E+00
		Zr-95	<6.93E+00	0.00E+00	6.93E+00
		Nb-95	<3.39E+00	0.00E+00	3.39E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<3.26E+00	0.00E+00	3.26E+00
		Cs-137	<3.69E+00	0.00E+00	3.69E+00
		BaLa-140	<5.15E+00	0.00E+00	5.15E+00



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
395315	10/13/2015 - 11/10/2015	Be-7	<3.57E+01	0.00E+00	3.57E+01
		K-40	<5.40E+01	0.00E+00	5.40E+01
397091	8/18/2015 - 12/8/2015	H3SW	4.99E+02	1.32E+02	2.04E+02
397186	11/10/2015 - 12/8/2015	Mn-54	<3.41E+00	0.00E+00	3.41E+00
		Co-58	<3.77E+00	0.00E+00	3.77E+00
		Fe-59	<1.00E+01	0.00E+00	1.00E+01
		Co-60	<2.40E+00	0.00E+00	2.40E+00
		Zn-65	<7.83E+00	0.00E+00	7.83E+00
		Zr-95	<6.67E+00	0.00E+00	6.67E+00
		Nb-95	<5.79E+00	0.00E+00	5.79E+00
		I-131	<1.13E+01	0.00E+00	1.13E+01
		Cs-134	<3.52E+00	0.00E+00	3.52E+00
		Cs-137	<3.91E+00	0.00E+00	3.91E+00
		BaLa-140	<1.04E+01	0.00E+00	1.04E+01
				Be-7	<4.29E+01
		K-40	<6.32E+01	0.00E+00	6.32E+01

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
371235	12/18/2014 - 3/19/2015	mR/Std Qtr	22.82
379882	3/19/2015 - 6/18/2015	mR/Std Qtr	16.01
387830	6/18/2015 - 9/17/2015	mR/Std Qtr	16.49
396805	9/17/2015 - 12/17/2015	mR/Std Qtr	16.39

Sample Point 201 [ INDICATOR - NE @ 0.53 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371236	12/18/2014 - 3/19/2015	mR/Std Qtr	23.50
379883	3/19/2015 - 6/18/2015	mR/Std Qtr	16.45
387831	6/18/2015 - 9/17/2015	mR/Std Qtr	16.35

Sample Point 203 [ INDICATOR - ESE @ 0.38 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371237	12/18/2014 - 3/19/2015	mR/Std Qtr	24.69
379884	3/19/2015 - 6/18/2015	mR/Std Qtr	17.01
387832	6/18/2015 - 9/17/2015	mR/Std Qtr	18.82
396807	9/17/2015 - 12/17/2015	mR/Std Qtr	20.09

Sample Point 204 [ INDICATOR - SSW @ 0.48 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371238	12/18/2014 - 3/19/2015	mR/Std Qtr	20.59
379885	3/19/2015 - 6/18/2015	mR/Std Qtr	16.90



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 204 [ INDICATOR - SSW @ 0.48 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
387833	6/18/2015 - 9/17/2015	mR/Std Qtr	16.95
396808	9/17/2015 - 12/17/2015	mR/Std Qtr	16.75

Sample Point 205 [ INDICATOR - SW @ 0.5 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371239	12/18/2014 - 3/19/2015	mR/Std Qtr	22.59
379886	3/19/2015 - 6/18/2015	mR/Std Qtr	18.33
387834	6/18/2015 - 9/17/2015	mR/Std Qtr	17.41
396809	9/17/2015 - 12/17/2015	mR/Std Qtr	18.42

Sample Point 206 [ INDICATOR - WNW @ 0.67 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371240	12/18/2014 - 3/19/2015	mR/Std Qtr	25.54
379887	3/19/2015 - 6/18/2015	mR/Std Qtr	21.26
387835	6/18/2015 - 9/17/2015	mR/Std Qtr	20.74
396810	9/17/2015 - 12/17/2015	mR/Std Qtr	20.38

Sample Point 207 [ INDICATOR - NNW @ 0.95 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371241	12/18/2014 - 3/19/2015	mR/Std Qtr	23.00
379888	3/19/2015 - 6/18/2015	mR/Std Qtr	21.49
387836	6/18/2015 - 9/17/2015	mR/Std Qtr	19.18
396811	9/17/2015 - 12/17/2015	mR/Std Qtr	19.40

Sample Point 212 [ INDICATOR - E @ 3.32 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
371242	12/18/2014 - 3/19/2015	mR/Std Qtr	23.32
379889	3/19/2015 - 6/18/2015	mR/Std Qtr	15.43
387837	6/18/2015 - 9/17/2015	mR/Std Qtr	15.32
396812	9/17/2015 - 12/17/2015	mR/Std Qtr	15.55

Sample Point 217 [ CONTROL - SSE @ 10.3 miles ]

TLD RING TLD\_CTRL

Sample ID:	Sample Dates:	Nuclide	Activity
371243	12/18/2014 - 3/19/2015	mR/Std Qtr	22.44
379890	3/19/2015 - 6/18/2015	mR/Std Qtr	10.26
387838	6/18/2015 - 9/17/2015	mR/Std Qtr	11.65



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

TLD RING TLD\_INNER

Sample ID	Sample Dates	Nuclide	Activity
371244	12/18/2014 - 3/19/2015	mR/Std Qtr	19.43
379891	3/19/2015 - 6/18/2015	mR/Std Qtr	16.07
387839	6/18/2015 - 9/17/2015	mR/Std Qtr	17.13
396814	9/17/2015 - 12/17/2015	mR/Std Qtr	16.74

Sample Point 223 [ INDICATOR - E @ 0.57 miles ]

TLD RING TLD\_INNER

Sample ID	Sample Dates	Nuclide	Activity
371245	12/18/2014 - 3/19/2015	mR/Std Qtr	22.01
379892	3/19/2015 - 6/18/2015	mR/Std Qtr	18.93
387840	6/18/2015 - 9/17/2015	mR/Std Qtr	19.38
396815	9/17/2015 - 12/17/2015	mR/Std Qtr	20.23

Sample Point 225 [ INDICATOR - SE @ 0.68 miles ]

TLD RING TLD\_INNER

Sample ID	Sample Dates	Nuclide	Activity
371246	12/18/2014 - 3/19/2015	mR/Std Qtr	21.40
379893	3/19/2015 - 6/18/2015	mR/Std Qtr	17.97
387841	6/18/2015 - 9/17/2015	mR/Std Qtr	18.36
396816	9/17/2015 - 12/17/2015	mR/Std Qtr	19.12

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

TLD RING TLD\_INNER

Sample ID	Sample Dates	Nuclide	Activity
371247	12/18/2014 - 3/19/2015	mR/Std Qtr	19.59
379894	3/19/2015 - 6/18/2015	mR/Std Qtr	18.34
387842	6/18/2015 - 9/17/2015	mR/Std Qtr	16.74
396817	9/17/2015 - 12/17/2015	mR/Std Qtr	15.92

Sample Point 227 [ INDICATOR - WSW @ 0.52 miles ]

TLD RING TLD\_INNER

Sample ID	Sample Dates	Nuclide	Activity
371248	12/18/2014 - 3/19/2015	mR/Std Qtr	21.88
379895	3/19/2015 - 6/18/2015	mR/Std Qtr	18.31
387843	6/18/2015 - 9/17/2015	mR/Std Qtr	17.24
396818	9/17/2015 - 12/17/2015	mR/Std Qtr	16.07

Sample Point 228 [ INDICATOR - W @ 0.61 miles ]

TLD RING TLD\_INNER

Sample ID	Sample Dates	Nuclide	Activity
371249	12/18/2014 - 3/19/2015	mR/Std Qtr	21.03



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 228 [ INDICATOR - W @ 0.61 miles ]

TLD RING TLD\_INNER

Sample ID: 379896	Sample Dates: 3/19/2015 - 6/18/2015	Nuclide mR/Std Qtr	Activity 17.04
Sample ID: 387844	Sample Dates: 6/18/2015 - 9/17/2015	Nuclide mR/Std Qtr	Activity 16.62
Sample ID: 396819	Sample Dates: 9/17/2015 - 12/17/2015	Nuclide mR/Std Qtr	Activity 17.61

Sample Point 229 [ INDICATOR - NW @ 0.84 miles ]

TLD RING TLD\_INNER

Sample ID: 371250	Sample Dates: 12/18/2014 - 3/19/2015	Nuclide mR/Std Qtr	Activity 27.69
Sample ID: 379897	Sample Dates: 3/19/2015 - 6/18/2015	Nuclide mR/Std Qtr	Activity 24.04
Sample ID: 387845	Sample Dates: 6/18/2015 - 9/17/2015	Nuclide mR/Std Qtr	Activity 21.32
Sample ID: 396820	Sample Dates: 9/17/2015 - 12/17/2015	Nuclide mR/Std Qtr	Activity 24.02

Sample Point 230 [ INDICATOR - N @ 4.37 miles ]

TLD RING TLD\_OUTER

Sample ID: 371251	Sample Dates: 12/18/2014 - 3/19/2015	Nuclide mR/Std Qtr	Activity 18.14
Sample ID: 379898	Sample Dates: 3/19/2015 - 6/18/2015	Nuclide mR/Std Qtr	Activity 12.33
Sample ID: 387846	Sample Dates: 6/18/2015 - 9/17/2015	Nuclide mR/Std Qtr	Activity 11.75
Sample ID: 396821	Sample Dates: 9/17/2015 - 12/17/2015	Nuclide mR/Std Qtr	Activity 13.13

Sample Point 231 [ INDICATOR - NNE @ 4.21 miles ]

TLD RING TLD\_OUTER

Sample ID: 371252	Sample Dates: 12/18/2014 - 3/19/2015	Nuclide mR/Std Qtr	Activity 25.11
Sample ID: 379899	Sample Dates: 3/19/2015 - 6/18/2015	Nuclide mR/Std Qtr	Activity 18.94
Sample ID: 387847	Sample Dates: 6/18/2015 - 9/17/2015	Nuclide mR/Std Qtr	Activity 17.07
Sample ID: 396822	Sample Dates: 9/17/2015 - 12/17/2015	Nuclide mR/Std Qtr	Activity 17.57

