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April 20, 1993

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Annual Radiological Environmental Operating Report

Please find attached the McGuire Nuclear Station Annual Radiological Environmental Operating Report for 1992 pursuant to McGuire Technical Specification 6.9.1.6.

Questions or problems with respect to this report should be directed to Kay Crane at (704) 875-4306.

Very truly yours,

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DUKE POWER COMPANY

McGuire Nuclear Station
Units 1 and 2

Annual
Radiological
Environmental
Operating Report
1992

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

for

DUKE POWER COMPANY
McGuire Nuclear Station
Units 1 and 2

January 1 - December 31

1992

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1.0 EXECUTIVE SUMMARY

This Annual Radiological Environmental Operating Report describes the McGuire Nuclear Station Radiological Environmental Program and the results of the program for the calendar year 1992.

Included in the report are identification of sampling locations, descriptions of environmental sampling and analysis procedures, comparisons of present environmental radioactivity levels and preoperational environmental data, analysis of trends in the environmental radioactivity levels since the beginning of station operation, comparisons of doses calculated from environmental measurements and doses calculated from effluent data, a summary of the results of the 1992 program, discussion of the results, and discussion of the quality assurance activities associated with the program. Deviations from program requirements are also included.

Sampling activities were conducted as prescribed by Selected Licensee Commitments. Required analyses were performed and detection capabilities met Selected Licensee Commitments Manual requirements. Supplemental samples also were taken in addition to the required sampling locations.

Concentrations observed in the environment in 1992 for station related radionuclides were within the ranges of concentrations observed in the past. All positive indications of radioactivity due to plant operations were less than the reporting levels specified by the Nuclear Regulatory Commission (NRC) and given in Selected Licensee Commitments. The environmental doses also were well below specified limits.

Statistical analysis of data indicates that there are no radionuclides demonstrating high to moderate increasing trends. All possible increasing trends showed moderate to no probability. It can be concluded that the contribution of McGuire to the radioactivity in the environment is slight.

2.0 INTRODUCTION

2.1 SITE DESCRIPTION AND SAMPLE LOCATIONS

McGuire Nuclear Station is located geographically near the center of the highly industrialized region of the Carolinas. The land is predominantly rural non-farm with a small amount of land being used to support beef cattle and farming. Recreation in the area is confined mostly to the lake and shores of Lake Norman and Mountain Island reservoir. The McGuire site is in northwestern Mecklenburg County, North Carolina, 17 miles north-northwest of Charlotte, North Carolina. The site is bounded to the west by the Catawba River channel and to the north by the 32,510 acre Lake Norman. Lake Norman is impounded by Duke Power Company's Cowans Ford Dam Hydroelectric Station, which is located immediately west of the site and on the Catawba River channel. The tailwater of Cowans Ford Dam is the upper limit of Mountain Island Reservoir. Mountain Island Dam is located 15 miles downstream from the site. Lookout Shoals Hydroelectric Station is at the upper reaches of Lake Norman. Marshall Coal Station is located on the western shore of Lake Norman, approximately 16 miles upstream from the site (reference 6.2 and 6.3). The sites exclusion radius is 2500 feet.

Tables 2.1-A and 2.1-B define the sampling and TLD locations for the McGuire Radiological Monitoring Program. Figures 1 and 2 illustrate these locations as compared to McGuire Nuclear Station.

2.2 SCOPE AND REQUIREMENTS OF ENVIRONMENTAL MONITORING PROGRAM

An environmental monitoring program has been in effect at McGuire Nuclear Station since 1977, four years prior to the Unit No. 1 startup in 1981. The preoperational program provided 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 Selected Licensee Commitments Manual Section 16.11-13 with regard to sample media, sampling locations, sampling frequency, and analytical sensitivity requirements. Tables 2.2-A and 2.2-B show the maximum values for LLD and the reporting levels, respectively, from Selected Licensee Commitments. Table 2.2-C shows the analysis schedule for each medium and the type of analysis required. 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 McGuire Nuclear Station. This program provides surveillance of all appropriate critical exposure pathways to man and satisfies vital interests of the company, public, and state and federal agencies concerned with the environment.

TABLE 2.1-A

McGuire Radiological Monitoring Program Sampling Locations

Code:

W-Weekly

BW-BiWeekly

M-Monthly

C-Control

SM-Semimonthly

Q-Quarterly

SA-Semiannually

Sampling	Location Description	Air Radioiodine and Particulates	Surface Water	Drinking Water	Shoreline Sediment	Food Products	Fish	Milk	Broadleaf Vegetation
120	Site Boundary (0.4 mi NNE)	W							M
121	Site Boundary (0.5 mi NE)	W							
125	Site Boundary (0.4 mi SW)	W							M
128	Discharge Canal Bridge (0.4 mi ENE)		BW						
129	Discharge Canal Entrance to Lake Norman (0.6 mi ENE)				SA		SA		
130	Hwy 73 Bridge Downstream (0.6 mi SW)				SA				
131	Cowans Form Dam (0.7 mi W)		BW						
132	Charlotte Municipal Water Supply (11.2 mi SSE)			BW					
133	Cornelius (6.2 mi NE)	W							
134C	East Lincoln Jr. High School (8.7 mi WNW)	W							M
135C	Plant Marshall Intake Canal (12.0 mi N)		BW						
136C	Mooresville Municipal Water Supply (12.5 mi NNE)			BW					
137C	Pinnacle Access Area (12.0 mi N)				SA		SA		
138	Henry Cook Dairy (2.75 mi ESE)							SM	
139	William Cook Dairy (2.6 mi E)							SM	
140	Kidd Dairy-Cows (2.8 mi SSE)							SM	
141C	Lynch Dairy-Cows (14.8 mi WNW)							SM	
142	Davidson Municipal Water Supply (7.5 mi NE)			BW					
158	4-5 mile radius (5.0 mi NNE)								M
184	5 mile radius Gardens (2.5 mi ENE)					M(a)			
185	5 mile radius Gardens (4.9 mi N) - Special Interest					M(a)			
188	5 mile radius Gardens (2.8 mi N) - Special Interest					M(a)			

(a) during harvest season

Table 2.1-B

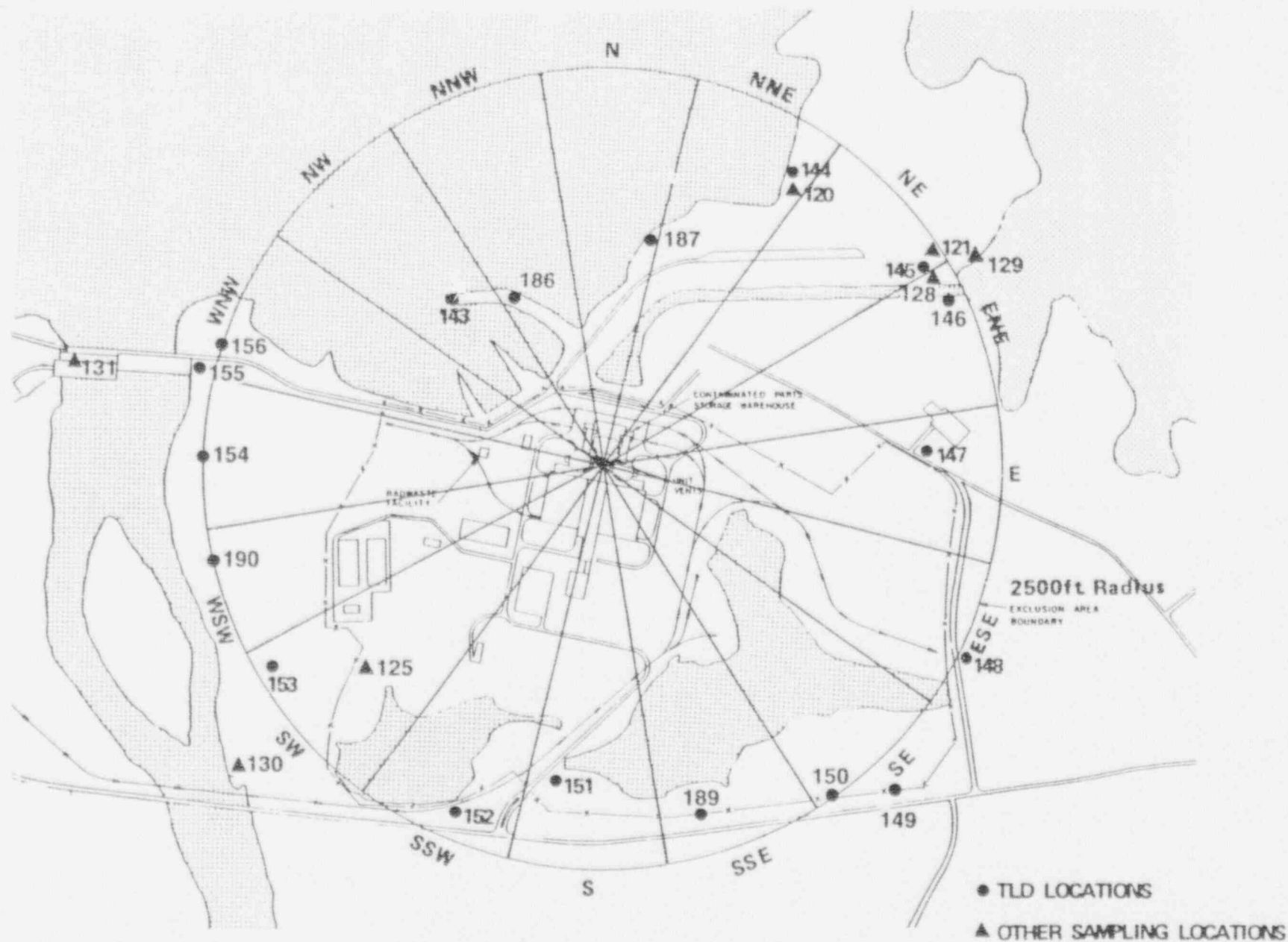
**MCGUIRE RADIOLOGICAL MONITORING PROGRAM SAMPLING LOCATIONS
(TLD LOCATIONS)**

SAMPLING LOCATION DESCRIPTION*			SAMPLING LOCATION DESCRIPTION*		
143	SITE BOUNDARY	(0.3 MILES NW)	164	4-5 MILE RADIUS	(4.5 MILES SSE)
144	SITE BOUNDARY	(0.4 MILES NNE)	165	4-5 MILE RADIUS	(5.0 MILES S)
145	SITE BOUNDARY	(0.5 MILES NE)	166	4-5 MILE RADIUS	(5.2 MILES SSW)
146	SITE BOUNDARY	(0.5 MILES ENE)	167	4-5 MILE RADIUS	(4.9 MILES SW)
147	SITE BOUNDARY	(0.4 MILES E)	168	4-5 MILE RADIUS	(4.7 MILES WSW)
148	SITE BOUNDARY	(0.5 MILES ESE)	169	4-5 MILE RADIUS	(4.4 MILES W)
149	SITE BOUNDARY	(0.6 MILES SE)	170	4-5 MILE RADIUS	(4.5 MILES WNW)
150	SITE BOUNDARY	(0.5 MILES SE)	171	4-5 MILE RADIUS	(4.5 MILES NW)
151	SITE BOUNDARY	(0.4 MILES S)	172	4-5 MILE RADIUS	(5.2 MILES NNW)
152	SITE BOUNDARY	(0.5 MILES SSW)	173	SPECIAL INTEREST	(8.5 MILES NNW)
153	SITE BOUNDARY	(0.5 MILES SW)	174	SPECIAL INTEREST	(8.7 MILES WNW)
154	SITE BOUNDARY	(0.5 MILES W)	175	CONTROL	(12.7 MILES WNW)
155	SITE BOUNDARY	(0.5 MILES WNW)	176	SPECIAL INTEREST	(11.0 MILES SW)
156	SITE BOUNDARY	(0.5 MILES WNW)	177	SPECIAL INTEREST	(8.6 MILES S)
189**	SITE BOUNDARY	(0.4 MILES SSE)	178	SPECIAL INTEREST	(9.2 MILES SE)
190**	SITE BOUNDARY	(0.5 MILES WSW)	179	SPECIAL INTEREST	(10.4 MILES ESE)
157	4-5 MILE RADIUS	(4.8 MILES N)	180	SPECIAL INTEREST	(11.5 MILES NNE)
158	4-5 MILE RADIUS	(4.4 MILES NNE)	181	SPECIAL INTEREST	(6.7 MILES NE)
159	4-5 MILE RADIUS	(5.0 MILES NE)	182	SPECIAL INTEREST	(6.0 MILES NE)
160	4-5 MILE RADIUS	(4.9 MILES ENE)	183	SPECIAL INTEREST	(5.5 MILES S)
161	4-5 MILE RADIUS	(4.7 MILES E)	186	SPECIAL INTEREST	(0.2 MILES NNW)
162	4-5 MILE RADIUS	(4.6 MILES ESE)	187	SPECIAL INTEREST	(0.3 MILES N)
163	4-5 MILE RADIUS	(5.0 MILES SE)			

* All TLD samples are collected quarterly.

** These TLD's were added 12/91 as a result of GPS data (See Appendix A)

FIGURE 1



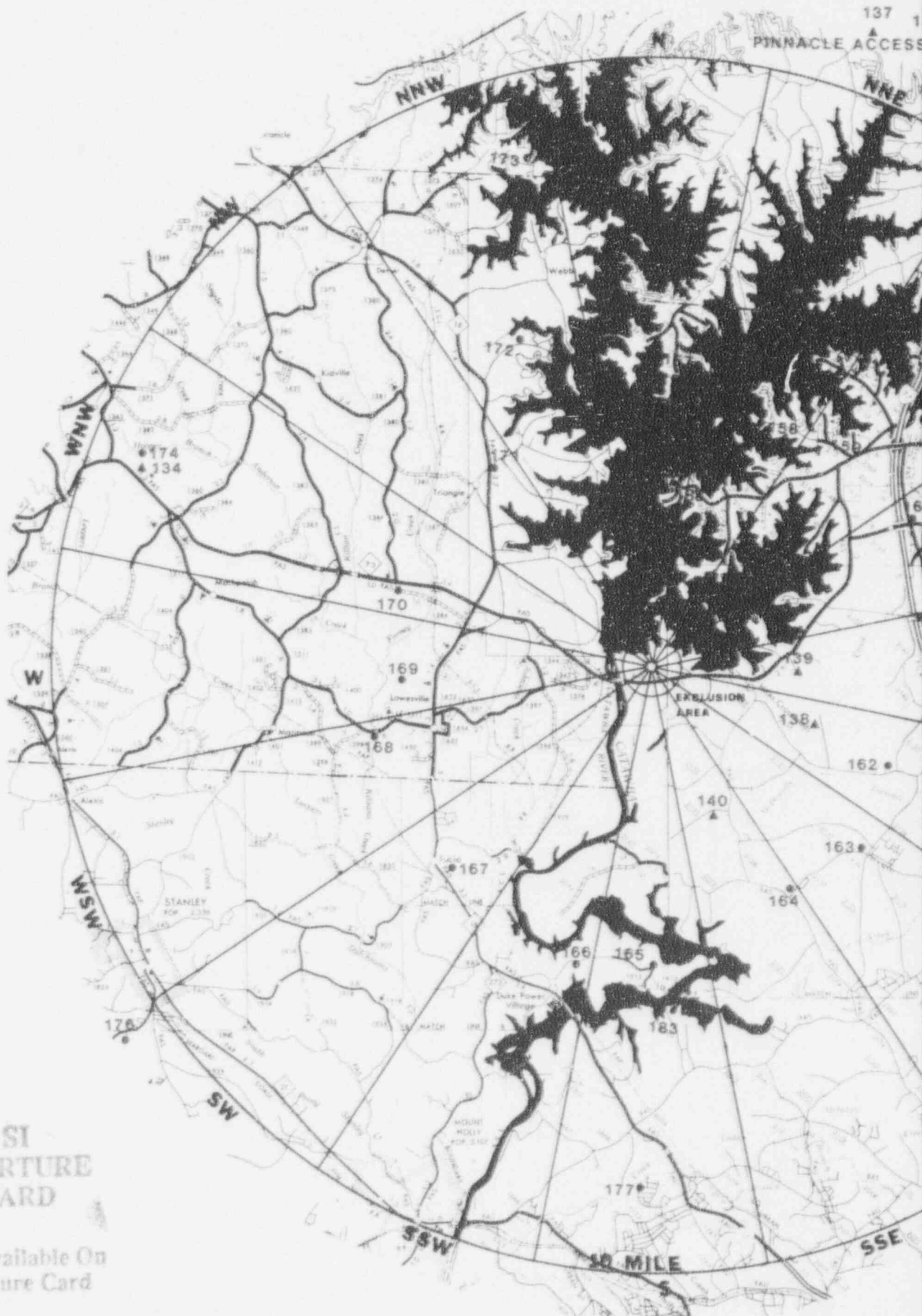
135 ▲ PLANT MARSHALL

137 1

PINNACLE ACCESS

▲ 141

175 ●



SI
APERTURE
CARD

Also Available On
Aperture Card

132 4

MOORESVILLE WATER
TREATMENT PLANT

• 180



- TLD LOCATIONS
- ▲ ALL OTHER SAMPLING LOCATIONS

LEGEND

- PRIMITIVE OR UNIMPROVED ROAD
- GRAVEL OR GRADED ROAD
- SOIL GRAVE OR STONE SURFACED ROAD
- HARD SURFACED ROAD
- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY
- HIGHWAY WITH FRONTAGE ROAD
- FULL CONTROL ACCESS
- FEDERAL AID INTERSTATE ROAD
- FEDERAL AID PRIMARY ROAD
- FEDERAL AID SECONDARY ROAD
- FEDERAL AID URBAN
- NON-SYSTEM ROAD
- PROJECTED LOCATION
- INTERSECTION DISTANCE
- TRAFFIC LIGHT
- HIGHWAY INTERCHANGE
- DETAILED HIGHWAY INTERCHANGE
- INTERSTATE HIGHWAY
- U.S. NUMBERED HIGHWAY
- NC. NUMBERED HIGHWAY
- SECONDARY ROAD NUMBER
- UNDERGROUND CABLE
- RAILROAD, ANY NUMBER OF TRACES USED BY SINGLE OPERATING COMPANY
- RAILROAD, ANY NUMBER OF TRACES USED BY MORE THAN ONE OPERATING COMPANY OR SAME OR ADJACENT RIGHTS OF WAY
- RAILROAD STATION
- GRADE CROSSING
- UNDERPASS
- OVERPASS
- RAILROAD TUNNEL
- ARMY, NAVY OR MARINE CORPS FIELD
- CIVIL OR MUNICIPAL AIRPORT
- MARKED AIRFIELD
- MARKED AIRFIELD 10' W. STRUCK
- DOCK, PIER OR LANDING
- RAIL OR TOL FERRY
- LIGHT NAUTICAL
- LIGHTHOUSE
- COAST GUARD STATION
- CANAL
- NARROW STREAM
- WIDE STREAM
- DAM WITH LOCK
- DAM
- RESERVOIR, POND OR LAKE
- PERMANENT PEAK, HUMBOLDT INDICATE ELEVATION
- ROAD THROUGH MOUNTAIN PASS
- HIGHWAY BRIDGE OVER 20 FT.
- DRY SPAN OR BRIDGE
- HIGHWAY TUNNEL
- FORD
- STATE LINE
- COUNTY LINE
- CITY LIMITS
- RESERVATION OR PARK BOUNDARY
- WATER AREA
- DELIMITED AREA, POPULATION EST.
- COUNTY SEAT
- OTHER TOWNS AND VILLAGES
- TRIANGULATION STATION
- INCORPORATED CITY OR VILLAGE, GENERALIZED
- SCHOOL
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- HOSPITAL
- CORRECTIONAL OR PENAL INSTIT.
- WORKING GARAGE OR MARIN. YARD
- HIGHWAY SHY OR DET. OFFICE
- WEIGHT STATION
- PATRICK STATION
- REST AREA
- MONUMENT - SMALL HISTORICAL SITE

MCGUIRE NUCLEAR STATION

Figure 2
Map of REMP
Sampling Locations

Pg. 2 - 6

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Table 2.2-A

MAXIMUM VALUES FOR THE LOWER LIMITS OF DETECTION (LLD)

ANALYSIS	WATER (pCi/l)	AIRBORN PARTICULATE OR GAS (pCi/m ³)	FISH (pCi/kg, wet)	MILK (pCi/l)	BROAD LEAF VEGETATION (pCi/kg, wet)	SEDIMENT (pCi/kg, dry)
Gross beta	4	N.A.	N.A.	N.A.	N.A.	N.A.
H-3	2000*	N.A.	N.A.	N.A.	N.A.	N.A.
Mn-54	15	N.A.	130	N.A.	N.A.	N.A.
Fe-59	30	N.A.	260	N.A.	N.A.	N.A.
Co-58, 60	15	N.A.	130	N.A.	N.A.	N.A.
Zn-65	30	N.A.	260	N.A.	N.A.	N.A.
Zr-95	15	N.A.	N.A.	N.A.	N.A.	N.A.
Nb-95	15	N.A.	N.A.	N.A.	N.A.	N.A.
I-131	1	7×10^{-2}	N.A.	1	60	N.A.
Cs-134	15	5×10^{-2}	130	15	60	150
Cs-137	18	6×10^{-2}	150	18	80	180
Ba-140	15	N.A.	N.A.	15	N.A.	N.A.
La-140	15	N.A.	N.A.	15	N.A.	N.A.

