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Subject: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Annual Radiological Environmental Operating Report - 1995

Gentlemen:

Arkansas Nuclear One (ANO), Units 1 and 2, Technical Specifications 6.12.2.5 and 6.9.4, respectively, require the submittal of an annual radiological environmental operating report for the previous calendar year prior to May 1 of each year.

Attached is the annual radiological environmental operating report for ANO for the year 1995. All radionuclides detected by the radiological environmental monitoring program during 1995 were significantly below regulatory limits. Therefore, plant operation during 1995 had no harmful effects nor resulted in any irreversible damage to the environment. This report fulfills the reporting requirements referenced above.

Should you have any questions regarding this submittal, please contact me.

Very truly yours,

Dwight C. Mims

Dwight C. Mims
Director, Nuclear Safety

DCM/dej

IE25 1/1

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ARKANSAS NUCLEAR ONE - UNITS 1 AND 2

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1995

Summary

The Annual Radiological Environmental Operating Report presents data obtained through analyses of environmental samples collected for Arkansas Nuclear One's (ANO's) Radiological Environmental Monitoring Program (REMP) for the period January 1, 1995 through December 31, 1995. This report fulfills the requirements of ANO Unit 1 Technical Specification 6.12.2.5 and Unit 2 Technical Specification 6.9.4.

During 1995, as in previous years, ANO detected radionuclides attributable to plant operations in the discharge surface water (Tritium), sediment (Manganese-54, Cobalt-58, Cobalt-60, Cesium-134 and Cesium-137) and fish (Cesium-137). ANO personnel routinely monitor results from this area in order to note any trends. Their review of 1995 results from this area indicates the following:

- Tritium levels in the discharge basin surface water were representative of the historic average and were well below reporting requirements.
- Radionuclides in the discharge sediment are not demonstrating any increase in comparison to previous years. Review indicates that 1995 levels are less than those of previous years.
- Radionuclides in the discharge fish are not demonstrating any increase in comparison to previous years. In addition, all results were well below the required lower limit of detection as identified in the technical specification.

Section 2.0 of this report discusses these results in more detail.

Radiological Environmental Monitoring Program

Radiation and radioactivity are monitored around ANO within a 22-mile radius. The environment around ANO has been monitored for radiation and radioactive contamination for approximately 22 years. The REMP was established about two years before the station became operational (1974). This program provides data on background radiation and radioactivity which is normally present in the area. ANO has continued to monitor the environment by sampling air, milk, water, food products, vegetation, sediment and fish, as well as measuring radiation directly.

Samples are collected from both indicator and control locations. Indicator locations are within approximately five miles of the site, and are expected to show any increases or buildup of radioactivity that might occur due to station operation. Control locations are further from the station and are expected to indicate the presence of only naturally occurring radioactivity. The results obtained from indicator locations are compared with control locations and with concentrations present in the environment before the station became operational. This allows for assessment of any impact the operation of ANO might have had on the surrounding environment.

In 1995, 949 radiological environmental samples were collected and analyzed for radioactivity. Radionuclide concentrations measured at indicator locations were compared to control locations, as well as concentrations in previous years. ANO personnel assessed plant operations using this data and concluded that no significant impact occurred on the environs surrounding the plant. Radiation levels in the environment were undetectable in many cases and at or near previous levels in significant pathways associated with ANO. Therefore, plant operation has had no harmful effects nor resulted in any irreversible damage to the environment.

Attachments

Attachment I contains results of air, milk, water, food products, vegetation, sediment and fish samples collected in 1995 and analyzed by Entergy Services, Inc. (ESI) System Chemistry. Results of ESI System Chemistry's participation in the Environmental Protection Agency (EPA) Interlaboratory Comparison Program are also contained in Attachment I. Attachment II contains results of thermoluminescent dosimeters (TLDs) collected in 1995 and analyzed by ANO Dosimetry. Attachment III contains statistical analyses performed on air and TLD results and the equations that were utilized. Attachment IV contains dose calculations performed for sediment using a generalized equation from Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I."

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SECTION 1.0

INTRODUCTION

Introduction

1.1 Radiation

People are always subjected to natural radiation. This radiation exposure comes from the sun and naturally occurring radioactive materials present in the earth, structures we inhabit, and in the food and water we consume. There are radioactive gases in the air we breathe and our bodies are themselves radioactive. The levels of natural or background radiation vary greatly from location to location. The average United States resident receives approximately 300 millirem a year from natural background as shown in Table 1-1.

In addition, man-made sources of radiation, such as X-rays, radiation for medical purposes, fallout from nuclear explosives testing and radioactive materials from nuclear power plants contribute additional exposure. However, as shown in Table 1-1, an individual receives the major portion of dose from natural background and other sources with nuclear power plants contributing <1.0 millirem. This would also be the case for individuals living around or next to ANO.

1.2 Benefits of Radiation

Nuclear power plays an important part in meeting today's electricity needs and will continue to serve as an important source of energy well into the future. In addition, other uses of radiation have brought tremendous benefits to our everyday lives during the past 20 to 30 years. Radioisotopes and controlled radiation are used, for example, to sterilize medical supplies, to improve the keeping qualities of foods, in industrial processes, in medical science, and in the study of environmental pollution, agriculture and hydrology. Medical diagnosis and treatment are the main sources of public exposure to man-made radiation, but the benefit in terms of human lives and health is enormous.

1.3 Radiation Perspectives

Although it is not generally realized, radioactive materials from nuclear power plants are strictly regulated, while naturally occurring radiation is for the most part, unregulated; however, as shown in Table 1-1, the public receives more exposure to naturally occurring radiation. For example, a person living near a 1000 MWe coal fired plant could receive 7.2 millirem in a year from naturally occurring radioactive materials contained in the coal that is burned. A person living adjacent to a similar sized nuclear plant is expected to receive less than 1.0 millirem in a year.

In addition, radioactive elements lose their radioactivity, and resulting toxicity, with time. In comparison, potentially toxic non-radioactive materials, such as lead, and mercury, can present a danger to humans until properly treated, stabilized, and disposed.

1.4 Radiological Environmental Monitoring Program Purpose and Design Criteria

The radiological environmental monitoring program (REMP) was established to ensure that plant operating controls properly function to minimize any associated radiation endangerment to human health or the environment. The purpose of the REMP is:

- to measure radiation levels and their variations in environmental media in the area surrounding the plant,
- to determine average levels of radiation and radioactive material in various environmental media,
- to evaluate environmental sampling procedures, equipment and techniques, and
- to detect effects, if any, of ANO's operation on the environmental radiation levels and concentrations.

The design criteria for the REMP are:

- to analyze important pathways for anticipated types and quantities of radionuclides released into the environment,

- to consider the possibility of a buildup of long-lived radionuclides in the environment and physical and biological accumulations that may contribute to human exposures,
- to consider the potential radiation exposure to plant and animal life in the environment surrounding ANO, and
- to correlate levels of radiation and radioactivity in the environment with radioactive releases from station operation.

1.5 Dose Pathways Associated with ANO

Figure 1-1 shows potential exposure pathways that could occur as a result of a nuclear power plant. However, the most significant environmental dose pathways from a nuclear power station are direct dose from gaseous effluent and thyroid dose due to the ingestion of milk. ANO operations are expected to have little, if any, impact by these pathways due to the absence of milking animals within the vicinity of the site and the very low levels of radiation released.

1.6 Pathways Monitored

The airborne, waterborne, ingestion and direct radiation pathways are monitored as required by ANO Technical Specifications. The REMP includes the sampling program required to meet the above intent. This program is supplemented with additional sampling in order to provide a comprehensive and well-balanced program. Sample locations to monitor exposure pathways are described in Table 1-2 and shown in Figure 1-2. Section 2.0 of this report provides a discussion of 1995 sampling results.

1.7 Previous Data Comparison

A comparison of 1995 results to preoperational studies, operational controls and previous annual radiological environmental operating reports indicate no significant changes. Results remained at levels similar to those of previous years. Such results confirm that ANO effluent controls and equipment are performing satisfactorily and that plant operation has had no harmful effects nor resulted in any irreversible damage to the environment.

TABLE 1-1

Radiation Risks *

Radiation Risks in Perspective

Radiation Dose Comparisons

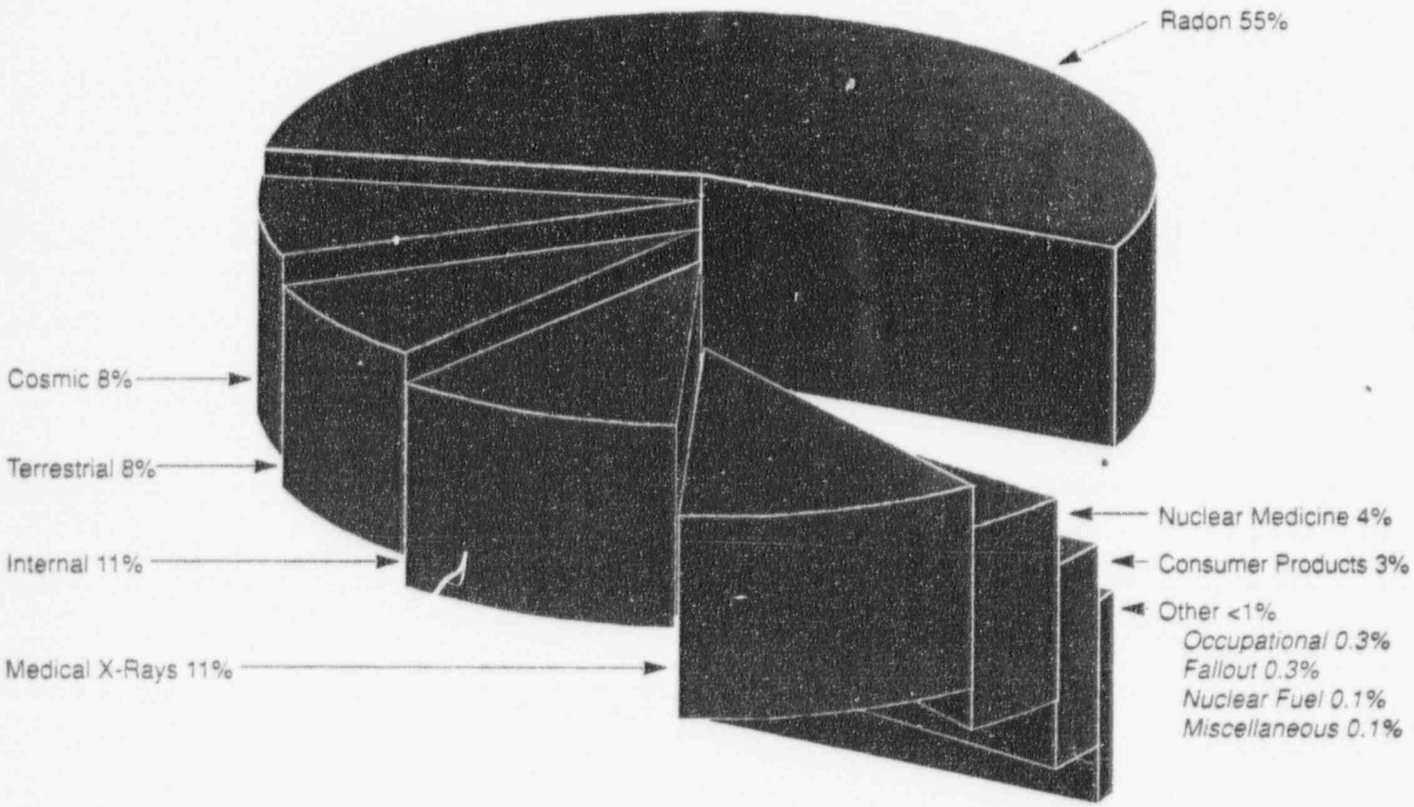
Natural Background	Approximate MREM/Year
Average U.S. Resident	300
Average Denver Resident	380
Radon in average households	
New York/New Jersey	360
Massachusetts	475
Medical Exposure	
Average U.S. Citizen	50
Typical Medical Examination	
Dental X-Rays *(Full Mouth)*	3,000 *(Skin)*
Chest X-Rays	10 *(Bone)*
Gastro-Intestinal Series *(Upper & Lower)*	1,400 *(Bone)*
Occupational Exposure	
Average Pilgrim Station Radiation Worker *(since 1980)*	600 MREM/Year

Estimated Loss of Average Life

Expectancy From Various Health Risks

Health Risk	Estimated Days of Life Expectancy Lost (average)
Smoking 20 Cigarettes/Day	2370 *(6.5 years)*
Overweight *(by 20%)*	985 *(2.7 Years)*
All Accidents Combined	435 *(1.2 Years)*
Auto Accidents	200
Alcohol Consumption *(U.S. Average)*	130
Home Accidents	95
Drowning	41
Natural Background Radiation	8
Medical Diagnostic X-Rays *(U.S. Average)*	6
All Catastrophes *(Earthquake, Etc.)*	3.5
One REM Radiation	1

Background Radiation Sources



The percentage contribution of various radiation sources to the total average effective dose equivalent in the U.S. population.

** Source from BOSTON EDISON*

TABLE 1-2

Sample Stations

Sample Station Number: 1
Approximate Direction and Distance from Plant: 88° - 0.6 miles
Sample Types: 1) Airborne radioiodines
2) Airborne particulates
3) Direct radiation
Sample Station Location:
The sample station is near the meteorology tower approximately 0.6 miles east of ANO.

Sample Station Number: 2
Approximate Direction and Distance from Plant: 235° - 0.4 miles
Sample Types: 1) Airborne radioiodines
2) Airborne particulates
3) Direct radiation
Sample Station Location:
IF traveling from ANO,
THEN go approximately 0.2 miles west toward Gate 4. Turn left and go approximately 0.1 miles. Turn right and go approximately 0.1 miles. The sample station is on the right at the former AP&L lodge location.
IF traveling south on Flatwood Road,
THEN go approximately 0.25 miles from sample station 109. Veer left at fork in road and go approximately 0.2 miles. Turn right and go approximately 0.1 miles. Turn right and go approximately 0.1 miles. The sample station is on the right at the former AP&L lodge location.

Sample Station Number: 3
Approximate Direction and Distance from Plant: 0° - 0.6 miles
Sample Types: 1) Airborne radioiodines
2) Airborne particulates
3) Direct radiation
4) Groundwater (alternate)
Sample Station Location:
IF traveling west on Highway 333,
THEN go approximately 0.35 miles from Gate 2 at ANO. Turn left onto gravel road and go approximately 0.05 miles. The sample station is on the left.
IF traveling east on Highway 333,
THEN go approximately 0.9 miles from junction of Highway 333 and Flatwood Road. Turn right onto gravel road and go approximately 0.05 miles. The sample station is on the left.

TABLE 1-2

Sample Stations

Sample Station Number: 4
Approximate Direction and Distance from Plant: 180° - 0.7 miles
Sample Types: 1) Airborne radioiodines
2) Airborne particulates
3) Direct radiation
Sample Station Location:
Go approximately 0.25 miles south from bridge over intake canal. Turn right onto gravel road. Proceed approximately 0.1 miles west of May Cemetery entrance. The sample station is on the left approximately 50 feet south of the road.

Sample Station Number: 5
Approximate Direction and Distance from Plant: 298° - 8.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
While traveling on Highway 64, turn onto Cherry Street in Knoxville, AR and go approximately 0.7 miles. Turn left onto Highway 64 South and go approximately 0.2 miles. The sample station is on the right.

Sample Station Number: 6
Approximate Direction and Distance from Plant: 111° - 7.0 miles
Sample Types: 1) Airborne radioiodines
2) Airborne particulates
3) Direct radiation
Sample Station Location:
Go to the AP&L local office which is located off Highway 7T in Russellville, AR (305 South Knoxville Avenue). The sample station is in the southeast corner of the back lot.

Sample Station Number: 7
Approximate Direction and Distance from Plant: 209° - 19.3 miles
Sample Types: 1) Airborne radioiodines
2) Airborne particulates
3) Direct radiation
Sample Station Location:
Turn west at junction of Highway 7 and Highway 27 in Dardanelle, AR. Proceed to junction of Highway 27 and Highway 10 in Danville, AR. Turn right onto Highway 10 and proceed a short distance to the AP&L supply yard, which is on the right adjacent to an AP&L substation. The sample station is in the southwest corner of the supply yard.