Sample Point 232 [ INDICATOR - NE @ 4.18 miles ]

TLD RING TLD\_OUTER

Sample ID: 371253	Sample Dates: 12/18/2014 - 3/19/2015	Nuclide mR/Std Qtr	Activity 26.86
Sample ID: 379900	Sample Dates: 3/19/2015 - 6/18/2015	Nuclide mR/Std Qtr	Activity 21.70
Sample ID: 387848	Sample Dates: 6/18/2015 - 9/17/2015	Nuclide mR/Std Qtr	Activity 22.65
Sample ID: 396823	Sample Dates: 9/17/2015 - 12/17/2015	Nuclide mR/Std Qtr	Activity 24.23

Sample Point 233 [ INDICATOR - ENE @ 3.95 miles ]

TLD RING TLD\_OUTER

Sample ID: 371254	Sample Dates: 12/18/2014 - 3/19/2015	Nuclide mR/Std Qtr	Activity 19.76
Sample ID: 379901	Sample Dates: 3/19/2015 - 6/18/2015	Nuclide mR/Std Qtr	Activity 15.02

# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 233 [ INDICATOR - ENE @ 3.95 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
387849	6/18/2015 - 9/17/2015	mR/Std Qtr	16.17
396824	9/17/2015 - 12/17/2015	mR/Std Qtr	15.52

Sample Point 234 [ INDICATOR - E @ 4.5 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371255	12/18/2014 - 3/19/2015	mR/Std Qtr	20.67
379902	3/19/2015 - 6/18/2015	mR/Std Qtr	17.61
387850	6/18/2015 - 9/17/2015	mR/Std Qtr	18.11
396825	9/17/2015 - 12/17/2015	mR/Std Qtr	18.39

Sample Point 235 [ INDICATOR - ESE @ 4.07 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371256	12/18/2014 - 3/19/2015	mR/Std Qtr	20.57
379903	3/19/2015 - 6/18/2015	mR/Std Qtr	15.58
387851	6/18/2015 - 9/17/2015	mR/Std Qtr	15.89
396826	9/17/2015 - 12/17/2015	mR/Std Qtr	18.29

Sample Point 236 [ INDICATOR - SE @ 4.25 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371257	12/18/2014 - 3/19/2015	mR/Std Qtr	25.26
379904	3/19/2015 - 6/18/2015	mR/Std Qtr	20.49
387852	6/18/2015 - 9/17/2015	mR/Std Qtr	21.26
396827	9/17/2015 - 12/17/2015	mR/Std Qtr	23.91

Sample Point 237 [ INDICATOR - SSE @ 4.75 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371258	12/18/2014 - 3/19/2015	mR/Std Qtr	30.14
379905	3/19/2015 - 6/18/2015	mR/Std Qtr	23.22
387853	6/18/2015 - 9/17/2015	mR/Std Qtr	21.06
396828	9/17/2015 - 12/17/2015	mR/Std Qtr	23.92

Sample Point 238 [ INDICATOR - S @ 4.02 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371259	12/18/2014 - 3/19/2015	mR/Std Qtr	19.77
379906	3/19/2015 - 6/18/2015	mR/Std Qtr	18.47
387854	6/18/2015 - 9/17/2015	mR/Std Qtr	16.77



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 238 [ INDICATOR - S @ 4.02 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
396829	9/17/2015 - 12/17/2015	mR/Std Qtr	17.79

Sample Point 239 [ INDICATOR - SSW @ 4.49 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371260	12/18/2014 - 3/19/2015	mR/Std Qtr	28.02

Sample ID:	Sample Dates:	Nuclide	Activity
379907	3/19/2015 - 6/18/2015	mR/Std Qtr	22.66

Sample ID:	Sample Dates:	Nuclide	Activity
387855	6/18/2015 - 9/17/2015	mR/Std Qtr	19.45

Sample ID:	Sample Dates:	Nuclide	Activity
396830	9/17/2015 - 12/17/2015	mR/Std Qtr	22.41

Sample Point 240 [ INDICATOR - SW @ 4.07 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371261	12/18/2014 - 3/19/2015	mR/Std Qtr	15.56

Sample ID:	Sample Dates:	Nuclide	Activity
379908	3/19/2015 - 6/18/2015	mR/Std Qtr	10.71

Sample ID:	Sample Dates:	Nuclide	Activity
387856	6/18/2015 - 9/17/2015	mR/Std Qtr	11.00

Sample ID:	Sample Dates:	Nuclide	Activity
396831	9/17/2015 - 12/17/2015	mR/Std Qtr	13.81

Sample Point 241 [ INDICATOR - WSW @ 4.58 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371262	12/18/2014 - 3/19/2015	mR/Std Qtr	15.76

Sample ID:	Sample Dates:	Nuclide	Activity
379909	3/19/2015 - 6/18/2015	mR/Std Qtr	12.81

Sample ID:	Sample Dates:	Nuclide	Activity
387857	6/18/2015 - 9/17/2015	mR/Std Qtr	12.36

Sample ID:	Sample Dates:	Nuclide	Activity
396832	9/17/2015 - 12/17/2015	mR/Std Qtr	13.64

Sample Point 242 [ INDICATOR - W @ 4.56 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371263	12/18/2014 - 3/19/2015	mR/Std Qtr	21.77

Sample ID:	Sample Dates:	Nuclide	Activity
379910	3/19/2015 - 6/18/2015	mR/Std Qtr	15.75

Sample ID:	Sample Dates:	Nuclide	Activity
387858	6/18/2015 - 9/17/2015	mR/Std Qtr	16.39

Sample ID:	Sample Dates:	Nuclide	Activity
396833	9/17/2015 - 12/17/2015	mR/Std Qtr	17.64

Sample Point 243 [ INDICATOR - WNW @ 4.39 miles ]

TLD RING TLD\_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
371264	12/18/2014 - 3/19/2015	mR/Std Qtr	23.14

Sample ID:	Sample Dates:	Nuclide	Activity
379911	3/19/2015 - 6/18/2015	mR/Std Qtr	15.57

Sample ID:	Sample Dates:	Nuclide	Activity
387859	6/18/2015 - 9/17/2015	mR/Std Qtr	17.05

Sample ID:	Sample Dates:	Nuclide	Activity
396834	9/17/2015 - 12/17/2015	mR/Std Qtr	17.55





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 244 [ INDICATOR - NW @ 4.02 miles ]

TLD RING TLD\_OUTER

Sample ID	Sample Dates	Nuclide	Activity
371265	12/18/2014 - 3/19/2015	mR/Std Qtr	25.57
379912	3/19/2015 - 6/18/2015	mR/Std Qtr	20.94
387860	6/18/2015 - 9/17/2015	mR/Std Qtr	20.09
396835	9/17/2015 - 12/17/2015	mR/Std Qtr	22.00

Sample Point 245 [ INDICATOR - NNW @ 4.01 miles ]

TLD RING TLD\_OUTER

Sample ID	Sample Dates	Nuclide	Activity
379913	3/19/2015 - 6/18/2015	mR/Std Qtr	17.67
387861	6/18/2015 - 9/17/2015	mR/Std Qtr	14.12
396836	9/17/2015 - 12/17/2015	mR/Std Qtr	17.56

Sample Point 246 [ INDICATOR - ENE @ 7.87 miles ]

TLD RING TLD\_SPEC

Sample ID	Sample Dates	Nuclide	Activity
371267	12/18/2014 - 3/19/2015	mR/Std Qtr	22.05
379914	3/19/2015 - 6/18/2015	mR/Std Qtr	12.91
387862	6/18/2015 - 9/17/2015	mR/Std Qtr	14.13
396837	9/17/2015 - 12/17/2015	mR/Std Qtr	16.86

Sample Point 247 [ CONTROL - ESE @ 7.33 miles ]

TLD RING TLD\_CTRL

Sample ID	Sample Dates	Nuclide	Activity
371268	12/18/2014 - 3/19/2015	mR/Std Qtr	16.98
379915	3/19/2015 - 6/18/2015	mR/Std Qtr	13.31
387863	6/18/2015 - 9/17/2015	mR/Std Qtr	12.61
396838	9/17/2015 - 12/17/2015	mR/Std Qtr	13.70

Sample Point 248 [ INDICATOR - S @ 6.54 miles ]

TLD RING TLD\_SPEC

Sample ID	Sample Dates	Nuclide	Activity
371269	12/18/2014 - 3/19/2015	mR/Std Qtr	20.68
379916	3/19/2015 - 6/18/2015	mR/Std Qtr	13.66
387864	6/18/2015 - 9/17/2015	mR/Std Qtr	15.24
396839	9/17/2015 - 12/17/2015	mR/Std Qtr	15.66

Sample Point 249 [ INDICATOR - S @ 7.17 miles ]

TLD RING TLD\_SPEC

Sample ID	Sample Dates	Nuclide	Activity
371270	12/18/2014 - 3/19/2015	mR/Std Qtr	22.88
379917	3/19/2015 - 6/18/2015	mR/Std Qtr	16.41



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 249 [ INDICATOR - S @ 7.17 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
396840	9/17/2015 - 12/17/2015	mR/Std Qtr	16.72

Sample Point 250 [ INDICATOR - WSW @ 10.4 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
371271	12/18/2014 - 3/19/2015	mR/Std Qtr	24.21

Sample ID:	Sample Dates:	Nuclide	Activity
379918	3/19/2015 - 6/18/2015	mR/Std Qtr	18.72

Sample ID:	Sample Dates:	Nuclide	Activity
387866	6/18/2015 - 9/17/2015	mR/Std Qtr	15.68

Sample ID:	Sample Dates:	Nuclide	Activity
396841	9/17/2015 - 12/17/2015	mR/Std Qtr	18.83

Sample Point 251 [ CONTROL - WNW @ 9.72 miles ]

TLD RING TLD\_CTRL

Sample ID:	Sample Dates:	Nuclide	Activity
371272	12/18/2014 - 3/19/2015	mR/Std Qtr	22.58