* If no drinking water pathway exists, a value of 3000 pCi/l may be used.

Table 2.2-B

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

REPORTING LEVELS

ANALYSIS	WATER (pCi/l)	AIRBORN PARTICULATE OR GAS (pCi/m ³)	FISH (pCi/kg,wet)	MILK (pCi/l)	BROAD LEAF VEGETATION (pCi/kg,wet)
H-3	$2 \times 10^*$	N.A.	N.A.	N.A.	N.A.
Mn-54	1×10^3	N.A.	3×10^4	N.A.	N.A.
Fe-59	4×10^2	N.A.	1×10^4	N.A.	N.A.
Co-58	1×10^3	N.A.	3×10^4	N.A.	N.A.
Co-60	3×10^2	N.A.	1×10^4	N.A.	N.A.
Zn-65	3×10^2	N.A.	2×10^4	N.A.	N.A.
Zr-Nb-95	4×10^2	N.A.	N.A.	N.A.	N.A.
I-131	2	1	N.A.	3	1×10^2
Cs-134	30	10	1×10^3	60	1×10^3
Cs-137	50	20	2×10^3	70	2×10^3
Ba-La-140	2×10^2	N.A.	N.A.	3×10^2	N.A.

* For drinking water samples. This is 40 CFR Part 141 value. If no drinking water pathway exists, a value of 3×10^4 pCi/l may be used.

Table 2.2-C

McGuire Radiological Monitoring Program Analysis

Sample Medium	Analyses Schedule	Analyses				
		Gamma Isotopic	Tritium	Low Level I-131	Gross Beta	TLD
Radioiodine & Particulates	Weekly	X X			X	
Direct Radiation	Quarterly					X
Surface Water	Biweekly			X		
	Monthly Composite	X				
	Quarterly Composite		X			
Drinking Water	Biweekly			X		
	Monthly Composite	X				
	Quarterly Composite		X		X	
Shoreline Sediment	Semiannually	X				
Milk	Semimonthly	X		X		
Fish	Semiannually	X				
Broadleaf Vegetation	Semiannually	X				
Food Products	Monthly (during harvest season)	X				

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 Environmental Monitoring Program. 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 .

NOTE: "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.

2.3.2 LOWER LEVEL OF DETECTION, MINIMUM DETECTABLE ACTIVITY, AND CRITICAL LEVEL

The Lower Level of Detection (LLD) and Minimum Detectable Activity (MDA) are used throughout the Environmental Monitoring Program, both in the Selected Licensee Commitments and in the implementation of the specifications.

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 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" LLD's for each sample medium and selected radionuclides are given in the Selected Licensee Commitments and are listed in Table 2.2-A.

The MDA may be thought of as an "actual" LLD for a particular sample measurement remembering that the MDA is calculated using a sample background instead of a system background. In gamma spectroscopy analyses, the sample background may be elevated above the system background due to the continuum produced by higher energy gammas from other radionuclides (either man-made or naturally produced). The continuum increases the smallest concentration of a particular radionuclide that could be positively identified in the sample. Therefore, to insure that the "required" LLD is not exceeded for any radionuclide in a sample medium, the MDA is calculated based on the actual background in the area of the identifying gamma energy and is compared to the "required" LLD. If the MDA exceeds the "required" LLD, the sample is counted for a longer time period so that the standard deviation of the sample background is minimized. If the "required" LLD exceeds the MDA, then the analysis of the sample meets the requirements for the detection capability for environmental sample analysis.

For "gross" counters (such as alpha/beta proportional counters and liquid scintillation counters), the MDA is calculated using the average of batch background counts. The average is used to account for background fluctuations over longer counting periods. This MDA is then compared to the "required" LLD. If the MDA exceeds the "required" LLD, the sample is counted for a longer time period so that the standard deviation of the batch background is minimized. If the "required" LLD exceeds the MDA, then the analysis of the sample meets the requirements for the detection capability for environmental sample analysis.

For "gross" counters, a critical level calculation is also performed to determine statistically significant levels of activity. The critical level is defined as the net count rate which must be exceeded before the sample is said to contain any measurable activity above background. In general, the critical level is equal to one-half of the MDA. Activities exceeding the critical level are reported for gross counters to minimize data biases, since most detectable activities fall within this range.

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. This is traditionally done by looking at historical data (including preoperational data) and determining if a trend exists. Trends, if they exist, may be either positive or negative. Since nuclear reactor operations do not normally remove radioactivity from the surrounding environment, a negative trend 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.

In some cases, visual inspection of tabular or graphical presentations of data may be sufficient to determine if a trend exists. In other cases, it may not be so obvious. Therefore, it is desirable to obtain a single numerical value from the data which will permit a meaningful interpretation of the relationship existing between the variations in the data. If it is assumed that a linear relationship exists between the time after startup of the reactor and the amount of radionuclides in a particular environmental medium, the least squares regression method may be used to define the linear relationship. To determine if the data actually correlate to the straight line assumption, the theoretical variance is compared to the actual variance. The numerical value that summarizes this comparison is known as the correlation coefficient. This correlation coefficient, symbolized by "r", is a determination of how closely the data fit a straight line and may be calculated from the following equation:

$$r = \frac{N\sum XY - \sum X \sum Y}{[(N\sum X^2 - (\sum X)^2)(N\sum Y^2 - (\sum Y)^2)]^{\frac{1}{2}}}$$

Where:

- r = correlation coefficient for the data set of X and Y,
- X = the year or point in time,
- Y = the radionuclide concentration associated with X,
- N = number of observations.

The range of values as calculated by the correlation coefficient lies between positive on (+1) and negative on (-1). The absolute value of the correlation coefficient represents the probability of a trend. Zero (0) represents no indication of either a positive or negative trend. A positive (+) correlation coefficient indicates an increasing trend, and conversely, a negative (-) correlation coefficient indicates a decreasing trend. The ranges of a correlation coefficient may be summarized as following:

- $1 > |r| > 0.7$ High to moderate probability of a trend.
- $0.7 > |r| > 0.3$ Moderate to poor probability of a trend.
- $0.3 > |r| \geq 0$ Poor to no probability of trend.

Identifying a trend by using the correlation coefficient is only useful for the time periods where the discharge from the nuclear plant is relatively stable and no other sources of radioactivity are present. 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. Other factors that may affect environmental levels of radionuclides include prevailing weather conditions (periods of drought or heavier than normal precipitation), construction in or around either the nuclear plant or the sampling location, addition or deletion of other sources of radioactive materials (such as the Chernobyl accident), etc.. Some of these factors may be obvious while others are sometimes unknown to the plant personnel.

The recent change in the method of calculating the mean (using only net positive results) will also affect the apparent trends.

Because of the above considerations, how trends are identified will depend not only on the least squares regression method, but will include some judgement by plant personnel on the factors affecting environmental levels.

2.3.4 TEST STATISTIC

In some cases, we would not expect to observe a buildup of radionuclides in the environment, but instead would expect to see a measurable increase in levels over a short duration. This is the case for direct radiation measurements, where the radiation level is measured over a finite period and is dependent upon whether plant discharges were occurring at that time or not. In this case, the correlation coefficient is not a sufficient indicator of whether effluents are having an impact on the environment, since there is no bioaccumulation. Another test is needed to give us a meaningful interpretation of the data. If we assume that the naturally occurring radiation levels around the plant are normally distributed and that the effluents are not affecting the environment outside of this normal distribution, then we can compare the values of two sets of measurements taken at different times around the plant. One measurement can be taken when we are certain no effect is occurring and one when an effect may be occurring, to determine if they are statistically different from one another.

The statistic that compares the means from two sets of measurements to determine if there is a statistically significant difference is called the test statistic, or t-statistic, and is calculated as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s_p \sqrt{1/n_1 + 1/n_2}}$$

Where:

\bar{X}_1 = the mean value of the first set of measurements

\bar{X}_2 = the mean value of the second set of measurements

s_p = the average standard deviation of the two sets of measurements

$$= \sqrt{s_p^2}$$

Where:

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

n_1 = the number of measurements in the first set

n_2 = the number of measurements in the second set

The calculated value of the test statistic is then compared to expected values of the test statistic tabulated based on the number of measurements taken and the degree of confidence required for the results. For our purposes, the expected value of the test statistic will always be chosen to give a 95% confidence level that a positive result is truly positive with only a 5% probability that a positive result is truly negative. This confidence level is chosen since it is consistent with the standard confidence levels specified for similar measurements.

Due to the existence of naturally occurring differences in background radiation levels over time (as a result of solar cycles and other meteorological phenomena) and systematic errors due to instrument variability, ratios of measurements can be used to calculate the t-statistic instead of individual measurements. By using ratios, biases associated with the measurement process are minimized and allow us to more accurately compare results from one year to the next. Specifically, in the case of TLD measurements, the inner ring of TLD results is ratioed with the outer ring of TLD measurements in a given year and the ratio for one year is compared to the ratio for another year.

As with other environmental samples, outside factors may affect the results observed and the resulting trends identified. Therefore, the significance of trends will be based in part on judgment of plant personnel familiar with the factors affecting environmental levels, as well as the statistical results.

3.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM MONITORING PROGRAM - DISCUSSION, INTERPRETATION AND TRENDING OF RESULTS

The radionuclides with Selected Licensee Commitments reporting levels in the environmental media samples have been historically trended over a thirteen-year period from 1979 - 1992. Analyses from 1977 - 1978 have been excluded since these results were much higher than the other preoperational years due to outside influence such as weapons testing. Including these results would have produced correlation coefficients and averages that were not representative. The highest annual mean concentration of each Selected Licensee Commitments radionuclide from the indicator and control locations for each media type was used for the estimation of the mean value and correlation coefficient. The preoperational analyses from 1981 were combined with the operational analyses from the latter part of 1981 and averaged to give one concentration for each radionuclide for that year. However, when preoperational comparisons were necessary, only the preoperational report was used.

Fourteen annual means were used to determine trends and often the average concentrations reported were negative. All negative values (concentrations) were replaced with a zero to properly represent environmental conditions. Figures 3 through 6 provide a graphical presentation of the annual mean concentrations for drinking water, shoreline sediment, fish, and TLD data. Some of these figures show both indicators and controls for significant radionuclides, while others show only indicators for clarity purposes. These media were chosen for graphical representation for special interest purposes or because they consistently show detectable activity for a few radionuclides. In addition, the percentages of Selected Licensee Commitments reporting levels were calculated for each reportable radionuclide in each media type.

No Selected Licensee Commitments reporting levels were exceeded in 1992 due to plant effluents.

Only the radionuclides with Selected Licensee Commitments reporting levels were historically trended and compared with the thirteen-year average and control levels. It is important to note that while historical trends are helpful in determining radioactivity buildup, environmental radionuclide levels could be affected without exhibiting increasing or decreasing trends.

3.1 AIRBORNE RADIOIODINES AND PARTICULATES

3.1.1 RADIOIODINES

In 1992, 260 radioiodine samples were analyzed, 208 at four indicator locations and 52 at the control location.

The I-131, concentration did not significantly differ from the thirteen-year average, preoperational data, or control location levels for the thirteen-year period. The historical trend based on highest annual mean for indicator and control location for I-131, showed poor to no probability of increasing or decreasing trends as illustrated in Table 3.1.1-A. Cs-137 activity which was present on the cartridge but not on the particulate filter, was determined to be inherent in the charcoal and was not included for trending purposes (see page 5-1).

Table 3.1.1-B shows the percentages of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicators at the locations with the highest annual mean for 1992.

Table 3.1.1-B

Radionuclide	Concentration (pCi/m ³)	Reporting Level(pCi/m ³)	Percentage
I-131	0.00E0	1.00E0	0.00%

**Table 3.1.1-A Concentration of Radionuclides in
Airborne Radioiodines**

YEAR	Concentration (pCi/m ³)	
	I-131	
	Indicator	Control
1979 *	3.28E-3	1.04E-3
1980 *	2.04E-3	1.10E-3
1981 *	4.17E-3	6.27E-4
1982 *	1.42E-3	2.48E-3
1983 *	1.99E-3	2.01E-4
1984	3.17E-3	-1.15E-3
1985	3.15E-3	1.04E-3
1986	1.27E-2	6.10E-3
1987	1.07E-2	6.60E-3
1988	0.00E0	0.00E0
1989	2.18E-2	0.00E0
1990	0.00E0	0.00E0
1991	0.00E0	0.00E0
13 YEAR AVERAGE	4.96E-3	1.48E-3
1992	0.00E0	0.00E0
CORRELATION COEFFICIENT	0.09	- 0.01

* Radioiodines and Particulates analyzed together.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.1.2 PARTICULATES

In 1992, 260 particulate samples were analyzed, 208 at the four indicator locations and 52 at the control location.

The I-131, Cs-134, and Cs-137 concentrations did not significantly differ from the twelve-year average, preoperational data, and control location levels. The historical trends for the indicator and control locations with the highest annual mean for I-131, Cs-134, and Cs-137 showed moderate to no probabilities of increasing or decreasing trends as illustrated in Table 3.1.2-A.

Table 3.1.2-B shows the percentages of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicator locations with the highest annual mean for 1992. No activity was detected and therefore no reporting levels were approached.

Table 3.1.2-B

Radionuclide	Concentration (pCi/m ³)	Reporting Level(pCi/m ³)	Percentage
I-131	0.00E0	1.00E0	0.00%
Cs-134	0.00E0	1.00E1	0.00%
Cs-137	0.00E0	2.00E1	0.00%

Table 3.1.2--A Concentration of Radionuclides in Airborne Particulates

YEAR	Concentration (pCi/m ³)					
	I-131		Cs-134		Cs-137	
	Indicator	Control	Indicator	Control	Indicator	Control
1979 *	3.28E-3	1.04E-3	1.19E-3	-7.64E-4	4.40E-3	1.47E-3
1980 *	2.04E-3	1.10E-3	-5.89E-5	-2.45E-4	6.70E-3	4.53E-3
1981 *	4.17E-3	6.27E-4	1.15E-3	2.99E-4	6.16E-3	5.32E-3
1982 *	1.42E-3	2.48E-3	4.85E-4	2.27E-3	3.82E-3	2.29E-3
1983 *	1.99E-3	2.01E-4	6.80E-4	4.98E-4	2.93E-3	3.21E-3
1984	2.72E-3	2.08E-3	9.90E-4	8.83E-4	1.74E-3	8.29E-4
1985	1.57E-3	2.05E-3	1.38E-3	1.05E-3	1.86E-3	1.32E-3
1986	4.42E-3	3.36E-3	2.76E-3	8.90E-4	4.98E-3	3.03E-3
1987	9.73E-3	0.00E0	7.25E-3	0.00E0	1.07E-2	7.91E-3
1988	0.00E0	9.15E-3	0.00E0	0.00E0	0.00E0	0.00E0
1989	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 YEAR AVERAGE	2.41E-3	1.70E-3	1.22E-3	4.53E-4	3.29E-3	2.30E-3
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
CORRELATION COEFFICIENT	-0.34	-0.03	-0.06	-0.33	-0.58	-0.48

* Radioiodines and Particulates analyzed together.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.2 DRINKING WATER

In 1992, 39 drinking water samples were analyzed for I-131/LL, 26 at the two indicator locations and 13 at the control location. Tritium (H-3) analyses were performed on 12 composite samples, eight at indicator locations and four at the control location. Thirty-nine samples were analyzed for other gamma emitting radionuclides, 26 at indicator locations, and 13 at the control location. Analyses showed zero ranges for all indicator locations except for tritium, which means no other detectable activity was measured. All radionuclides did not significantly differ from the thirteen-year average. All radionuclides, except tritium, did not significantly differ from preoperational data.

A moderate to poor probability of an increasing trend was seen for H-3 at the indicator locations. However, the 1992 H-3 concentration only resulted in 3.37% of the Selected Licensee Commitments reporting level. All other radionuclide indicators and controls exhibited moderate to no probabilities of increasing or decreasing trends. Table 3.2-A and Figure 3 illustrate these trends.

FIGURE 3

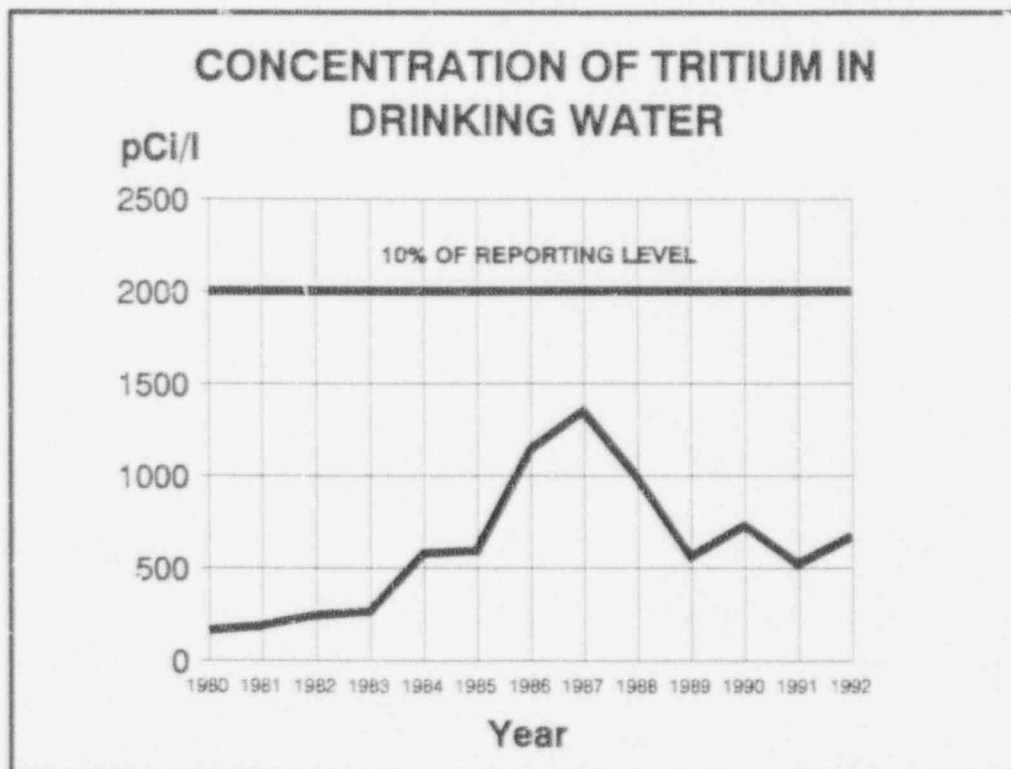


Table 3.2-B shows the percentages of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicators at the locations with the highest annual mean for 1991.