Sample Station Number: 8
Approximate Direction and Distance from Plant: 180° - 0.1 miles
Sample Types: 1) Surface water (composite)
2) Shoreline sediment
3) Fish
Sample Station Location: Plant discharge canal

TABLE 1-2

Sample Stations

Sample Station Number: 10
Approximate Direction and Distance from Plant: 95° - 0.9 miles
Sample Types: 1) Surface water (composite)
2) Shoreline sediment
3) Fish
Sample Station Location:
Surface water (composite) is collected at plant intake structure. Shoreline sediment and fish are collected at plant inlet canal.

Sample Station Number: 13
Approximate Direction and Distance from Plant: 271° - 0.5 miles
Sample Types: 1) Broadleaf vegetation
Sample Station Location:
IF traveling south on Flatwood Road,
THEN go approximately 0.2 miles from sample station 109. The sample station is on the left.
IF traveling west from ANO toward Gate 4,
THEN go approximately 0.4 miles and turn right onto Flatwood Road. Go a short distance (approximately 30 yards). The sample station is on the right.

Sample Station Number: 14
Approximate Direction and Distance from Plant: 70° - 5.3 miles
Sample Types: 1) Drinking water
Sample Station Location:
From junction of Highway 7 and Water Works Road, go approximately 0.8 miles west on Water Works Road. The sample station is on the left at the intake to the Russellville city water system from the Illinois Bayou.

Sample Station Number: 16
Approximate Direction and Distance from Plant: 290° - 5.9 miles
Sample Types: 1) Shoreline sediment
Sample Station Location:
From junction of Highway 64 and Highway 359 (Flat Rock Piney Bay Recreational Area turnoff), go approximately 0.7 miles west on Highway 64. The sample station is at the Piney Creek area on Lake Dardanelle.

Sample Station Number: 19
Approximate Direction and Distance from Plant: 95° - 5.1 miles
Sample Types: 1) Milk
Sample Station Location:
Turn from Highway 7 onto Harrell Drive in Russellville, AR and go approximately 0.1 miles. Turn right and go approximately 0.25 miles. The sample station is on the left at the Arkansas Tech Dairy.

TABLE 1-2

Sample Stations

Sample Station Number: 29
Approximate Direction and Distance from Plant: 24° - 6.9 miles
Sample Types: 1) Milk (alternate)
Sample Station Location:
Turn south from Highway 333 onto County Road 141 and go approximately 0.55 miles. Turn left and go approximately 0.6 miles. Turn left and go approximately 0.05 miles. The sample station is on the right at the Harold Steuber Dairy.

Sample Station Number: 32
Approximate Direction and Distance from Plant: 132° - 0.9 miles
Sample Types: 1) Groundwater
Sample Station Location:
From bridge over intake canal, go south approximately 0.25 miles. Turn left and go approximately 0.25 miles. Turn left on Bunker Hill Lane and go approximately 0.05 miles. The sample station is on the right at Clifton Stewart's Resident.

Sample Station Number: 33
Approximate Direction and Distance from Plant: 94° - 3.8 miles
Sample Types: 1) Groundwater
Sample Station Location:
From junction of Highway 64 and Highway 326 (Dike Road), go approximately 0.3 miles east on Dike Road. The sample station is on the left at the Ouita Lake Recreation Area on the Illinois Bayou.

Sample Station Number: 36
Approximate Direction and Distance from Plant: 140° - 0.05 miles
Sample Types: 1) Pond water
2) Pond sediment
Sample Station Location:
The sample station is at the Wastewater Holding Pond on the ANO site east of the discharge canal.

Sample Station Number: 37
Approximate Direction and Distance from Plant: 0° - 7.5 miles
Sample Types: 1) Milk
Sample Station Location:
IF traveling north on Highway 333,
THEN go approximately 3.5 miles from junction of Highway 333 and Mill Creek Road on Highway 333. Turn left and go approximately 0.1 miles. The sample station is on the left at the Lawrence Steuber Dairy.
IF traveling from junction of Highway 7 and Highway 333,
THEN go approximately 6.0 miles west on Highway 333. Turn right and go approximately 0.1 mile. The sample station is on the left at the Lawrence Steuber Dairy.

TABLE 1-2

Sample Stations

Sample Station Number: 38
Approximate Direction and Distance from Plant: 314° - 2.4 miles
Sample Types: 1) Food products (alternate)
Sample Station Location:
From west junction of Highway 64 and Highway 333 in London, AR, go approximately 0.4 miles west on Highway 64. Turn right at Hornet Estate and go approximately 0.1 miles. Turn left and go approximately 0.1 miles. The sample station is on the left at Ronnie Jones' residence.

Sample Station Number: 40
Approximate Direction and Distance from Plant: 119° - 2.2 miles
Sample Types: 1) Food products
Sample Station Location:
From junction on Highway 64 and Highway 326 (Marina Road), go approximately 2.0 miles on Marina Road. The sample station is on the left at Horace Hollis' residence just prior to curve.

Sample Station Number: 42
Approximate Direction and Distance from Plant: 73° - 12.4 miles
Sample Types: 1) Milk
Sample Station Location:
From junction of Highway 124 and Highway 326 in Gum Log, AR, go approximately 1.1 miles northeast on Highway 124. Turn left onto Gravel Hill Road and go approximately 0.6 miles. Turn right onto Hudson Loop and go approximately 0.3 miles. The sample station is on the left at the Hudson Dairy.

Sample Station Number: 45
Approximate Direction and Distance from Plant: 90° - 0.9 miles
Sample Types: 1) Broadleaf vegetation
Sample Station Location:
The sample station is located near mouth of intake canal.

Sample Station Number: 46
Approximate Direction and Distance from Plant: 295° - 4.1 miles
Sample Types: 1) Food products
Sample Station Location:
From west junction on Highway 64 and Highway 333 in London, AR, go west on Highway 64 approximately 2.4 miles. Turn right onto Scottie Lane and go approximately 0.1 miles. The sample station is on the right at Dewey Gregory's residence.

Sample Station Number: 48
Approximate Direction and Distance from Plant: 316° - 2.2 miles
Sample Types: 1) Food products
Sample Station Location:
R. J. Cochran residence, No. 26 Hwy 64 London West, directly North (across from) London Volunteer Fire Dept.

TABLE 1-2

Sample Stations

Sample Station Number: 49
Approximate Direction and Distance from Plant: 338° - 9.0 miles
Sample Types: 1) Milk
Sample Station Location:
IF traveling from London,
THEN take Hwy. 333 N. to Augsburg community. Turn left (west) at the Augsburg Church. Travel west on County Road 81 for 3.2 miles. Rylee Dairy on right (north) side of County Road 81.

Sample Station Number: 50
Approximate Direction and Distance from Plant: 47° - 10.8 miles
Sample Types: 1) Milk
Sample Station Location:
Take state Highway 7 north to Dover. Turn right (east) on state Highway 27. Go approximately 1.6 miles. Dairy is located on left (north) side of state Highway 27.

Sample Station Number: 108
Approximate Direction and Distance from Plant: 301° - 0.9 miles
Sample Types: 1) Direct radiation
2) Food products
Sample Station Location:
IF traveling from Highway 333,
THEN turn south onto Flatwood Road and go approximately 0.4 miles. The sample station is on the right.
IF traveling north on Flatwood Road,
THEN go approximately 0.4 miles from sample station 109. The sample station is on the left.

Sample Station Number: 109
Approximate Direction and Distance from Plant: 285° - 0.5 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling south on Flatwood Road,
THEN go approximately 0.4 miles from sample station 108. Sample station 109 is on a utility pole on the left across from the junction of Flatwood Road and Round Mountain Road just before pavement ends.
IF traveling west from ANO toward Gate 4,
THEN go approximately 0.4 miles and turn right onto Flatwood Road. Go approximately 0.2 miles. The sample station is on a utility pole on the right across from the junction of Flatwood Road and Round Mountain Road just after pavement begins.

Sample Station Number: 110
Approximate Direction and Distance from Plant: 138° - 0.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
From bridge over intake canal, go south approximately 0.25 miles. Turn left and go approximately 0.25 miles. Turn right on Bunker Hill Lane. The sample station is on the first utility pole on the left.

TABLE 1-2

Sample Stations

Sample Station Number: 111
Approximate Direction and Distance from Plant: 121° - 2.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
From junction of Highway 64 and Highway 326 (Marina Road) , go approximately 2.1 miles on Marina Road. The sample station is on a utility pole on the left just prior to curve.

Sample Station Number: 112
Approximate Direction and Distance from Plant: 74° - 2.6 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Go to the junction of Highway 64 and the I-40 exit which is approximately 1.3 miles east of sample station 113. Sample station 112 is on a utility pole on the northeast corner of the junction.

Sample Station Number: 113
Approximate Direction and Distance from Plant: 52° - 1.5 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Go to the east junction of Highway 333 and Highway 64. The sample station is on a utility pole on the southwest corner of the junction.

Sample Station Number: 114
Approximate Direction and Distance from Plant: 31° - 1.3 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on Highway 64,
THEN go approximately 0.6 miles west of the east junction of Highway 64 and Highway 333. The sample station is on a utility pole on the right.
IF traveling east on Highway 64,
THEN go approximately 1.1 miles from sample station 115. Sample station 114 is on a utility pole on the left.

Sample Station Number: 115
Approximate Direction and Distance from Plant: 344° - 1.4 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on Highway 64,
THEN go approximately 1.1 miles west of sample station 114. Sample Station 115 is on a utility pole on the right.
IF traveling east on Highway 64,
THEN go approximately 0.8 miles from the west junction of Highway 64 and Highway 333 in London, AR. The sample station is on a utility pole on the left.

TABLE 1-2

Sample Stations

Sample Station Number: 116
Approximate Direction and Distance from Plant: 320° - 1.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Go one block south of the west junction of Highway 333 and Highway 64 in London, AR. The sample station is on a utility pole north of the railroad tracks.

Sample Station Number: 117
Approximate Direction and Distance from Plant: 305° - 17.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on I-40,
THEN take Exit 58 at Clarksville, AR. Turn right onto Rogers Street. At junction of Rogers Street and Highway 64, turn left and proceed west to first stop light. Turn left onto Cravens Street. The sample station is on a utility pole on the right between the county courthouse and the post office.
IF traveling west on Highway 64,
THEN go to first stop light past junction of Rogers Street and Highway 64. Turn left onto Cravens Street. The sample station is on a utility pole on the right between the county courthouse and the post office.

Sample Station Number: 118
Approximate Direction and Distance from Plant: 294° - 5.6 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling east on Highway 64,
THEN go approximately 0.3 miles from Bridge which goes across Piney. The sample station is on a utility pole on the left.
IF traveling west on Highway 64,
THEN go approximately 0.4 miles past Flat Rock Piney Bay Recreational Area turnoff. The sample station is on a utility pole on the right.

Sample Station Number: 119
Approximate Direction and Distance from Plant: 309° - 4.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Turn west from Highway 333 onto Will Baker Road, which intersects Highway 333 approximately 1.4 miles north of the I-40 Overpass near London, AR. Go approximately 2.0 miles. The sample station is on a utility pole on the left just prior to pavement ending.

TABLE 1-2

Sample Stations

Sample Station Number: 120
Approximate Direction and Distance from Plant: 336° - 4.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling from I-40 Overpass in London, AR,
THEN go north on Highway 333 approximately 2.4 miles. The sample station is on a utility pole on the right near Martin Chapel.
IF traveling from junction of Mill Creek Road and Highway 333,
THEN go approximately 1.0 mile south on Highway 333. The sample station is on a utility pole on the left near Martin Chapel.

Sample Station Number: 121
Approximate Direction and Distance from Plant: 349° - 4.6 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling from I-40 Overpass in London, AR,
THEN go north on Highway 333 approximately 3.4 miles to Mill Creek Road. Turn right onto Mill Creek Road and go approximately 0.7 miles. The sample station is on a utility pole on the right.
IF traveling northwest on Mill Creek Road,
THEN go approximately 0.4 miles past East Point Baptist Church and Cemetery. The sample station is on a utility pole on the left.

Sample Station Number: 122
Approximate Direction and Distance from Plant: 18° - 3.3 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling north from junction of Highway 64 and Mill Creek Road,
THEN go approximately 2.5 miles. The sample station is on a utility pole on the right.
IF traveling southeast on Mill Creek Road,
THEN go approximately 1.9 miles from East Point Baptist Church. The sample station is on a utility pole on the left.

Sample Station Number: 123
Approximate Direction and Distance from Plant: 46° - 3.5 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Turn north from Pleasant View Road onto Ball Hill Road and go approximately 0.8 miles. The sample station is on a utility pole on the left.

TABLE 1-2

Sample Stations

Sample Station Number: 124
Approximate Direction and Distance from Plant: 60° - 3.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling from junction of Highway 64 and Mill Creek Road,
THEN go north on Mill Creek Road approximately 0.7 miles. Turn right onto Pleasant View Road and go approximately 1.3 miles. The sample station is on the right on a utility pole which is across from a siren and below a transmission line.
IF traveling west from junction of Highway 7 and Pleasant View Road,
THEN go approximately 3.1 miles. The sample station is on the left on a utility pole which is across from a siren and below a transmission line.

Sample Station Number: 125
Approximate Direction and Distance from Plant: 46° - 9.1 miles
Sample Types: 1) Direct radiation
Sample Station Location:
While traveling north on Highway 7, turn left onto Water Street in Dover, AR. Go one block and turn left onto South Elizabeth Street. Go one block and turn right onto College Street. The sample station is on a utility pole at the southeast corner of the red brick school building, which is located on top of hill.

Sample Station Number: 126
Approximate Direction and Distance from Plant: 81° - 5.5 miles
Sample Types: 1) Direct radiation
Sample Station Location:
The sample station is located on the west side of Highway 7 directly across from Shiloh Road, which is approximately 1.3 miles north of the junction of Highway 7 and Dike Road.

Sample Station Number: 127
Approximate Direction and Distance: 102° - 5.6 miles
Sample Types: 1) Direct radiation
Sample Station Location:
The sample station is located on the Arkansas Tech Campus on West 0 Street on a security light pole in front of Bryan Hall, which is the first building on the left when traveling from North Arkansas on West 0 Street.

Sample Station Number: 128
Approximate Direction and Distance from Plant: 113° - 8.6 miles
Sample Types: 1) Direct radiation
Sample Station Location:
The sample station is on a utility pole inside the security fence near the Russellville Airport Office. The airport is located off of East 16th Street and is well marked by airport signs.

TABLE 1-2

Sample Stations

Sample Station Number: 129
Approximate Direction and Distance from Plant: 118° - 7.3 miles
Sample Types: 1) Direct radiation
Sample Station Location:
The sample station is on a utility pole north of the Russellville High School sign, which is in front of the high school on east side of Highway 7T.

Sample Station Number: 130
Approximate Direction and Distance from Plant: 245° - 4.6 miles
Sample Types: 1) Direct radiation
Sample Station Location:
At junction of Highway 7 and Highway 22 in Dardanelle, AR, take Highway 22 toward Delaware, AR. Go approximately 0.4 miles west of Delaware Recreation Area turnoff. The sample station is on a utility pole on the right in Delaware, AR near Shirley's Beauty Salon.

Sample Station Number: 131
Approximate Direction and Distance from Plant: 244° - 2.4 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Turn north from Highway 22 onto Highway 393 at Delaware Recreation Area turnoff and go approximately 2.9 miles. The sample station is located past the boat ramp on an oak tree near crosstie steps in northeast quadrant of circle drive.

Sample Station Number: 132
Approximate Direction and Distance from Plant: 267° - 5.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Turn north from Highway 22 onto Highway 393 at Delaware Recreation Area turnoff and go approximately 0.9 miles. Turn left onto dirt road and go approximately 2.3 miles. The sample station is on a utility pole on the right.

Sample Station Number: 133
Approximate Direction and Distance from Plant: 233° - 3.7 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on Highway 22,
THEN go approximately 2.0 miles from sample station 134. Sample station 133 is on the south side of the Highway 22 causeway attached to the first NO PARKING ANY TIME sign west of the bridge.
IF traveling east on Highway 22 from Delaware, A.P.,
THEN go approximately 0.8 miles from Delaware Recreation Area turnoff. The sample station is on the south side of the Highway 22 causeway attached to the first NO PARKING ANY TIME sign west of the bridge.

TABLE 1-2

Sample Stations

Sample Station Number: 134
Approximate Direction and Distance from Plant: 200° - 2.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on Highway 22,
THEN go approximately 0.8 miles from sample station 135. Sample station 134 is on a utility pole on the right at Mockingbird Lane.
IF traveling east on Highway 22,
THEN go approximately 2.0 miles from sample station 133. Sample station 134 is on a utility pole on the left at Mockingbird Lane.