Sample ID:	Sample Dates:	Nuclide	Activity
379919	3/19/2015 - 6/18/2015	mR/Std Qtr	16.60

Sample ID:	Sample Dates:	Nuclide	Activity
387867	6/18/2015 - 9/17/2015	mR/Std Qtr	15.44

Sample ID:	Sample Dates:	Nuclide	Activity
396842	9/17/2015 - 12/17/2015	mR/Std Qtr	18.01

Sample Point 255 [ INDICATOR - ENE @ 0.61 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371273	12/18/2014 - 3/19/2015	mR/Std Qtr	27.61

Sample ID:	Sample Dates:	Nuclide	Activity
379920	3/19/2015 - 6/18/2015	mR/Std Qtr	19.95

Sample ID:	Sample Dates:	Nuclide	Activity
387868	6/18/2015 - 9/17/2015	mR/Std Qtr	20.48

Sample ID:	Sample Dates:	Nuclide	Activity
396843	9/17/2015 - 12/17/2015	mR/Std Qtr	21.98

Sample Point 256 [ INDICATOR - SSE @ 0.58 miles ]

TLD RING TLD\_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
371274	12/18/2014 - 3/19/2015	mR/Std Qtr	23.02

Sample ID:	Sample Dates:	Nuclide	Activity
379921	3/19/2015 - 6/18/2015	mR/Std Qtr	19.42

Sample ID:	Sample Dates:	Nuclide	Activity
387869	6/18/2015 - 9/17/2015	mR/Std Qtr	22.17

Sample ID:	Sample Dates:	Nuclide	Activity
396844	9/17/2015 - 12/17/2015	mR/Std Qtr	22.06

Sample Point 258 [ INDICATOR TLD / CONTROL - W @ 9.84 miles ]

TLD RING TLD\_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
371275	12/18/2014 - 3/19/2015	mR/Std Qtr	27.31

Sample ID:	Sample Dates:	Nuclide	Activity
379922	3/19/2015 - 6/18/2015	mR/Std Qtr	19.25

Sample ID:	Sample Dates:	Nuclide	Activity
387870	6/18/2015 - 9/17/2015	mR/Std Qtr	19.99

Sample ID:	Sample Dates:	Nuclide	Activity
396845	9/17/2015 - 12/17/2015	mR/Std Qtr	22.45



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
365078	1/6/2015 - 1/6/2015	MIXEDBLV	Mn-54	<3.39E+01	0.00E+00	3.39E+01
			Co-58	<2.38E+01	0.00E+00	2.38E+01
			Fe-59	<6.04E+01	0.00E+00	6.04E+01
			Co-60	<3.48E+01	0.00E+00	3.48E+01
			Zn-65	<8.84E+01	0.00E+00	8.84E+01
			Zr-95	<5.86E+01	0.00E+00	5.86E+01
			Nb-95	<3.00E+01	0.00E+00	3.00E+01
			I-131	<2.92E+01	0.00E+00	2.92E+01
			Cs-134	<3.70E+01	0.00E+00	3.70E+01
			Cs-137	<3.20E+01	0.00E+00	3.20E+01
			BaLa-140	<4.05E+01	0.00E+00	4.05E+01
			Be-7	5.23E+02	3.09E+02	4.71E+02
			K-40	4.45E+03	7.65E+02	3.76E+02
367557	2/3/2015 - 2/3/2015	MIXEDBLV	Mn-54	<3.44E+01	0.00E+00	3.44E+01
			Co-58	<2.82E+01	0.00E+00	2.82E+01
			Fe-59	<7.37E+01	0.00E+00	7.37E+01
			Co-60	<3.21E+01	0.00E+00	3.21E+01
			Zn-65	<5.65E+01	0.00E+00	5.65E+01
			Zr-95	<4.22E+01	0.00E+00	4.22E+01
			Nb-95	<3.67E+01	0.00E+00	3.67E+01
			I-131	<3.86E+01	0.00E+00	3.86E+01
			Cs-134	<3.53E+01	0.00E+00	3.53E+01
			Cs-137	<3.39E+01	0.00E+00	3.39E+01
			BaLa-140	<4.99E+01	0.00E+00	4.99E+01
			Be-7	5.48E+02	2.48E+02	3.43E+02
			K-40	4.29E+03	7.40E+02	3.39E+02
371552	3/3/2015 - 3/3/2015	MIXEDBLV	Mn-54	<1.89E+01	0.00E+00	1.89E+01
			Co-58	<1.86E+01	0.00E+00	1.86E+01
			Fe-59	<3.44E+01	0.00E+00	3.44E+01
			Co-60	<1.47E+01	0.00E+00	1.47E+01
			Zn-65	<3.61E+01	0.00E+00	3.61E+01
			Zr-95	<3.48E+01	0.00E+00	3.48E+01
			Nb-95	<1.86E+01	0.00E+00	1.86E+01
			I-131	<1.43E+01	0.00E+00	1.43E+01
			Cs-134	<2.12E+01	0.00E+00	2.12E+01
			Cs-137	<1.48E+01	0.00E+00	1.48E+01
			BaLa-140	<5.40E+00	0.00E+00	5.40E+00
			Be-7	7.24E+02	1.87E+02	1.96E+02
			K-40	2.65E+03	4.79E+02	2.38E+02
374946	4/7/2015 - 4/7/2015	MIXEDBLV	Mn-54	<1.21E+01	0.00E+00	1.21E+01
			Co-58	<1.50E+01	0.00E+00	1.50E+01
			Fe-59	<2.18E+01	0.00E+00	2.18E+01
			Co-60	<1.96E+01	0.00E+00	1.96E+01
			Zn-65	<3.41E+01	0.00E+00	3.41E+01
			Zr-95	<2.86E+01	0.00E+00	2.86E+01
			Nb-95	<1.44E+01	0.00E+00	1.44E+01
			I-131	<1.09E+01	0.00E+00	1.09E+01
			Cs-134	<2.17E+01	0.00E+00	2.17E+01
			Cs-137	<1.75E+01	0.00E+00	1.75E+01
			BaLa-140	<1.81E+01	0.00E+00	1.81E+01
			Be-7	4.06E+02	1.30E+02	1.57E+02
			K-40	4.03E+03	5.73E+02	3.11E+02
378067	5/5/2015 - 5/5/2015	MIXEDBLV	Mn-54	<1.36E+01	0.00E+00	1.36E+01
			Co-58	<1.35E+01	0.00E+00	1.35E+01
			Fe-59	<3.19E+01	0.00E+00	3.19E+01
			Co-60	<1.37E+01	0.00E+00	1.37E+01
			Zn-65	<3.31E+01	0.00E+00	3.31E+01
			Zr-95	<2.65E+01	0.00E+00	2.65E+01
			Nb-95	<1.40E+01	0.00E+00	1.40E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
378067	5/5/2015 - 5/5/2015	MIXEDBLV	I-131	<1.25E+01	0.00E+00	1.25E+01
			Cs-134	<1.72E+01	0.00E+00	1.72E+01
			Cs-137	<1.68E+01	0.00E+00	1.68E+01
			BaLa-140	<1.29E+01	0.00E+00	1.29E+01
			Be-7	4.76E+02	1.40E+02	1.71E+02
			K-40	3.83E+03	5.20E+02	1.56E+02
380193	6/2/2015 - 6/2/2015	MIXEDBLV	Mn-54	<1.28E+01	0.00E+00	1.28E+01
			Co-58	<1.43E+01	0.00E+00	1.43E+01
			Fe-59	<3.07E+01	0.00E+00	3.07E+01
			Co-60	<9.81E+00	0.00E+00	9.81E+00
			Zn-65	<3.26E+01	0.00E+00	3.26E+01
			Zr-95	<3.13E+01	0.00E+00	3.13E+01
			Nb-95	<1.68E+01	0.00E+00	1.68E+01
			I-131	<1.36E+01	0.00E+00	1.36E+01
			Cs-134	<1.34E+01	0.00E+00	1.34E+01
			Cs-137	<1.66E+01	0.00E+00	1.66E+01
			BaLa-140	<1.81E+01	0.00E+00	1.81E+01
			Be-7	3.68E+02	1.28E+02	1.52E+02
			K-40	2.99E+03	4.92E+02	2.74E+02
382173	7/7/2015 - 7/7/2015	MIXEDBLV	Mn-54	<1.84E+01	0.00E+00	1.84E+01
			Co-58	<1.42E+01	0.00E+00	1.42E+01
			Fe-59	<2.78E+01	0.00E+00	2.78E+01
			Co-60	<1.44E+01	0.00E+00	1.44E+01
			Zn-65	<2.95E+01	0.00E+00	2.95E+01
			Zr-95	<1.84E+01	0.00E+00	1.84E+01
			Nb-95	<1.42E+01	0.00E+00	1.42E+01
			I-131	<1.46E+01	0.00E+00	1.46E+01
			Cs-134	<2.17E+01	0.00E+00	2.17E+01
			Cs-137	<1.75E+01	0.00E+00	1.75E+01
			BaLa-140	<1.12E+01	0.00E+00	1.12E+01
			Be-7	7.72E+02	1.83E+02	2.03E+02
			K-40	3.58E+03	5.27E+02	2.57E+02
384651	8/4/2015 - 8/4/2015	MIXEDBLV	Mn-54	<1.69E+01	0.00E+00	1.69E+01
			Co-58	<1.67E+01	0.00E+00	1.67E+01
			Fe-59	<3.62E+01	0.00E+00	3.62E+01
			Co-60	<1.64E+01	0.00E+00	1.64E+01
			Zn-65	<4.56E+01	0.00E+00	4.56E+01
			Zr-95	<2.80E+01	0.00E+00	2.80E+01
			Nb-95	<1.50E+01	0.00E+00	1.50E+01
			I-131	<2.14E+01	0.00E+00	2.14E+01
			Cs-134	<2.17E+01	0.00E+00	2.17E+01
			Cs-137	<1.57E+01	0.00E+00	1.57E+01
			BaLa-140	<2.49E+01	0.00E+00	2.49E+01
			Be-7	7.63E+02	1.89E+02	2.09E+02
			K-40	3.38E+03	5.07E+02	2.17E+02
388284	9/1/2015 - 9/1/2015	MIXEDBLV	Mn-54	<1.59E+01	0.00E+00	1.59E+01
			Co-58	<2.18E+01	0.00E+00	2.18E+01
			Fe-59	<3.58E+01	0.00E+00	3.58E+01
			Co-60	<2.75E+01	0.00E+00	2.75E+01
			Zn-65	<4.77E+01	0.00E+00	4.77E+01
			Zr-95	<3.07E+01	0.00E+00	3.07E+01
			Nb-95	<1.70E+01	0.00E+00	1.70E+01
			I-131	<1.96E+01	0.00E+00	1.96E+01
			Cs-134	<2.98E+01	0.00E+00	2.98E+01
			Cs-137	<2.07E+01	0.00E+00	2.07E+01
			BaLa-140	<2.50E+01	0.00E+00	2.50E+01
			Be-7	9.15E+02	2.10E+02	1.99E+02
			K-40	4.33E+03	6.64E+02	3.33E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
391027	10/6/2015 - 10/6/2015	MIXEDBLV	Mn-54	<1.91E+01	0.00E+00	1.91E+01
			Co-58	<1.65E+01	0.00E+00	1.65E+01
			Fe-59	<3.12E+01	0.00E+00	3.12E+01
			Co-60	<2.57E+01	0.00E+00	2.57E+01
			Zn-65	<4.02E+01	0.00E+00	4.02E+01
			Zr-95	<2.55E+01	0.00E+00	2.55E+01
			Nb-95	<2.20E+01	0.00E+00	2.20E+01
			I-131	<1.72E+01	0.00E+00	1.72E+01
			Cs-134	<2.84E+01	0.00E+00	2.84E+01
			Cs-137	<1.78E+01	0.00E+00	1.78E+01
			BaLa-140	<2.36E+01	0.00E+00	2.36E+01
			Be-7	1.44E+03	2.56E+02	1.90E+02
			K-40	2.44E+03	4.74E+02	3.39E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
394428	11/3/2015 - 11/3/2015	MIXEDBLV	Mn-54	<1.63E+01	0.00E+00	1.63E+01
			Co-58	<1.79E+01	0.00E+00	1.79E+01
			Fe-59	<3.68E+01	0.00E+00	3.68E+01
			Co-60	<2.25E+01	0.00E+00	2.25E+01
			Zn-65	<4.82E+01	0.00E+00	4.82E+01
			Zr-95	<3.75E+01	0.00E+00	3.75E+01
			Nb-95	<1.88E+01	0.00E+00	1.88E+01
			I-131	<1.28E+01	0.00E+00	1.28E+01
			Cs-134	<3.00E+01	0.00E+00	3.00E+01
			Cs-137	<1.76E+01	0.00E+00	1.76E+01
			BaLa-140	<2.66E+01	0.00E+00	2.66E+01
			Be-7	9.27E+02	2.25E+02	2.43E+02
			K-40	3.37E+03	6.09E+02	5.03E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
396492	12/1/2015 - 12/1/2015	MIXEDBLV	Mn-54	<1.87E+01	0.00E+00	1.87E+01
			Co-58	<1.68E+01	0.00E+00	1.68E+01
			Fe-59	<3.17E+01	0.00E+00	3.17E+01
			Co-60	<2.73E+01	0.00E+00	2.73E+01
			Zn-65	<5.13E+01	0.00E+00	5.13E+01
			Zr-95	<3.69E+01	0.00E+00	3.69E+01
			Nb-95	<1.98E+01	0.00E+00	1.98E+01
			I-131	<1.57E+01	0.00E+00	1.57E+01
			Cs-134	<2.95E+01	0.00E+00	2.95E+01
			Cs-137	<2.33E+01	0.00E+00	2.33E+01
			BaLa-140	<1.84E+01	0.00E+00	1.84E+01
			Be-7	9.04E+02	1.56E+02	1.73E+02
			K-40	3.99E+03	6.16E+02	2.86E+02