Table 3.2-B

Radionuclide	Concentration (pCi/l)	Reporting Level (pCi/l)	Percentage
H-3	6.73E2	2.00E4	3.37%
Mn-54	0.00E0	1.00E3	0.00%
Fe-59	0.00E0	4.00E2	0.00%
Co-58	0.00E0	1.00E3	0.00%
Co-60	0.00E0	3.00E2	0.00%
Zn-65	0.00E0	3.00E2	0.00%
Nb-95	0.00E0	4.00E2	0.00%
Zr-95	0.00E0	4.00E2	0.00%
I-131/LL	0.00E0	2.00E0	0.00%
Cs-134	0.00E0	3.00E1	0.00%
Cs-137	0.00E0	5.00E1	0.00%
Ba/La-140	0.00E0	2.00E2	0.00%

Table 3.2-A Concentration of Radionuclides in Drinking Water

(Page 1 of 3)

Year	Concentration (pCi/liter)							
	H-3		Mn-54		Fe-59		Co-58	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	1.65E2	1.50E2	1.46E0	4.27E-1	1.29E0	5.96E-1	1.14E0	2.01E0
1980	1.63E2	2.05E2	6.20E-1	-4.29E-1	1.77E0	5.20E-1	5.62E-1	-3.72E-1
1981	1.88E2	1.78E2	1.40E-1	-1.96E0	8E0	1.13E0	9.36E-1	4.33E-1
1982	2.43E2	1.45E2	8.63E-1	7.05E-2	3.50E0	-7.39E-1	7.71E-1	6.26E-1
1983	2.65E2	1.45E2	4.18E-1	-3.06E-2	1.44E0	7.93E-1	6.78E-1	-2.60E-1
1984	5.77E2	2.45E2	1.05E0	1.42E-1	2.15E0	1.60E-1	8.89E-1	-2.57E-1
1985	5.93E2	4.00E2	7.14E-2	9.49E-2	7.73E-1	-4.73E-1	3.39E-1	6.16E-1
1986	1.14E3	4.37E2	9.76E-1	-4.59E-2	2.16E0	-4.92E-1	3.82E-1	1.04E-2
1987	1.35E3	7.75E2	4.80E0	0.00E0	6.60E0	0.00E0	4.20E0	0.00E0
1988	9.92E2	7.11E2	0.00E0	2.50E0	0.00E0	0.00E0	0.00E0	0.00E0
1989	5.62E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	7.32E2	6.11E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	5.22E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr. Avg.	5.76E2	3.08E2	8.00E-1	2.49E-1	1.87E0	2.46E-1	7.61E-1	2.48E-1
1992	6.73E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	0.59	0.11	-0.17	0.08	-0.44	-0.69	-0.24	-0.58

NOTE: All negative values were replaced with "zero's" for calculational purposes.

Table 3.2-A Concentration of Radionuclides in Drinking Water

(Page 2 of 3)

Year	Concentration (pCi/liter)							
	Co-60		Zn-65		Nb-95		Zr-95	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	2.30E0	2.01E0	1.10E-1	2.56E-1	2.52E0*	-3.74E-2*	2.52E0*	-3.74E-2*
1980	2.26E0	1.80E0	1.18E0	-7.44E-1	1.71E0*	6.52E-1*	1.71E0*	6.52E-1*
1981	1.43E0	1.34E-1	1.76E0	1.29E0	2.30E0	1.47E0	2.42E0	1.81E0
1982	8.25E-1	5.98E-1	1.16E-1	9.43E-1	1.35E0	1.42E0	2.49E0	2.02E0
1983	1.26E0	1.22E0	-6.05E-2	-2.48E0	-3.99E-1	2.32E-1	1.82E0	1.05E0
1984	7.22E-1	-2.81E-1	5.03E-1	1.29E-1	7.47E-1	1.91E-1	2.70E0	-1.06E0
1985	8.44E-1	7.09E-1	-3.43E-1	-7.20E-2	9.32E-1	4.63E-1	1.09E0	5.70E-1
1986	2.33E-1	-3.46E-1	2.44E-1	7.25E-2	9.87E-1	1.06E0	5.17E-1	-4.43E-1
1987	0.00E0	0.00E0	0.00E0	0.00E0	5.30E0	0.00E0	0.00E0	7.10E0
1988	0.00E0	4.50E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1989	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr. Avg.	7.60E-1	8.44E-1	3.01E-1	2.07E-1	1.22E0	4.22E-1	1.17E0	1.01E0
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	-0.91	-0.26	-0.55	-0.50	-0.42	-0.53	-0.88	-0.11

* Nb-95 and Zr-95 analyzed as Nb/Zr-95

NOTE: All negative values were replaced with "zero's" for calculational purposes.

Table 3.2-A Concentration of Radionuclides in Drinking Water

(Page 3 of 3)

Year	Concentration (pCi/liter)							
	I-131		Cs-134		Cs-137		Ba/La-140	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	4.95E0	6.97E-1	-1.09E0	-4.12E-1	2.55E0	2.86E-1	1.62E0	1.54E-2
1980	7.39E-1	8.96E-1	-3.54E-1	-6.24E-1	9.53E-1	1.73E0	8.53E-2	2.06E-1
1981	1.83E0	1.05E0	1.46E0	4.77E-1	1.13E0	1.16E0	1.09E0	-8.20E-1
1982	2.45E0	7.79E-2	5.38E-1	2.64E0	1.08E0	3.50E0	8.28E-1	-6.73E-1
1983	4.34E-1	-5.57E-1	6.29E-1	1.54E0	8.91E-1	5.31E-1	4.26E-1	1.13E0
1984	9.46E-2*	-8.65E-2*	6.16E-1	-2.01E-1	2.80E0	6.07E-1	1.16E0	-7.66E-1
1985	-1.84E-1*	-1.27E-1*	1.00E0	5.55E-1	1.43E0	-1.79E-1	5.15E-1	7.75E-1
1986	3.07E-2*	5.63E-2*	8.18E-1	-1.45E-2	2.58E-1	2.83E-1	7.53E-1	-1.11E-1
1987	4.10E-1	0.00E0	0.00E0	5.90E0	4.20E0	2.80E0	0.00E0	4.00E0
1988	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1989	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr Avg.	8.10E-1	2.14E-1	3.89E-1	8.55E-1	1.18E0	8.38E-1	4.98E-1	4.71E-1
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	-0.70	-0.70	-0.42	-0.07	-0.45	-0.43	-0.72	0.03

* I-131/LL analysis data used.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.3 SURFACE WATER

In 1992, 39 surface water samples were analyzed for I-131/LL, 26 at the two indicator locations and 13 at the control location. Analyses for H-3 were performed on 12 samples, eight at indicator locations and four at the control location. Thirty-nine samples were analyzed for other radionuclides, 26 at indicator locations and 13 at the control location. All Selected Licensee Commitments radionuclides except H-3 showed zero ranges indicating that no other detectable activity was measured. All radionuclides, except H-3, were not significantly different from preoperational data and the control location levels. All radionuclides did not differ significantly from the thirteen-year average.

There is a moderate to poor probability of an increasing trend for H-3 indicator. The 1992 concentration of H-3 resulted in 4.07% of the Selected Licensee Commitments reporting levels. All other radionuclide indicators and controls exhibited moderate to no probability of increasing or decreasing trends. Table 3.3-A illustrates these trends.

Table 3.3-B shows the percentages of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicators at the location with the highest annual mean for 1991.

Table 3.3-B

Radionuclide	Concentration (pCi/l)	Reporting Level (pCi/l)	Percentage
H-3	8.13E2	2.00E4	4.07%
Mn-54	0.00E0	1.00E3	0.00%
Fe-59	0.00E0	4.00E2	0.00%
Co-58	0.00E0	1.00E3	0.00%
Co-60	0.00E0	3.00E2	0.00%
Zn-65	0.00E0	3.00E2	0.00%
Nb-95	0.00E0	4.00E2	0.00%
Zr-95	0.00E0	4.00E2	0.00%
I-131/LL	0.00E0	2.00E0	0.00%
Cs-134	0.00E0	3.00E1	0.00%
Cs-137	0.00E0	5.00E1	0.00%
Ba/La-140	0.00E0	2.00E2	0.00%

Table 3.3-A Concentration of Radionuclides in Surface Water

(Page 1 of 3)

Year	Concentration (pCi/liter)							
	H-3		Mn-54		Fe-59		Co-58	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	1.85E2	1.66E2	8.95E-1	6.35E-1	1.69E0	2.55E0	1.47E0	1.90E-1
1980	2.13E2	1.93E2	2.17E0	5.81E-1	5.21E-1	9.48E-1	1.17E0	-5.16E-2
1981	1.75E2	1.70E2	4.95E-2	-1.10E0	1.79E0	3.40E0	9.74E-1	-1.35E-1
1982	3.30E2	1.23E2	1.02E0	-1.22E-1	1.97E0	-3.99E-2	1.63E-1	5.10E-1
1983	5.75E2	3.67E2	-2.30E-1	9.74E-1	1.76E0	-7.08E-1	6.14E-1	5.08E-2
1984	4.10E2	2.65E2	-7.56E-2	-4.19E-1	-4.88E-1	9.15E-1	3.30E-1	4.24E-1
1985	7.33E2	*	1.01E0	-4.75E-1	3.91E-1	1.04E0	7.61E-1	1.65E-1
1986	2.33E3	6.13E2	5.13E-1	3.97E-1	-1.67E-1	4.36E-2	-2.95E-3	3.31E-1
1987	9.20E2	7.70E2	0.00E0	0.00E0	1.10E1	0.00E0	0.00E0	0.00E0
1988	9.40E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1989	8.22E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	6.77E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	7.53E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr. Avg.	6.97E2	2.05E2	4.35E-1	1.99E-1	1.47E0	6.84E-1	4.22E-1	1.29E-1
1992	8.13E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	0.46	-0.24	-0.6	-0.54	-0.11	-0.66	-0.84	-0.38

* No sample analyzed.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

Table 3.3-A Concentration of Radionuclides in Surface Water

(Page 2 of 3)

Year	Concentration (pCi/liter)							
	Co-60		Zn-65		Nb-95		Zr-95	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	2.45E0	2.60E0	8.62E-1	-5.33E-1	-2.53E-1*	5.77E-1*	-2.53E-1*	5.77E-1*
1980	1.36E0	1.12E0	7.70E-1	1.80E0	1.00E0*	-2.54E-1*	1.00E0*	-2.54E-1*
1981	2.47E-1	1.54E0	-6.29E-1	6.93E-1	-2.92E-1	3.50E-2	1.98E0	9.04E-1
1982	1.14E0	6.02E-1	6.28E-1	-3.93E-1	2.16E0	8.89E-1	2.23E0	8.92E-1
1983	1.66E0	2.01E0	-1.20E0	4.71E-1	3.22E-1	1.15E0	3.27E-2	1.41E0
1984	1.47E0	3.38E-1	-9.79E-2	5.91E-1	8.59E-1	2.66E-2	1.67E0	-1.45E-1
1985	3.86E-1	9.97E-1	1.22E0	-2.43E-2	6.10E-1	4.17E-1	1.16E0	1.74E0
1986	-1.36E-1	2.24E-2	-1.24E0	-1.65E0	1.05E0	1.19E0	1.33E0	-3.91E-1
1987	5.20E0	0.00E0	0.00E0	0.00E0	4.50E0	0.00E0	1.20E1	0.00E0
1988	0.00E0	0.00E0	2.70E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1989	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr. Avg.	1.07E0	7.10E-1	4.75E-1	2.73E-1	8.08E-1	3.30E-1	1.65E0	4.25E-1
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	-0.35	-0.81	-0.14	-0.54	-0.12	-0.38	-0.04	-0.47

* Nb-95 and Zr-95 analyzed as Nb/Zr-95

NOTE: All negative values were replaced with "zero's" for calculational purposes.

Table 3.3-A Concentration of Radionuclides in Surface Water

(Page 3 of 3)

Year	Concentration (pCi/liter)							
	I-131		Cs-134		Cs-137		Ba/La-140	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	2.66E0	-8.27E-1	-3.62E-1	-1.00E-1	2.63E0	-2.21E-1	2.26E-1	-4.25E-1
1980	1.13E0	1.20E0	-2.60E-1	-9.98E-1	1.97E0	1.27E0	9.70E-1	-3.20E-1
1981	2.32E0	-6.85E-1	2.10E-2	1.88E-1	1.05E0	2.45E0	6.98E-1	8.66E-1
1982	-3.11E-1	-9.19E-1	-5.68E-1	8.34E-1	1.23E-1	1.65E0	4.30E-1	-4.11E-1
1983	1.89E0	2.88E0	7.87E-1	2.50E-1	8.43E-1	2.39E-1	1.38E0	2.89E-1
1984	3.02E-2*	1.58E-1*	7.36E-1	1.70E0	9.46E-1	3.30E-2	-2.84E-1	-6.81E-3
1985	-8.69E-2*	-7.90E-2*	1.72E0	1.25E0	1.23E0	3.26E-1	3.79E-1	4.53E-1
1986	8.94E-2*	2.13E-2*	7.54E-1	1.13E-1	5.61E-1	1.97E-1	8.72E-1	8.29E-1
1987	0.00E0	0.00E0	4.40E0	0.00E0	4.70E0	0.00E0	0.00E0	0.00E0
1988	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1989	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr. Avg.	6.25E-1	3.28E-1	6.48E-1	3.33E-1	1.08E0	4.74E-1	3.81E-1	1.87E-1
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	-0.72	-0.32	-0.04	-0.25	-0.41	-0.58	-0.59	-0.26

* I-131/LL analysis data used.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.4 MILK

In 1992, 104 milk samples were analyzed, 78 at the three indicator locations and 26 at the control location.

All Selected Licensee Commitments radionuclides showed a zero range indicating no detectable activity was measured in 1992. The I-131/LL, Cs-134, Cs-137, and Ba/La-140 concentrations did not significantly differ from the twelve-year average, preoperational data, and control levels.

A high to moderate probability of a decreasing trend was indicated for Cs-137 indicator. All other radionuclide indicators and controls exhibited moderate to no probability of increasing or decreasing trends. These trends are illustrated in Table 3.4-A.

Table 3.4-B shows the percentages of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicators at the location with the highest annual mean for 1992.

Table 3.4-B

Radionuclide	Concentration (pCi/l)	Reporting Level(pCi/l)	Percentage
I-131/LL	0.00E0	3.00E0	0.00%
Cs-134	0.00E0	6.00E1	0.00%
Cs-137	0.00E0	7.00E1	0.00%
Ba/La-140	0.00E0	3.00E2	0.00%

Table 3.4-A Concentration of Radionuclides in Milk

Year	Concentration (pCi/liter)							
	I-131		Cs-134		Cs-137		Ba/La-140	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	6.87E-3	-6.13E-2	-7.05E-1	7.63E-1	2.48E1	6.04E0	0.00E0	-6.15E-1
1980	1.06E0	3.22E-2	-7.94E-2	-6.12E-1	1.72E1	4.13E0	1.29E0	1.33E-1
1981	-3.70E-3	-6.54E-2	1.37E0	-2.88E-1	2.04E1	4.15E0	3.77E-1	-7.95E-2
1982	-3.22E-2	-8.49E-2	9.44E-1	-4.38E-2	1.21E1	5.20E0	2.31E-1	-4.11E-1
1983	1.23E-2	-4.57E-2	1.26E0	1.55E0	2.02E1	2.82E0	4.44E-1	2.35E-1
1984	1.78E-2	-4.30E-2	1.08E0	1.80E0	1.48E1	2.56E0	4.79E-1	1.43E-1
1985	2.00E-2	-5.80E-2	9.32E-1	1.99E-1	1.42E1	2.72E0	5.78E-1	5.97E-1
1986	8.30E-1	7.55E-1	2.36E0	9.38E-1	3.74E0	3.45E0	2.95E-1	1.08E-1
1987	4.80E-1	0.00E0	5.10E0	3.60E0	5.20E0	8.60E0	0.00E0	4.40E0
1988	0.00E0	0.00E0	0.00E0	0.00E0	3.40E0	2.90E0	0.00E0	0.00E0
1989	0.00E0	0.00E0	0.00E0	0.00E0	6.00E0	5.60E0	0.00E0	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	5.30E0	2.60E0	0.00E0	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 Yr. Avg.	1.87E-1	6.06E-2	1.00E0	6.81E-1	1.13E1	3.91E0	2.84E-1	4.32E-1
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	-0.25	0.02	-0.08	-0.10	-0.92	-0.47	-0.58	0.08

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.5 BROADLEAF VEGETATION

In 1992, 48 broadleaf vegetation samples were analyzed, 36 at the three indicator locations and 12 at the control location. The 1986 data is higher than the other years due to the Chernobyl accident.

All Selected Licensee Commitments radionuclides except Cs-137 showed zero ranges indicating that no detectable activity was measured. Only one of 36 samples taken indicated Cs-137 activity. However, this concentration resulted in only 2.45% of the Selected Licensee Commitments reporting level.

The correlation coefficients for the location with the highest annual mean indicated a moderate to poor probability of an increasing trend for Cs-137 indicator. A moderate to poor probability of a decreasing trend was indicated for I-131 indicator and Cs-137 control. Since there were anomalous results in 1984 for Cs-134 and Cs-137, new concentrations for these radionuclides were calculated using the location with the highest annual mean excluding these anomalies. The remaining radionuclide indicators and controls exhibited poor to no probabilities of increasing or decreasing trends. These trends are illustrated in Table 3.5-A.

Table 3.5-B shows the percentage of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicators at the locations with the highest annual mean for 1992.

Table 3.5-B

Radionuclide	Concentration (pCi/kg)	Reporting Level(pCi/kg)	Percentage
I-131	0.00E0	1.00E2	0.00%
Cs-134	0.00E0	1.00E3	0.00%
Cs-137	4.90E1	2.00E3	2.45%

**Table 3.5-A Concentration of Radionuclides in Broadleaf
Vegetation**

YEAR	Concentration (pCi/kg-wet)					
	I-131		Cs-134		Cs-137	
	Indicator	Control	Indicator	Control	Indicator	Control
1979	-5.82E0	7.30E-1	-1.00E1	-1.06E1	2.19E1	1.93E1
1980	1.91E1	6.15E0	-2.59E0	-1.25E1	2.30E1	1.92E1
1981	-1.87E0	3.16E0	1.24E1	5.96E0	3.04E1	2.02E1
1982	1.41E1	6.59E0	1.50E1	-6.31E-1	2.46E1	1.22E1
1983	1.13E1	7.19E0	4.13E0	1.24E0	9.07E0	7.85E0
1984	6.06E0	5.99E0	8.46E0	2.80E0	1.02E1	1.05E1
1985	5.67E0	7.98E-1	9.77E0	1.66E1	8.05E0	2.37E-2
1986	2.85E1	1.76E1	2.53E1	2.07E1	4.03E1	1.27E1
1987	0.00E0	1.10E1	1.70E1	2.50E1	2.20E1	1.70E1
1988	0.00E0	0.00E0	0.00E0	0.00E0	3.90E1	3.40E1
1989	0.00E0	0.00E0	0.00E0	0.00E0	9.60E1	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	4.00E1	0.00E0
1991	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
13 YEAR AVERAGE	6.52E0	4.55E0	7.08E0	5.56E0	3.06E1	1.18E1
1992	0.00E0	0.00E0	0.00E0	0.00E0	3.30E1	0.00E0
CORRELATION COEFFICIENT	-0.37	-0.27	-0.22	0.01	0.52	-0.50

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.6 SHORELINE SEDIMENT

In 1992, six shoreline sediment samples were analyzed, four from two indicator locations and two at the control location.