Sample Station Number: 135
Approximate Direction and Distance from Plant: 188° - 3.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on Highway 22,
THEN go approximately 1.7 miles from sample station 136. Sample station 135 is on a utility pole on the right.
IF traveling east on Highway 22,
THEN go approximately 0.8 miles from sample station 134. Sample station 135 is on a utility pole on the left.

Sample Station Number: 136
Approximate Direction and Distance from Plant: 168° - 4.3 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling west on Highway 22,
THEN go approximately 3.7 miles from junction of Highway 22 and Highway 7. The sample station is on the right on the first utility pole west of the Little Hays Creek Bridge.
IF traveling east on Highway 22,
THEN go approximately 1.7 miles from sample station 135. Sample station 136 is on the left on the first utility pole west of the Little Hays Creek Bridge.

Sample Station Number: 137
Approximate Direction and Distance from Plant: 150° - 8.4 miles
Sample Types: 1) Direct radiation
Sample Station Location:
At junction of Highway 7 and Highway 28 in Dardanelle, AR, go approximately 0.2 miles on Highway 28. The sample station is on a speed limit sign on the right in front of the Morris R. Moore Arkansas National Guard Armory.

TABLE 1-2

Sample Stations

Sample Station Number: 138
Approximate Direction and Distance from Plant: 193° - 5.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
At junction of Highway 22 and Highway 155 (Mt. Nebo Road) in Dardanelle, AR, turn west and go to top of mountain. Veer right at stop sign and proceed toward Sunset Point. The sample station is down a dirt road on the right which is approximately 0.1 miles southeast of Sunset Point. The sample station is on the left side of the dirt road on a utility pole near a TV tower.

Sample Station Number: 139
Approximate Direction and Distance from Plant: 178° - 19.2 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Take Highway 7 South through Dardanelle, AR to Ola, AR. Turn left at junction of Highway 7 and Highway 10 West in Ola, AR and go approximately 1/2 block. The sample station is on a utility pole on the left in front of the U. S. Post Office.

Sample Station Number: 140
Approximate Direction and Distance from Plant: 151° - 21.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
Proceed through Ola, AR and take Highway 10 East to Casa, AR, which is in Perry County. Turn right at the Perry-Casa High School. The sample station is on a utility pole at the southwest corner of the school.

Sample Station Number: 141
Approximate Direction and Distance from Plant: 125° - 3.8 miles
Sample Types: 1) Direct radiation
Sample Station Location:
While traveling southwest on Highway 326 (Marina Road), go approximately 2.4 miles from sample station 111. Sample station 141 is on the right on a utility pole, which is approximately 50 yards east of a transmission line. (The sample station is approximately 0.35 miles west of the junction of Hilltop Drive and Marina Road.)

Sample Station Number: 142
Approximate Direction and Distance from Plant: 129° - 5.1 miles
Sample Types: 1) Direct radiation
Sample Station Location:
The sample station is on a utility pole at the junction of Skyline Drive and Nordin Lane in Russellville, AR, near a peach orchard.

TABLE 1-2

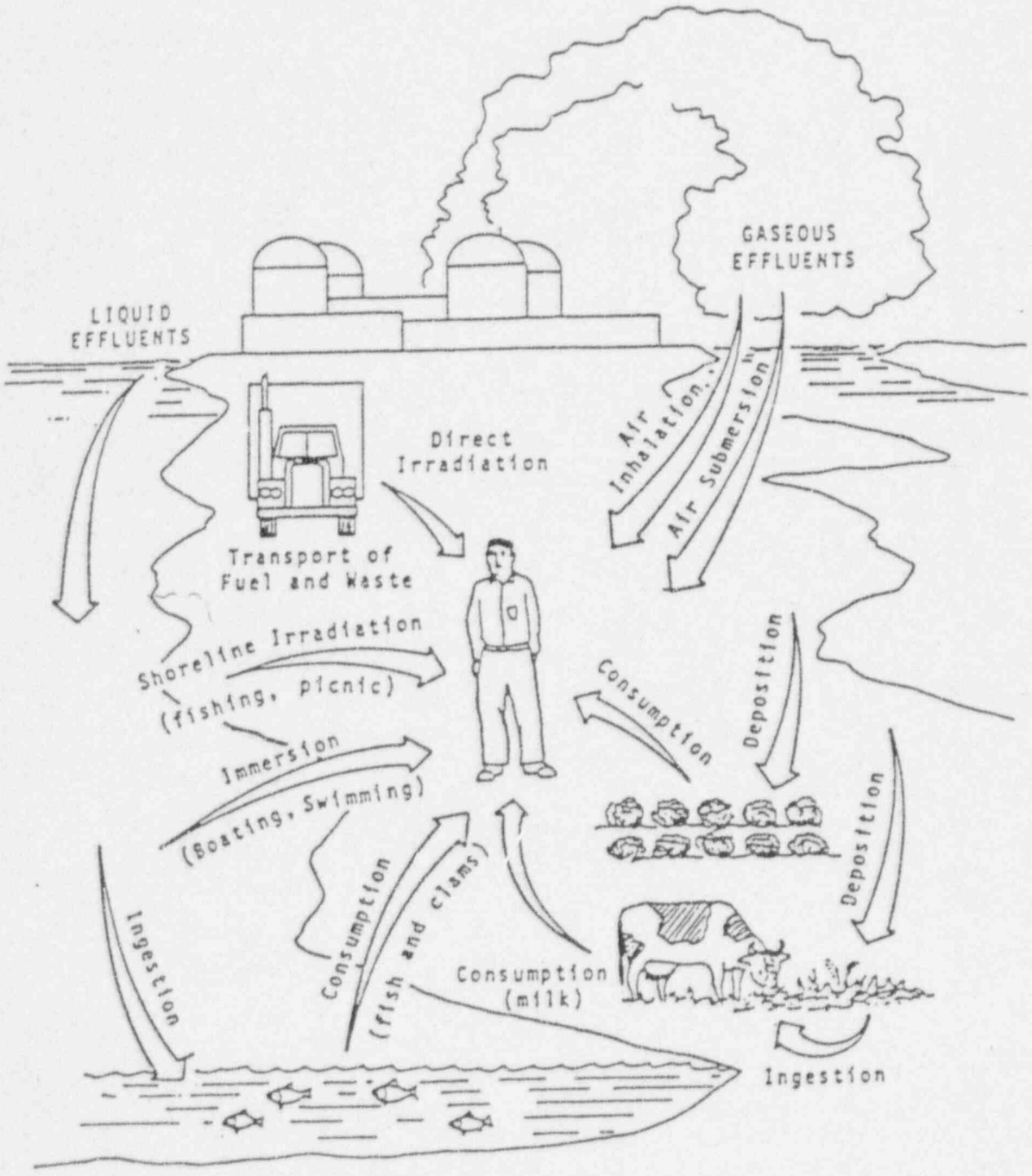
Sample Stations

Sample Station Number: 143
Approximate Direction and Distance from Plant: 106° - 17.5 miles
Sample Types: 1) Direct radiation
Sample Station Location:
IF traveling east on Highway 64 to Atkins, AR,
THEN turn left at junction of Highway 64 and North Church Street. Proceed north. The sample station is on a utility pole on the left in front of Atkins High School near stop sign at corner of North Church Street and Northeast 3rd Street.
IF traveling east on Interstate 40,
THEN take Exit 94 at Atkins, AR. Turn left onto North Church Street and proceed south. The sample station is on a utility pole on the right in front of Atkins High School near stop sign at corner of North Church Street and Northeast 3rd Street.

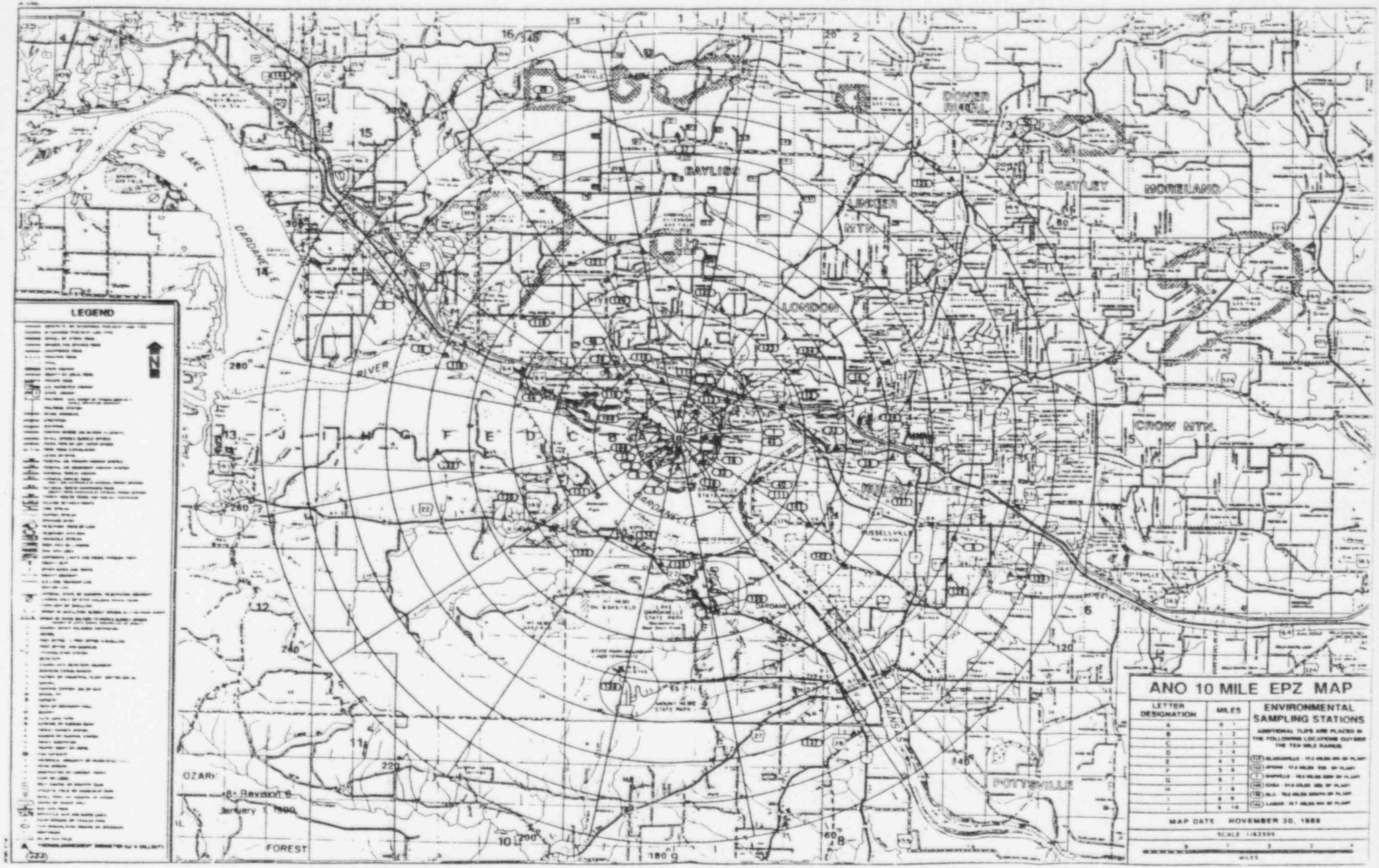
Sample Station Number: 144
Approximate Direction and Distance from Plant: 313° - 12.7 miles
Sample Types: 1) Direct radiation
Sample Station Location:
While traveling on Highway 64, turn south onto Cumberland Street in Lamar, AR, and go approximately 0.7 miles. Veer left at stop sign. The sample station is on a utility pole across the one way fire lane in front of Lamar Elementary School.

FIGURE 1-1

Exposure Pathways



Sample Collection Sites



SECTION 2.0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

- INTERPRETATIONS AND TRENDS OF RESULTS
- PROGRAM DESCRIPTION

2.1 AIR PARTICULATES AND RADIOIODINES

Note: Analytical results are presented in Tables 1.1 through 1.7 of Attachment I and summarized in Section 4.0.

2.1.1 Interpretations and Trends of Results

Gross beta air particulate and Iodine-131 results for 1995 were similar to those obtained in previous years of the operational REMP. In addition, gross beta air particulate results were well below the preoperational average of 0.093 pCi/m^3 for indicator locations and 0.091 pCi/m^3 for control locations. However, fallout from atmospheric nuclear weapons testing was detected during the preoperational period. Therefore, preoperational results are not representative of actual conditions.

In 1995, gross beta results for indicator locations ranged from 0.003 - 0.034 pCi/m^3 with a mean of 0.014 pCi/m^3 as compared to control locations which ranged from 0.006 - 0.035 pCi/m^3 with a mean of 0.016 pCi/m^3. All Iodine-131 results were less than the lower limit of detection (LLD). This indicates the airborne exposure pathway has not been affected by the operation of ANO and that airborne concentrations continue to be at, or near, background levels.

In addition, the standard "t" test was used to compare average gross beta concentrations from the indicator locations to the control. The test result indicates concentrations at indicator sample location 1 to be statistically identical to the control location, and indicator sample locations 2, 3 and 4 to be statistically lower than the control. Although a minor difference exists in the results for sample stations 2, 3 4, background fluctuations and geographical location are contributing factors to be considered. Results of this analysis are summarized in Attachment III.

Gross beta concentrations shown in Figure 2-1 further emphasize that ANO has had no influence on the airborne pathway. This figure shows 1995 monthly average results compared to a 1982 baseline average and 1987 through 1995 yearly average results for indicator locations compared to controls.

2.1.2 Program Description

ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-1 and 3.12-1, respectively, require five air sampler locations for measurement of

radioactivity in the airborne exposure pathway. ANO used six continuous air samplers to provide gross beta, gamma and radioiodine activity measurements. Four of the air samplers were used as indicators (Stations 1, 2, 3 and 4) with the remaining two utilized as controls (Stations 6 and 7). These air samplers were placed at distances from 0.4 to 19.3 miles (Table 1-2 and Figure 1-2).

The air samplers were placed approximately one meter above the ground in weatherproof houses. A 47-millimeter glass fiber filter was installed in the intake line by the vacuum pump with a charcoal cartridge located directly downstream. Flows were adjusted to 30 ± 3 liters per minute. Filters and cartridges were changed weekly and analyzed for gross beta radionuclides and radioiodine activity, respectively. In addition, the filters were composited quarterly and analyzed for gamma radionuclides.