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

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
365079	1/6/2015 - 1/6/2015	MIXEDBLV	Mn-54	<2.70E+01	0.00E+00	2.70E+01
			Co-58	<2.22E+01	0.00E+00	2.22E+01
			Fe-59	<4.84E+01	0.00E+00	4.84E+01
			Co-60	<3.16E+01	0.00E+00	3.16E+01
			Zn-65	<5.99E+01	0.00E+00	5.99E+01
			Zr-95	<4.09E+01	0.00E+00	4.09E+01
			Nb-95	<2.54E+01	0.00E+00	2.54E+01
			I-131	<2.67E+01	0.00E+00	2.67E+01
			Cs-134	<2.70E+01	0.00E+00	2.70E+01
			Cs-137	<2.77E+01	0.00E+00	2.77E+01
			BaLa-140	<2.79E+01	0.00E+00	2.79E+01
			Be-7	1.43E+03	2.93E+02	3.30E+02
			K-40	4.14E+03	6.21E+02	3.67E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
367558	2/3/2015 - 2/3/2015	MIXEDBLV	Mn-54	<1.31E+01	0.00E+00	1.31E+01
			Co-58	<1.24E+01	0.00E+00	1.24E+01
			Fe-59	<3.14E+01	0.00E+00	3.14E+01
			Co-60	<1.46E+01	0.00E+00	1.46E+01
			Zn-65	<2.78E+01	0.00E+00	2.78E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
367558	2/3/2015 - 2/3/2015	MIXEDBLV	Zr-95	<2.66E+01	0.00E+00	2.66E+01
			Nb-95	<1.42E+01	0.00E+00	1.42E+01
			I-131	<2.02E+01	0.00E+00	2.02E+01
			Cs-134	<1.80E+01	0.00E+00	1.80E+01
			Cs-137	<1.65E+01	0.00E+00	1.65E+01
			BaLa-140	<2.22E+01	0.00E+00	2.22E+01
			Be-7	5.52E+02	1.30E+02	1.39E+02
			K-40	3.15E+03	4.38E+02	2.65E+02
			371553	3/3/2015 - 3/3/2015	MIXEDBLV	Mn-54
Co-58	<1.70E+01	0.00E+00				1.70E+01
Fe-59	<4.14E+01	0.00E+00				4.14E+01
Co-60	<1.77E+01	0.00E+00				1.77E+01
Zn-65	<5.77E+01	0.00E+00				5.77E+01
Zr-95	<3.73E+01	0.00E+00				3.73E+01
Nb-95	<2.34E+01	0.00E+00				2.34E+01
I-131	<2.32E+01	0.00E+00				2.32E+01
Cs-134	<2.33E+01	0.00E+00				2.33E+01
Cs-137	<3.05E+01	0.00E+00				3.05E+01
BaLa-140	<2.23E+01	0.00E+00				2.23E+01
Be-7	1.35E+03	2.93E+02				2.99E+02
K-40	2.00E+03	4.49E+02				2.90E+02
374947	4/7/2015 - 4/7/2015	MIXEDBLV				Mn-54
			Co-58	<9.98E+00	0.00E+00	9.98E+00
			Fe-59	<2.38E+01	0.00E+00	2.38E+01
			Co-60	<1.54E+01	0.00E+00	1.54E+01
			Zn-65	<2.80E+01	0.00E+00	2.80E+01
			Zr-95	<1.73E+01	0.00E+00	1.73E+01
			Nb-95	<1.18E+01	0.00E+00	1.18E+01
			I-131	<9.16E+00	0.00E+00	9.16E+00
			Cs-134	<1.39E+01	0.00E+00	1.39E+01
			Cs-137	<6.64E+00	0.00E+00	6.64E+00
			BaLa-140	<1.27E+01	0.00E+00	1.27E+01
			Be-7	2.16E+02	9.62E+01	1.33E+02
			K-40	3.23E+03	4.39E+02	1.50E+02
			378068	5/5/2015 - 5/5/2015	MIXEDBLV	Mn-54
Co-58	<1.21E+01	0.00E+00				1.21E+01
Fe-59	<2.58E+01	0.00E+00				2.58E+01
Co-60	<9.55E+00	0.00E+00				9.55E+00
Zn-65	<2.41E+01	0.00E+00				2.41E+01
Zr-95	<2.20E+01	0.00E+00				2.20E+01
Nb-95	<1.08E+01	0.00E+00				1.08E+01
I-131	<1.42E+01	0.00E+00				1.42E+01
Cs-134	<1.40E+01	0.00E+00				1.40E+01
Cs-137	<1.55E+01	0.00E+00				1.55E+01
BaLa-140	<2.09E+01	0.00E+00				2.09E+01
Be-7	3.89E+02	1.16E+02				1.48E+02
K-40	2.99E+03	4.02E+02				2.07E+02
380194	6/2/2015 - 6/2/2015	MIXEDBLV				Mn-54
			Co-58	<1.49E+01	0.00E+00	1.49E+01
			Fe-59	<3.17E+01	0.00E+00	3.17E+01
			Co-60	<1.91E+01	0.00E+00	1.91E+01
			Zn-65	<4.23E+01	0.00E+00	4.23E+01
			Zr-95	<2.58E+01	0.00E+00	2.58E+01
			Nb-95	<1.51E+01	0.00E+00	1.51E+01
			I-131	<1.33E+01	0.00E+00	1.33E+01
			Cs-134	<2.34E+01	0.00E+00	2.34E+01
			Cs-137	<1.70E+01	0.00E+00	1.70E+01
			BaLa-140	<2.41E+01	0.00E+00	2.41E+01
			Be-7	2.20E+02	1.27E+02	1.84E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
380194	6/2/2015 - 6/2/2015		K-40	2.05E+03	4.09E+02	2.71E+02
382174	7/7/2015 - 7/7/2015		Mn-54	<1.25E+01	0.00E+00	1.25E+01
			Co-58	<1.71E+01	0.00E+00	1.71E+01
			Fe-59	<2.16E+01	0.00E+00	2.16E+01
			Co-60	<1.21E+01	0.00E+00	1.21E+01
			Zn-65	<2.96E+01	0.00E+00	2.96E+01
			Zr-95	<2.86E+01	0.00E+00	2.86E+01
			Nb-95	<1.41E+01	0.00E+00	1.41E+01
			I-131	<1.31E+01	0.00E+00	1.31E+01
			Cs-134	<2.01E+01	0.00E+00	2.01E+01
			Cs-137	<2.16E+01	0.00E+00	2.16E+01
			BaLa-140	<1.21E+01	0.00E+00	1.21E+01
			Be-7	8.78E+02	1.84E+02	1.67E+02
			K-40	1.91E+03	3.66E+02	1.95E+02
384652	8/4/2015 - 8/4/2015		Mn-54	<1.40E+01	0.00E+00	1.40E+01
			Co-58	<1.16E+01	0.00E+00	1.16E+01
			Fe-59	<2.92E+01	0.00E+00	2.92E+01
			Co-60	<1.03E+01	0.00E+00	1.03E+01
			Zn-65	<2.85E+01	0.00E+00	2.85E+01
			Zr-95	<2.40E+01	0.00E+00	2.40E+01
			Nb-95	<1.22E+01	0.00E+00	1.22E+01
			I-131	<1.95E+01	0.00E+00	1.95E+01
			Cs-134	<1.15E+01	0.00E+00	1.15E+01
			Cs-137	4.83E+01	1.44E+01	1.59E+01
			BaLa-140	<2.40E+01	0.00E+00	2.40E+01
			Be-7	1.54E+03	2.21E+02	1.46E+02
			K-40	2.12E+03	3.37E+02	1.91E+02
388285	9/1/2015 - 9/1/2015		Mn-54	<2.08E+01	0.00E+00	2.08E+01
			Co-58	<1.74E+01	0.00E+00	1.74E+01
			Fe-59	<3.96E+01	0.00E+00	3.96E+01
			Co-60	<2.74E+01	0.00E+00	2.74E+01
			Zn-65	<5.02E+01	0.00E+00	5.02E+01
			Zr-95	<3.55E+01	0.00E+00	3.55E+01
			Nb-95	<2.06E+01	0.00E+00	2.06E+01
			I-131	<1.82E+01	0.00E+00	1.82E+01
			Cs-134	<2.63E+01	0.00E+00	2.63E+01
			Cs-137	<3.30E+01	0.00E+00	3.30E+01
			BaLa-140	<2.15E+01	0.00E+00	2.15E+01
			Be-7	7.39E+02	2.49E+02	3.28E+02
			K-40	2.87E+03	5.41E+02	3.16E+02
391028	10/6/2015 - 10/6/2015		Mn-54	<2.78E+01	0.00E+00	2.78E+01
			Co-58	<2.24E+01	0.00E+00	2.24E+01
			Fe-59	<4.54E+01	0.00E+00	4.54E+01
			Co-60	<2.25E+01	0.00E+00	2.25E+01
			Zn-65	<4.75E+01	0.00E+00	4.75E+01
			Zr-95	<3.67E+01	0.00E+00	3.67E+01
			Nb-95	<2.27E+01	0.00E+00	2.27E+01
			I-131	<2.30E+01	0.00E+00	2.30E+01
			Cs-134	<3.50E+01	0.00E+00	3.50E+01
			Cs-137	<3.39E+01	0.00E+00	3.39E+01
			BaLa-140	<2.49E+01	0.00E+00	2.49E+01
			Be-7	3.12E+03	4.69E+02	3.07E+02
			K-40	2.01E+03	5.08E+02	4.67E+02
394429	11/3/2015 - 11/3/2015		Mn-54	<1.71E+01	0.00E+00	1.71E+01
			Co-58	<1.22E+01	0.00E+00	1.22E+01
			Fe-59	<3.85E+01	0.00E+00	3.85E+01
			Co-60	<1.65E+01	0.00E+00	1.65E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
394429	11/3/2015 - 11/3/2015		Zn-65	<3.79E+01	0.00E+00	3.79E+01
			Zr-95	<2.80E+01	0.00E+00	2.80E+01
			Nb-95	<1.42E+01	0.00E+00	1.42E+01
			I-131	<1.71E+01	0.00E+00	1.71E+01
			Cs-134	<2.12E+01	0.00E+00	2.12E+01
			Cs-137	3.74E+01	1.58E+01	1.88E+01
			BaLa-140	<2.10E+01	0.00E+00	2.10E+01
			Be-7	2.32E+03	3.27E+02	1.98E+02
			K-40	3.26E+03	5.10E+02	1.89E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
396493	12/1/2015 - 12/1/2015		Mn-54	<2.40E+01	0.00E+00	2.40E+01
			Co-58	<1.83E+01	0.00E+00	1.83E+01
			Fe-59	<4.39E+01	0.00E+00	4.39E+01
			Co-60	<2.35E+01	0.00E+00	2.35E+01
			Zn-65	<4.95E+01	0.00E+00	4.95E+01
			Zr-95	<3.68E+01	0.00E+00	3.68E+01
			Nb-95	<2.43E+01	0.00E+00	2.43E+01
			I-131	<1.85E+01	0.00E+00	1.85E+01
			Cs-134	<2.79E+01	0.00E+00	2.79E+01
			Cs-137	<2.75E+01	0.00E+00	2.75E+01
			BaLa-140	<2.44E+01	0.00E+00	2.44E+01
			Be-7	2.15E+03	3.48E+02	2.55E+02
			K-40	3.53E+03	6.01E+02	3.25E+02