The correlation coefficient for the location with the highest annual mean indicated a moderate to poor probability of an increasing trend for Cs-137 indicator. However, the Cs-137 concentration only corresponds to a small percentage of the Selected Licensee Commitments reporting level as shown in Table 3.6-B. Cs-134 control and Cs-137 control exhibited moderate to poor probability of a decreasing trend. The Cs-134 indicator exhibited poor to no probability of a trend. These trends are illustrated in Table 3.6-A and Figure 4.

Table 3.6-B

Radionuclide	Concentration (pCi/kg)	Reporting Level(pCi/kg)	Percentage
Cs-134	9.20E0	3.00E3	0.31%
Cs-137	8.60E1	3.00E3	2.87%

FIGURE 4

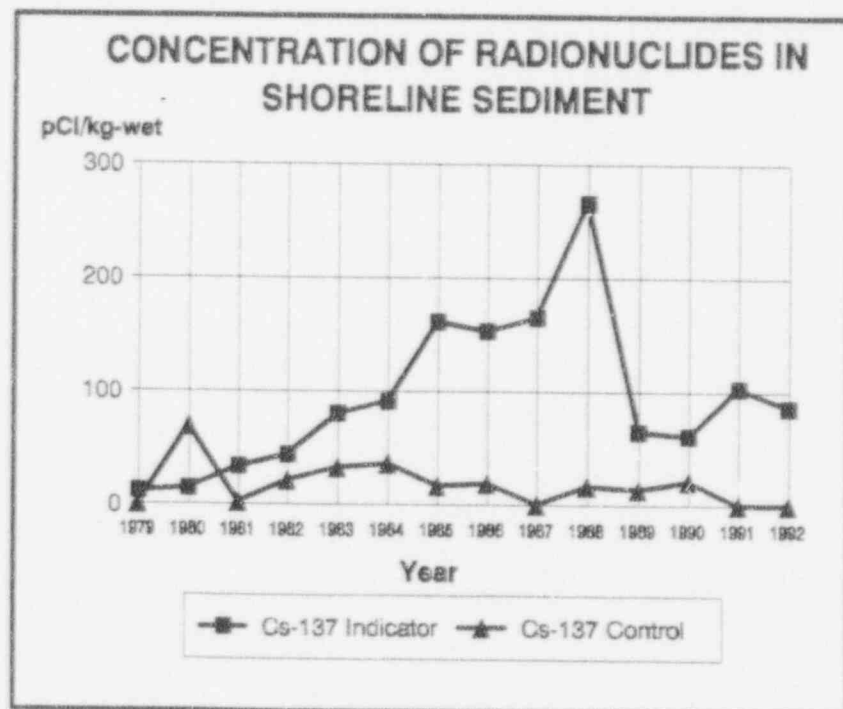


Table 3.6-A Concentration of Radionuclides in Shoreline Sediment

Year	Concentration (pCi/kg-dry)			
	Cs-134		Cs-137	
	Indicator	Control	Indicator	Control
1979	0.00E0	1.20E1	1.20E1	-1.77E1
1980	-3.53E0	-1.85E1	1.44E1	6.88E1
1981	3.97E1	6.08E0	3.36E1	1.65E0
1982	7.67E1	4.61E1	4.40E1	2.13E1
1983	7.65E1	2.78E1	8.02E1	3.28E1
1984	3.34E1	1.32E1	9.13E1	3.65E1
1985	2.02E1	1.03E1	1.61E2	1.70E1
1986	6.35E1	3.67E1	1.53E2	1.95E1
1987	4.20E1	2.40E1	1.65E2	0.00E0
1988	9.10E0	0.00E0	2.66E2	1.70E1
1989	5.30E1	0.00E0	6.50E1	1.40E1
1990	0.00E0	0.00E0	6.10E1	2.10E1
1991	0.00E0	0.00E0	0.00E0	0.00E0
13 Year Average	3.19E1	1.36E1	9.61E1	1.92E1
1992	9.20E0	0.00E0	8.60E1	0.00E0
Correlation Coefficient	-0.21	-0.37	0.45	-0.39

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.7 FISH

In 1992, 12 fish samples were analyzed, six at the indicator locations and six at the control location. All Selected Licensee Commitments radionuclides except Cs-137 showed zero ranges indicating no detectable activity was measured. All radionuclides were not significantly different from the thirteen-year average, preoperational data, and control location levels. The Cs-137 concentration corresponds to a small percentage of the Selected Licensee Commitments reporting level as shown in Table 3.7-B. The correlation coefficients for the location with the highest annual mean indicated a moderate to poor probability of an increasing trend for the indicator concentrations of Co-60, and Cs-137, a moderate to poor probability of a decreasing trend for the concentrations of Mn-54 (control), Co-58 (control), Co-60 (control), Zn65 (indicator and control), and a high to moderate probability of a decreasing trend for the control concentration of Fe-59. All other radionuclide indicators and controls exhibited moderate to no probability of increasing or decreasing trends. These trends are illustrated in Table 3.7-A and Figure 5.

Table 3.7-B

Radionuclide	Concentration (pCi/kg)	Reporting Level (pCi/kg)	Percentage
Mn-54	0.00E0	3.00E4	0.00%
Fe-59	0.00E0	1.00E4	0.00%
Co-58	0.00E0	3.00E4	0.00%
Co-60	0.00E0	1.00E4	0.00%
Zn-65	0.00E0	2.00E4	0.00%
Cs-134	0.00E0	1.00E3	0.00%
Cs-137	2.90E1	2.00E3	1.45%

Table 3.7-A Concentration of Radionuclides in Fish

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Year	Concentration (pCi/kg-wet)							
	Mn-54		Fe-59		Co-58		Co-60	
	Indicator	Control	Indicator	Control	Indicator	Control	Indicator	Control
1979	*	0.00E-0	*	3.71E1	*	-2.78E-1	*	9.86E0
1980	-1.97E1	1.14E1	-1.95E1	4.74E1	8.36E0	8.60E0	-2.25E1	1.14E1
1981	-2.71E0	2.74E0	3.70E0	2.97E1	-2.98E0	4.25E0	-2.65E0	-2.36E0
1982	-3.83E0	1.28E1	0.00E0	8.47E1	8.16E0	2.65E0	-4.34E-1	2.95E0
1983	-2.60E0	-1.84E0	-8.68E0	8.28E0	2.60E1	-5.31E0	1.11E1	2.42E0
1984	3.61E0	3.87E0	-1.23E1	2.21E1	1.45E2	4.15E0	2.82E1	2.83E0
1985	2.53E-1	-1.75E0	4.25E0	4.49E0	7.19E0	1.32E1	1.72E1	1.55E1
1986	1.03E0	-1.91E0	-1.21E0	3.77E0	3.17E1	-1.79E0	2.96E1	5.13E0
1987	0.00E0	0.00E0	0.00E0	0.00E0	2.71E2	0.00E0	1.25E2	0.00E0
1988	1.20E1	0.00E0	0.00E0	0.00E0	7.70E1	0.00E0	0.00E0	0.00E0
1989	9.00E1	5.40E0	0.00E0	0.00E0	4.05E2	0.00E0	2.99E2	0.00E0
1990	0.00E0	0.00E0	0.00E0	0.00E0	5.60E1	0.00E0	4.10E1	0.00E0
1991	6.20E0	0.00E0	0.00E0	0.00E0	1.40E1	0.00E0	6.50E1	0.00E0
13 Yr. Avg.	9.42E0	2.79E0	6.63E-1	1.83E1	8.75E1	2.53E0	5.13E1	3.85E0
1992	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
Corr. Coef	0.29	-0.45	-0.24	-0.72	0.30	-0.40	0.39	-0.55

* No sample analyzed.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

Table 3.7-A Concentration of Radionuclides in Fish

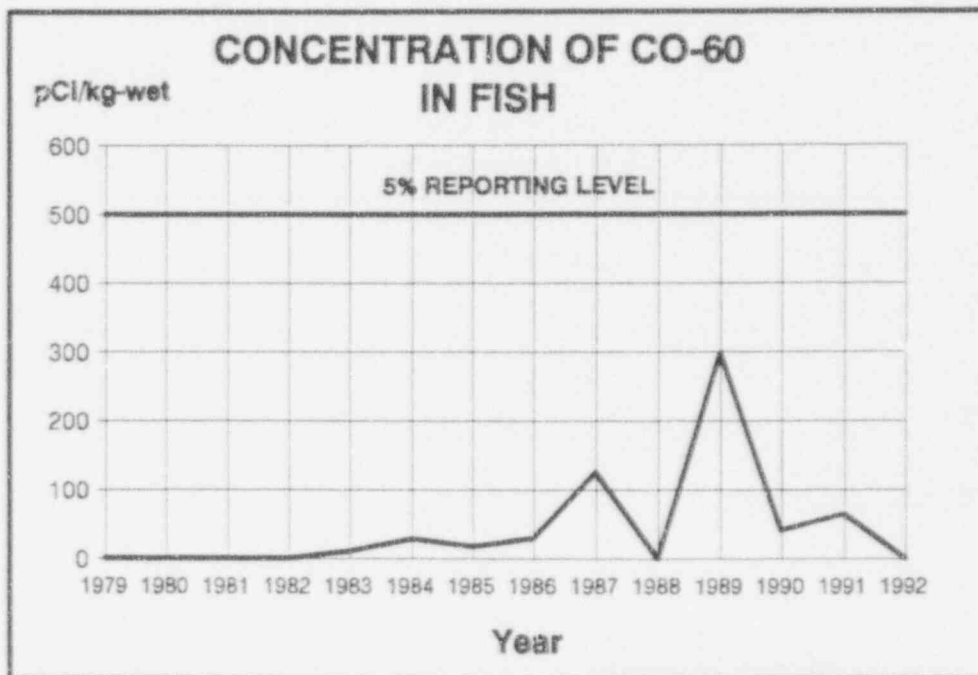
(Page 2 of 2)

YEAR	Concentration (pCi/kg-wet)					
	Zn-65		Cs-134		Cs-137	
	Indicator	Control	Indicator	Control	Indicator	Control
1979	*	1.73E0	*	-4.17E0	*	2.20E1
1980	-3.22E1	-2.26E1	-2.70E1	-2.10E0	-4.13E0	8.07E0
1981	4.62E0	1.16E0	-1.99E0	9.09E0	1.80E1	2.77E1
1982	-1.39E1	-9.21E0	-8.22E-1	3.57E-1	2.69E1	9.52E0
1983	-1.07E0	4.86E0	-1.32E0	-2.57E0	6.03E1	2.08E1
1984	-2.87E0	-3.26E0	3.11E1	-7.09E-1	4.38E1	8.18E0
1985	-2.55E0	3.17E0	-1.56E0	5.22E0	1.86E1	1.48E1
1986	-8.09E0	-1.40E1	1.67E1	1.56E0	3.49E1	8.64E0
1987	0.00E0	0.00E0	2.60E1	0.00E0	5.10E1	2.90E1
1988	0.00E0	0.00E0	2.70E1	0.00E0	3.60E1	2.30E1
1989	0.00E0	0.00E0	1.10E1	0.00E0	3.50E1	1.50E1
1990	0.00E0	0.00E0	0.00E0	0.00E0	3.30E1	1.60E1
1991	0.00E0	0.00E0	5.90E0	0.00E0	2.60E1	0.00E0
13 Year Average	3.85E-1	8.40E-1	9.81E0	1.25E0	3.20E1	1.61E1
1992	0.00E0	0.00E0	0.00E0	0.00E0	2.90E1	1.10E1
CORRELATION COEFFICIENT	-0.31	-0.37	0.22	-0.30	0.42	-0.21

* No sample analyzed.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

FIGURE 5



3.8 DIRECT GAMMA RADIATION

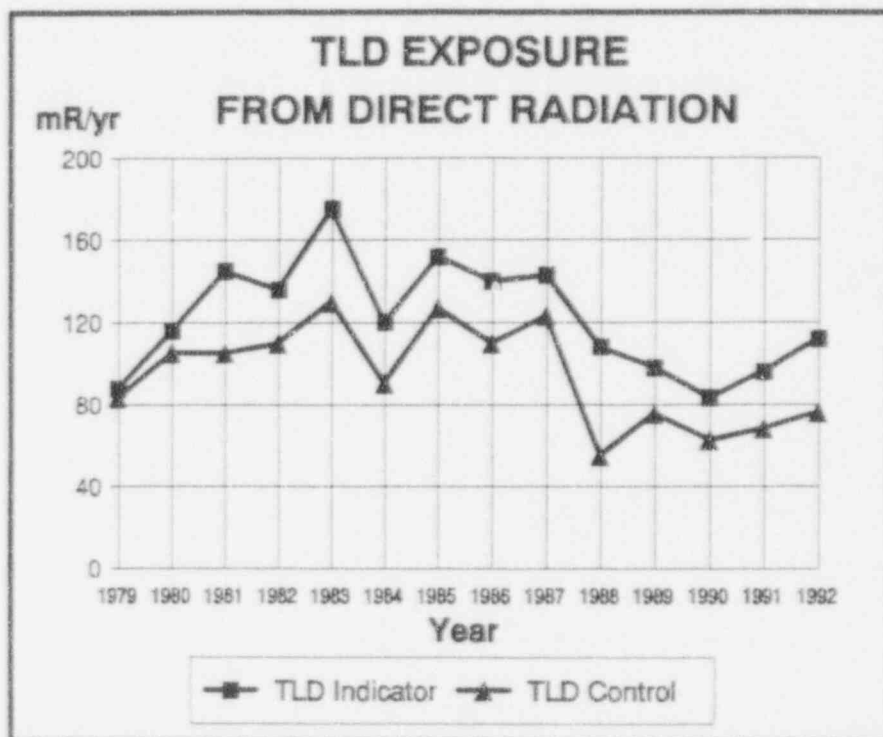
In 1992, 176 TLD's were analyzed, 172 at indicator locations and four at the control location. The 1992 exposure rate at the indicator location with the highest annual mean did not significantly differ from the preoperational data or thirteen-year average. Table 3.8-A and Figure 6 illustrate this summary.

Table 3.8-A TLD Exposure from Direct Radiation

YEAR	Exposure (mrem/yr)	
	Indicator	Control
1979	8.76E1	8.32E1
1980	1.16E2	1.05E2
1981	1.45E2	1.05E2
1982	1.36E2	1.10E2
1983	1.75E2	1.30E2
1984	1.20E2	9.02E1
1985	1.52E2	1.27E2
1986	1.40E2	1.10E2
1987	1.43E2	1.23E2
1988	1.08E2	5.48E1
1989	9.77E1	7.55E1
1990	8.30E1	6.23E1
1991	9.60E1	6.80E1
13 Year Average	1.22E2	9.45E1
1992	1.12E2	7.60E1

NOTE: The expected background for North Carolina is 120 mrem per year from FSAR 11.6.1.

FIGURE 6



The test statistic, or t-test, was used to compare the TLD measurements during preoperation to those taken during 1992. In this case, ratios of results from the 1-2 mile radius and the 4-5 mile radius were compared from one year to the next. Since the inner ring of TLD's are most likely to be affected by plant operations, the hypothesis was used that a significant change in the ratio from one year to another would be indicative of an environmental effect or some other phenomena requiring investigation. A statistically significant change in the ratio was determined by comparing the calculated t-value to the expected value of the test statistic based on the number of measurements and the desired accuracy of the results.

The value of the t-statistic was calculated by comparing preoperational results to 1991. As shown in Table 3.8-B, the t-value was -2.363. This is slightly higher than the expected value of ± 2.056 , based on 26 degrees of freedom and 95% confidence in the result ($\alpha = 0.025$, $n = 26$). However, it is well within the acceptable value of ± 2.779 based on 26 degrees of freedom and 99% confidence in the results.

Further review of the data in Table 3.8.2, shows the inner ring TLD results are slightly higher than in 1991, but well below the preoperational levels. In addition, the ratio of inner ring/outer ring results in 1992 are only 13% higher than the preoperational ratio. This is well within acceptable error limits for these low level measurements. The failure at the 95% confidence interval is believed to be due to the low variance in the measurements, which reduces the statistical uncertainty. As a result, it can be concluded that the operation of McGuire has had a negligible impact on doserates around the plant and surrounding environs.

Table 3.8-B
Comparison of Inner Ring/Outer Ring TLD Results

	1992 (mr/yr)	Preop (mr/yr)
Inner Ring	56.47	79.14
Outer Ring	55.54	88.16
Ratio	1.04	0.91
Variance	0.02	0.02
t-value	-2.363	
t-table (95%)	-2.056	
t-table (99%)	-2.779	

3.9 FOOD PRODUCTS

In 1992, 17 food products (crops) samples were analyzed, all at the two indicator locations. No control site was available for food products in 1992. All Selected Licensee Commitments radionuclides exhibited a zero range indicating no measurable activity present.

The I-131, Cs-137, and Cs-134 concentrations did not significantly differ from the thirteen-year average and preoperational data. The concentrations of I-131 and Cs-134 exhibited moderate to no probability of a decreasing trend, while Cs-137 exhibited high to moderate probability of a decreasing trend. No control sites were available for 1984 through 1992; therefore, a representative correlation coefficient could not be calculated for the control data. Table 3.9-A illustrates this summary.

Table 3.9-B shows the percentages of environmental concentrations to the Selected Licensee Commitments reporting levels for the indicators at the location with the highest annual mean for 1992. No activity was detected and therefore no reporting levels were approached.

Table 3.9-B

Radionuclide	Concentration (pCi/kg)	Reporting Level (pCi/kg)	Percentage
I-131	0.00E0	1.00E2	0.00%
Cs-134	0.00E0	1.00E3	0.00%
Cs-137	0.00E0	2.00E3	0.00%

Table 3.9-A Concentration of Radionuclides in Food Products

YEAR	Concentration (pCi/kg-wet)					
	I-131		Cs-134		Cs-137	
	Indicator	Control	Indicator	Control	Indicator	Control
1979*	-5.82E0	7.30E-1	-1.00E1	-1.06E1	2.19E1	1.93E1
1980*	1.91E1	6.15E0	-2.59E0	-1.25E1	2.30E1	1.92E1
1981*	-1.87E0	3.16E0	1.24E1	5.96E0	3.04E1	2.02E1
1982*	1.41E1	6.59E0	1.50E1	-6.31E-1	2.46E1	1.22E1
1983*	1.13E1	7.19E0	4.13E0	1.24E0	9.07E0	7.85E0
1984	-5.08E-1	**	4.49E-1	**	8.45E0	**
1985	1.02E-1	**	-2.48E0	**	7.99E0	**
1986	1.52E1	**	1.74E0	**	2.15E1	**
1987	0.00E0	**	0.00E0	**	2.90E1	**
1988	0.00E0	**	0.00E0	**	0.00E0	**
1989	0.00E0	**	0.00E0	**	0.00E0	**
1990	0.00E0	**	0.00E0	**	0.00E0	**
1991	0.00E0	**	0.00E0	**	0.00E0	**
13 YEAR AVERAGE	4.60E0	4.76E0	2.59E0	1.44E0	1.35E1	1.58E1
1992	0.00E0	**	0.00E0	**	0.00E0	**
CORRELATION COEFFICIENT	-0.45	---	-0.44	---	-0.74	---

* Broadleaf vegetation samples used for food products media.