Figure 2-1
Air Sample Gross Beta Concentrations

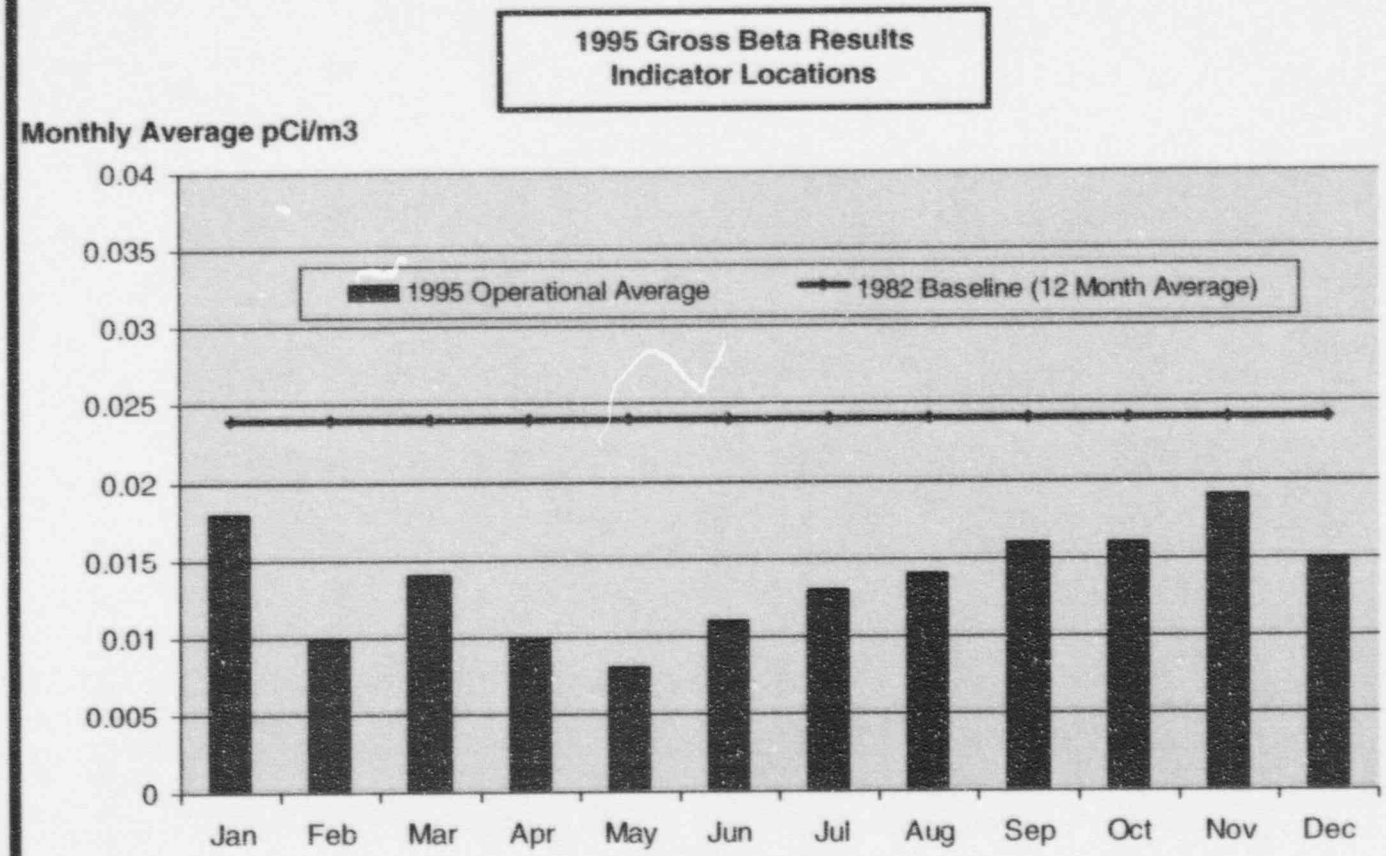
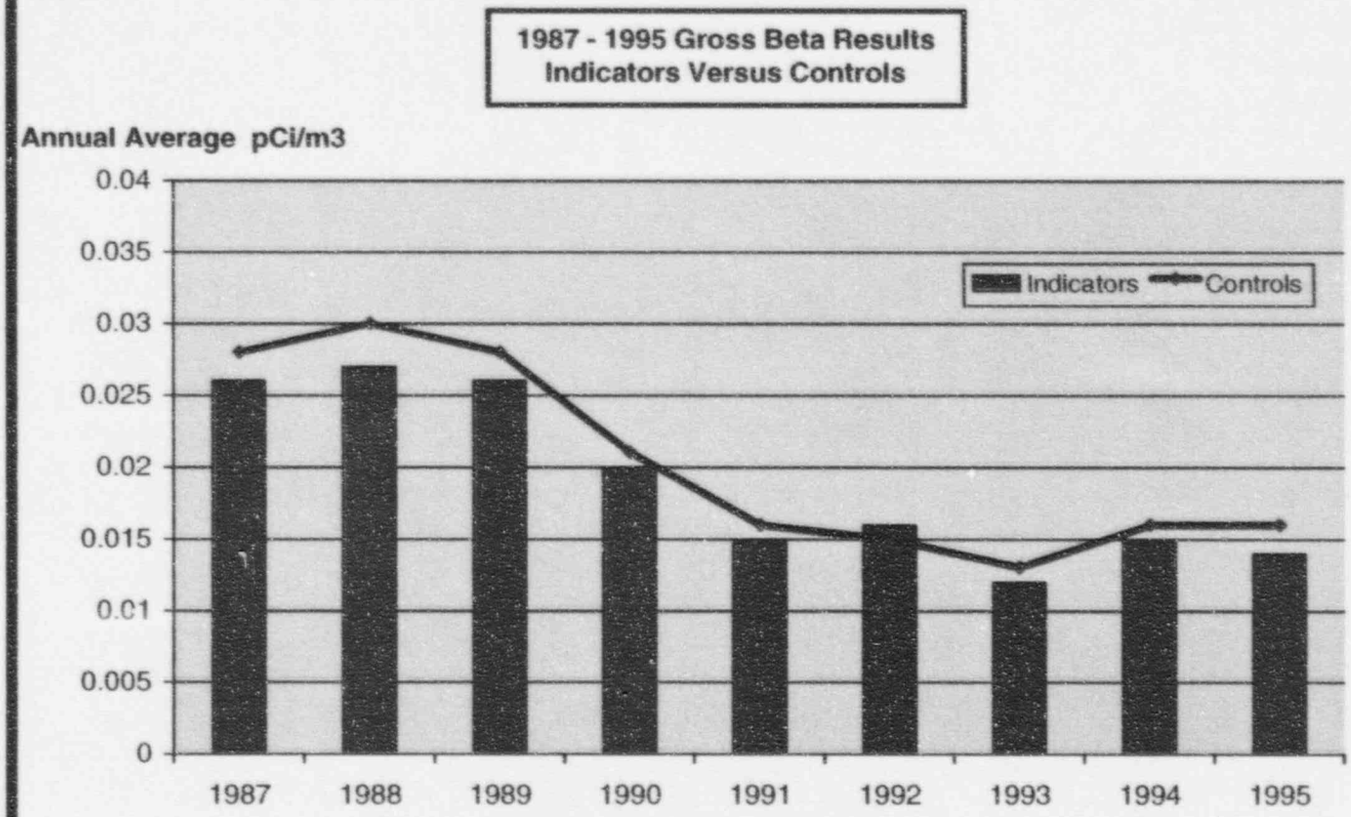


Figure 2-1
Air Sample Gross Beta Concentrations



2.2 THERMOLUMINESCENT DOSIMETRY

Note: Analytical results are presented in Attachment II and summarized in Section 4.0.

2.2.1 Interpretations and Trends of Results

Gamma radiation dose in 1995 was similar to that obtained in previous preoperational and operational years as illustrated in Table 2-1. During the the second quarter of 1995, an increase in dose was noted as compared to previous quarters. Investigation into this matter by ANO personnel revealed that the thermoluminescent dosimeters (TLDs) were apparently exposed to an onsite radiation source. This conclusion was based on seeing an increase in all indicator and control TLD results and no increase in TLD results reported by the Arkansas Department of Health for the same quarter. In addition, a review of the TLD processing activities showed no abnormalities. Quarterly doses recorded by TLDs were as follows:

- 0 - 2 miles, mean of 18.1 mrem and range of 14.0 - 40.0 mrem
- 2 - 5 miles, mean of 15.7 mrem and range of 11.0 - 42.0 mrem
- >5 miles, mean of 16.8 mrem and range of 12.0 - 45.0 mrem

These results indicate that the ambient radiation levels remained at or near background in 1995 and have been unaffected by the operation of ANO. In addition, the standard "t" test was used to compare average radiation doses from the 0 - 2 and 2 - 5 mile area TLDs to the >5 mile area TLDs. The result from this test indicates radiation doses at the 0 - 2 and 2 - 5 mile range to be statistically identical to the >5 mile range. Attachment III summarizes the results of this analysis.

Radiation doses shown in Figure 2-2 further emphasize that ambient radiation levels have remained at or near background levels. This figure shows 1995 quarterly average results compared to preoperational levels and 1987 through 1995 annual quarterly average results for indicator locations compared to controls.

2.2.2 Program Description

ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-1 and 3.12-1, respectively, require forty TLD locations for measurement of direct radiation doses. ANO measured ambient radiation in the environment surrounding the plant with 44 TLDs (two lithium borate and calcium sulfate elements) to provide a quantitative measurement of the area radiation levels. ANO personnel placed these environmental TLDs at distances from 0.4 to 21.8 miles (Table 1-2 and Figure 1-2).

Each dosimeter was sealed in a plastic protective holder and suspended above the ground. The dosimeters were collected and analyzed quarterly. The TLD locations may be summarized as follows:

- 11 stations in the 0 - 2 mile range,
- 15 stations in the 2 - 5 mile range, and
- 18 stations in the >5 mile range.

TABLE 2-1

TLD Dose Rates *

Year	Indicators	Controls
1973	20.8	24.3
1974	24.0	29.3
1987 **	23.2	21.5
1988	23.0	24.2
1989	21.0	22.0
1990	26.4	29.0
1991	25.9	26.3
1992	26.0	27.0
1993	26.9	26.6
1994 ***	15.7	15.7
1995	16.9	16.8

*** Values reported as annual average mR/quarter.**

**** Began utilizing Panasonic TLDs.**

***** Dose based on deep working dose (1000 mg/cm^2). Previous doses based on lens of eye (300 mg/cm^2).**

Figure 2-2
TLD Radiation Dose

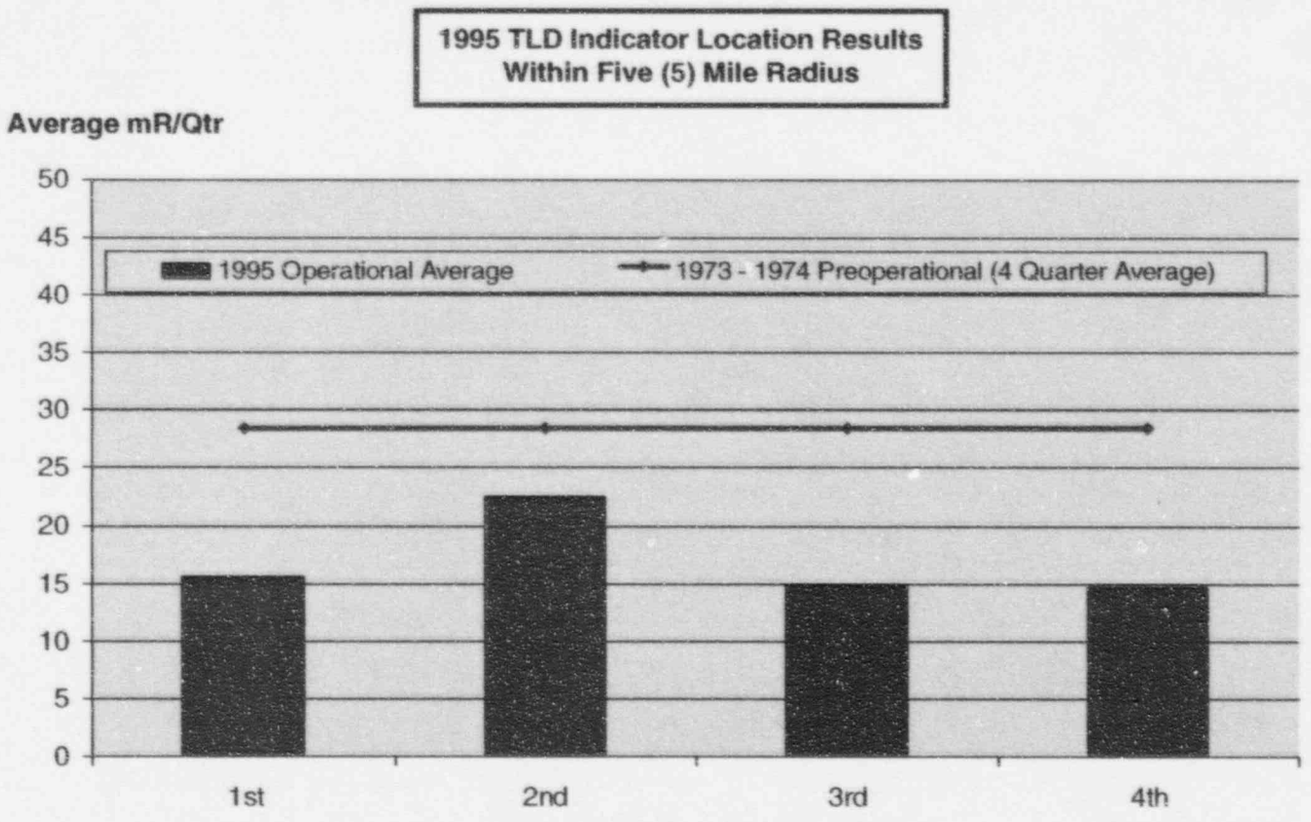
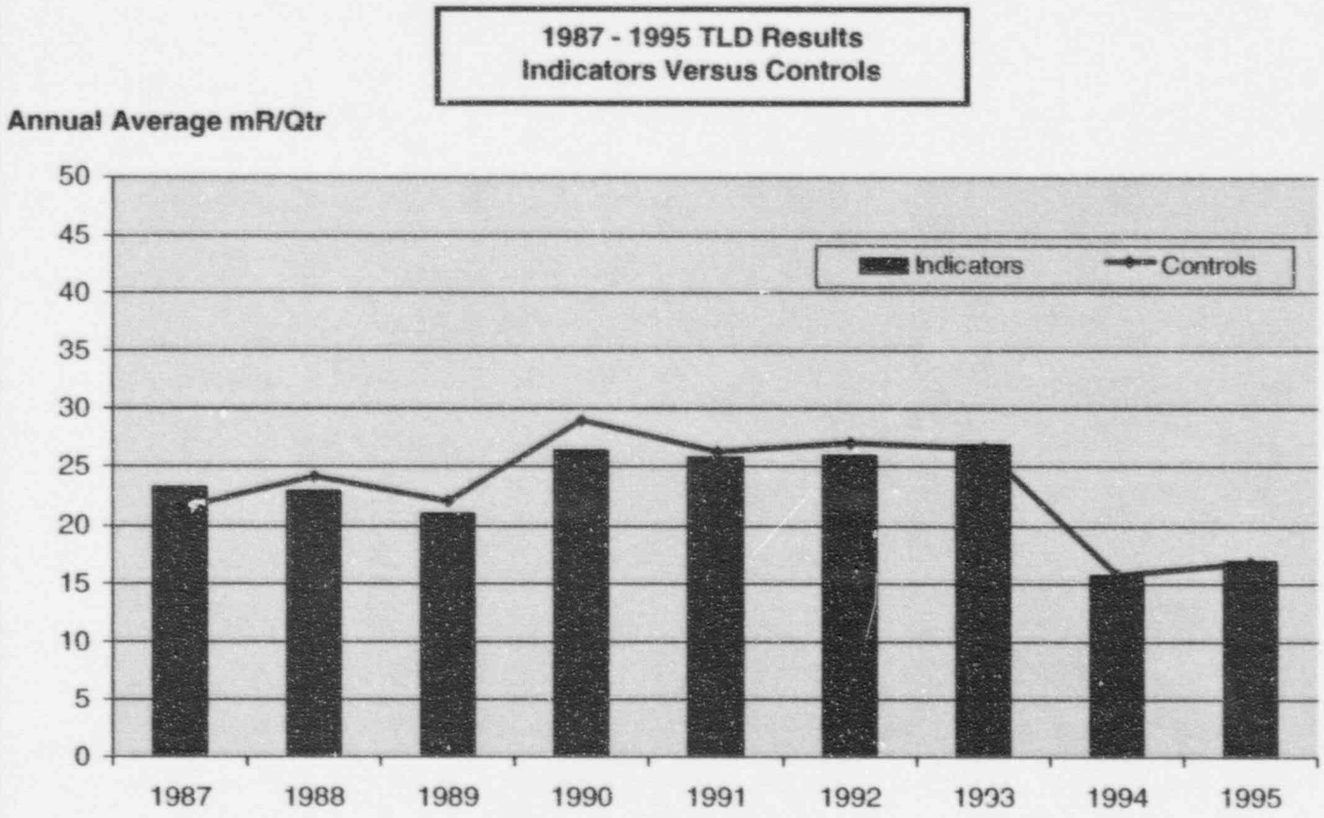


Figure 2-2
TLD Radiation Dose



2.3 MILK

Note: Analytical results are presented in Tables 2.1 through 2.5 of Attachment I and summarized in Section 4.0.

2.3.1 Interpretations and Trends of Results

Milk samples were collected monthly from four control locations in 1995 and analyzed for Iodine-131 and gamma radionuclides, except as described in Section 6.4. Iodine-131 was below detectable limits in all control locations. Cesium-137 was detected once at the Hudson Dairy at a concentration of 5.0 pCi/l and the Rylee Dairy at an averaged concentration of 3.0 pCi/l. Listed below is a comparison of 1995 results to the preoperational and operational years. Results are reported in pCi/l units.

Radionuclide	1995	1987 - 1994	Preoperational
Iodine-131	<LLD	0.5	2.7
Cesium-137	3.5	4.2	<LLD
Other Gammas	<LLD	<LLD	<LLD

The level of Cesium-137 detected in the control locations samples is indicative of concentrations attributed to past atmospheric weapons testing. Since their are no dairies within the five miles of the ANO site and the control locations do not indicate any unusual concentrations of radioisotopes, it is concluded ANO's operation had no impact on this pathway in 1995, as has been the case in previous years.