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
365080	1/6/2015 - 1/6/2015		Mn-54	<3.85E+01	0.00E+00	3.85E+01
			Co-58	<3.35E+01	0.00E+00	3.35E+01
			Fe-59	<8.75E+01	0.00E+00	8.75E+01
			Co-60	<5.39E+01	0.00E+00	5.39E+01
			Zn-65	<8.55E+01	0.00E+00	8.55E+01
			Zr-95	<6.64E+01	0.00E+00	6.64E+01
			Nb-95	<3.41E+01	0.00E+00	3.41E+01
			I-131	<3.77E+01	0.00E+00	3.77E+01
			Cs-134	<3.36E+01	0.00E+00	3.36E+01
			Cs-137	<4.01E+01	0.00E+00	4.01E+01
			BaLa-140	<4.92E+01	0.00E+00	4.92E+01
			Be-7	5.37E+02	2.46E+02	3.20E+02
			K-40	3.76E+03	7.51E+02	8.42E+01

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
367559	2/3/2015 - 2/3/2015		Mn-54	<3.04E+01	0.00E+00	3.04E+01
			Co-58	<4.04E+01	0.00E+00	4.04E+01
			Fe-59	<5.90E+01	0.00E+00	5.90E+01
			Co-60	<4.43E+01	0.00E+00	4.43E+01
			Zn-65	<6.56E+01	0.00E+00	6.56E+01
			Zr-95	<7.25E+01	0.00E+00	7.25E+01
			Nb-95	<3.13E+01	0.00E+00	3.13E+01
			I-131	<3.52E+01	0.00E+00	3.52E+01
			Cs-134	<3.41E+01	0.00E+00	3.41E+01
			Cs-137	<4.19E+01	0.00E+00	4.19E+01
			BaLa-140	<3.93E+01	0.00E+00	3.93E+01
			Be-7	3.47E+02	1.57E+02	2.88E+02
			K-40	1.58E+03	5.79E+02	6.51E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
371554	3/3/2015 - 3/3/2015		Mn-54	<1.99E+01	0.00E+00	1.99E+01
			Co-58	<2.29E+01	0.00E+00	2.29E+01
			Fe-59	<3.92E+01	0.00E+00	3.92E+01
			Co-60	<2.09E+01	0.00E+00	2.09E+01
			Zn-65	<5.07E+01	0.00E+00	5.07E+01
			Zr-95	<2.97E+01	0.00E+00	2.97E+01
			Nb-95	<2.10E+01	0.00E+00	2.10E+01
			I-131	<1.81E+01	0.00E+00	1.81E+01
			Cs-134	<2.70E+01	0.00E+00	2.70E+01





# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
371554	3/3/2015 - 3/3/2015		Cs-137	<1.93E+01	0.00E+00	1.93E+01
			BaLa-140	<2.63E+01	0.00E+00	2.63E+01
			Be-7	1.04E+03	2.42E+02	2.33E+02
			K-40	2.81E+03	5.38E+02	2.68E+02
374948	4/7/2015 - 4/7/2015		Mn-54	<2.55E+01	0.00E+00	2.55E+01
			Co-58	<2.77E+01	0.00E+00	2.77E+01
			Fe-59	<5.76E+01	0.00E+00	5.76E+01
			Co-60	<2.53E+01	0.00E+00	2.53E+01
			Zn-65	<5.36E+01	0.00E+00	5.36E+01
			Zr-95	<5.00E+01	0.00E+00	5.00E+01
			Nb-95	<2.67E+01	0.00E+00	2.67E+01
			I-131	<2.24E+01	0.00E+00	2.24E+01
			Cs-134	<1.68E+01	0.00E+00	1.68E+01
			Cs-137	<2.60E+01	0.00E+00	2.60E+01
			BaLa-140	<2.20E+01	0.00E+00	2.20E+01
			Be-7	2.50E+02	1.78E+02	2.67E+02
			K-40	2.70E+03	5.72E+02	3.10E+02
			378069	5/5/2015 - 5/5/2015		Mn-54
Co-58	<1.61E+01	0.00E+00				1.61E+01
Fe-59	<3.26E+01	0.00E+00				3.26E+01
Co-60	<2.08E+01	0.00E+00				2.08E+01
Zn-65	<3.10E+01	0.00E+00				3.10E+01
Zr-95	<2.93E+01	0.00E+00				2.93E+01
Nb-95	<1.64E+01	0.00E+00				1.64E+01
I-131	<1.51E+01	0.00E+00				1.51E+01
Cs-134	<2.30E+01	0.00E+00				2.30E+01
Cs-137	<1.92E+01	0.00E+00				1.92E+01
BaLa-140	<1.45E+01	0.00E+00				1.45E+01
Be-7	2.87E+02	1.42E+02				1.99E+02
K-40	3.31E+03	5.31E+02				1.84E+02
380195	6/2/2015 - 6/2/2015					Mn-54
			Co-58	<1.20E+01	0.00E+00	1.20E+01
			Fe-59	<2.32E+01	0.00E+00	2.32E+01
			Co-60	<1.51E+01	0.00E+00	1.51E+01
			Zn-65	<2.79E+01	0.00E+00	2.79E+01
			Zr-95	<2.26E+01	0.00E+00	2.26E+01
			Nb-95	<1.04E+01	0.00E+00	1.04E+01
			I-131	<1.09E+01	0.00E+00	1.09E+01
			Cs-134	<1.49E+01	0.00E+00	1.49E+01
			Cs-137	<1.18E+01	0.00E+00	1.18E+01
			BaLa-140	<3.63E+00	0.00E+00	3.63E+00
			Be-7	2.92E+02	1.08E+02	1.37E+02
			K-40	2.09E+03	3.54E+02	1.59E+02
			382175	7/7/2015 - 7/7/2015		Mn-54
Co-58	<1.59E+01	0.00E+00				1.59E+01
Fe-59	<3.12E+01	0.00E+00				3.12E+01
Co-60	<2.03E+01	0.00E+00				2.03E+01
Zn-65	<4.09E+01	0.00E+00				4.09E+01
Zr-95	<2.75E+01	0.00E+00				2.75E+01
Nb-95	<1.53E+01	0.00E+00				1.53E+01
I-131	<1.53E+01	0.00E+00				1.53E+01
Cs-134	<1.64E+01	0.00E+00				1.64E+01
Cs-137	<1.62E+01	0.00E+00				1.62E+01
BaLa-140	<1.60E+01	0.00E+00				1.60E+01
Be-7	<2.47E+02	0.00E+00				2.47E+02
K-40	<2.16E+02	0.00E+00				2.16E+02
384653	8/4/2015 - 8/4/2015					Mn-54