** No control site available.

--- Insufficient data to calculate a representative correlation coefficient.

NOTE: All negative values were replaced with "zero's" for calculational purposes.

3.10 LAND USE CENSUS

The land use census was completed May 29, 1992 and the results are shown in Table 3.10. The 1992 census revealed seven new irrigated gardens at 2.8 miles NNW, 2 at 3.3 miles NNW, 3.9 miles NNW, 3.2 miles N, 3.4 miles N, and 4.4 miles SSE. The census revealed five milk animal locations that were not included in the 1991 sampling program. However, four of the locations do not produce sufficient volume to be added to the program and the fifth is outside the five kilometer area of participation. The census revealed one closer residence in the SSW sector. The residence in the NNW sector is shown on Table 3.10 to be .5 miles closer than last year; however, this is due to an error in last years (1991) data measurement. The corrected distance for 1991 and 1992 is 1.25 miles.

Table 3.10 Land Use Census Results

Page 1 of 2

<u>SECTOR</u>		<u>DISTANCE</u>
N	Nearest Residence	2.7 miles
	Nearest Meat Animal	None in 5 miles
	Nearest Garden	2.8 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
NNE	Nearest Residence	1.5 miles
	Nearest Meat Animal	None in 5 miles
	Nearest Garden	2.6 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
NE	Nearest Residence	2.0 miles
	Nearest Meat Animal	None in 5 miles
	Nearest Garden	2.2 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
ENE	Nearest Residence	0.7 miles
	Nearest Meat Animal	4.0 miles
	Nearest Garden	2.95 miles
	Nearest Cow	3.6 miles
	Nearest Goat	None in 5 miles
E	Nearest Residence	0.5 miles
	Nearest Meat Animal	4.0 miles
	Nearest Garden	0.75 miles
	Nearest Cow	2.6 miles
	Nearest Goat	None in 5 miles
ESE	Nearest Residence	0.5 miles
	Nearest Meat Animal	1.3 miles
	Nearest Garden	0.8 miles
	Nearest Cow	2.8 miles
	Nearest Goat	1.4 miles
SE	Nearest Residence	0.8 miles
	Nearest Meat Animal	1.5 miles
	Nearest Garden	0.85 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	1.9 miles
SSE	Nearest Residence	0.9 miles
	Nearest Meat Animal	2.9 miles
	Nearest Garden	0.9 miles
	Nearest Cow	2.8 miles
	Nearest Goat	None in 5 miles
S	Nearest Residence	1.3 miles
	Nearest Meat Animal	None in 5 miles
	Nearest Garden	3.1 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles

Table 3.10 Land Use Census Results

Page 2 of 2

<u>SECTOR</u>		<u>DISTANCE</u>
SSW	Nearest Residence	2.1 miles
	Nearest Meat Animal	2.5 miles
	Nearest Garden	2.1 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
SW	Nearest Residence	1.8 miles
	Nearest Meat Animal	None in 5 miles
	Nearest Garden	1.8 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
WSW	Nearest Residence	1.0 miles
	Nearest Meat Animal	4.9 miles
	Nearest Garden	1.25 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
W	Nearest Residence	0.9 miles
	Nearest Meat Animal	3.1 miles
	Nearest Garden	1.2 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	3.3 miles
WNW	Nearest Residence	1.1 miles
	Nearest Meat Animal	4.9 miles
	Nearest Garden	1.75 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
NW	Nearest Residence	1.5 miles
	Nearest Meat Animal	3.75 miles
	Nearest Garden	2.2 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles
NNW	Nearest Residence	1.25 miles
	Nearest Meat Animal	3.6 miles
	Nearest Garden	1.75 miles
	Nearest Cow	None in 5 miles
	Nearest Goat	None in 5 miles

4.0 EVALUATION OF DOSE FROM ENVIRONMENTAL MEASUREMENTS VERSUS ESTIMATED DOSE FROM RELEASES

4.1 DOSE FROM ENVIRONMENTAL MEASUREMENTS

Doses were estimated for measured concentrations of radionuclides in direct pathways to man using NRC Regulatory Guide 1.109 methodology. The highest annual mean values for each sample type and radionuclide were used after the background concentrations, as measured at the control location, had been subtracted. The maximum exposed individual doses are summarized in Table 4.1.

4.2 ESTIMATED DOSE FROM RELEASES

Doses were estimated for release concentrations of radionuclides in direct pathways to man using NRC Regulatory Guide 1.109 methodology. The doses were calculated using GASPAP and LADTAP computer programs. The maximum exposed individual's doses are summarized in Table 4.1.

4.3 COMPARISON OF DOSES

The environmental doses compared well with doses calculated from effluent releases. 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.

In the liquid pathway, the environmental data doses for the bone were higher than the comparable effluent dose. This can be attributed to differences in dose calculation methodology which tends to bias the environmental dose high. Environmental doses are calculated using the high mean of detectables. Also, Cs-137 was the only isotope identified in the environmental fish samples in 1992, and effluent dose models do not account for buildup in the environment as can occur with Cesium. This tends to bias the effluent dose calculations low. It is observed that the 1992 Cs-137 concentration in fish did not differ from those in previous years and were in fact somewhat lower. This trend will continue to be observed and evaluated in future years to ensure detection of significant changes.

In the gaseous pathway, all the environmental data doses are the result of one Broadleaf Vegetation sample that contained Cs-137. The doses were conservatively calculated based on only that one sample.

The doses, as calculated using the environmental sample results, are well below the limits specified in Selected Licensee Commitments Manual Section 16.11-12.

4.4 PATHWAY DOSE CALCULATIONS

Dose calculations for each age and pathway can be found on the following pages.

TABLE 4.1

(Page 1 of 2)

1992 ENVIRONMENTAL AND EFFLUENT DOSESLiquid Release Pathway

Organ	Environmental or Effluent Data	Critical Age	Critical Pathway	Maximum Dose (mrem)
Skin	Environ.	Teen	Shoreline Sediment	1.20E-3
Skin	Effluent	Teen	Shoreline Sediment	4.70E-3
Bone	Environ.	Child	Fish	6.54E-2
Bone	Effluent	Child	Fish	3.08E-2
Liver	Environ.	Child	Drinking Water	6.97E-2
Liver	Effluent	Child	Drinking Water	9.58E-2
T. Body	Environ.	Child	Drinking Water	6.97E-2
T. Body	Effluent	Adult	Drinking Water	7.26E-2
Thyroid	Environ.	Child	Drinking Water	6.97E-2
Thyroid	Effluent	Child	Drinking Water	7.10E-2
Kidney	Environ.	Child	Drinking Water	6.97E-2
Kidney	Effluent	Child	Drinking Water	7.30E-2
Lung	Environ.	Child	Drinking Water	6.97E-2
Lung	Effluent	Child	Drinking Water	6.66E-2
GI-LLI	Environ.	Child	Drinking Water	6.97E-2
GI-LLI	Effluent	Adult	Fish	1.68E-1

TABLE 4.1

(Page 2 of 2)

1992 ENVIRONMENTAL AND EFFLUENT DOSESGaseous Release PathwayNoble Gas Exposure

Organ	Environmental or Effluent Data	Critical Age	Critical Pathway	Maximum Dose (mrem)
Skin	Environ.	-	-	Noble Gas Not Sampled
Skin	Effluent	N/A	Noble Gas Exposure	1.91E+0
T. Body	Environ.	-	-	Noble Gas Not Sampled
T. Body	Effluent	N/A	Noble Gas Exposure	8.20E-1

Iodine, Particulate, and Tritium Exposure

Organ	Environmental or Effluent Data	Critical Age	Critical Pathway	Maximum Dose (mrem)
Bone	Environ.	Child	Broadleaf Vegetation	4.17E-1
Liver	Environ.	Child	Broadleaf Vegetation	3.99E-1
T. Body	Environ.	Adult	Broadleaf Vegetation	2.24E-1
Thyroid	Environ.	-	-	0.00E0
Thyroid	Effluent	Infant	Goat Milk	3.18E-1
Kidney	Environ.	Child	Broadleaf Vegetation	1.30E-1
Lung	Environ.	Child	Broadleaf Vegetation	4.68E-2
GI-LLI	Environ.	Adult	Broadleaf Vegetation	6.62E-3

Dose from Air Radioiodine Inhalation Pathway for 1992 Data Maximum Exposed Infant

Breathing rate = 1400 m³/yr

Highest Annual Mean Concentration

Radionuclide	INFANT															
	Inhalation Dose Factor (mrem per pCi inhaled)								Dose (mrem/yr)							
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	Air (pCi/m3)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.81E-05	3.56E-06	NO DATA	3.56E-06	7.14E-04	5.04E-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	8.71E-07	1.30E-06	NO DATA	NO DATA	5.55E-04	7.95E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	9.69E-06	1.68E-05	6.77E-06	NO DATA	NO DATA	7.25E-04	1.77E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	5.73E-06	8.41E-06	NO DATA	NO DATA	3.22E-03	2.28E-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	1.38E-05	4.47E-05	2.22E-05	NO DATA	2.32E-05	4.62E-04	3.67E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	1.12E-05	4.59E-06	2.70E-06	NO DATA	3.37E-06	3.42E-04	9.05E-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
Zr-95	8.24E-05	1.99E-05	1.45E-05	NO DATA	2.22E-05	1.25E-03	1.55E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	2.71E-05	3.17E-05	1.40E-05	1.06E-02	3.70E-05	NO DATA	7.56E	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	2.83E-04	5.02E-04	5.32E-05	NO DATA	1.36E-04	5.69E-05	9.53E-07	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	3.92E-04	4.37E-04	3.25E-05	NO DATA	1.23E-04	5.09E-05	9.53E-07	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	4.00E-05	4.00E-08	2.07E-06	NO DATA	9.59E-09	1.14E-03	2.74E-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

Total Dose Equivalent (mrem/yr) =

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Air Particulate Inhalation Pathway for 1992 Data Maximum Exposed Infant

Breathing rate = 1400 m³/yr

Highest Annual Mean Concentration

Radionuclide	INFANT															
	Inhalation Dose Factor (mrem per pCi inhaled fed)								Indicator Location	Air (pCi/m ³)	Dose (mrem/yr)					
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Bone			Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.81E-05	3.56E-06	NO DATA	3.56E-06	7.14E-04	5.04E-06	ALL	0.00E+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	8.71E-07	1.30E-06	NO DATA	NO DATA	5.55E-04	7.95E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	9.69E-06	1.68E-05	6.77E-06	NO DATA	NO DATA	7.25E-04	1.77E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	5.73E-06	8.41E-06	NO DATA	NO DATA	3.22E-03	2.28E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.38E-05	4.47E-05	2.22E-05	NO DATA	2.32E-05	4.62E-04	3.67E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	1.12E-05	4.59E-06	2.70E-06	NO DATA	3.37E-06	3.42E-04	9.05E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	8.24E-05	1.99E-05	1.45E-05	NO DATA	2.22E-05	1.25E-03	1.55E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	2.71E-05	3.17E-05	1.40E-05	1.06E-02	3.70E-05	NO DATA	7.56E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.83E-04	5.02E-04	5.32E-05	NO DATA	1.36E-04	5.69E-05	9.53E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.92E-04	4.37E-04	3.25E-05	NO DATA	1.23E-04	5.09E-05	9.53E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	4.00E-05	4.00E-08	2.07E-06	NO DATA	9.59E-09	1.14E-03	2.74E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose Equivalent (mrem/yr)=

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Drinking Water Pathway for 1992 Data Maximum Exposed Infant

Usage (intake rate) = 330 L/yr

Highest Annual Mean Concentration

Radionuclide	INFANT										Indicator Location	Water (pCi/L)	Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI			
Mn-54	NO DATA	1.99E-05	4.51E-06	NO DATA	4.41E-06	NO DATA	7.31E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	3.80E-06	8.98E-06	NO DATA	NO DATA	NO DATA	8.97E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	3.08E-05	5.38E-05	2.12E-05	NO DATA	NO DATA	1.59E-05	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	1.08E-05	2.55E-05	NO DATA	NO DATA	NO DATA	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.84E-05	6.31E-05	2.91E-05	NO DATA	3.06E-05	NO DATA	5.33E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	4.20E-08	1.73E-08	1.00E-08	NO DATA	1.24E-08	NO DATA	1.46E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	2.06E-07	5.02E-08	3.56E-08	NO DATA	5.41E-08	NO DATA	2.50E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	NO DATA	1.51E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	3.77E-04	7.03E-04	7.10E-05	NO DATA	1.81E-04	7.42E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	5.22E-04	8.11E-04	4.33E-05	NO DATA	1.64E-04	6.64E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	1.71E-04	1.71E-07	8.81E-08	NO DATA	4.06E-08	1.05E-07	4.20E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	132	673	0.00E+00	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02
Total Dose Equivalent (mrem/yr) =										0.00E+00	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02	6.84E-02

Dose from Milk Pathway for 1992 Data Maximum Exposed Infant

Usage (intake rate) = 330 L/yr

Highest Annual Mean Concentration

Radionuclide	INFANT										Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	Milk (pCi/L)	Bone	Liver	T. Body	Thyroid	Kidney	GI-LLI
Ingestion Dose Factor (mrem per pCi ingested)															
Mn-54	NO DATA	1.99E-05	4.51E-06	NO DATA	4.41E-06	NO DATA	7.31E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	3.60E-06	8.98E-06	NO DATA	NO DATA	NO DATA	8.97E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	3.08E-05	5.38E-05	2.12E-05	NO DATA	NO DATA	1.59E-05	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	1.08E-05	2.55E-05	NO DATA	NO DATA	NO DATA	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.84E-05	6.31E-05	2.91E-05	NO DATA	3.06E-05	NO DATA	5.33E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	4.20E-08	1.73E-08	1.00E-08	NO DATA	1.24E-08	NO DATA	1.48E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	2.06E-07	5.02E-08	3.56E-08	NO DATA	5.41E-08	NO DATA	2.50E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	3.59E-05	4.23E-05	1.86E-05	1.38E-02	4.94E-05	NO DATA	1.51E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	3.77E-04	7.03E-04	7.10E-05	NO DATA	1.81E-04	7.42E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	5.22E-04	6.11E-04	4.33E-05	NO DATA	1.64E-04	6.64E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	1.71E-04	1.71E-07	8.81E-06	NO DATA	4.06E-08	1.05E-07	4.20E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Dose Equivalent (mrem/yr) =										0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Dose from Inhalation Air Radioiodines Pathway for 1992 Data Maximum Exposed Child

Breathing rate = 3700 m³/yr

Highest Annual Mean Concentration

CHILD																
Radionuclide	Inhalation Dose Factor (mrem per pCi inhaled)							Indicator Location	Air (pCi/m3)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI			Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.16E-05	2.57E-06	NO DATA	2.71E-06	4.26E-04	6.19E-06	ALL	0.00E+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	4.79E-07	8.55E-07	NO DATA	NO DATA	2.99E-04	9.29E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	5.59E-06	9.04E-06	4.51E-06	NO DATA	NO DATA	3.43E-04	1.91E-05	ALL	0.00E+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	3.55E-06	6.12E-06	NO DATA	NO DATA	1.91E-03	2.60E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.15E-05	3.06E-05	1.90E-05	NO DATA	1.93E-05	2.69E-04	4.41E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.35E-06	2.48E-06	1.77E-06	NO DATA	2.33E-06	1.66E-04	1.00E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	5.13E-05	1.13E-05	1.00E-05	NO DATA	1.61E-05	6.03E-04	1.65E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	1.30E-05	1.30E-05	7.37E-06	4.39E-03	2.13E-05	NO DATA	7.68E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	1.76E-04	2.74E-04	6.07E-05	NO DATA	8.93E-05	3.27E-05	1.04E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	2.45E-04	2.23E-04	3.47E-05	NO DATA	7.63E-05	2.81E-05	9.78E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.00E-05	1.75E-08	1.17E-06	NO DATA	5.71E-09	4.71E-04	2.75E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Dose Equivalent(mrem/yr)=										0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Dose from Inhalation Air Particulate Pathway for 1992 Data Maximum Exposed Child

Breathing rate = 3700 (m3/yr)

Highest Annual Mean Concentration

Radionuclide	CHILD								Indicator Location	Air (pCi/m3)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Inhalation Dose Factor (mrem per pCi inhaled)		Lung	GI-LLI	Bone			Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	
				Thyroid	Kidney												
Mn-54	NO DATA	1.16E-05	2.57E-06	NO DATA	2.71E-06	4.26E-04	8.19E-06	ALL	0.00E+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	4.79E-07	8.55E-07	NO DATA	NO DATA	2.99E-04	9.29E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Fe-59	5.59E-06	9.04E-06	4.51E-06	NO DATA	NO DATA	3.43E-04	1.91E-05	ALL	0.00E+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	3.55E-06	6.12E-06	NO DATA	NO DATA	1.91E-03	2.60E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Zn-65	1.15E-05	3.06E-05	1.90E-05	NO DATA	1.93E-05	2.69E-04	4.41E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Nb-95	6.35E-06	2.48E-06	1.77E-06	NO DATA	2.33E-06	1.66E-04	1.00E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Zr-95	5.13E-05	1.13E-05	1.00E-05	NO DATA	1.81E-05	8.03E-04	1.65E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
I-131	1.30E-05	1.30E-05	7.37E-06	4.39E-03	2.13E-05	NO DATA	7.68E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Cs-134	1.76E-04	2.74E-04	6.07E-05	NO DATA	8.93E-05	3.27E-05	1.04E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Cs-137	2.45E-04	2.23E-04	3.47E-05	NO DATA	7.83E-05	2.81E-05	9.78E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
BaLa-140	2.00E-05	1.75E-08	1.17E-06	NO DATA	5.71E-09	4.71E-04	2.75E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Total Dose Equivalent (mrem/yr) =											0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Dose from Drinking Water Pathway for 1992 Data Maximum Exposed Child

Usage (intake rate) = 510 (l/yr)

CHILD Highest Annual Mean Concentration

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)						Indicator Location	Water (pCi/l)	Dose (mrem/yr)					
	Bone	Liver	T. Body	Thyroid	Kidney	Lung			Bone	Liver	T. Body	Thyroid	Kidney	Lung
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
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
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
Co-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
Nb-95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
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
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	132	673	0.00E+00	6.97E-02	6.97E-02	6.97E-02	6.97E-02

Total Dose Equivalent(mrem/yr) =

0.00E+00 6.97E-02 6.97E-02 6.97E-02 6.97E-02 6.97E-02 6.97E-02

Dose from Milk Pathway for 1992 Data Maximum Exposed Child

Usage (intake rate) = 330.00 (l/yr)

Highest Annual Mean Concentration

CHILD

Ingestion Dose Factor
(mrem per pCi ingested)

Radionuclide	Bone	Liver	T. Body	Thyroid	F _{1/2} (yrs)	Lung	GI-LLI	Indicator Location	Milk (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-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
Ce-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose (mrem/yr) =

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Broadleaf Vegetation Pathway for 1992 Data Maximum Exposed Child

Usage (intake rate) = 26 kg/yr

CHILD

Highest Annual Mean Concentration

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)							Indicator Location	Food (pCi/kg)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI			Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	120	49.00	4.17E-01	3.99E-01	5.89E-02	0.00E+00	1.30E-01	4.68E-02	2.50E-03
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose (mrem/yr) = 4.17E-01 3.99E-01 5.89E-02 0.00E+00 1.30E-01 4.68E-02 2.50E-03

Dose from Shoreline Sediment Pathway for 1992 Data *Maximum Exposed Child*

Shoreline Recreation 14 hr/yr
 Shore Width Factor = 0.3 (lake shore - location 129)
 Shore Width Factor = 0.2 (river shoreline - location 130)