2.3.2 Program Description

ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-1 and 3.12-1, respectively, require four milk locations for measurement of radioactivity by the ingestion exposure pathway. ANO and Arkansas Department of Health (ADH) personnel collected milk monthly from four locations at distances from 5.1 to 12.4 miles (Table 1-2 and Figure 1-2). Since no indicator locations exist within five miles of ANO, four locations were utilized as controls (Arkansas Tech, L. Steuber, Hudson and Rylee). An additional control location (Ragsdale) was added to the program in December 1995 to replace the Hudson Dairy which discontinued milking operations.

Milk was collected from each location in two one-gallon labeled containers. Samples were preserved with formaldehyde and then analyzed for Iodine-131 and gamma radionuclides.

2.4 WATER

Note: Analytical results are presented in Tables 3.1 through 5.2 of Attachment I and summarized in Section 4.0.

2.4.1 Interpretations and Trends of Results

Analytical results for 1995 drinking water, surface water and groundwater samples were similar to those reported in previous years.

Drinking water samples were collected monthly from one location and analyzed for gross beta radionuclides, Iodine-131 and gamma radionuclides. In addition, a composite was analyzed quarterly for tritium. Tritium, gamma radionuclides and Iodine-131 were below detectable limits, which is consistent with preoperational data. Gross beta concentrations ranged from 1.4 - 7.1 pCi/l with a mean of 3.0 pCi/l, which are consistent with preoperational and operational levels. Listed below is a comparison of 1995 results to preoperational and operational years. Results are reported in pCi/l units.

Radionuclide	1995	1987 - 1994	Preoperational
Gross Beta	3.0	3.6	6.5
Iodine-131	<LLD	0.3	<LLD
Gammas	<LLD	<LLD	<LLD
Tritium	<LLD	580.0	165.0

Based on this comparison, the operation of ANO had no impact on this pathway during 1995.

Surface water samples were collected monthly and analyzed for gamma radionuclides and a composite was analyzed quarterly for tritium. In addition, the ADH and ANO split monthly grab samples from the discharge canal and Piney Creek locations. These samples were analyzed monthly for gamma radionuclides and tritium. Listed below is a comparison of 1995 results from indicator locations as compared to the preoperational and operational years. Results are reported in pCi/l units and do not include ADH split samples. Results of ADH samples are summarized in Table 4-1.

Isotope	1995	1987 - 1994	Preoperational
Cobalt-58	<LLD	7.5	<LLD
Cesium-137	<LLD	<LLD	17.8
Other Gammas	<LLD	<LLD	<LLD
Tritium	546.7	681.1	200.0

Based on this comparison, 1995 levels are representative of the historic average; therefore, the operation of ANO had little or no impact on this pathway. Figure 2-3, which presents 1995 tritium concentrations in comparison to previous years, further emphasizes the above conclusion.

Groundwater samples were collected quarterly from two locations and analyzed for gamma radionuclides and tritium. As in preoperational and previous operational years, gamma radionuclides remained undetectable. Although tritium has been detected in small concentrations during the preoperational and operational years, it was undetectable during 1995. Therefore, concentrations continue to be at, or near, background levels.

2.4.2 Program Description

ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-1 and 3.12-1, respectively, require one drinking water, two surface water and two groundwater locations for the measurement of radioactivity by the waterborne exposure pathway.

Drinking water was sampled monthly from an indicator location (intake to Russellville City Water System from Illinois Bayou) at a distance of 5.3 miles (Table 1-2 and Figure 1-2). Water was collected in two one-gallon labeled containers. Upon return from the field, the samples were acidified with hydrochloric acid and then analyzed for gross beta radionuclides, Iodine-131 and gamma radionuclides. In addition, a composite was analyzed quarterly for tritium.

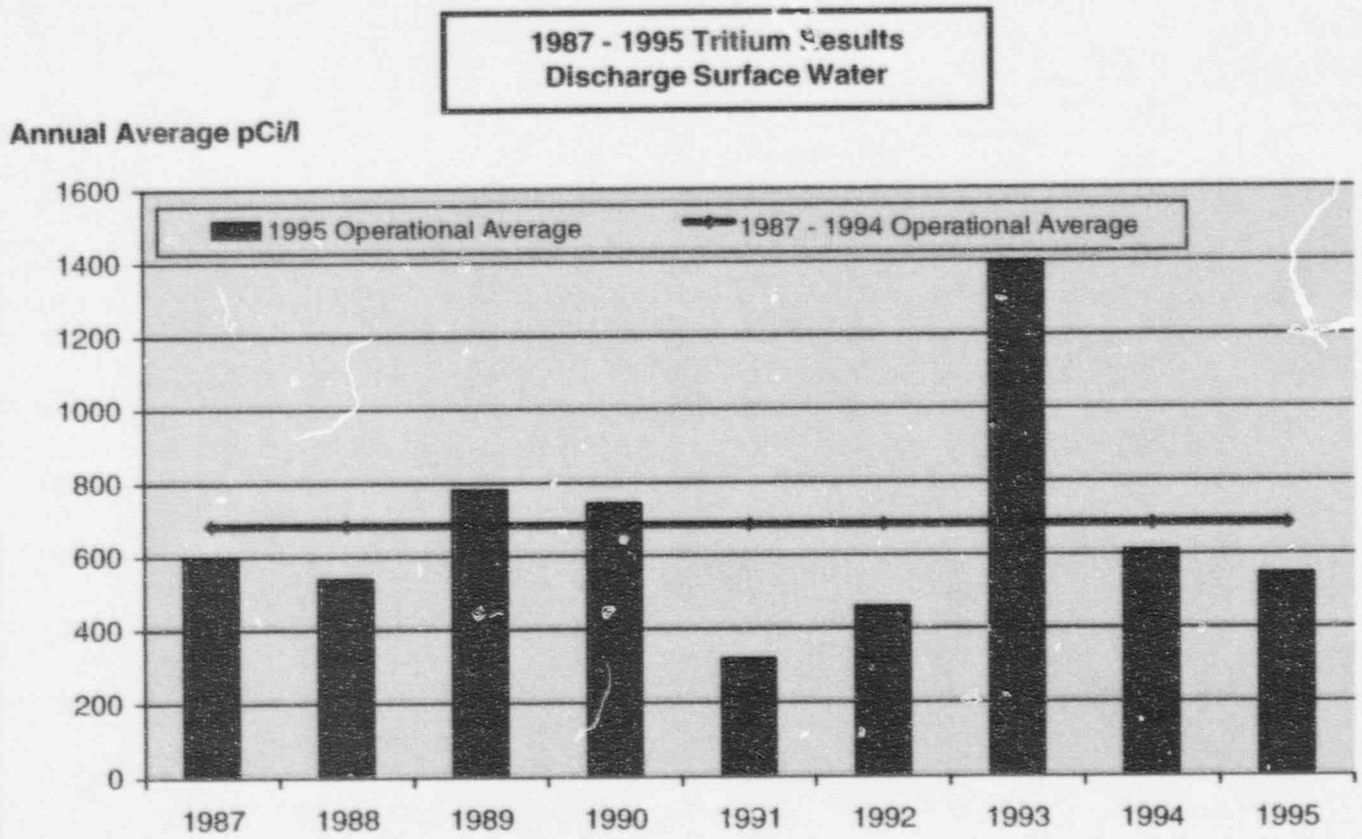
Surface water was sampled monthly from two locations, an indicator location (discharge) and a control location (intake) at distances from 0.1 - 0.9 miles (Tables 1-2 and Figure 1-2). The discharge and intake surface water

samples were composited with an automatic sampler that collected a preset volume at set intervals (~ 2 gallons per week). Weekly, one-gallon of sample from each location was acidified with hydrochloric acid and placed in an appropriately labeled composite carboy. At the end of the month, a one-gallon sample from each composite carboy was placed in a labeled container. The samples were then analyzed for gamma radionuclides and a composite was analyzed quarterly for tritium.

In addition, monthly grab surface water samples from the discharge and Piney Creek locations were collected by the ADH and split with ANO. These samples were analyzed monthly for gamma radionuclides and tritium.

Groundwater was sampled quarterly from two locations, the C. Stewart Residence (indicator) and Ouita Lake Recreation Area (control), at distances from 0.9 to 3.8 miles (Table 1-2 and Figure 1-2). Water was collected from each location in two one-gallon labeled containers. Upon return from the field, the samples were acidified with hydrochloric acid and then analyzed for gamma radionuclides and tritium.

Figure 2-3
Discharge Tritium Concentrations



2.5 VEGETATION AND FOOD PRODUCTS

Note: Analytical results are presented in Tables 8.1 through 8.7 of Attachment I and summarized in Section 4.0.

2.5.1 Interpretations and Trends of Results

Vegetation and food product samples were collected when available from six locations in 1995 and analyzed for Iodine-131 and gamma radionuclides. The 1995 levels remained undetectable, as has been the case since 1989. Overall, concentrations continue to remain at, or near, background levels, and continue to be well below the preoperational Iodine-131 average levels of 60.0 pCi/kg, Cesium-134 average levels of 71.0 pCi/kg and Cesium-137 average levels of 350.0 pCi/kg, as measured from the indicator locations.

2.5.2 Program Description

ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-1 and 3.12-1, respectively, require three food product locations and one vegetation location for measurement of radioactivity by the ingestion exposure pathway. ANO personnel collected, when available, from two vegetation indicator locations (Flatwood Road and Intake Canal) and four food product indicator locations (Jones, Hollis, Cochran and Shivers) at distances of 0.5 to 2.4 miles (Table 1-2 and Figure 1-2). In addition, the ADH collected and split samples with ANO at the Shivers location.

The preferred source of food products were fruits, flowering vegetables and tubular vegetables. The preferred source of non-food products were any vegetation with relatively broad leaves on which airborne radioactive particulate material might be deposited. Normally, when available, a minimum of 1000 grams of food products or vegetation was collected. The samples were then analyzed for gamma radionuclides and Iodine-131.

2.6 SEDIMENT

Note: Analytical results are presented in Table 7.1 of Attachment I and summarized in Section 4.0.

2.6.1 Interpretations and Trends of Results

Sediment samples were collected semiannually from three locations in 1995 and analyzed for gamma radionuclides. As in previous years, radionuclides attributable to ANO were detected in the discharge sediment. Table 2-2 shows 1987 through 1995 average levels of radionuclides detected as compared to preoperational levels. Figure 2-4, which is derived from Table 2-2, shows that 1995 levels are lower than those of previous operational years.

Since reporting levels for radionuclides in sediment have not been established, an evaluation of potential dose to the public from this media was performed as shown in Attachment IV. The annual maximum dose from all radionuclides to the skin and total body was < 0.01 millirem. Design objectives given in 10CFR50, Appendix I for liquid effluents are annual doses of ≤ 3 millirem total body and ≤ 10 millirem any organ. The values of < 0.01 millirem for the skin and total body are well within the design objective criteria. Therefore, the level of radionuclides detected in 1995 had no significant impact on the environment or public.

2.6.2 Program Description

ANO Unit 1 and Unit 2 Specification Tables 4.30-1 and 3.12-1, respectively, require two sediment locations for measurement of radioactivity by the waterborne exposure pathway. Contract personnel collected sediment semiannually from three locations, an indicator (discharge) and two control locations (intake and Piney Creek), at distances from 0.1 to 5.9 miles (Table 1-2 and Figure 1-2). A minimum of 1.5 liters of sample was collected with a dredge from the top layer of sediment from each location. After foreign objects were discarded, the samples were transferred to labeled containers and then analyzed for gamma radionuclides.

TABLE 2-2

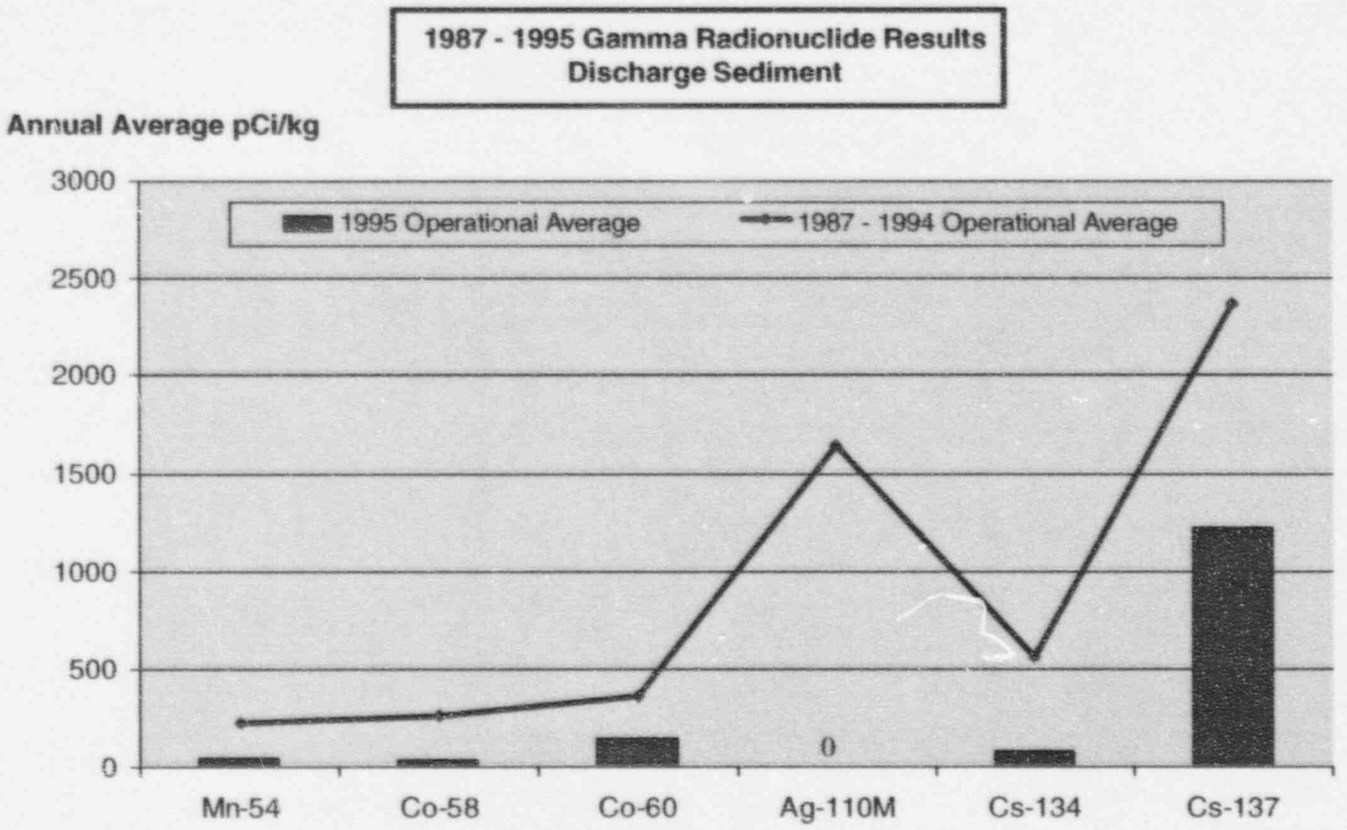
Discharge Sediment Analytical Summary *

Year	Manganese-54	Cobalt-58	Cobalt-60	Silver-110m	Cesium-134	Cesium-137
1973	ND **	ND **	ND **	ND **	ND **	200.0
1974	18.0	ND **	ND **	ND **	ND **	170.0
1987	83.0	162.0	460.0	ND **	590.0	3147.0
1988	359.0	901.0	619.0	4130.0	785.0	3425.0
1989	606.0	246.0	508.0	1535.0	658.0	3200.0
1990	204.0	126.0	304.0	690.0	290.0	2087.0
1991	228.0	338.5	340.5	197.0	387.0	2404.5
1992	154.5	190.5	350.5	ND **	686.0	2228.0
1993	130.0	63.0	175.0	ND **	ND **	1412.5
1994	33.0	61.0	123.5	ND **	ND **	988.5
1995	49.5	32.0	142.0	ND **	85.0	1220.0

* **Units in pCi/kg**

** **None detected**

Figure 2-4
Discharge Sediment



2.7 FISH

Note: Analytical results are presented in Tables 6.1 through 6.4 of Attachment I and summarized in Section 4.0.