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
384653	8/4/2015 - 8/4/2015	MIXEDBLV	Co-58	<1.77E+01	0.00E+00	1.77E+01
			Fe-59	<4.59E+01	0.00E+00	4.59E+01
			Co-60	<1.80E+01	0.00E+00	1.80E+01
			Zn-65	<4.21E+01	0.00E+00	4.21E+01
			Zr-95	<2.39E+01	0.00E+00	2.39E+01
			Nb-95	<1.98E+01	0.00E+00	1.98E+01
			I-131	<2.23E+01	0.00E+00	2.23E+01
			Cs-134	<1.99E+01	0.00E+00	1.99E+01
			Cs-137	<1.88E+01	0.00E+00	1.88E+01
			BaLa-140	<2.11E+01	0.00E+00	2.11E+01
			Be-7	5.72E+02	1.80E+02	2.24E+02
			K-40	2.19E+03	4.09E+02	2.38E+02
			388286	9/1/2015 - 9/1/2015	MIXEDBLV	Mn-54
Co-58	<1.80E+01	0.00E+00				1.80E+01
Fe-59	<3.57E+01	0.00E+00				3.57E+01
Co-60	<2.13E+01	0.00E+00				2.13E+01
Zn-65	<4.88E+01	0.00E+00				4.88E+01
Zr-95	<4.29E+01	0.00E+00				4.29E+01
Nb-95	<2.00E+01	0.00E+00				2.00E+01
I-131	<1.60E+01	0.00E+00				1.60E+01
Cs-134	<2.37E+01	0.00E+00				2.37E+01
Cs-137	<2.50E+01	0.00E+00				2.50E+01
BaLa-140	<2.68E+01	0.00E+00				2.68E+01
Be-7	6.25E+02	2.06E+02				2.58E+02
K-40	1.85E+03	4.57E+02				4.31E+02
391029	10/6/2015 - 10/6/2015	MIXEDBLV	Mn-54	<2.04E+01	0.00E+00	2.04E+01
			Co-58	<1.70E+01	0.00E+00	1.70E+01
			Fe-59	<3.45E+01	0.00E+00	3.45E+01
			Co-60	<2.24E+01	0.00E+00	2.24E+01
			Zn-65	<4.14E+01	0.00E+00	4.14E+01
			Zr-95	<2.44E+01	0.00E+00	2.44E+01
			Nb-95	<2.01E+01	0.00E+00	2.01E+01
			I-131	<1.74E+01	0.00E+00	1.74E+01
			Cs-134	<2.21E+01	0.00E+00	2.21E+01
			Cs-137	<1.83E+01	0.00E+00	1.83E+01
			BaLa-140	<1.89E+01	0.00E+00	1.89E+01
			Be-7	8.59E+02	2.17E+02	2.39E+02
			K-40	1.88E+03	4.28E+02	3.72E+02
394430	11/3/2015 - 11/3/2015	MIXEDBLV	Mn-54	<2.12E+01	0.00E+00	2.12E+01
			Co-58	<1.71E+01	0.00E+00	1.71E+01
			Fe-59	<3.45E+01	0.00E+00	3.45E+01
			Co-60	<2.23E+01	0.00E+00	2.23E+01
			Zn-65	<3.88E+01	0.00E+00	3.88E+01
			Zr-95	<2.96E+01	0.00E+00	2.96E+01
			Nb-95	<1.80E+01	0.00E+00	1.80E+01
			I-131	<1.80E+01	0.00E+00	1.80E+01
			Cs-134	<2.30E+01	0.00E+00	2.30E+01
			Cs-137	<2.69E+01	0.00E+00	2.69E+01
			BaLa-140	<2.62E+01	0.00E+00	2.62E+01
			Be-7	8.94E+02	2.02E+02	1.89E+02
			K-40	2.91E+03	5.04E+02	2.45E+02
396494	12/1/2015 - 12/1/2015	MIXEDBLV	Mn-54	<2.63E+01	0.00E+00	2.63E+01
			Co-58	<2.34E+01	0.00E+00	2.34E+01
			Fe-59	<3.83E+01	0.00E+00	3.83E+01
			Co-60	<3.03E+01	0.00E+00	3.03E+01
			Zn-65	<4.32E+01	0.00E+00	4.32E+01
			Zr-95	<3.54E+01	0.00E+00	3.54E+01
			Nb-95	<1.39E+01	0.00E+00	1.39E+01
			I-131	<2.17E+01	0.00E+00	2.17E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 222 [ INDICATOR - N @ 0.71 miles ]

Sample ID:	396494	Sample Dates:	12/1/2015 - 12/1/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Cs-134	<2.81E+01	0.00E+00	2.81E+01
					Cs-137	<3.17E+01	0.00E+00	3.17E+01
					BaLa-140	<3.50E+01	0.00E+00	3.50E+01
					Be-7	<2.68E+02	0.00E+00	2.68E+02
					K-40	1.55E+03	4.17E+02	2.55E+02

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

Sample ID:	365081	Sample Dates:	1/6/2015 - 1/6/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<4.04E+01	0.00E+00	4.04E+01
					Co-58	<3.25E+01	0.00E+00	3.25E+01
					Fe-59	<6.55E+01	0.00E+00	6.55E+01
					Co-60	<3.54E+01	0.00E+00	3.54E+01
					Zn-65	<8.71E+01	0.00E+00	8.71E+01
					Zr-95	<5.63E+01	0.00E+00	5.63E+01
					Nb-95	<3.07E+01	0.00E+00	3.07E+01
					I-131	<2.92E+01	0.00E+00	2.92E+01
					Cs-134	<3.23E+01	0.00E+00	3.23E+01
					Cs-137	<2.89E+01	0.00E+00	2.89E+01
					BaLa-140	<3.90E+01	0.00E+00	3.90E+01
					Be-7	8.50E+02	3.70E+02	5.44E+02
					K-40	4.63E+03	7.81E+02	4.22E+02

Sample ID:	367560	Sample Dates:	2/3/2015 - 2/3/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<3.50E+01	0.00E+00	3.50E+01
					Co-58	<2.67E+01	0.00E+00	2.67E+01
					Fe-59	<7.88E+01	0.00E+00	7.88E+01
					Co-60	<4.75E+01	0.00E+00	4.75E+01
					Zn-65	<9.43E+01	0.00E+00	9.43E+01
					Zr-95	<5.58E+01	0.00E+00	5.58E+01
					Nb-95	<3.65E+01	0.00E+00	3.65E+01
					I-131	<3.69E+01	0.00E+00	3.69E+01
					Cs-134	<4.05E+01	0.00E+00	4.05E+01
					Cs-137	<3.39E+01	0.00E+00	3.39E+01
					BaLa-140	<2.48E+01	0.00E+00	2.48E+01
					Be-7	1.07E+03	3.40E+02	4.33E+02
					K-40	<1.46E+03	0.00E+00	1.46E+03

Sample ID:	371555	Sample Dates:	3/3/2015 - 3/3/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<1.92E+01	0.00E+00	1.92E+01
					Co-58	<1.14E+01	0.00E+00	1.14E+01
					Fe-59	<3.79E+01	0.00E+00	3.79E+01
					Co-60	<1.83E+01	0.00E+00	1.83E+01
					Zn-65	<3.65E+01	0.00E+00	3.65E+01
					Zr-95	<3.52E+01	0.00E+00	3.52E+01
					Nb-95	<1.80E+01	0.00E+00	1.80E+01
					I-131	<1.42E+01	0.00E+00	1.42E+01
					Cs-134	<2.23E+01	0.00E+00	2.23E+01
					Cs-137	<2.08E+01	0.00E+00	2.08E+01
					BaLa-140	<2.60E+01	0.00E+00	2.60E+01
					Be-7	7.10E+02	1.84E+02	2.02E+02
					K-40	3.45E+03	5.46E+02	3.06E+02