External Dose Factor for Standing on Contaminated Ground			Highest Annual Mean Concentration			
Radionuclide	(mrem/hr per pCi/m ²)		Indicator Location	Dose (mrem/yr)		
	T. Body	Skin		Sediment (pCi/kg)	T. Body	Skin
Mn-54	5.80E-09	6.80E-09	125	9.4	9.16E-06	1.07E-05
Co-58	7.00E-09	8.20E-09	ALL	0.0	0.00E+00	0.00E+00
Fe-59	8.00E-09	9.40E-09	ALL	0.0	0.00E+00	0.00E+00
Co-60	1.70E-08	2.00E-08	129	51.0	1.46E-04	1.71E-04
Zn-65	4.00E-09	4.60E-09	ALL	0.0	0.00E+00	0.00E+00
Nb-95	5.10E-09	6.00E-09	ALL	0.0	0.00E+00	0.00E+00
Zr-95	5.00E-09	5.80E-09	ALL	0.0	0.00E+00	0.00E+00
I-131	2.80E-09	3.40E-09	ALL	0.0	0.00E+00	0.00E+00
Cs-134	1.20E-08	1.40E-08	129	9.2	1.85E-05	2.16E-05
Cs-137	4.20E-09	4.90E-09	130	86.0	4.05E-05	4.72E-05
BaLa-140	2.10E-09	2.40E-09	ALL	0.0	0.00E+00	0.00E+00

Total Dose (mrem/yr) = 2.14E-04 2.51E-04

Dose from Fish Pathway for 1992 Data Maximum Exposed Child

Usage (intake rate) = 6.9 kg/yr

Highest Annual Mean Concentration

CHILD

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)						Indicator Location	Fish (pCi/kg)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung			GI-LLI	Bone	Liver	T. Body	Thyroid	Kidney	Lung
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
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
Fe-58	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
Co-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
Nb-95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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
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
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	129	29.00	6.54E-02	6.26E-02	9.24E-03	2.04E-02	7.34E-03	3.92E-04
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose (mrem/yr) =

6.54E-02 6.26E-02 9.24E-03 2.04E-02 7.34E-03 3.92E-04

Dose from Food Pathway (Crops) for 1992 Data Maximum Exposed Child

Usage (intake rate) = 520 kg/yr

Highest Annual Mean Concentration

CHILD

Ingestion Dose Factor
(mrem per pCi ingested)

Radionuclide	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	5.29E-06	1.58E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	2.25E-08	8.76E-09	6.28E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose Equivalent(mrem/yr)=

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Air Radioiodines Inhalation Pathway for 1992 Data Maximum Exposed Teen

Usage (intake rate) = 8000 (m3/yr)

Highest Annual Mean Concentration

Radionuclide	TEEN															
	Inhalation dose factor (mrem per pCi inhaled)								Dose (mrem/yr)							
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	Air (pCi/m3)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	6.39E-06	1.05E-06	NO DATA	1.59E-06	2.48E-04	8.35E-06	ALL	0.00E+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	2.59E-07	3.47E-07	NO DATA	NO DATA	1.86E-04	1.19E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.09E-06	4.62E-06	1.79E-06	NO DATA	NO DATA	1.91E-04	2.23E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	1.89E-06	2.48E-06	NO DATA	NO DATA	1.09E-03	3.24E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	4.82E-06	1.67E-05	7.80E-06	NO DATA	1.08E-05	1.55E-04	5.83E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	2.32E-06	1.29E-06	7.08E-07	NO DATA	1.25E-06	9.39E-05	1.21E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.82E-05	5.73E-06	3.94E-06	NO DATA	8.42E-06	3.36E-04	1.86E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.43E-06	6.14E-06	3.30E-06	1.83E-03	1.05E-05	NO DATA	8.11E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.28E-05	1.41E-04	6.86E-05	NO DATA	4.69E-05	1.83E-05	1.22E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	8.38E-05	1.06E-04	3.89E-05	NO DATA	3.80E-05	1.51E-05	1.06E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	6.84E-06	8.38E-09	4.40E-07	NO DATA	2.85E-09	2.54E-04	2.86E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose Equivalent (mrem/yr)=

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Air Particulate Inhalation Pathway for 1992 Data Maximum Exposed Teen

Usage (intake rate) = 8000 (m³/yr)

Highest Annual Mean Concentration

Radionuclide	TEEN										Indicator Location	Air (pCi/m3)	Dose (mrem/yr)						
	Inhalation dose factor (mrem per pCi inhaled)												T. Body	Thyroid	Kidney	Lung	GI-LLI		
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Bone	Liver	T. Body									
Mn-54	NO DATA	8.39E-06	1.05E-06	NO DATA	1.59E-06	2.48E-04	8.35E-06	ALL	0.00E+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	2.59E-07	3.47E-07	NO DATA	NO DATA	1.88E-04	1.19E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Fe-59	1.09E-06	4.62E-06	1.79E-06	NO DATA	NO DATA	1.91E-04	2.23E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Co-60	NO DATA	1.89E-06	2.48E-06	NO DATA	NO DATA	1.09E-03	3.24E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Zn-65	4.82E-06	1.67E-05	7.80E-06	NO DATA	1.08E-05	1.55E-04	5.83E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Nb-95	2.32E-06	1.29E-06	7.08E-07	NO DATA	1.25E-06	9.39E-05	1.21E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Zr-95	1.82E-05	5.73E-06	3.94E-06	NO DATA	8.42E-06	3.36E-04	1.86E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
I-131	4.43E-06	6.14E-06	3.30E-06	1.83E-03	1.05E-05	NO DATA	8.11E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Cs-134	6.28E-05	1.41E-04	6.86E-05	NO DATA	4.69E-05	1.83E-05	1.22E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Cs-137	8.38E-05	1.06E-04	3.89E-05	NO DATA	3.80E-05	1.51E-05	1.06E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
BaLa-140	6.84E-06	8.38E-09	4.40E-07	NO DATA	2.85E-09	2.54E-04	2.86E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Total Dose Equivalent (mrem/yr)=													0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Dose from Drinking Water Pathway for 1992 Data Maximum Exposed Teen

Usage (intake rate) = 510 L/yr

Highest Annual Mean Concentration

Teen

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)						Indicator Location	Drinking Water (pCi/L)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung			GI-LLI	Bone	Liver	T. Body	Thyroid	Kidney	Lung
Mn-54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05	ALL	0.0	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	0.0	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	0.0	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	0.0	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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.01E-08	NO DATA	3.00E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.0	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	0.0	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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.3E-05	ALL	0.0	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	132	673	0.00E+00	3.64E-02	3.64E-02	3.64E-02	3.64E-02	3.64E-02

Total Dose Equivalent (mrem/yr)=

0.00E+00 3.64E-02 3.64E-02 3.64E-02 3.64E-02 3.64E-02

Dose from Milk Pathway for 1992 Data Maximum Exposed Teen

Usage (intake rate) = 400 L/yr

Teen Highest Annual Mean Concentration

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)										Indicator Location	Milk (pCi/L)	Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	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	0.0	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	0.0	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	0.0	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	0.0	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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.01E-08	NO DATA	3.00E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.0	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	0.0	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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		

Total Dose Equivalent (mrem/yr)=

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Broadleaf Vegetation Pathway for 1992 Data Maximum Exposed Teen

Usage (intake rate) = 42 (kg/yr)

Highest Annual Mean Concentration

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)										Indicator Location	Food (kg/yr)	Dose (mrem/yr)					
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	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	NO DATA	1.21E-05	ALL	0.0	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	NO DATA	1.34E-05	ALL	0.0	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	ALL	0.0	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	ALL	0.0	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	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.01E-08	NO DATA	3.00E-05	ALL	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	ALL	0.0	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	ALL	0.0	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	120	49.0	2.30E-01	3.07E-01	1.07E-01	0.00E+00	1.04E-01	4.05E-02	4.36E-03		
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05	ALL	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		

Total Dose Equivalent (mrem/yr)=

2.30E-01 3.07E-01 1.07E-01 0.00E+00 1.04E-01 4.05E-02 4.36E-03

Dose from Shoreline Sediment Pathway for 1992 Data Maximum Exposed Teen

Shoreline Recreation 67 hr/yr
 Shore Width Factor = 0.3 (lake shore - location 129)
 Shore Width Factor = 0.2 (river shoreline - location 130)

External Dose Factor
 for Standing on:
 Contaminated Ground Highest Annual Mean Concentration

Radionuclide	(mrem/hr per pCi/m ²)		Indicator Location	Dose (mrem/yr)		
	T. Body	Skin		Sediment (pCi/kg)	T. Body	Skin
Mn-54	5.80E-09	6.80E-09	129	9.4	4.38E-05	5.14E-05
Co-58	7.00E-09	8.20E-09	ALL	0.0	0.00E+00	0.00E+00
Fe-59	8.00E-09	9.40E-09	ALL	0.0	0.00E+00	0.00E+00
Co-60	1.70E-08	2.00E-08	129	51.0	6.97E-04	8.20E-04
Zn-65	4.00E-09	4.60E-09	ALL	0.0	0.00E+00	0.00E+00
Nb-95	5.10E-09	6.00E-09	ALL	0.0	0.00E+00	0.00E+00
Zr-95	5.00E-09	5.80E-09	ALL	0.0	0.00E+00	0.00E+00
I-131	2.80E-09	3.40E-09	ALL	0.0	0.00E+00	0.00E+00
Cs-134	1.20E-08	1.40E-08	129	9.2	8.88E-05	1.04E-04
Cs-137	4.20E-09	4.90E-09	130	86.0	1.94E-04	2.26E-04
BaLa-140	2.10E-09	2.40E-09	ALL	0.0	0.00E+00	0.00E+00

Total Dose Equivalent (mrem/yr)= 1.02E-03 1.20E-03

Dose from Fish Pathway for 1992 Data Maximum Exposed Teen

Usage (intake rate) = 16 (kg/yr)

Highest Annual Mean Concentration

TEEN

Radionuclide	Ingestion Dose Factor) (mrem per pCi ingested)										Indicator Location	Fish (kg/yr)	Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	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	0.0	0.00E+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	0.0	0.00E+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	0.0	0.00E+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	0.0	0.00E+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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.01E-08	NO DATA	3.00E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-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	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	129	29.0	5.20E-02	6.91E-02	2.41E-02	0.00E+00	2.35E-02	9.14E-03	9.84E-04	
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose Equivalent (mrem/yr)=

5.20E-02 6.91E-02 2.41E-02 0.00E+00 2.35E-02 9.14E-03 9.84E-04

Dose from Food Products Pathway (Crops) for 1992 Data *Maximum Exposed Teen*

Usage (intake rate) = 630 (kg/yr)

Highest Annual Mean Concentration

Highest Annual Mean Concentration															
Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)						Indicator Location	Food (pCi/kg)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung			GI-LLI	Bone	Liver	T. Body	Thyroid	Kidney	Lung
Mn-54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05	ALL	0.0	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	0.0	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	0.0	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	0.0	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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.01E-08	NO DATA	3.00E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Dose Equivalent (mrem/yr)=									0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Dose from Air Radioiodines Inhalation Pathway for 1992 Data Maximum Exposed Adult

Usage (intake rate) = 8000.00 (m3/yr)

Highest Annual Mean Concentration

Radionuclide	Adult										Inhalation dose factor (mrem per pCi inhaled)										Air (pCi/m3)					Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location			Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI				Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI			
Mn-54	NO DATA	4.95E-06	7.87E-07	NO DATA	1.23E-06	1.74E-04	9.67E-06	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+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	1.98E-07	2.59E-07	NO DATA	NO DATA	1.16E-04	1.33E-05	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Fe-59	1.47E-06	3.47E-06	1.32E-06	NO DATA	NO DATA	1.27E-04	2.35E-05	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Co-60	NO DATA	1.44E-06	1.85E-06	NO DATA	NO DATA	7.46E-04	3.56E-05	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Zn-65	4.05E-06	1.29E-05	5.28E-06	NO DATA	8.62E-06	1.08E-04	6.68E-06	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Nb-95	1.76E-06	9.77E-07	5.26E-07	NO DATA	9.67E-07	6.31E-05	1.30E-05	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Zr-95	1.34E-05	4.30E-06	2.91E-06	NO DATA	6.77E-06	2.21E-04	1.88E-05	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
I-131	3.15E-06	4.47E-06	2.56E-06	1.49E-03	7.66E-06	NO DATA	7.85E-07	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Cs-134	4.66E-05	1.06E-04	9.10E-05	NO DATA	3.59E-05	1.22E-05	1.30E-06	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Cs-137	5.95E-05	7.76E-05	5.35E-05	NO DATA	2.78E-05	9.40E-06	1.05E-06	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
BaLa-140	4.88E-06	6.13E-09	3.20E-07	NO DATA	2.09E-09	1.59E-04	2.73E-05	ALL			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
TOTAL DOSE EQUIVALENT(mrem/yr)=																0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00										0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00				

Dose from Air Particulate Inhalation Pathway for 1992 Data Maximum Exposed Adult

Usage (intake rate) = 8000 (m3/yr)

Highest Annual Mean Concentration

Radionuclide	Adult										Dose (mrem/yr)					
	Inhalation dose factor (mrem per pCi inhaled)					Air (pCi/m3)					T. Body	Thyroid	Kidney	Lung	GI-LLI	
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location		Bone						Liver
Mn-54	NO DATA	4.95E-06	7.87E-07	NO DATA	1.23E-06	1.74E-04	9.67E-06	ALL	0.00E+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	1.98E-07	2.59E-07	NO DATA	NO DATA	1.16E-04	1.33E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.47E-06	3.47E-06	1.32E-06	NO DATA	NO DATA	1.27E-04	2.35E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	1.44E-06	1.85E-06	NO DATA	NO DATA	7.46E-04	3.56E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	4.05E-06	1.29E-05	5.28E-06	NO DATA	8.62E-06	1.08E-04	6.68E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	1.76E-06	9.77E-07	5.26E-07	NO DATA	9.67E-07	6.31E-05	1.30E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.34E-05	4.30E-06	2.91E-06	NO DATA	6.77E-06	2.21E-04	1.88E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	3.15E-06	4.47E-06	2.56E-06	1.49E-03	7.66E-06	NO DATA	7.85E-07	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	4.66E-05	1.06E-04	9.10E-05	NO DATA	3.59E-05	1.22E-05	1.30E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	5.95E-05	7.76E-05	5.35E-05	NO DATA	2.78E-05	9.40E-06	1.05E-06	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	4.88E-06	6.13E-09	3.20E-07	NO DATA	2.09E-09	1.59E-04	2.73E-05	ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL DOSE EQUIVALENT(mrem/yr)= 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Drinking Water Pathway for 1992 Data Maximum Exposed Adult

Usage (intake rate) = 730 (l/yr)

Highest Annual Mean Concentration

Radionuclide	Adult										Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05	ALL	0	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	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	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	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	6.86E-06	NO DATA	1.03E-05	NO DATA	9.70E-06	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	3.04E-08	9.75E-09	8.60E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ca-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.87E-09	1.46E-08	4.18E-05	ALL	0	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	132	673	0.00E+00	5.16E-02	5.16E-02	5.16E-02	5.16E-02	5.16E-02
TOTAL DOSE EQUIVALENT(mrem/yr)=										0.00E+00	5.16E-02	5.16E-02	5.16E-02	5.16E-02	5.16E-02

Dose from Milk Pathway for 1992 Data Maximum Exposed Adult

Usage (intake rate) = 310 L/yr

Highest Annual Mean Concentration

Adult

Ingestion Dose Factor
(mrem per pCi ingested)

Radionuclide	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Milk (pCi/L)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05	ALL	0.0	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	0.0	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	0.0	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	0.0	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	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	3.04E-08	9.75E-09	6.80E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.75E-05	1.59E-05	2.59E-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
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-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
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.46E-06	9.25E-05	ALL	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose Equivalent (mrem/yr)=

0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00

Dose from Broadleaf Vegetation Pathway for 1992 Data *Maximum Exposed Adult*

Usage (intake rate) = 64 kg/yr

Highest Annual Mean Concentration

Radionuclide	Ingestion Dose Factor (mrem per pCi ingested)							Indicator Location	Food (pCi/kg)	Dose (mrem/yr)						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI			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	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	1.87E-06	NO DATA	NO DATA	NO DATA	1.51E-05	ALL	0	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	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	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	3.79E-06	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.22E-09	3.48E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	3.04E-08	9.75E-09	6.60E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0	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	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	120	49	2.50E-01	3.42E-01	2.24E-01	0.00E+00	1.16E-01	3.86E-02	6.62E-03
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.48E-08	4.18E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total Dose Equivalent(mrem/yr)=

2.50E-01 3.42E-01 2.24E-01 0.00E+00 1.16E-01 3.88E-02 6.62E-03

Dose from Shoreline Sediment Pathway for 1992 Data Maximum Exposed Adult

Shoreline Recreation 12 hr/yr
 Shore Width Factor = 0.3 (lake shore - location 129)
 Shore Width Factor = 0.2 (river shoreline - location 130)

Radionuclide	External Dose Factor for Standing on Contaminated Ground (mrem/hr per pCi/m2)		Highest Annual Mean Concentration			
	T. Body	Skin	Indicator Location	Dose (mrem/yr)		
				Sediment (pCi/kg)	T. Body	Skin
Mn-54	5.80E-09	6.80E-09	129	9.4	7.85E-06	9.20E-06
Co-58	7.00E-09	8.20E-09	ALL	0.0	0.00E+00	0.00E+00
Fe-59	8.00E-09	9.40E-09	ALL	0.0	0.00E+00	0.00E+00
Co-60	1.70E-08	2.00E-08	129	51.0	1.25E-04	1.47E-04
Zn-65	4.00E-09	4.60E-09	ALL	0.0	0.00E+00	0.00E+00
Nb-95	5.10E-09	6.00E-09	ALL	0.0	0.00E+00	0.00E+00
Zr-95	5.00E-09	5.80E-09	ALL	0.0	0.00E+00	0.00E+00
I-131	2.80E-09	3.40E-09	ALL	0.0	0.00E+00	0.00E+00
Cs-134	1.20E-08	1.40E-08	129	9.2	1.59E-05	1.24E-05
Cs-137	4.20E-09	4.90E-09	130	88.0	3.47E-05	4.05E-05
BaLa-140	2.10E-09	2.40E-09	ALL	0.0	0.00E+00	0.00E+00

Total Dose (mrem/yr) = 1.83E-04 2.09E-04

Dose from Fish Pathway for 1992 Data Maximum Exposed Adult

Usage (intake rate) = 21 kg/yr

Highest Annual Mean Concentration

Radionuclide	Adult										Dose (mrem/yr)				
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Fish (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.38E-06	NO DATA	1.40E-05	ALL	0	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	1.47E-06	NO DATA	NO DATA	NO DATA	1.51E-05	ALL	0	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	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	3.04E-08	9.75E-09	6.60E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0	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	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	129	29	4.85E-02	6.64E-02	4.35E-02	0.00E+00	2.25E-02	7.49E-03
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.46E-08	4.18E-05	ALL	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL DOSE EQUIVALENT(mrem/yr)= 4.85E-02 6.64E-02 4.35E-02 0.00E+00 2.25E-02 7.49E-03 1.28E-03

Dose from Food Products (Crops) Pathway for 1992 Data Maximum Exposed Adult

Usage (intake rate) = 520 kg/yr

Highest Annual Mean Concentration

Radionuclide	Adult										Dose (mrem/yr)						
	Ingestion Dose Factor (mrem per pCi ingested)					Indicator		Food (pCi/Kg)									
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location		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	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	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	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Nb-95	5.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL		0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Zr-95	3.04E-08	9.75E-09	6.80E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL		0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL		0	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.46E-08	4.18E-05	ALL		0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
TOTAL DOSE EQUIVALENT(mrem/yr)=											0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

5.0 QUALITY ASSURANCE

5.1 DUKE POWER COMPANY'S RADIOLOGICAL ENVIRONMENTAL LABORATORIES

5.1.1 SAMPLE COLLECTION

The Radiological and Environmental Services Group and the Fisheries work group perform the environmental sample collections as specified by approved sample collection procedures.