2.7.1 Interpretations and Trends of Results

Fish samples were collected semiannually from two locations and analyzed for gamma radionuclides. In 1995, Cesium-134 was undetectable in indicator and control locations. ANO's indicator sample location contained Cesium-137 which ranged from 7.0 - 14.0 pCi/kg with an annual mean of 10.5 pCi/kg. Cesium-137 was also detected in the ADH split sample at the indicator location which ranged from 14.0 - 15.0 pCi/kg with an annual mean of 14.5 pCi/kg. During the preoperational monitoring period, gamma radionuclides were not detected.

No reporting levels as outlined in ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-3 and 3.12-3 respectively, were equaled or exceeded when averaged over any calendar quarter. Also, as shown in Figure 2-5, all detectable activities over previous years were well below the required LLD specified in the technical specifications.

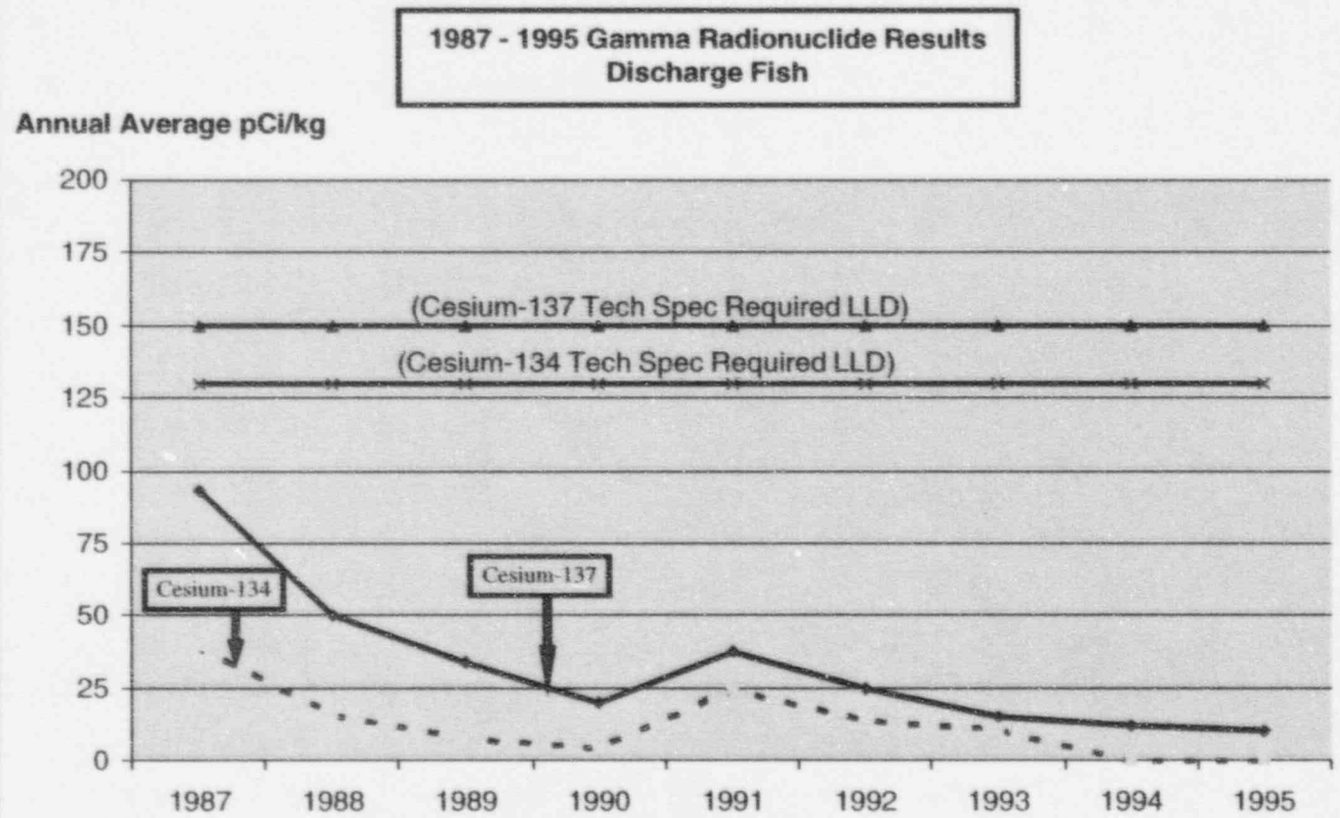
In addition, atmospheric fallout from nuclear weapons testing during the preoperational years and the most recent incident, Chernobyl Nuclear Power Plant in 1986, could be contributing to these levels since Cesium-137 has been detected in the control location over previous preoperational and operational years. However overall, the operation of ANO had no significant radiological impact upon the environment or public by this pathway.

2.7.2 Program Description

ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-1 and 3.12-1, respectively, require two fish locations for measurement of radioactivity by the ingestion exposure pathway. Fish were collected semiannually by a contractor from two locations, an indicator (discharge) and a control (intake), at distances from 0.1 to 0.9 miles (see Table 1-2 and Figure 1-2). In addition, the ADH collected and split samples with ANO at the discharge and intake location.

A sufficient amount was collected from each location to provide a minimum of 1000 grams (wet weight) of eviscerated fish sample. The samples were then analyzed for gamma radionuclides.

Figure 2-5
Discharge Fish



2.8 ANNUAL LAND USE CENSUS

2.8.1 Interpretations and Trends of Results

ANO did not modify the REMP, even though some changes occurred from 1994 to 1995. These changes involved replacing the Mhalderman and C. Bohannan residences in Sectors 11 and 16 with nearer residences (Northup and Roshto).

In addition, the land use census identified no location which yielded a calculated dose or dose commitment greater than those currently calculated. ANO personnel chose not to perform a garden census in 1995, which is allowed by ANO Unit One Technical Specification 4.30.2 and Unit Two Technical Specification 3/4.12.2, in lieu of broadleaf vegetation sampling in the meteorological sector (Sector 13) with the highest "D/Q". Results of the 1995 land use census are presented in Table 2-3.

2.8.2 Program Description

ANO personnel conducted an annual land use census, as required by ANO Unit 1 and Unit 2 Technical Specifications 4.30.2 and 3/4.12.2, respectively. The purpose of the census was to identify changes in uses of land within five miles of ANO which would require modifications to the REMP or Offsite Dose Calculation Manual (ODCM). The most important criteria during the census were to determine location in each sector of the nearest:

- Residence
- Animal milked for human consumption
- Garden of greater than 50 m^2 (500 ft^2) producing broadleaf vegetation *.

The method used for conducting the 1995 Land Use Census was as follows:

- ANO personnel conducted door-to-door field surveys in each meteorological sector out to five miles in order to locate the nearest resident, milk animal and garden *.

- Consultation with local agricultural authorities was used in instances when personal contact could not be made.
- As a result of these surveys, the following information was obtained in each meteorological sector:
  - Nearest permanent residence
  - Nearest garden and approximate size *
  - Nearest milking animal.
- ANO personnel identified locations on the map, measured distances to ANO and recorded results.
- ANO personnel compared 1995 census results to 1994 census results.

* ANO personnel chose not to perform a garden census in 1995, which is allowed by Unit 1 Technical Specification 4.30.2 and Unit 2 Technical Specification 3/4.12.2, in lieu of broadleaf vegetation sampling in the highest "D/Q" meteorological sector (Sector 13).

TABLE 2-3

1995 Land Use Census

(September 1995)

LAND USE CENSUS OF MILK-PRODUCING ANIMALS WITHIN FIVE (5) MILES

Milk-Producing animals are divided into two categories defined as:

1. **Class A Dairies**: dairies in which milk is intended for human consumption as Grade A milk.

2. **Individual Milk Animals**: family animals in which the milk is intended for home use.

Class A Dairies

None

Individual Milk Animals

Bryan Irby	344 degrees - 2.8 miles

CURRENTLY SAMPLED MILK-PRODUCING ANIMALS OUTSIDE FIVE MILES

Class A Dairies

Dairy	Azimuth - Distance
Arkansas Tech Dairy	95 degrees - 5.1 miles
Steuber Dairy	0 degrees - 7.5 miles
Hudson Dairy	73 degrees - 12.4 miles
Rylee Dairy	338 degrees - 9.0 miles

INDIVIDUAL MILK -PRODUCING ANIMALS

None

TABLE 2-3

1995 Land Use Census

(September 1995)

Location of Nearest Residence

Sector	Residence	Location	Distance (miles)
1	S. Lynn	Hwy 333	0.7
2	Snider	8893 Hwy 64	1.2
3	G. Murray	Gum Lane	0.9
4	Knight	Knight Lane	0.7
5	O. Bibler	Bibler Lane	0.9
6	R. Lambert	Scott Lane	0.8
7	Douglas	237 Bunker Hill Lane	0.8
8	M. A. Wood	Wood Lane	0.8
9	J. Kelley	Rt. 3 Dardanelle	2.8
10	McClurley	May Road	0.8
11	Bob Northup *	1269 River Oaks	3.2
12	G. Sides	Flatwood Road	0.7
13	J. Nichols	Flatwood Road	1.0
14	Young	110 Round Mt. Lane	0.7
15	Stiles	Flatwood Road	0.9
16	Roshto *	85 Bennett Circle	0.8

*** Changed since 1994 census.**

TABLE 2-3

1995 Land Use Census

(September 1995)

Distance to Nearest Milk Animal, Residence and Garden (miles)

Sector	Milk Animal	Residence	Garden
1		0.7	*
2		1.2	*
3		0.9	*
4		0.7	*
5		0.9	*
6		0.8	*
7		0.8	*
8		0.8	*
9		2.8	*
10		0.8	*
11		3.2	*
12		0.7	*
13		1.0	*
14		0.7	*
15		0.9	*
16	2.8	0.8	*

*** Garden census not performed in lieu of broadleaf vegetation sampling in the meteorological sector (Sector 13) with the highest "D/Q".**

SECTION 3.0

ANALYTICAL PROGRAM TECHNICAL DESCRIPTION

3.1 Sampling Handling and Treatment

Once a representative sample is received by the analytical laboratory, the laboratory staff is responsible for properly treating and storing the sample. Environmental samples frequently require treatment prior to analysis. Treatment of the sample after it is received depends on the sample and analyses to be performed.

3.1.1 Water Samples

Depending on sample type, one-gallon water samples were acidified with five to twenty milliliters (ml) of concentrated hydrochloric (HCl) acid when collected. Samples for tritium analyses should not be stored in polyethylene bottles for more than 3 or 4 months because water can evaporate through polyethylene.

3.1.2 Air Filters

Air filters were handled with care when heavy dust loadings were observed because particulate matter is easily removed from the filter. Air filters were normally received by the laboratory in plastic containers; some extremely low-level analyses required analysis of the container as well as the sample.

3.1.3 Milk

Milk samples were usually refrigerated until analyses could be performed. Milk samples analyzed for Iodine-131 had 100 ml of formaldehyde added to avoid binding of the iodine that may occur with smaller levels of formaldehyde.

3.1.4 Soil and Bottom Sediment

Soil and sediment samples were dried, pulverized and sieved before analysis. To ensure a homogeneous sample, thorough mixing was required.

3.1.5 Other Samples

Perishable samples were preserved by refrigeration or freezing. Vegetation and other samples may need to be dried, pulverized or ashed before or after analysis for long-term storage.

3.2 Gross Beta Air Sample Analysis

Air filters were counted for 100 minutes, or until required LLDs shown in ANO's Unit 1 Technical Specification Table 4.30-2 and Unit 2 Technical Specification Table 3.12-2 were achieved, in a low-background alpha-beta counter at least 24-hours after collection in order to allow for decay of short-lived materials such as radon and thoron.

3.3 Gross Beta Water Sample Analysis

This analysis measures the overall beta radionuclides of water samples without identifying specific radioactive isotopes present. No chemical separation techniques were involved. Two hundred ml of sample were evaporated in a beaker on a hot plate. The residue was transferred and dried in a 2-inch stainless steel planchet. The planchets were counted for 100 minutes, or until required LLDs referenced in Section 3.2 were achieved, in a low-background alpha-beta counting system. Calculation of activity includes a self-absorption correction factor for counter efficiency based on weight of residue on each planchet.

3.4 Tritium Water Sample Analysis

Five ml of water was added to 15 ml of liquid scintillation solution in a 25 ml vial. The sample was inserted into a liquid scintillation spectrometer and counted for 300 - 500 minutes, or until required LLDs referenced in Section 3.2 were achieved.

3.5 Iodine-131 Sample Analysis

Four liters or more of the sample were thoroughly mixed with a stable iodine carrier solution, and passed through an anion exchange resin column to remove iodine from the sample.

Next, the iodine was stripped from the resin with a sodium hypochlorite solution, reduced with hydroxylamine hydrochloride and extracted into carbon tetrachloride as free iodine. It was then back-extracted into sodium bisulfite solution and was precipitated as silver iodide. The precipitate was mounted on a stainless steel planchet and counted for 240 minutes, or until required LLDs referenced in Section 3.2 were achieved, in a low-background alpha-beta counting system.

3.6 Gamma Isotopic Sample Analysis

3.6.1 Milk and Water

A 3.5-liter Marinelli beaker was filled with a representative aliquot of the sample. The sample was then counted for a minimum of 240 minutes, or until required LLDs referenced in Section 3.2 were achieved, in a shielded GeLi detector.

A computer software program defined peaks by certain changes in slope of the spectrum. The program also compared the energy of each peak with a library of peaks for radionuclide identification and then performed a calculation using appropriate fractional gamma ray abundance, half-life, detector efficiency and net counts in the peak region.

3.6.2 Vegetation, Food and Garden Crops and Fish

A maximum quantity of undried vegetation, food or garden crop sample was loaded into a tared 3.5-liter Marinelli and weighed. The sample was then counted for 60 minutes, or until required LLDs referenced in Section 3.2 were achieved, in a shielded GeLi detector as described in Section 3.6.1.

As much as possible (up to the total sample) of the edible portion of a fish was loaded into a tared Marinelli beaker and weighed. The sample was diluted with deionized water to weigh 3.5 kilograms and counted for a minimum of 240 minutes, or until required LLDs referenced in Section 3.2 were achieved, in a shielded GeLi detector as described in Section 3.6.1.

3.6.3 Soils and Sediments

Soils and sediments were dried at a low temperature (less than 100° C), loaded into a tared 1.0-liter Marinelli beaker and weighed. The sample was then counted for 240 minutes, or until required LLDs referenced in Section 3.2 were achieved, in a shielded GeLi detector as described in Section 3.6.1.

3.6.4 Charcoal Cartridges

Charcoal cartridges were counted in a Marinelli beaker, with one to four cartridges positioned on the face of a GeLi detector and up to seven cartridges on its side. Each detector was calibrated for both top and side positions and a counting efficiency determined. The Iodine-131 detection limit was determined for each charcoal cartridge, assuming no positive results for Iodine-131, by utilizing smallest volume of air recorded for a cartridge within the Marinelli beaker. If Iodine-131 was observed in the screening count of a set of cartridges, each charcoal cartridge was positioned on the face of the detector and then counted separately.

3.6.5 Air Particulate

The 12 to 14 (depending on the calendar quarter) air particulate filters for a quarterly composite for each field station were stacked one on top of another and counted for at least one hour in a shielded GeLi detector, as described in Section 3.6.1, or until required LLDs referenced in Section 3.2 were achieved.

3.7 Thermoluminescent Dosimetry

Environmental radiation doses were measured using TLDs that contained two lithium borate and calcium sulfate elements. Approximately forty-eight hours prior to installation, the TLDs were annealed. After cooling, the TLDs were mounted in appropriate labeled blue clamshell type hangers and double-sealed in a whirl-pak, or similar protective covering. Upon return from the field, TLDs were read in a Panasonic UD-710A TLD Reader.

3.8 Data Reporting Conventions

The mean of the analytical results is calculated as follows:

$$\overline{X} = {}_{y}Xi / n$$

where: $\overline{X}$ = Mean

Xi = Individual sample results

n = Number of sample results

Rounding of calculated values is accomplished by inspection of digits to the right of the last reported digit with values less than 5 rounded down and values greater than 5 rounded up. When values equals 5, reported value is rounded to an even number.

Analytical results, which are less than the two sigma counting error, are reported as less than the lower limit of detection calculated for that sample. Analytical results greater than the two sigma counting error are reported along with the associated two sigma counting error as a plus or minus (±) term.