Sample ID:	374949	Sample Dates:	4/7/2015 - 4/7/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<1.50E+01	0.00E+00	1.50E+01
					Co-58	<8.95E+00	0.00E+00	8.95E+00
					Fe-59	<2.63E+01	0.00E+00	2.63E+01
					Co-60	<8.59E+00	0.00E+00	8.59E+00
					Zn-65	<3.04E+01	0.00E+00	3.04E+01
					Zr-95	<1.44E+01	0.00E+00	1.44E+01
					Nb-95	<1.03E+01	0.00E+00	1.03E+01
					I-131	<1.04E+01	0.00E+00	1.04E+01
					Cs-134	<1.64E+01	0.00E+00	1.64E+01
					Cs-137	<1.28E+01	0.00E+00	1.28E+01
					BaLa-140	<1.14E+01	0.00E+00	1.14E+01
					Be-7	3.53E+02	9.93E+01	1.05E+02
					K-40	3.23E+03	4.44E+02	1.88E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
378070	5/5/2015 - 5/5/2015	MIXEDBLV	Mn-54	<1.96E+01	0.00E+00	1.96E+01
			Co-58	<1.86E+01	0.00E+00	1.86E+01
			Fe-59	<4.47E+01	0.00E+00	4.47E+01
			Co-60	<2.05E+01	0.00E+00	2.05E+01
			Zn-65	<2.77E+01	0.00E+00	2.77E+01
			Zr-95	<3.23E+01	0.00E+00	3.23E+01
			Nb-95	<1.90E+01	0.00E+00	1.90E+01
			I-131	<2.19E+01	0.00E+00	2.19E+01
			Cs-134	<2.20E+01	0.00E+00	2.20E+01
			Cs-137	<1.99E+01	0.00E+00	1.99E+01
			BaLa-140	<2.13E+01	0.00E+00	2.13E+01
			Be-7	4.45E+02	1.73E+02	2.22E+02
			K-40	4.34E+03	6.53E+02	1.85E+02
380196	6/2/2015 - 6/2/2015	MIXEDBLV	Mn-54	<2.00E+01	0.00E+00	2.00E+01
			Co-58	<1.84E+01	0.00E+00	1.84E+01
			Fe-59	<3.46E+01	0.00E+00	3.46E+01
			Co-60	<2.37E+01	0.00E+00	2.37E+01
			Zn-65	<3.41E+01	0.00E+00	3.41E+01
			Zr-95	<3.53E+01	0.00E+00	3.53E+01
			Nb-95	<1.96E+01	0.00E+00	1.96E+01
			I-131	<1.35E+01	0.00E+00	1.35E+01
			Cs-134	<1.73E+01	0.00E+00	1.73E+01
			Cs-137	<2.49E+01	0.00E+00	2.49E+01
			BaLa-140	<2.26E+01	0.00E+00	2.26E+01
			Be-7	5.57E+02	1.50E+02	1.43E+02
			K-40	3.72E+03	5.84E+02	2.74E+02
382176	7/7/2015 - 7/7/2015	MIXEDBLV	Mn-54	<2.55E+01	0.00E+00	2.55E+01
			Co-58	<2.03E+01	0.00E+00	2.03E+01
			Fe-59	<3.63E+01	0.00E+00	3.63E+01
			Co-60	<2.16E+01	0.00E+00	2.16E+01
			Zn-65	<5.66E+01	0.00E+00	5.66E+01
			Zr-95	<2.53E+01	0.00E+00	2.53E+01
			Nb-95	<2.20E+01	0.00E+00	2.20E+01
			I-131	<1.81E+01	0.00E+00	1.81E+01
			Cs-134	<2.19E+01	0.00E+00	2.19E+01
			Cs-137	<2.16E+01	0.00E+00	2.16E+01
			BaLa-140	<1.68E+01	0.00E+00	1.68E+01
			Be-7	8.61E+02	2.10E+02	2.04E+02
			K-40	3.36E+03	5.64E+02	4.89E+01
384654	8/4/2015 - 8/4/2015	MIXEDBLV	Mn-54	<1.18E+01	0.00E+00	1.18E+01
			Co-58	<1.07E+01	0.00E+00	1.07E+01
			Fe-59	<2.58E+01	0.00E+00	2.58E+01
			Co-60	<1.33E+01	0.00E+00	1.33E+01
			Zn-65	<2.63E+01	0.00E+00	2.63E+01
			Zr-95	<2.20E+01	0.00E+00	2.20E+01
			Nb-95	<1.29E+01	0.00E+00	1.29E+01
			I-131	<1.84E+01	0.00E+00	1.84E+01
			Cs-134	<1.21E+01	0.00E+00	1.21E+01
			Cs-137	<1.27E+01	0.00E+00	1.27E+01
			BaLa-140	<1.58E+01	0.00E+00	1.58E+01
			Be-7	7.75E+02	1.50E+02	1.55E+02
			K-40	4.70E+03	5.38E+02	1.88E+02
388287	9/1/2015 - 9/1/2015	MIXEDBLV	Mn-54	<2.68E+01	0.00E+00	2.68E+01
			Co-58	<1.80E+01	0.00E+00	1.80E+01
			Fe-59	<4.62E+01	0.00E+00	4.62E+01
			Co-60	<2.48E+01	0.00E+00	2.48E+01
			Zn-65	<5.21E+01	0.00E+00	5.21E+01
			Zr-95	<4.30E+01	0.00E+00	4.30E+01
			Nb-95	<2.22E+01	0.00E+00	2.22E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (Appendix E)

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

Sample Point 226 [ INDICATOR - S @ 0.48 miles ]

Sample ID:	388287	Sample Dates:	9/1/2015 - 9/1/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					I-131	<1.78E+01	0.00E+00	1.78E+01
					Cs-134	<2.42E+01	0.00E+00	2.42E+01
					Cs-137	<2.60E+01	0.00E+00	2.60E+01
					BaLa-140	<2.56E+01	0.00E+00	2.56E+01
					Be-7	1.09E+03	2.46E+02	2.35E+02
					K-40	3.72E+03	6.39E+02	3.43E+02

Sample ID:	391030	Sample Dates:	10/6/2015 - 10/6/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<2.56E+01	0.00E+00	2.56E+01
					Co-58	<2.07E+01	0.00E+00	2.07E+01
					Fe-59	<3.35E+01	0.00E+00	3.35E+01
					Co-60	<2.17E+01	0.00E+00	2.17E+01
					Zn-65	<4.11E+01	0.00E+00	4.11E+01
					Zr-95	<3.68E+01	0.00E+00	3.68E+01
					Nb-95	<1.66E+01	0.00E+00	1.66E+01
					I-131	<2.09E+01	0.00E+00	2.09E+01
					Cs-134	<2.70E+01	0.00E+00	2.70E+01
					Cs-137	<2.40E+01	0.00E+00	2.40E+01
					BaLa-140	<2.14E+01	0.00E+00	2.14E+01
					Be-7	1.18E+03	2.52E+02	2.33E+02
					K-40	3.43E+03	5.82E+02	2.13E+02

Sample ID:	394431	Sample Dates:	11/3/2015 - 11/3/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<2.53E+01	0.00E+00	2.53E+01
					Co-58	<2.04E+01	0.00E+00	2.04E+01
					Fe-59	<4.13E+01	0.00E+00	4.13E+01
					Co-60	<2.49E+01	0.00E+00	2.49E+01
					Zn-65	<5.75E+01	0.00E+00	5.75E+01
					Zr-95	<4.18E+01	0.00E+00	4.18E+01
					Nb-95	<2.15E+01	0.00E+00	2.15E+01
					I-131	<1.46E+01	0.00E+00	1.46E+01
					Cs-134	<2.43E+01	0.00E+00	2.43E+01
					Cs-137	<1.89E+01	0.00E+00	1.89E+01
					BaLa-140	<2.59E+01	0.00E+00	2.59E+01
					Be-7	1.27E+03	2.50E+02	1.80E+02
					K-40	3.68E+03	6.28E+02	2.92E+02

Sample ID:	396495	Sample Dates:	12/1/2015 - 12/1/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<2.31E+01	0.00E+00	2.31E+01
					Co-58	<1.71E+01	0.00E+00	1.71E+01
					Fe-59	<2.78E+01	0.00E+00	2.78E+01
					Co-60	<2.19E+01	0.00E+00	2.19E+01
					Zn-65	<5.47E+01	0.00E+00	5.47E+01
					Zr-95	<3.28E+01	0.00E+00	3.28E+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	<2.51E+01	0.00E+00	2.51E+01
					Cs-137	<2.51E+01	0.00E+00	2.51E+01
					BaLa-140	<1.56E+01	0.00E+00	1.56E+01
					Be-7	1.26E+03	2.45E+02	1.93E+02
					K-40	3.92E+03	6.21E+02	2.93E+02

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

Sample ID:	365082	Sample Dates:	1/6/2015 - 1/6/2015	MIXEDBLV	Nuclide	Activity	2 Sigma Error	LLD
					Mn-54	<3.16E+01	0.00E+00	3.16E+01
					Co-58	<2.78E+01	0.00E+00	2.78E+01
					Fe-59	<7.68E+01	0.00E+00	7.68E+01
					Co-60	<3.67E+01	0.00E+00	3.67E+01
					Zn-65	<6.75E+01	0.00E+00	6.75E+01
					Zr-95	<5.45E+01	0.00E+00	5.45E+01
					Nb-95	<3.46E+01	0.00E+00	3.46E+01
					I-131	<3.33E+01	0.00E+00	3.33E+01
					Cs-134	<4.01E+01	0.00E+00	4.01E+01
					Cs-137	<3.37E+01	0.00E+00	3.37E+01
					BaLa-140	<5.18E+01	0.00E+00	5.18E+01
					Be-7	1.11E+03	3.17E+02	3.75E+02