Modifications and improvements made to the environmental sampling program during the past year can be found in Appendix A.

5.1.2 SAMPLE ANALYSIS

The Radiological and Environmental Services Group performed the environmental sample analyses as specified by approved analysis procedures.

In 1989, reviewed data indicated detection of Cs-137 in airborne radioiodine cartridges, but not in associated airborne filters for the same sampling period and location. An extensive investigation was conducted in 1990 to determine reasons why low level Cs-137 activity, approximately 1 to 8 picocuries per total cartridge, was being detected on a low percentage basis of all cartridges counted by the Duke Power Radiological and Environmental Services Group. The possibility of detecting low-level activity was increased due to the installation of low background shields for gamma spectroscopy. In addition to the new shields employed, analysis techniques in some instances used extended count times. Experimental results determined that the Cs-137 activity was due to the activated carbon media and was present prior to placement into field sampling units.

Various airborne radioiodine cartridges were obtained from different vendors nationwide which had similar characteristics as the cartridges that were in current use by the Duke Power Environmental Collection Team. Findings support that low-level Cs-137 is a fallout product that is incorporated into the carbon media.

It is anticipated that continual observance of low activity Cs-137 will be detected on a random basis in airborne radioiodine cartridges and any trending of this data will be reported by the Radiological and Environmental Services Group to appropriate nuclear station personnel for consideration.

5.1.3 DOSIMETRY ANALYSIS

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

5.1.4 INTRALABORATORY QUALITY ASSURANCE

Radiological and Environmental Services 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.

Additionally, 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 out of limits.

5.1.5 INTERLABORATORY QUALITY ASSURANCE

5.1.5.1 DUKE POWER'S AUDIT DIVISION

Radiological and Environmental Services was audited by the Quality Verification group in 1992. Sample collection personnel were observed performing sample collection and the sample collection program was evaluated. No findings or recommendations were identified.

5.1.5.2 DUKE POWER'S NUCLEAR PRODUCTION INTERCOMPARISON PROGRAM

The Radiological and Environmental Services Group participated in the Duke Power Nuclear Generation Department Intercomparison Program during 1992.

Interlaboratory cross-check standards including marinelli beakers, air filters, air cartridges, gross alpha/beta on smears, and tritium in water samples were analyzed at various times of the year by the four counting laboratories in Duke Power Company for this program.

5.1.5.3 U.S. NUCLEAR REGULATORY COMMISSION INSPECTIONS

Radiological and Environmental Services was not audited by the NRC in 1992.

5.1.5.4 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INTERCOMPARISON PROGRAM

The Radiological and Environmental Services Group participated in the Environmental Protection Agency (EPA) Environmental Monitoring Systems Laboratory Intercomparison Program. The EPA sample types included mixed gamma in water (3 times per year), mixed gamma in milk (2 times per year), gamma in air filters (2 times per year), iodine in milk (2 times per year), tritium in water (3 times per year), iodine in water (2 times per year), gross alpha/beta in air filters (2 times per year), and gross alpha/beta in water (3 times per year).

Radiological and Environmental Services prepared and analyzed each sample as quickly as possible. Should the data obtained be out of EPA limits, Radiological and Environmental Services would have performed and documented follow-up investigations. The Radiological and Environmental Services EPA Intercomparison Report code is "CP". A summary of the EPA Intercomparison Reports for 1992 is documented in Table 5.1. Of the thirty-four (34) analyses performed in 1992, one analysis (Gross Beta in Water cross-check, reference date 1/31/92) was out of EPA acceptance limits.

An investigation was performed to find out why the results for the EPA Drinking Water were not within statistical limits. The following areas were investigated in an effort to resolve these poor results:

1. Geometry of the sample
2. Gas flow
3. Efficiency calibration files
4. Errors in the activity calculation
5. X-Checks and calibration checks counted at about the same time of the analysis
6. Trends of past EPA Alpha/Beta X-Checks
7. Recounting the EPA Drinking Water X-Check
8. Reanalyzing the EPA Drinking Water X-Check (preparation and counting)
9. Reagents used in sample preparation

The geometry of this sample is a 2 inch concentric ring stainless steel planchet. The planchets were visually inspected and no abnormalities were discovered.

From the review of the logbooks, the gas flow on the system was normal at the time the cross-checks were analyzed.

The efficiency calibration files were checked and verified to be correct.

The activity calculations were reviewed thoroughly and no errors were found.

There were no other EPA x-checks analyzed at the time of this cross-check, but a G.O. swipe cross-check was analyzed on February 13, 1992. The results of this cross-check were within statistical limits. Calibration checks, using EPA waters and filters, were also performed on March 27-29, 1992, and the results were also within statistical limits. This part of the investigation determined that the system was operating properly at the time of the cross-check analysis.

Analyzed results of past EPA cross-checks Drinking Waters, since 1984, were gathered and plotted to verify trends in the results. Other than one beta cross-check result which exceeded the statistical limits (i. e. . from 1/22/88), there were no "significant trends" shown by this data over this time period. There was a slight bias high trend in the beta activities, which may have been caused by the difference in the background levels between the EPA water and the ASC water (i. e. . the water used by the EPA to prepare the cross-check may have less natural activity than the ultra pure demineralized water that we use to prepare the cross-check sample here at the laboratory).

The original EPA Drinking Water samples were analyzed again to see if the initial results could be duplicated. The results were not duplicated in the recounts, in that the beta results were almost half of the original activities. These findings would indicate the instrument was not operating properly, but this was found not to be the case in previous investigation steps.

The EPA Drinking Water samples were prepared and analyzed again to see if there was a problem in the preparation of the original samples. The results produced were within statistical limits, therefore indicating there might have been a preparation error in the original samples or the background levels of the ultra-pure demineralized water was higher than the water used by the EPA.

The reagents used in the two sample preparations were compared, and the only difference was that the second preparation was performed using fresh reagents (i. e. . prepared at the time the sample preparation was performed).

To conclude this investigation, it appears the only possible reasons for obtaining poor results may have been due to the reagents and demineralized water used in the preparation of the samples. The only way to determine this would be for the EPA to send us a container of their water used in the preparation of the cross-check along with the cross-check sample. This would remove the chances of error which could be caused by the differences in background levels of water sources. Seeing this has not shown a significant problem over the past 7-8 years, there will be no major changes in the preparation of future samples.

Additional documentation of this investigation is available from Radiological and Environmental Services.

5.1.5.5 NRC/STATE OF S.C. ENVIRONMENTAL MONITORING PROGRAM

The ONS Chemistry Section and Radiological and Environmental Services routinely participate with the State of South Carolina in their NRC/State Contract Environmental Monitoring Program. The ONS Chemistry Section splits water, milk, vegetation, sediment, and fish samples with the Bureau of Radiological Health of the State's Department of Health and Environmental Control (DHEC) for analysis. DHEC collects air samples from two of the locations sampled for air by ONS. Results of the analyses performed on split and duplicate samples by the Radiological and Environmental Services Group and DHEC Laboratory are compiled by DHEC and provided to the NRC. TLDs are also co-located with the State and NRC at various environmental sites.

5.1.5.6 NRC/STATE OF N.C. INTERCOMPARISON PROGRAM

Radiological and Environmental Services, and the Radiation Dosimetry & Records group routinely participates with the State of North Carolina Department of Environmental Health and Natural Resources (DEHNR) in an intercomparison program. Radiological and Environmental Services sends air, water, milk, vegetation, sediment, and fish samples which have been collected to the State of North Carolina Radiation Protection Section for intercomparison analysis. TLDs are also co-located with the State and NRC at various environmental sites. Also, every six to eight months, the State of North Carolina Radiation Protection Section irradiates environmental dosimeters and sends them to the Radiation Dosimetry and Records group for analysis of the unknown estimated delivered exposure. A summary of the State of North Carolina Environmental Dosimetry Intercomparison Report for 1992 is documented in Table 5.2. The Dosimetry Laboratory results were within -0.82% of the State of North Carolina results (excluding Standard Deviation values) for the December 1992 cross-check.

5.1.5.7 U.S. DEPARTMENT OF ENERGY INTERCOMPARISON PROGRAM

There was no DOE intercomparison program during calendar year 1992.

5.2 CONTRACTOR LABORATORY

No contractor laboratories were used during 1992.

TABLE 5-1

(Page 1 of 3)

U.S. ENVIRONMENTAL PROTECTION AGENCY INTERLABORATORY COMPARISON PROGRAM
1992 CROSS-CHECK RESULTS FOR THE RADIOLOGICAL AND ENVIRONMENTAL SERVICES LABORATORY

ANALYSIS	DATE	NUCLIDE(S)	KNOWN VALUE	CONTROL LIMITS 3 SIGMA; N=3	REPORTED VALUE
Gamma in Water	2/14/92	Ba-133	76 pCi/L	62.1 - 89.9 pCi/L	80.00 pCi/L
		Co-60	40 pCi/L	31.1 - 48.7 pCi/L	42.00 pCi/L
		Zn-65	148 pCi/L	122.0 - 174.0 pCi/L	156.00 pCi/L
		Ru-106	203 pCi/L	168.3 - 237.7 pCi/L	207.00 pCi/L
		Cs-134	31 pCi/L	22.3 - 39.7 pCi/L	31.00 pCi/L
		Cs-137	49 pCi/L	40.3 - 57.7 pCi/L	51.00 pCi/L
	6/05/92	Ba-133	98 pCi/L	80.7 - 115.3 pCi/L	101.33 pCi/L
		Co-60	20 pCi/L	11.3 - 28.7 pCi/L	21.00 pCi/L
		Zn-65	99 pCi/L	81.7 - 116.3 pCi/L	106.67 pCi/L
		Ru-106	141 pCi/L	116.7 - 165.3 pCi/L	148.33 pCi/L
		Cs-134	15 pCi/L	6.3 - 23.7 pCi/L	15.33 pCi/L
		Cs-137	15 pCi/L	6.3 - 23.7 pCi/L	15.00 pCi/L
	10/09/92	Ba-133	74 pCi/L	61.9 - 86.1 pCi/L	76.33 pCi/L
		Co-60	10 pCi/L	1.3 - 18.7 pCi/L	11.00 pCi/L
		Zn-65	148 pCi/L	122.0 - 174.0 pCi/L	161.67 pCi/L

TABLE 5-1

(Page 2 of 3)

U.S. ENVIRONMENTAL PROTECTION AGENCY INTERLABORATORY COMPARISON PROGRAM
1992 CROSS-CHECK RESULTS FOR THE RADIOLOGICAL AND ENVIRONMENTAL SERVICES LABORATORY

ANALYSIS	DATE	NUCLIDE(S)	KNOWN VALUE	CONTROL LIMITS (3 SIGMA; N=3)	REPORTED VALUE
Gamma in Water	10/09/92	Ru-106	175 pCi/L	143.8 - 206.2 pCi/L	154.00 pCi/L
		Cs-134	8 pCi/L	0.0 - 16.7 pCi/L	8.00 pCi/L
		Cs-137	8 pCi/L	0.0 - 16.7 pCi/L	8.67 pCi/L
	2/07/92	I-131	59 pCi/L	48.6 - 69.4 pCi/L	53.00 pCi/L
	8/07/92	I-131	45 pCi/L	34.6 - 55.4 pCi/L	50.30 pCi/L
Air Filter	3/27/92	Cs-137	10 pCi/Filter	1.3 - 18.7 pCi/Filter	12.00 pCi/Filter
		Gross Beta	41 pCi/Filter	32.3 - 49.7 pCi/Filter	40.67 pCi/Filter
	8/28/92	Cs-137	18 pCi/Filter	9.3 - 26.7 pCi/Filter	20.00 pCi/Filter
		Gross Beta	69 pCi/Filter	51.7 - 86.3 pCi/Filter	68.70 pCi/Filter
Tritium in Water	2/21/92	H-3	7904 pCi/L	6533.4 - 9274.6 pCi/L	7961.67 pCi/L
	6/19/92	H-3	2125 pCi/L	1523.0 - 2727.0 pCi/L	2014.00 pCi/L
	10/23/92	H-3	5962 pCi/L	4928.0 - 6996.0 pCi/L	6033.00 pCi/L

TABLE 5-1

(Page 3 of 3)

U.S. ENVIRONMENTAL PROTECTION AGENCY INTERLABORATORY COMPARISON PROGRAM
1992 CROSS-CHECK RESULTS FOR THE RADIOLOGICAL AND ENVIRONMENTAL SERVICES LABORATORY

ANALYSIS	DATE	NUCLIDE(S)	KNOWN VALUE	CONTROL LIMITS (3 SIGMA; N=3)	REPORTED VALUE
Gamma in Milk	4/24/92	I-131	78 pCi/L	64.1 - 91.9 pCi/L	80.00 pCi/L
		Cs-137	39 pCi/L	0.3 - 47.7 pCi/L	39.00 pCi/L
	9/25/92	I-131	100 pCi/L	82.7 - 117.3 pCi/L	103.00 pCi/L
		Cs-137	15 pCi/L	6.3 - 23.7 pCi/L	16.00 pCi/L
Beta in Water	1/31/92	Gross Beta	30 pCi/L	21.3 - 38.7 pCi/L	43.30 pCi/L
	5/15/92	Gross Beta	44 pCi/L	35.3 - 52.7 pCi/L	45.67 pCi/L
	9/18/92	Gross Beta	45 pCi/L	25.9 - 64.1 pCi/L	43.00 pCi/L

TABLE 5.2

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL
HEALTH AND NATURAL RESOURCES

ENVIRONMENTAL DOSIMETER CROSS-CHECK - 1992

STATE OF N.C. ESTIMATED VALUE			RADIATION DOSIMETRY & RECORDS ESTIMATED VALUE	
Date of Cross-Check	Exposure (mR)	Estimated Uncertainty (1 S.D. mR)	Exposure (mR)	Estimated Uncertainty (1 S.D. mR)
12/92	49.0	± 2.46	48.6	± 3.96

6.0

REFERENCES

1. Final Safety Analysis Report, McGuire 1 & 2, Section 1.2.1.
2. Final Safety Analysis Report, McGuire 1 & 2, Section 2.1.
3. Final Safety Analysis Report, McGuire 1 & 2, Section 2.1.1.
4. Final Safety Analysis Report, McGuire 1 & 2, Section 11.6.1.
5. Final Safety Analysis Report, McGuire 1 & 2, Section 11.6.3.
6. Final Safety Analysis Report, McGuire 1 & 2, Section 11.6.4.
7. Selected Licensee Commitments Manual Section 16.11-13.
8. McGuire Nuclear Station Technical Specification 6.9.1.6.
9. Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR Part 50, Appendix I", U.S. Nuclear Regulatory Commission, Rev. 1, October 1977.
10. Probability in Statistics in Engineering and Management Science, Hines and Montgomery, 1969, pp. 287-293.
11. Practical Statistics for the Physical Sciences, American Chemical Society, 1988, pp. 84-100.

APPENDIX A

ENVIRONMENTAL SAMPLING AND ANALYSIS PROCEDURES

APPENDIX A

ENVIRONMENTAL SAMPLING AND ANALYSIS PROCEDURES

Adherence to established procedures for sampling and analysis of all environmental media at McGuire 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 the Duke Power Generation Services Department Radiological and Environmental Services Group, the Dosimetry Laboratory, and the Fisheries work groups.

Starting at Section A.1, this appendix describes the environmental sampling frequencies and analysis procedures by media type.

I. CHANGE OF SAMPLING PROCEDURES

One new TLD location was added in December 1992 as a "SPECIAL INTEREST" monitoring site. This location was designated as location 191 (2.81 miles NNE). No results were available for this site since the TLD was placed in the field at the end of the fourth quarter 1992.

II. CHANGE OF ANALYSIS PROCEDURES

No changes were incorporated to the sample analysis procedures in 1992.

III. SAMPLING AND ANALYSIS PROCEDURES

A.1 AIRBORNE PARTICULATE AND RADIOIODINE

Airborne particulate and radioiodine samples at each of five 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 situated 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 weekly gamma analysis and gross beta analysis was performed on each filter and a weekly gamma analysis was performed on each charcoal cartridge. The filter and charcoal cartridge were analyzed independently. The continuous composite samples were collected from the locations listed below.

Location 120	=	Site Boundary (0.4 mi. NNE)
Location 121	=	Site Boundary (0.5 mi. NE)
Location 125	=	Site Boundary (0.4 mi. SW)
Location 133	=	Cornelius, NC (6.2 mi. NE)
Location 134	=	East Lincoln Junior High School (8.7 mi. WNW)

A.2 DRINKING WATER

Biweekly composite samples were collected. A low-level Iodine-131 analysis was performed on each composite sample. A gross beta and gamma analysis was performed on monthly composites. Tritium analysis was performed on the quarterly composites. The composites were collected biweekly from the locations listed below.

Location 132	=	Charlotte Municipal Water Supply (11.2 mi. SSE)
Location 136	=	Mooresville Municipal Water Supply (12.5 mi. NNE)
Location 142	=	Davidson Municipal Water Supply (7.5 mi. NE)

A.3 SURFACE WATER

Biweekly composite samples were collected. A low-level Iodine-131 analysis was performed on each composite sample. A gamma analysis was performed on the monthly composites. Tritium analysis was performed on each sample. The composites were collected biweekly from the locations listed below.

Location 128	=	Discharge Canal Bridge (0.4 mi. ENE)
Location 131	=	Cowans Ford Dam (0.7 mi. W)
Location 135	=	Plant Marshall Intake Canal (12.0 mi. N)

- A.4 MILK Biweekly grab samples were collected at each dairy and a gamma and low-level Iodine-131 analysis was performed on each. The biweekly grab samples were collected from the locations listed below.

Location 138	=	Henry Cook Dairy - COWS (2.75 mi. ESE)
Location 139	=	William Cook Dairy - COWS (2.6 mi. E)
Location 140	=	Kidd Dairy - COWS (2.8 mi. SSE)
Location 141	=	Lynch Dairy - COWS (14.8 mi. WNW)

A.5 BROADLEAF VEGETATION

Monthly samples were collected and a gamma analysis was performed on each. The samples were collected from the locations listed below.

Location 120	=	Site Boundary (0.4 mi. NNE)
Location 125	=	Site Boundary (0.4 mi. SW)
Location 134	=	East Lincoln Junior High School (8.7 mi. WNW)
Location 158	=	4-5 Mile Radius (5.0 mi. NNE)

A.6 SHORELINE SEDIMENT

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

Location 129	=	Discharge Canal Entrance to Lake Norman (0.6 mi. ENE)
Location 130	=	Highway 73 Bridge Downstream (0.6 mi. ENE)
Location 137	=	Pinnacle Access Area (12.0 mi. N)

A.7 FISH

Semiannual samples were collected and a gamma analysis was performed on the edible portions of each sample. Boney fish such as Shad were prepared whole minus the head and tail portions. The samples were collected from the locations listed below.

Location 129	=	Discharge Canal Entrance to Lake Norman (0.6 mi. ENE)
Location 137	=	Pinnacle Access Area (12.0 mi. N)

A.8 DIRECT GAMMA RADIATION (TLD)

Thermoluminescent dosimeters (TLD) were collected quarterly at 30 concentric locations. A gamma dose rate was determined for each TLD. The TLDs were placed as indicated below.