Calendar quarters are considered to be the following time periods:

- 1st Quarter = January - March
- 2nd Quarter = April - June
- 3rd Quarter = July - September
- 4th Quarter = October - December

SECTION 4.0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

4.1 1995 Program Results Summary

Table 4-1, which includes all sampling locations and samples split with the ADH, summarizes the 1995 REMP results. Table 4-2 lists indicator and control locations used to develop Table 4-1. ANO personnel did not use values reported as less than the lower limit of detection (<LLD) when determining ranges and means for indicator and control locations.

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Air Particulates (pCi/m^3)	GB 312	0.01	0.014 (207 / 208) [0.003 - 0.034]	Station 1 (88°, 0.6 mi)	0.016 (52 / 52) [0.004 - 0.029]	0.016 (104 / 104) [0.006 - 0.035]	0
	GS 24						
	Cs-134	0.01	<LLD	N/A	N/A	<LLD	0
	Cs-137	0.01	<LLD	N/A	N/A	<LLD	0
Airborne Iodine (pCi/m^3)	I-131 312	0.07	<LLD	N/A	N/A	<LLD	0
0 - 2 Mile TLDs (mR/Qtr)	Gamma 43	(f)	18.1 (43 / 43) [14.0 - 40.0]	Station 109 (285°, 0.5 mi)	25.0 (3 / 3) [16.0 - 40.0]	N/A	0
2 - 5 Mile TLDs (mR/Qtr)	Gamma 58	(f)	15.7 (58 / 58) [11.0 - 42.0]	Station 119 (309°, 4.8 mi)	22.0 (4 / 4) [15.0 - 42.0]	N/A	0
>5 Mile TLDs (mR/Qtr)	Gamma 68	(f)	N/A	N/A	N/A	16.8 (68 / 68) [12.0 - 45.0]	0

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Drinking Water (pCi/l)	GB 13	4	3.0 (4 / 13) [1.4 - 7.1]	Station 14 (70°, 5.3 mi)	3.0 (4 / 13) [1.4 - 7.1]	N/A	0
	I-131 13	1.0	<LLD	N/A	N/A	N/A	0
	H-3 4	1000	<LLD	N/A	N/A	N/A	0
	GS 13						
	Mn-54	15	<LLD	N/A	N/A	N/A	0
	Fe-59	30	<LLD	N/A	N/A	N/A	0
	Co-58	15	<LLD	N/A	N/A	N/A	0
	Co-60	15	<LLD	N/A	N/A	N/A	0
	Zn-65	30	<LLD	N/A	N/A	N/A	0
	Zr-95	15	<LLD	N/A	N/A	N/A	0
	Nb-95	15	<LLD	N/A	N/A	N/A	0
	Cs-134	10	<LLD	N/A	N/A	N/A	0
	Cs-137	18	<LLD	N/A	N/A	N/A	0
	Ba-140	15	<LLD	N/A	N/A	N/A	0
	La-140	15	<LLD	N/A	N/A	N/A	0

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Surface Water (pCi/l)	H-3 8	(g)	546.7 (3 / 4) [430.0 - 640.0]	Station 8 (180°, 0.1 mi)	546.7 (3 / 4) [430.0 - 640.0]	<LLD	0
	GS 24						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	15	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	15	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0
ADH Split Surface Water (pCi/l)	H-3 24	(g)	2520.0 (3 / 12) [1860.0 - 3020.0]	Station 8 (180°, 0.1 mi)	2520.0 (3 / 12) [1860.0 - 3020.0]	<LLD	0
	GS 24						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	15	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	15	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Repo ting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Groundwater (pCi/l)	H-3 10	1000	<LLD	N/A	N/A	<LLD	0
	GS 10						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	15	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	10	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	15	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0
Milk (pCi/l)	I-131 49	1.0	N/A	N/A	N/A	<LLD	0
	GS 49						
	Cs-134	15	N/A	N/A	N/A	<LLD	0
	Cs-137	18	N/A	N/A	N/A	3.5 (4 / 49) [3.0 - 5.0]	0
	Ba-140	15	N/A	N/A	N/A	<LLD	0
	La-140	15	N/A	N/A	N/A	<LLD	0

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Vegetation (pCi/kg wet)	I-131 6	60	<LLD	N/A	N/A	N/A	0
	GS 6						
	Cs-134	60	<LLD	N/A	N/A	N/A	0
	Cs-137	80	<LLD	N/A	N/A	N/A	0
Food Product (pCi/kg wet)	I-131 11	60	<LLD	N/A	N/A	N/A	0
	GS 11						
	Cs-134	60	<LLD	N/A	N/A	N/A	0
	Cs-137	80	<LLD	N/A	N/A	N/A	0
ADH Split Food Product (pCi/kg wet)	I-131 2	60	<LLD	N/A	N/A	N/A	0
	GS 2						
	Cs-134	60	<LLD	N/A	N/A	N/A	0
	Cs-137	80	<LLD	N/A	N/A	N/A	0

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Fish	GS 8						
(pCi/kg wet)	Mn-54	130	<LLD	N/A	N/A	<LLD	0
	Fe-59	260	<LLD	N/A	N/A	<LLD	0
	Co-58	130	<LLD	N/A	N/A	<LLD	0
	Co-60	130	<LLD	N/A	N/A	<LLD	0
	Zn-65	260	<LLD	N/A	N/A	<LLD	0
	Cs-134	130	<LLD	N/A	N/A	<LLD	0
	Cs-137	150	10.5 (2 / 4) [7.0 - 14.0]	Station 8 (180°, 0.1 mi)	10.5 (2 / 4) [7.0 - 14.0]	<LLD	0
ADH Split Fish	GS 3						
(pCi/kg wet)	Mn-54	130	<LLD	N/A	N/A	<LLD	0
	Fe-59	260	<LLD	N/A	N/A	<LLD	0
	Co-58	130	<LLD	N/A	N/A	<LLD	0
	Co-60	130	<LLD	N/A	N/A	<LLD	0
	Zn-65	260	<LLD	N/A	N/A	<LLD	0
	Cs-134	130	<LLD	N/A	N/A	<LLD	0
	Cs-137	150	14.5 (2 / 2) [14.0 - 15.0]	Station 8 (180°, 0.1 mi)	14.5 (2 / 2) [14.0 - 15.0]	<LLD	0

TABLE 4-1

Radiological Environmental Monitoring Program Summary

Name of Facility ANO - Units 1 and 2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period January - December 1995
(County, State)

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Bottom Sediment (pCi/kg dry)	GS 6						
	Mn-54	(f)	49.5 (2 / 2) [45.0 - 54.0]	Station 8 (180°, 0.1 mi)	49.5 (2 / 2) [45.0 - 54.0]	29.0 (1 / 4) [N/A]	0
	Co-58	(f)	32.0 (2 / 2) [19.0 - 45.0]	Station 8 (180°, 0.1 mi)	32.0 (2 / 2) [19.0 - 45.0]	<LLD	0
	Co-60	(f)	142.0 (2 / 2) [132.0 - 152.0]	Station 8 (180°, 0.1 mi)	142.0 (2 / 2) [132.0 - 152.0]	21.0 (1 / 4) [N/A]	0
	Ag-110m	(f)	<LLD	N/A	<LLD	<LLD	0
	Cs-134	150	85.0 (1 / 2) [N/A]	Station 8 (180°, 0.1 mi)	85.0 (1 / 2) [N / A]	<LLD	0
	Cs-137	180	1220.0 (2 / 2) [1141.0 - 1299.0]	Station 8 (180°, 0.1 mi)	1220.0 (2 / 2) [1141.0 - 1299.0]	320.0 (2 / 4) [250.0 - 390.0]	0

a GB = Gross beta; I-131 = Iodine-131; H-3 = Tritium; GS = Gamma scan.
b LLD = Required lower limit of detection based on Arkansas Nuclear One Unit 1 and Unit 2 Technical Specification Tables 4.30-2 and 3.12-2, respectively.
c Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (F).
d Locations are specified (1) by name and (2) degrees relative to reactor site.
e Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.
f LLD is not defined in ANO Unit 1 and Unit 2 Technical Specification Tables.
g LLD not defined in ANO Technical Specification Tables, therefore, assumed 2000 based on Regulatory Guide 4.8.

TABLE 4-2

Indicator & Control Locations

Sample Type	Locations	Total Samples	Total and Type Analyses
Air	• **Indicators** - Station 1 (Met Tower)	52	52 ea. - Gross Beta, I-131; 4-Gamma
	Station 2 (AP&L Lodge)	52	52 ea. - Gross Beta, I-131; 4-Gamma
	Station 3 (Bennett Farm)	52	52 ea. - Gross Beta, I-131; 4-Gamma
	Station 4 (May Cemetery)	52	52 ea. - Gross Beta, I-131; 4-Gamma
	• **Controls** - Station 6 (Russellville)	52	52 ea. - Gross Beta, I-131; 4-Gamma
	Station 7 (AP&L Substation)	52	52 ea. - Gross Beta, I-131; 4-Gamma
TLDs	• **Indicators**		
	- **0 - 2 Miles** - Stations 1, 2, 3, 4, 108, 109, 110, 113, 114, 115, 116	43	43-Gamma
	- **2 - 5 Miles** - Stations 111, 112, 119, 120, 121, 122, 123, 124, 130, 131, 133, 134, 135, 136, 141	58	58-Gamma
	• **Controls**		
	- **> 5 Miles** - Stations 5, 6, 7, 117, 118, 125, 126, 127, 128, 129, 132, 137, 138, 139, 140, 142, 143, 144	68	68-Gamma
Water	<u>Drinking</u>		
	• **Indicator** - Station 14 (Russellville)	13	13 ea. - Gross Beta, I-131, Gamma; 4-Tritium
	• **Control** - None	N/A	N/A

TABLE 4-2

Indicator & Control Locations

Sample Type	Locations	Total Samples	Total and Type Analyses
Water	Surface		
	• **Indicators** - Station 8 (Discharge)	12	12 Gamma; 4-Tritium
	Station 8 (Discharge) *	12	12 ea. - Tritium, Gamma
	• **Controls** - Station 10 (Intake)	12	12-Gamma; 4-Tritium
	Station 16 (Piney Creek) *	12	12 ea. - Tritium, Gamma
	Groundwater		
	• **Indicator** - Station 32 (Stewarts)	5	5 ea. - Tritium, Gamma
	• **Control** - Station 33 (Ouita Lake Recreation Area)	5	5 ea. - Tritium, Gamma
Milk	• **Indicators** - None	N/A	
	• **Controls** - Station 19 (Arkansas Tech)	13	13 ea. - I-131, Gamma
	Station 37 (Steuber)	13	13 ea. - I-131, Gamma
	Station 42 (Hudson)	12	12 ea. - I-131, Gamma
	Station 49 (Rylee)	10	10 ea. - I-131, Gamma
	Station 50 (Ragsdale)	1	1 ea. - I-131, Gamma
Vegetation	• **Indicators** - Station 13 (Flatwood Road)	3	3 ea. - I-131, Gamma
	Station 45 (Intake Canal)	3	3 ea. - I-131, Gamma
	• **Control** - None	N/A	N/A
Food Products	• **Indicators** - Station 38 (Jones Residence)	4	4 ea. - I-131, Gamma
	Station 40 (Hollis Residence)	1	1 ea. - I-131, Gamma
	Station 48 (Cochran Residence)	4	4 ea. - I-131, Gamma
	Station 108 (Shivers Residence)	2	2 ea. - I-131, Gamma
	Station 108 (Shivers Residence) *	2	2 ea. - I-131, Gamma
	• **Control** - None	N/A	N/A

*** ADH split sample**

TABLE 4-2

Indicator & Control Locations

Sample Type	Locations	Total Samples	Total and Type Analyses
Fish	• **Indicators** - Station 8 (Discharge)	4	4-Gamma
	Station 8 (Discharge) *	2	2-Gamma
	• **Controls** - Station 10 (Intake)	4	4-Gamma
	Station 10 (Intake) *	1	1-Gamma
Sediment	• **Indicator** - Station 8 (Discharge)	2	2-Gamma
	• **Controls** - Station 10 (Intake)	2	2-Gamma
	Station 16 (Piney Creek)	2	2-Gamma

*** ADH split sample**

SECTION 5.0

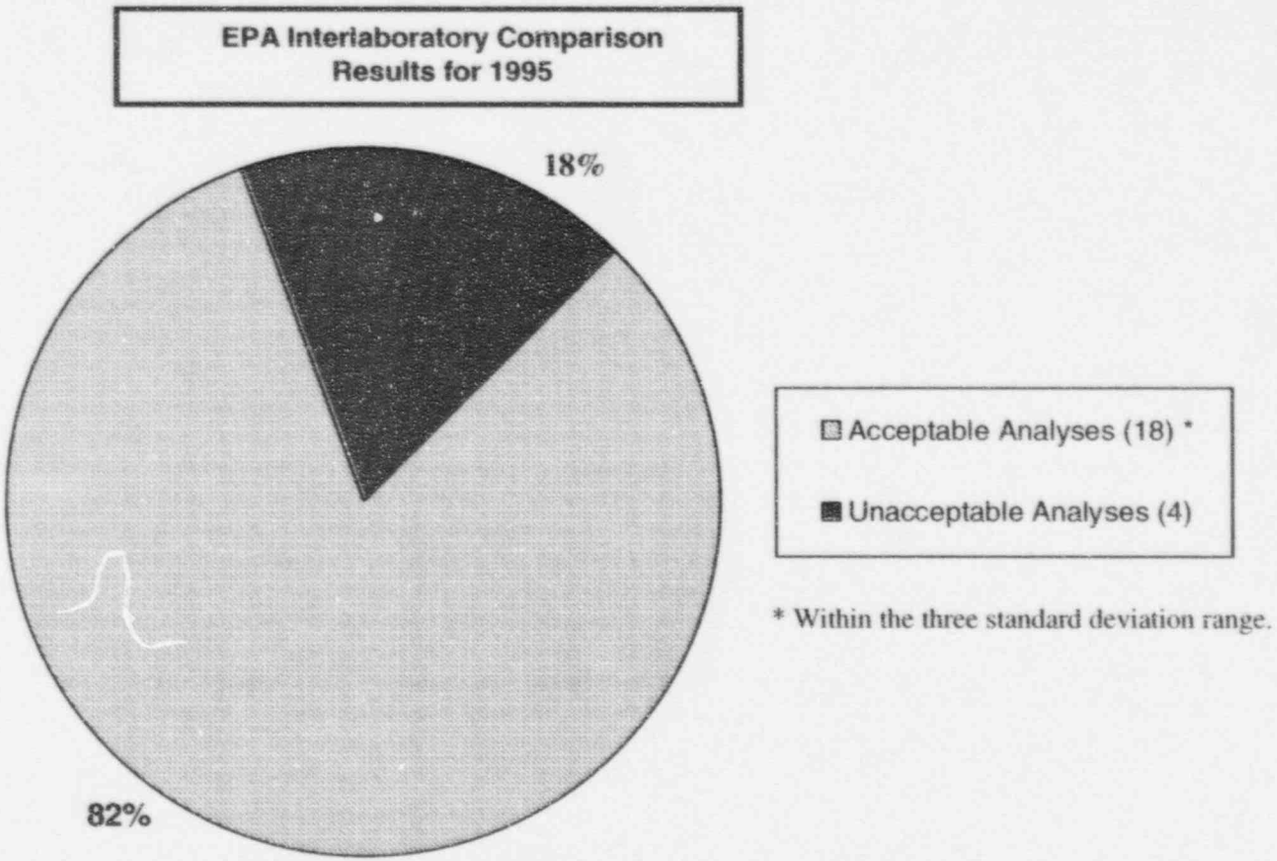
QUALITY CONTROL DATA

5.1 Crosscheck Program Results

ESI System Chemistry analyzed EPA crosscheck samples for ANO to fulfill the requirements of ANO Unit 1 and Unit 2 Technical Specifications 4.30.3 and 3/4.12.3, respectively. Attachment I, 1995 Radiological Environmental Monitoring Report, contains these results. ESI System Chemistry's analysis participation, shown in Figure 5-1, indicates that the laboratory achieved an 82% (18 of 22) acceptance on intercomparison sample analyses.

The four unacceptable analysis results, which involved Cobalt-60, Zinc-65, Cesium-137 and Barium-133 gamma radionuclides, was determined by the laboratory to be associated with a dilution error during sample preparation. This conclusion was based on results being 14 - 33% higher than those reported by EPA and no appreciable differences in the efficiency curves after the detectors were re-calibrated. This dilution error did not affect the validity of ANO's 1995 gamma spectroscopy data. For additional explanation, refer to the EPA Cross Check Results shown in Attachment I.