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
365082	1/6/2015 - 1/6/2015		K-40	4.77E+03	8.22E+02	4.45E+02
367561	2/3/2015 - 2/3/2015		Mn-54	<2.41E+01	0.00E+00	2.41E+01
			Co-58	<3.30E+01	0.00E+00	3.30E+01
			Fe-59	<7.52E+01	0.00E+00	7.52E+01
			Co-60	<3.97E+01	0.00E+00	3.97E+01
			Zn-65	<7.56E+01	0.00E+00	7.56E+01
			Zr-95	<5.90E+01	0.00E+00	5.90E+01
			Nb-95	<3.75E+01	0.00E+00	3.75E+01
			I-131	<3.48E+01	0.00E+00	3.48E+01
			Cs-134	<2.89E+01	0.00E+00	2.89E+01
			Cs-137	<3.73E+01	0.00E+00	3.73E+01
			BaLa-140	<2.37E+01	0.00E+00	2.37E+01
			Be-7	8.53E+02	2.83E+02	3.51E+02
			K-40	4.73E+03	8.20E+02	4.12E+02
371556	3/3/2015 - 3/3/2015		Mn-54	<2.02E+01	0.00E+00	2.02E+01
			Co-58	<1.72E+01	0.00E+00	1.72E+01
			Fe-59	<3.13E+01	0.00E+00	3.13E+01
			Co-60	<2.38E+01	0.00E+00	2.38E+01
			Zn-65	<4.66E+01	0.00E+00	4.66E+01
			Zr-95	<3.31E+01	0.00E+00	3.31E+01
			Nb-95	<1.84E+01	0.00E+00	1.84E+01
			I-131	<1.66E+01	0.00E+00	1.66E+01
			Cs-134	<2.85E+01	0.00E+00	2.85E+01
			Cs-137	<2.46E+01	0.00E+00	2.46E+01
			BaLa-140	<2.82E+01	0.00E+00	2.82E+01
			Be-7	2.28E+03	3.46E+02	2.12E+02
			K-40	2.37E+03	4.93E+02	3.96E+02
374950	4/7/2015 - 4/7/2015		Mn-54	<1.02E+01	0.00E+00	1.02E+01
			Co-58	<6.91E+00	0.00E+00	6.91E+00
			Fe-59	<2.21E+01	0.00E+00	2.21E+01
			Co-60	<1.23E+01	0.00E+00	1.23E+01
			Zn-65	<2.73E+01	0.00E+00	2.73E+01
			Zr-95	<2.30E+01	0.00E+00	2.30E+01
			Nb-95	<9.88E+00	0.00E+00	9.88E+00
			I-131	<1.03E+01	0.00E+00	1.03E+01
			Cs-134	<1.88E+01	0.00E+00	1.88E+01
			Cs-137	<1.33E+01	0.00E+00	1.33E+01
			BaLa-140	<9.22E+00	0.00E+00	9.22E+00
			Be-7	5.07E+02	1.23E+02	1.28E+02
			K-40	4.18E+03	5.31E+02	1.48E+02
378071	5/5/2015 - 5/5/2015		Mn-54	<1.81E+01	0.00E+00	1.81E+01
			Co-58	<1.75E+01	0.00E+00	1.75E+01
			Fe-59	<3.69E+01	0.00E+00	3.69E+01
			Co-60	<1.77E+01	0.00E+00	1.77E+01
			Zn-65	<3.92E+01	0.00E+00	3.92E+01
			Zr-95	<3.13E+01	0.00E+00	3.13E+01
			Nb-95	<1.87E+01	0.00E+00	1.87E+01
			I-131	<1.65E+01	0.00E+00	1.65E+01
			Cs-134	<2.03E+01	0.00E+00	2.03E+01
			Cs-137	<1.35E+01	0.00E+00	1.35E+01
			BaLa-140	<1.69E+01	0.00E+00	1.69E+01
			Be-7	5.22E+02	1.70E+02	2.16E+02
			K-40	3.81E+03	5.69E+02	2.34E+02
380197	6/2/2015 - 6/2/2015		Mn-54	<1.71E+01	0.00E+00	1.71E+01
			Co-58	<1.38E+01	0.00E+00	1.38E+01
			Fe-59	<2.97E+01	0.00E+00	2.97E+01
			Co-60	<1.54E+01	0.00E+00	1.54E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
380197	6/2/2015 - 6/2/2015	MIXEDBLV	Zn-65	<3.35E+01	0.00E+00	3.35E+01
			Zr-95	<2.50E+01	0.00E+00	2.50E+01
			Nb-95	<1.73E+01	0.00E+00	1.73E+01
			I-131	<1.62E+01	0.00E+00	1.62E+01
			Cs-134	<2.21E+01	0.00E+00	2.21E+01
			Cs-137	<1.48E+01	0.00E+00	1.48E+01
			BaLa-140	<1.51E+01	0.00E+00	1.51E+01
			Be-7	1.93E+02	1.18E+02	1.74E+02
			K-40	3.69E+03	5.36E+02	1.59E+02
			382177	7/7/2015 - 7/7/2015	MIXEDBLV	Mn-54
Co-58	<1.31E+01	0.00E+00				1.31E+01
Fe-59	<3.23E+01	0.00E+00				3.23E+01
Co-60	<1.33E+01	0.00E+00				1.33E+01
Zn-65	<3.36E+01	0.00E+00				3.36E+01
Zr-95	<1.95E+01	0.00E+00				1.95E+01
Nb-95	<1.58E+01	0.00E+00				1.58E+01
I-131	<1.36E+01	0.00E+00				1.36E+01
Cs-134	<1.60E+01	0.00E+00				1.60E+01
Cs-137	<1.33E+01	0.00E+00				1.33E+01
BaLa-140	<2.26E+01	0.00E+00				2.26E+01
Be-7	<2.19E+02	0.00E+00				2.19E+02
K-40	<1.86E+02	0.00E+00				1.86E+02
384655	8/4/2015 - 8/4/2015	MIXEDBLV				Mn-54
			Co-58	<2.53E+01	0.00E+00	2.53E+01
			Fe-59	<3.04E+01	0.00E+00	3.04E+01
			Co-60	<2.37E+01	0.00E+00	2.37E+01
			Zn-65	<4.54E+01	0.00E+00	4.54E+01
			Zr-95	<4.57E+01	0.00E+00	4.57E+01
			Nb-95	<2.66E+01	0.00E+00	2.66E+01
			I-131	<2.34E+01	0.00E+00	2.34E+01
			Cs-134	<3.05E+01	0.00E+00	3.05E+01
			Cs-137	<2.17E+01	0.00E+00	2.17E+01
			BaLa-140	<3.56E+01	0.00E+00	3.56E+01
			Be-7	5.08E+02	2.08E+02	2.74E+02
			K-40	4.53E+03	7.05E+02	5.36E+01
			388288	9/1/2015 - 9/1/2015	MIXEDBLV	Mn-54
Co-58	<2.23E+01	0.00E+00				2.23E+01
Fe-59	<4.45E+01	0.00E+00				4.45E+01
Co-60	<1.34E+01	0.00E+00				1.34E+01
Zn-65	<4.14E+01	0.00E+00				4.14E+01
Zr-95	<4.28E+01	0.00E+00				4.28E+01
Nb-95	<2.78E+01	0.00E+00				2.78E+01
I-131	<2.30E+01	0.00E+00				2.30E+01
Cs-134	<2.89E+01	0.00E+00				2.89E+01
Cs-137	<2.27E+01	0.00E+00				2.27E+01
BaLa-140	<2.77E+01	0.00E+00				2.77E+01
Be-7	5.12E+02	2.24E+02				3.18E+02
K-40	4.60E+03	7.20E+02				3.74E+02
391031	10/6/2015 - 10/6/2015	MIXEDBLV				Mn-54
			Co-58	<2.01E+01	0.00E+00	2.01E+01
			Fe-59	<3.34E+01	0.00E+00	3.34E+01
			Co-60	<1.82E+01	0.00E+00	1.82E+01
			Zn-65	<4.19E+01	0.00E+00	4.19E+01
			Zr-95	<3.12E+01	0.00E+00	3.12E+01
			Nb-95	<2.02E+01	0.00E+00	2.02E+01
			I-131	<1.93E+01	0.00E+00	1.93E+01
			Cs-134	<2.68E+01	0.00E+00	2.68E+01
			Cs-137	<2.57E+01	0.00E+00	2.57E+01
			BaLa-140	<2.17E+01	0.00E+00	2.17E+01



# CATAWBA Radiological Environmental Monitoring Analysis Report - 2015 (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	LLD
391031	10/6/2015 - 10/6/2015	MIXEDBLV	Be-7	2.17E+03	3.35E+02	2.32E+02
			K-40	2.24E+03	4.59E+02	3.71E+02
394432	11/3/2015 - 11/3/2015	MIXEDBLV	Mn-54	<2.52E+01	0.00E+00	2.52E+01
			Co-58	<1.89E+01	0.00E+00	1.89E+01
			Fe-59	<3.70E+01	0.00E+00	3.70E+01
			Co-60	<2.09E+01	0.00E+00	2.09E+01
			Zn-65	<4.17E+01	0.00E+00	4.17E+01
			Zr-95	<4.80E+01	0.00E+00	4.80E+01
			Nb-95	<2.04E+01	0.00E+00	2.04E+01
			I-131	<1.89E+01	0.00E+00	1.89E+01
			Cs-134	<2.77E+01	0.00E+00	2.77E+01
			Cs-137	<2.01E+01	0.00E+00	2.01E+01
			BaLa-140	<1.50E+01	0.00E+00	1.50E+01
			Be-7	1.15E+03	2.32E+02	1.99E+02
			K-40	3.29E+03	5.55E+02	3.16E+02
			396496	12/1/2015 - 12/1/2015	MIXEDBLV	Mn-54
Co-58	<1.53E+01	0.00E+00				1.53E+01
Fe-59	<3.48E+01	0.00E+00				3.48E+01
Co-60	<1.87E+01	0.00E+00				1.87E+01
Zn-65	<4.12E+01	0.00E+00				4.12E+01
Zr-95	<2.90E+01	0.00E+00				2.90E+01
Nb-95	<1.68E+01	0.00E+00				1.68E+01
I-131	<1.74E+01	0.00E+00				1.74E+01
Cs-134	<1.98E+01	0.00E+00				1.98E+01
Cs-137	<1.84E+01	0.00E+00				1.84E+01
BaLa-140	<2.57E+01	0.00E+00				2.57E+01
Be-7	1.55E+03	2.55E+02				1.65E+02
K-40	3.76E+03	5.80E+02				2.98E+02





**APPENDIX F**

**ERRATA TO  
PREVIOUS REPORTS**

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# APPENDIX F

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## ERRATA TO THE 2015 AREOR

There are no errata to be appended to the 2015 AREOR.