- * An inner ring of 14 TLDs at the site boundary, one in each available meteorological sector. The site boundary locations in the N and NNW sectors are over water; however, two special interest TLD's were placed in these sectors inside the site boundary in March, 1991.
- * 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 CONTROL locations.

A.9 FOOD PRODUCTS

Samples were collected monthly when available during the harvest season and a gamma analysis was performed on each. The samples were collected at the locations listed below.

Location 184	=	5 Mile Radius (2.5 mi. ENE) - Gardens (Davenport's Residence)
Location 188	=	5 Mile Radius (2.8 mi. N) - Gardens (Austin's Residence)

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 Meat Animal
- * The Nearest Garden
 - ▶ greater than 50 square meters or 500 square feet
- * The Nearest Milk-giving Animal (cow or goat)

This census was completed May 29, 1992 and the results are shown in Table 3.10 (page 3-31).

IV. SAMPLING AND ANALYSIS IMPROVEMENTS

Several enhancements were made to the environmental monitoring program in 1992. Focus was centered on reducing the number of sampling deviations by researching equipment upgrades, establishing acceptance criteria for equipment replacement, implementing equipment labelling and serial number documentation, and carefully reviewing deviations by site location and sample type. Also, the Global Positioning System (GPS) Project was implemented to more accurately determine distance and sector for each sampling location. GPS is a satellite - based radio navigation system which provides precise positioning data.

APPENDIX B

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SUMMARY OF RESULTS

Summary sheets for each media have been included in this Appendix.

B.1 RADIOIODINES

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:(USER.ASC)MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed		Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
					Name, Distance and Direction Location Code	Mean (Fraction) Range		
RADIOIODINES								
PC1/M3)							134 (8.7 Mi WNW)	
Locations	MN-54	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	CO-58	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	FE-59	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	CO-60	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	ZN-65	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	NB-95	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	ZR-95	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	I-131	260	7.00E-02	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	CS-134	260	5.00E-02	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	
	CS-137	260	6.00E-02	6.93E-03(2/ 208) 6.74E-03-- 7.12E-03	120 (0.4 Mi NNE) 7.12E-03(1/ 52) 7.12E-03-- 7.12E-03	2.67E-02(1/ 52) 2.67E-02-- 2.67E-02	0	
	BALA-140	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0	

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 120 = Site Boundary (0.4 Mi NNE)

Location 121 = Site Boundary (0.5 Mi NE)

Location 125 = Site Boundary (0.4 Mi SW)

Location 133 = Cornelius, NC (6.2 Mi NE)

Location 134 = East Lincoln Junior High School (8.7 Mi WNW)

B.2 PARTICULATE

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
IR PARTICULATE (C1/M3)						134 (8.7 Mi WNW)	
Locations	MN-54	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	CO-58	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	FE-59	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	CO-60	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	ZN-65	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	NB-95	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	ZR-95	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	I-131	260	7.00E-02	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	CS-134	260	5.00E-02	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	CS-137	260	6.00E-02	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	BALA-140	260	0.0	0.00E+00(0/ 208) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0.00E+00(0/ 52) 0.00E+00-- 0.00E+00	0
	BETA	260	1.00E-02	1.83E-02(208/ 208) 7.06E-03-- 3.93E-02	120 (0.4 Mi NNE) 1.92E-02(52/ 52) 9.20E-03-- 3.93E-02	2.02E-02(52/ 52) 9.70E-03-- 4.20E-02	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 120 = Site Boundary (0.4 Mi NNE)

Location 121 = Site Boundary (0.5 Mi NE)

Location 125 = Site Boundary (0.4 Mi SW)

Location 133 = Cornelius, NC (6.2 Mi NE)

Location 134 = East Lincoln Junior High School (8.7 Mi WNW)

B.3 DRINKING WATER

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.3AF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
DRINKING WATER (PC/LITER)						136 (12.5 Mi NNE)	
3 Locations	ANAL1-LL 39	1.0	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	ANAL2-LL 39	1.0	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	MN-54 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	CO-58 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	FE-59 39	30.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	CO-60 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	ZN-65 39	30.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	NB-95 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	ZR-95 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	I-131 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 132 = Charlotte Municipal Water Supply (11.2 Mi SSE)

Location 136 = Mooresville Municipal Water Supply (12.5 Mi NNE)

Location 142 = Davidson Municipal Water Supply (7.5 Mi NE)

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
DRINKING WATER (PCI/LITER)						136 (12.5 Mi NNE)	
	CS-134	39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	CS-137	39	18.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	BALA-140	39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
WATER TRITIUM (PCI/LITER)	BETA	39	4.0	1.9 (17/ 26) 0.54 -- 3.0	2.0 (8/ 13) 0.54 -- 3.0	1.7 (8/ 13) 0.35 -- 2.8	0
				132 (11.2 Mi SSE)			
	H-3	12	2.00E+03	6.73E+02(1/ 8) 6.73E+02-- 6.73E+02	6.73E+02(1/ 4) 6.73E+02-- 6.73E+02	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

132 = Charlotte Municipal Water Supply (11.2 Mi SSE)
 136 = Mooresville Municipal Water Supply (12.5 Mi NNE)
 142 = Davidson Municipal Water Supply (7.5 Mi NE)

B.4 SURFACE WATER

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
SURFACE WATER (PI/LITER)						135 (12.0 Mi N)	
Locations	ANAL1-LL 39	1.0	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	ANAL2-LL 39	1.0	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	MN-54 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	CO-58 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	FE-59 39	30.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	CO-60 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	2N-65 39	30.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	NB-95 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	2R-95 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0
	1-131 39	15.	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00		0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0.00E+00(0/ 13) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 128 = Discharge Canal Bridge (0.4 Mi ENE)

Location 131 = Cowans Ford Dam (0.7 Mi W)

Location 135 = Plant Marshall Intake Canal (12.0 Mi N)

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
SURFACE WATER PCI/LITER Locations	CS-134 39	15.	0.00E+00(0/ 26)	135 (12.0 Mi N)	0.00E+00(0/ 13)	0.00E+00(0/ 13)	0
			0.00E+00-- 0.00E+00			0.00E+00-- 0.00E+00	
	CS-137 39	18.	0.00E+00(0/ 26)	131 (0.7 Mi W)	0.00E+00(0/ 13)	0.00E+00(0/ 13)	0
			0.00E+00-- 0.00E+00			0.00E+00-- 0.00E+00	
	BALA-140 39	15.	0.00E+00(0/ 26)	128 (0.4 Mi ENE)	0.00E+00(0/ 13)	0.00E+00(0/ 13)	0
			0.00E+00-- 0.00E+00			0.00E+00-- 0.00E+00	
GW TRITIUM PCI/LITER Locations	H-3 12	2.00E+03	8.13E+02(2/ 8)	128 (0.4 Mi ENE)	8.13E+02(2/ 4)	0.00E+00(0/ 4)	0
			4.94E+02-- 1.13E+03			0.00E+00-- 0.00E+00	

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 128 = Discharge Canal Bridge (0.4 Mi ENE)

Location 131 = Cowans Ford Dam (0.7 Mi W)

Location 135 = Plant Marshall Intake Canal (12.0 Mi N)

B.5 MILK

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
MILK (PCI/LITER)						141 (14.8 Mi WNW)	
Locations	MN-54	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	CO-58	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	FE-59	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	CO-60	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	ZN-65	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	NB-95	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	ZR-95	104	0.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	I-131	104	15.	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	LLI-131	104	1.0	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	CS-134	104	15.	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	CS-137	104	18.	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0
	BALA-140	104	15.	0.00E+00(0/ 78) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0.00E+00(0/ 26) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 138 = Henry Cook Dairy (2.75 Mi ESE)

Location 140 = Kidd Dairy - COWS (2.8 Mi SSE)

Location 139 = William Cook Dairy (2.6 Mi E)

Location 141 = Lynch Dairy - COWS (14.8 Mi WNW)

B.6 BROADLEAF VEGETATION

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
BROAD LEAF VEGETATION PC1/WEI/KG)						134 (8.7 Mi WNW)	
Locations	MN-54	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	CO-58	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	FE-59	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	CO-60	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	ZN-65	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	NB-95	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	ZR-95	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	1-131	48	60.	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	CS-134	48	60.	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	CS-137	48	80.	49. (1/ 36) 49. -- 49.	49. (1/ 12) 49. -- 49.	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0
	BALA-140	48	0.0	0.00E+00(0/ 36) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 120 = Site Boundary (0.4 Mi NNE)

Location 125 = Site Boundary (0.4 Mi SW)

Location 134 = East Lincoln Junior High School (8.7 Mi WNW)

Location 158 = 4-5 Mile Radius (5.0 Mi NNE)

B.7 SHORELINE SEDIMENT

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction	Location Mean (Fraction) Range		
SEDIMENT PCI/DRY/KG)						137 (12.0 Mi N)	
Locations	MN-54	6	0.0	9.4 (1/ 4) 9.4 -- 9.4	129 (0.6 Mi ENE) 9.4 (1/ 2) 9.4 -- 9.4	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	CO-58	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	FE-59	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	CO-60	6	0.0	51. (1/ 4) 51. -- 51.	129 51. (1/ 2) 51. -- 51.	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	ZN-65	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	NB-95	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	ZR-95	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	I-131	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	CS-134	6	1.50E+02	9.2 (1/ 4) 9.2 -- 9.2	129 9.2 (1/ 2) 9.2 -- 9.2	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	CS-137	6	1.80E+02	67. (3/ 4) 29. -- 92.	130 (0.6 Mi SW) 86. (2/ 2) 81. -- 92.	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0
	BALA-140	6	0.0	0.00E+00(0/ 4) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0.00E+00(0/ 2) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 129 = Discharge Canal Entrance to Lake Norman (0.6 Mi ENE)

Location 130 = Highway 73 Bridge Downstream (0.6 Mi SW)

Location 137 = Pinnacle Access Area (12.0 Mi N)

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
SH CI/WET/KG)						137 (12.0 Mi N)	
Locations	MN-54	12	1.30E+02	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	CO-58	12	1.30E+02	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	FE-59	12	2.60E+02	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	CO-60	12	1.30E+02	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	ZN-65	12	2.60E+02	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	NB-95	12	0.0	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	ZR-95	12	0.0	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	I-131	12	0.0	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	CS-134	12	1.30E+02	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0
	CS-137	12	1.50E+02	29. (4/ 6) 16. -- 49.	29. (4/ 6) 16. -- 49.	11. (4/ 6) 4.5 -- 16.	0
	BALA-140	12	0.0	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0.00E+00(0/ 6) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 129 = Discharge Canal Entrance to Lake Norman (0.6 Mi ENE)

Location 137 = Pinnacle Access Area (12.0 Mi N)

B.9 DIRECT GAMMA RADIATION

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County
 Time Report Generated : 14-JAN-1993 11:35:38

Docket Number : 50-369,370
 Reporting Period : 1-DEC-1991 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non-Routine Report Meas.
				Name, Distance and Direction Location Code	Mean (Fraction) Range		
DIRECT RAD-TLD (mR/Quarter)						175 (12.7 Mi WNW)	
	mR/Qtr 176	0.00E+00	16. (172/ 172) 7.0 -- 32.	180 (11.5 Mi NNE)	28. (4/ 4) 24. -- 32.	19. (4/ 4) 15. -- 22.	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

143 = SITE BOUNDARY (0.3 MI NW)	163 = 4-5 MILE RADIUS (5.0 MI SE)
144 = SITE BOUNDARY (0.4 MI NNE)	164 = 4-5 MILE RADIUS (4.5 MI SSE)
145 = SITE BOUNDARY (0.5 MI NE)	165 = 4-5 MILE RADIUS (5.0 MI S)
146 = SITE BOUNDARY (0.5 MI ENE)	166 = 4-5 MILE RADIUS (5.2 MI SSW)
147 = SITE BOUNDARY (0.4 MI E)	167 = 4-5 MILE RADIUS (4.9 MI SW)
148 = SITE BOUNDARY (0.5 MI ESE)	168 = 4-5 MILE RADIUS (4.7 MI WSW)
149 = SITE BOUNDARY (0.6 MI SE)	169 = 4-5 MILE RADIUS (4.4 MI W)
150 = SITE BOUNDARY (0.5 SE)	170 = 4-5 MILE RADIUS (4.5 MI WNW)
151 = SITE BOUNDARY (0.4 MI S)	171 = 4-5 MILE RADIUS (4.5 MI NW)
152 = SITE BOUNDARY (0.5 MI SSW)	172 = 4-5 MILE RADIUS (5.2 MI NNW)
153 = SITE BOUNDARY (0.5 MI SW)	173 = SPECIAL INTEREST (8.5 MI NNW)
154 = SITE BOUNDARY (0.5 MI W)	174 = SPECIAL INTEREST (8.7 MI WNW)
155 = SITE BOUNDARY (0.5 MI WNW)	175 = CONTROL (12.7 MI WNW)
156 = SITE BOUNDARY (0.5 MI WNW)	176 = SPECIAL INTEREST (11.0 MI SW)
157 = 4-5 MILE RADIUS (4.8 MI N)	177 = SPECIAL INTEREST (8.6 MI S)
158 = 4-5 MILE RADIUS (4.4 MI NNE)	178 = SPECIAL INTEREST (9.2 MI SE)
159 = 4-5 MILE RADIUS (5.0 MI NE)	179 = SPECIAL INTEREST (10.4 MI ESE)
160 = 4-5 MILE RADIUS (4.9 MI ENE)	180 = SPECIAL INTEREST (11.5 MI NNE)
161 = 4-5 MILE RADIUS (4.7 MI E)	181 = SPECIAL INTEREST (6.7 MI NE)
162 = 4-5 MILE RADIUS (4.6 MI ESE)	182 = SPECIAL INTEREST (6.0 MI NE)
	183 = SPECIAL INTEREST (5.5 MI S)
	186 = SPECIAL INTEREST (0.2 MI NNW)
	187 = SPECIAL INTEREST (0.3 MI N)
	189 = SITE BOUNDARY (0.4 MI SSE)
	190 = SITE BOUNDARY (0.5 MI WSW)

B.10 FOOD PRODUCTS (CROPS)

Environmental Radiological Monitoring Program Summary

Name of Facility : McGuire Nuclear Station
 Location of Facility : Mecklenburg County, N.C.
 Time Report Generated : 14-JAN-1993 11:31:00

Docket Number : 50-369,370
 Reporting Period : 1-JAN-1992 through 31-DEC-1992
 Database Name : \$DISK1:[USER.ASC]MNS92.SAF;2

Medium or Pathway Sampled (Units)	Type & Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (Fraction) Range	Location with Highest Mean		Control Locations Mean (Fraction) Range	No. of Non- Routine Report Meas.
				Name, Distance and Direction Location	Mean (Fraction) Range		
CROPS PCI/WET/KG)						No Control Locations	
Locations	MN-54	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	CO-58	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	FE-59	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	CO-60	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	ZN-65	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	NB-95	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	ZR-95	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	I-131	19	60.	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	CS-134	19	60.	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	CS-137	19	80.	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0
	BALA-140	19	0.0	0.00E+00(0/ 19) 0.00E+00-- 0.00E+00	0.00E+00(0/ 12) 0.00E+00-- 0.00E+00	0.00E+00(0/ 0) 0.00E+00-- 0.00E+00	0

Mean and range based upon detectable measurements only

Fraction of detectable measurements at specified locations is indicated in parentheses, (Fraction)

Zero range indicates no detectable activity measurements

If LLD is equal to 0, then LLD is not required by Technical Specifications

The LLDs listed above are the values required by Station Technical Specifications

Location 184 = 5 mile radius (2.5 Mi ENE) - Gardens (Davenport's Residence)

Location 188 = 5 mile radius (2.8 Mi W) - Garden (Austin's Residence)

APPENDIX C

SAMPLING DEVIATIONS AND UNAVAILABLE ANALYSES

APPENDIX C
SAMPLING DEVIATIONS AND UNAVAILABLE ANALYSES FOR 1992

I. SAMPLING DEVIATIONS

The following deviations from sampling requirements occurred during 1992.

SAMPLE TYPE	LOCATION	SCHEDULED COLLECTION DATES	ACTUAL COLLECTION DATES	DEVIATION	REASON	ACTIONS TAKEN
Air Particulate & Air Radioiodines	120	6/2 - 6/9/92	6/2 - 6/8/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse
	121	1/7 - 1/15/92	1/7 - 1/9/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse
		2/18 - 2/25/92	2/18 - 2/22/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse
		9/29 - 10/6/92	9/29 - 10/6/92	Sample not collected for entire period	Sporadic power loss during collection period due to faulty electrical connection	Electrical connection restored and verified to be acceptable
	125	11/24 - 12/1/92	11/24 - 12/1/92	Sampler not running at time of collection	Loss of Power	Work request initiated to restore power to air sample site
		12/1 - 12/8/92	12/2 - 12/8/92	Sample not collected for entire period	Loss of Power	Work request initiated to restore power to air sample site
	133	1/21 - 1/28/92	1/21 - 1/25/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse
		2/4 - 2/11/92	2/4 - 2/8/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse
		4/28 - 5/5/92	4/28 - 4/29/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse
	134	9/15 - 9/22/92	9/15 - 9/15/92	Sample not collected for entire period	Blown Fuse	Replaced Fuse

Surface Water	128	3/17 - 3/31/92	3/31 - 3/31/92	Sample not collected for entire period	Pump Malfunction	Grab sample collected. Work request initiated for pump repair.
		3/31 - 4/14/92	4/2 - 4/14/92	Sample not collected for entire period.	Pump Malfunction	Abbreviated sample collected following pump repair.
		6/9 - 6/23/92	6/11 - 6/23/92	Sample not collected for entire period.	Intake lines clogged.	Lines unclogged and pump restarted.
Crops	188	1/7/92	1/29/92	Sample not collected within normal sampling period	Sample inadvertently not included on sample collection schedule	Collection schedule revised to include winter crops
TLD	151	6/26 - 9/28/92	8/14 - 9/28/92	TLD observed to be missing	TLD was removed by construction and permanently lost	New TLD placed in field at new location on 8/14/92
	177	6/26 - 9/28/92	6/26 - 9/28/92	TLD was removed from normal monitoring location from 9/8 - 9/10/92	Tree removal by property owner displaced the TLD	The sample TLD was replaced in field at same address

UNAVAILABLE ANALYSES FOR 1992

II. UNAVAILABLE ANALYSES

The following unavailable analyses occurred resulting from inappropriate samples during 1992.

SAMPLE TYPE	LOCATION	SCHEDULED COLLECTION DATES	DEVIATION	REASON	ACTIONS TAKEN
CROPS	184	1/7/92	No Sample Available	Monthly collection was inadvertently left off of collection schedule	Collection schedule updated to include winter crops
TLD	161	3/5 - 6/26/92	TLD missing	Telephone pole TLD was attached to was removed. The TLD could not be located.	New TLD was placed in field at another location.
	165	6/26 - 9/28/92	TLD missing	Theft of TLD	New TLD placed in field on 9/28/92
	178	12/5 - 3/5/92	TLD missing	Theft of TLD	New TLD placed in field on 3/5/92. Request for relocation of TLD initiated.

APPENDIX D

ANALYTICAL DEVIATIONS LOWER LIMITS OF DETECTION

No analytical deviations were incurred for the 1991 environmental sampling program.

APPENDIX E

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM RESULTS

This appendix includes all of the sample analysis reports generated from each sample medium for 1992.

Appendix E is located separately from this report and is permanently archived at Duke Power Company's Applied Science Center environmental data master file, located at Huntersville, NC at the McGuire Nuclear Station Site.



DUKE POWER



DUKE POWER