Figure 5-1
EPA Intercomparison Study



* Within the three standard deviation range.

SECTION 6.0

1995 SAMPLING AND ANALYTICAL RESULTS

6.1 1995 Data

Attachments I and II present analytical data obtained by ESI System Chemistry and ANO's Dosimetry Section on samples collected from January through December 1995. ESI System Chemistry provided data in monthly progress reports with exception of TLDs. ANO's Dosimetry Section provided TLD data in quarterly reports. Data presented in Attachments I and II compare to that encountered in previous years.

6.2 Lower Limit of Detection

ESI System Chemistry routinely counted below the maximum required LLDs specified in ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-2 and 3.12-2, respectively. Factors such as unavoidable small sample size, background fluctuations, presence of interfering radionuclides or other uncontrollable circumstances may cause Technical Specification LLDs to be unachievable. However, ANO personnel's review of 1995 results indicates acceptable LLDs within the required Technical Specifications limits.

6.3 Reporting Levels

ANO found radioactivity attributable to plant operations in surface water, sediment and fish from the discharge. However, no reporting levels for radioactivity concentration in environmental samples, as outlined in ANO Unit 1 and Unit 2 Technical Specification Tables 4.30-3 and 3.12-3, respectively, when averaged over any calendar quarter, were equaled or exceeded due to ANO effluents. Therefore, no Radiological Monitoring Special Reports were required.

6.4 Sampling Deviations

Seven TLDs were lost in the field during 1995 due to vandalism. TLD losses of this type are characteristic of other TLD programs. The 1995 TLD recovery rate was 96% (169 of 176) which is comparable with other TLD programs. These losses were isolated instances which did not recur during the year and were replaced by ANO personnel once discovered.

In January and February of 1995, a milk sample was not collected from the Gibson Dairy, due to the owner discontinuing his milking operations. This reduced ANO's active sampling locations from four to three. Due to a misinterpretation of the technical specifications, an additional location was not added to the program until March 1995. This condition and corrective actions taken are discussed in Licensee Event Report 50-313/95-003-00, submitted on April 14, 1995 (0CAN049511).

The Hudson Dairy discontinued milking operations in November 1995 and was replaced by Ragsdale. This activity was not a deviation since ANO's active sampling locations continued to meet the technical specification requirement of four locations.

All other samples were within program parameters.

6.5 Radioactivity Not Attributable to ANO

Radioactivity attributable to other sources was detected by the ANO REMP in 1977, 1978 and 1981 following nuclear weapons testing. The most recent incident occurred in May 1986 when the radioactive plume release due to reactor core degradation at the Chernobyl Nuclear Power Plant was detected.

6.6 Sampling Relocation

Two milk locations (Gibson and Hudson) discontinued milking operations during 1995 and were replaced by Rylee and Ragsdale. These changes were incorporated in the ODCM.

6.7 Comparison to Federal and State Programs

Data from the ANO REMP was compared to federal and state monitoring programs as results became available. The federal monitoring program used for comparison was the U.S. Nuclear Regulatory Commission (NRC) TLD Direct Radiation Monitoring Network. The state program is conducted by the ADH.

The latest available results from the NRC TLD Network have been compared to those from ANO's program. Through 1995, no change in TLD results has been attributed to ANO operation.

Radiological monitoring by the ADH entails similar sampling requirements to the ANO REMP. In many cases air samples and TLDs are collocated, while sample media such as food products, water, milk and fish are shared or split. Throughout 1995, both programs have obtained results that are within similar ranges. The only common location where radioactivity attributable to ANO has been detected is the ANO discharge. Discharge water, sediment and fish results were above background levels due to ANO effluents.

6.8 Unavailable Results

Analytical contractor results were received in adequate time for inclusion in this report. No missing results were identified during ANO personnel's review.

6.9 Harmful Effects or Irreversible Damage

No harmful effects or evidence of irreversible damage were detected by ANO monitoring. Therefore, no analysis or planned course of action to alleviate problems was necessary.

ATTACHMENT I

1995 Radiological Environmental Monitoring Report

ARKANSAS NUCLEAR ONE
RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE OF CONTENTS

Summary of Monitoring Results

In 1995, the following plant-related isotopes were detected:

- Tritium in the discharge basin surface water
- Cesium-137 in the discharge fish
- Manganese-54, Cobalt-58, Cobalt-60, Cesium-134 and Cesium-137 in the discharge sediment
- Manganese-54, Cobalt-60 and Cesium-137 in the intake sediment

Cesium-137, which is attributable to past atmospheric weapons testing, was detected in small quantities at the Hudson and Rylee Dairies.

Sample Deviations

All samples were within program parameters.

The Ragsdale Dairy, which was added to the radiological environmental monitoring program in December 1995 due to the Hudson Dairy discontinuing milking operations. was not a deviation since ANO's active sampling locations continued to meet the technical specifications requirement of four.

Required Lower Limit of Detection (LLD) Values

All LLD values reported in 1995 were within the acceptable limits required by the technical specifications.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.1
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 01, MET TOWER

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500307	12/27/94	01/03/95	0.027 +/-0.003	< 0.030
9500724	01/03/95	01/10/95	0.029 +/-0.002	< 0.028
9500932	01/10/95	01/17/95	0.015 +/-0.002	< 0.024
9501363	01/17/95	01/24/95	0.013 +/-0.002	< 0.024
9501910	01/24/95	01/31/95	0.022 +/-0.002	< 0.024
9502542	01/31/95	02/07/95	0.015 +/-0.002	< 0.021
9502998	02/07/95	02/14/95	0.009 +/-0.002	< 0.018
9503800	02/14/95	02/21/95	0.013 +/-0.002	< 0.023
9503868	02/21/95	02/28/95	0.012 +/-0.002	< 0.024
9504451	02/28/95	03/07/95	0.014 +/-0.002	< 0.030
9505244	03/07/95	03/14/95	0.013 +/-0.002	< 0.043
9505251	03/14/95	03/21/95	0.025 +/-0.002	< 0.023
9506111	03/21/95	03/28/95	0.009 +/-0.002	< 0.040
9506512	03/28/95	04/04/95	0.014 +/-0.002	< 0.034
9507029	04/04/95	04/11/95	0.010 +/-0.002	< 0.013
9507989	04/11/95	04/18/95	0.013 +/-0.002	< 0.041
9508201	04/18/95	04/25/95	0.008 +/-0.002	< 0.022
9508783	04/25/95	05/02/95	0.012 +/-0.002	< 0.019
9509332	05/02/95	05/09/95	0.008 +/-0.002	< 0.031
9509617	05/09/95	05/16/95	0.011 +/-0.002	< 0.029
9510363	05/16/95	05/23/95	0.010 +/-0.002	< 0.013
9510758	05/23/95	05/30/95	0.006 +/-0.002	< 0.023
9512222	05/30/95	06/06/95	0.011 +/-0.002	< 0.035
9512750	06/06/95	06/13/95	0.011 +/-0.002	< 0.015
9512757	06/13/95	06/20/95	0.017 +/-0.002	< 0.020
9513370	06/20/95	06/27/95	0.014 +/-0.002	< 0.019

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.1a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 01, MET TOWER

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513902	06/27/95	07/04/95	0.011 +/-0.002	< 0.024
9514526	07/04/95	07/11/95	0.016 +/-0.002	< 0.029
9514972	07/11/95	07/18/95	0.018 +/-0.002	< 0.018
9515695	07/18/95	07/25/95	0.014 +/-0.004	< 0.019
9516279	07/25/95	08/01/95	0.004 +/-0.002	< 0.020
9517031	08/01/95	08/08/95	0.011 +/-0.002	< 0.020
9518074	08/08/95	08/15/95	0.018 +/-0.002	< 0.037
9518377	08/15/95	08/22/95	0.018 +/-0.002	< 0.016
9518853	08/22/95	08/29/95	0.027 +/-0.002	< 0.015
9520269	08/29/95	09/05/95	0.021 +/-0.002	< 0.039
9520472	09/05/95	09/12/95	0.018 +/-0.002	< 0.010
9520655	09/12/95	09/19/95	0.022 +/-0.002	< 0.018
9521109	09/19/95	09/26/95	0.015 +/-0.002	< 0.026
9522084	09/26/95	10/03/95	0.024 +/-0.002	< 0.041
9522229	10/03/95	10/10/95	0.017 +/-0.002	< 0.026
9522915	10/10/95	10/17/95	0.023 +/-0.002	< 0.025
9523327	10/17/95	10/24/95	0.013 +/-0.002	< 0.034
9523603	10/24/95	10/31/95	0.013 +/-0.002	< 0.023
9523890	10/31/95	11/07/95	0.011 +/-0.002	< 0.026
9524739	11/07/95	11/14/95	0.021 +/-0.002	< 0.030
9525271	11/14/95	11/21/95	0.020 +/-0.002	< 0.028
9525419	11/21/95	11/28/95	0.028 +/-0.002	< 0.029
9525806	11/28/95	12/05/95	0.016 +/-0.002	< 0.028
9526184	12/05/95	12/12/95	0.020 +/-0.002	< 0.024
9526741	12/12/95	12/19/95	0.015 +/-0.002	< 0.016
9600122	12/19/95	12/26/95	0.018 +/-0.002	< 0.039

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.2
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 02, SW OF SITE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500308	12/27/94	01/03/95	0.024 +/-0.003	< 0.030
9500725	01/03/95	01/10/95	0.022 +/-0.002	< 0.028
9500933	01/10/95	01/17/95	0.009 +/-0.002	< 0.024
9501364	01/17/95	01/24/95	0.011 +/-0.002	< 0.024
9501911	01/24/95	01/31/95	0.024 +/-0.002	< 0.024
9502543	01/31/95	02/07/95	0.012 +/-0.002	< 0.021
9502999	02/07/95	02/14/95	0.012 +/-0.002	< 0.018
9503601	02/14/95	02/21/95	0.012 +/-0.002	< 0.023
9503869	02/21/95	02/28/95	0.012 +/-0.002	< 0.024
9504452	02/28/95	03/07/95	0.010 +/-0.002	< 0.030
9505245	03/07/95	03/14/95	0.015 +/-0.002	< 0.043
9505252	03/14/95	03/21/95	0.021 +/-0.002	< 0.023
9506112	03/21/95	03/28/95	0.010 +/-0.002	< 0.040
9506513	03/28/95	04/04/95	0.016 +/-0.002	< 0.034
9507030	04/04/95	04/11/95	0.011 +/-0.002	< 0.013
9507990	04/11/95	04/18/95	0.013 +/-0.002	< 0.041
9508202	04/18/95	04/25/95	0.008 +/-0.002	< 0.022
9508784	04/25/95	05/02/95	0.010 +/-0.002	< 0.019
9509333	05/02/95	05/09/95	0.008 +/-0.002	< 0.031
9509618	05/09/95	05/16/95	0.010 +/-0.002	< 0.029
9510364	05/16/95	05/23/95	0.012 +/-0.002	< 0.013
9510759	05/23/95	05/30/95	0.009 +/-0.002	< 0.023
9512223	05/30/95	06/06/95	0.007 +/-0.002	< 0.035
9512751	06/06/95	06/13/95	0.010 +/-0.002	< 0.015
9512758	06/13/95	06/20/95	0.014 +/-0.002	< 0.020
9513371	06/20/95	06/27/95	0.015 +/-0.002	< 0.019

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.2a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 02, SW OF SITE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513903	06/27/95	07/04/95	0.011 +/-0.002	< 0.024
9514527	07/04/95	07/11/95	0.011 +/-0.002	< 0.029
9514973	07/11/95	07/18/95	0.018 +/-0.002	< 0.018
9515696	07/18/95	07/25/95	0.009 +/-0.002	< 0.019
9516280	07/25/95	08/01/95	0.011 +/-0.002	< 0.020
9517032	08/01/95	08/08/95	0.009 +/-0.002	< 0.020
9518075	08/08/95	08/15/95	0.015 +/-0.002	< 0.037
9518378	08/15/95	08/22/95	0.015 +/-0.002	< 0.016
9518854	08/22/95	08/29/95	0.023 +/-0.002	< 0.015
9520270	08/29/95	09/05/95	0.021 +/-0.002	< 0.039
9520473	09/05/95	09/12/95	0.014 +/-0.002	< 0.040
9520656	09/12/95	09/19/95	0.019 +/-0.002	< 0.018
9521110	09/19/95	09/26/95	0.014 +/-0.002	< 0.026
9522085	09/26/95	10/03/95	0.020 +/-0.002	< 0.041
9522230	10/03/95	10/10/95	0.010 +/-0.002	< 0.026
9522916	10/10/95	10/17/95	0.018 +/-0.002	< 0.025
9523328	10/17/95	10/24/95	0.010 +/-0.002	< 0.034
9523604	10/24/95	10/31/95	0.013 +/-0.002	< 0.023
9523891	10/31/95	11/07/95	0.013 +/-0.002	< 0.026
9524740	11/07/95	11/14/95	0.016 +/-0.002	< 0.030
9525272	11/14/95	11/21/95	0.028 +/-0.002	< 0.028
9525420	11/21/95	11/28/95	0.026 +/-0.002	< 0.029
9525807	11/28/95	12/05/95	0.020 +/-0.002	< 0.028
9526185	12/05/95	12/12/95	0.013 +/-0.002	< 0.024
9526742	12/12/95	12/19/95	0.011 +/-0.002	< 0.016
9600123	12/19/95	12/26/95	0.014 +/-0.002	< 0.039

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.3
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 03, N OF SITE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500309	12/27/94	01/03/95	0.024 +/-0.003	< 0.030
9500726	01/03/95	01/10/95	0.034 +/-0.003	< 0.028
9500934	01/10/95	01/17/95	0.011 +/-0.002	< 0.024
9501365	01/17/95	01/24/95	0.013 +/-0.002	< 0.024
9501912	01/24/95	01/31/95	0.018 +/-0.002	< 0.024
9502544	01/31/95	02/07/95	0.013 +/-0.002	< 0.021
9503000	02/07/95	02/14/95	0.014 +/-0.002	< 0.018
9503602	02/14/95	02/21/95	0.003 +/-0.001	< 0.023
9503670	02/21/95	02/28/95	0.007 +/-0.002	< 0.024
9504453	02/28/95	03/07/95	0.014 +/-0.002	< 0.030
9505246	03/07/95	03/14/95	0.015 +/-0.002	< 0.043
9505253	03/14/95	03/21/95	0.019 +/-0.002	< 0.023
9506113	03/21/95	03/28/95	0.013 +/-0.002	< 0.040
9506514	03/28/95	04/04/95	0.012 +/-0.002	< 0.034
9507031	04/04/95	04/11/95	0.010 +/-0.002	< 0.013
9507991	04/11/95	04/18/95	0.014 +/-0.002	< 0.041
9508203	04/18/95	04/25/95	0.004 +/-0.002	< 0.022
9508785	04/25/95	05/02/95	0.003 +/-0.001	< 0.019
9509334	05/02/95	05/09/95	0.009 +/-0.002	< 0.031
9509619	05/09/95	05/16/95	0.004 +/-0.002	< 0.029
9510365	05/16/95	05/23/95	0.012 +/-0.002	< 0.013
9510760	05/23/95	05/30/95	< 0.003	< 0.023
9512224	05/30/95	06/06/95	0.005 +/-0.002	< 0.035
9512752	06/06/95	06/13/95	0.010 +/-0.002	< 0.015
9512759	06/13/95	06/20/95	0.011 +/-0.002	< 0.020
9513372	06/20/95	06/27/95	0.018 +/-0.002	< 0.019

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.3a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 03, N OF SITE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513904	06/27/95	07/04/95	0.014 +/-0.002	< 0.024
9514528	07/04/95	07/11/95	0.016 +/-0.002	< 0.029
9514974	07/11/95	07/18/95	0.018 +/-0.002	< 0.018
9515697	07/18/95	07/25/95	0.008 +/-0.002	< 0.019
9516281	07/25/95	08/01/95	0.012 +/-0.002	< 0.020
9517033	08/01/95	08/08/95	0.012 +/-0.002	< 0.020
9518076	08/08/95	08/15/95	0.015 +/-0.002	< 0.037
9518379	08/15/95	08/22/95	0.009 +/-0.002	< 0.016
9518855	08/22/95	08/29/95	0.014 +/-0.002	< 0.015
9520271	08/29/95	09/05/95	0.015 +/-0.002	< 0.039
9520474	09/05/95	09/12/95	0.012 +/-0.002	< 0.040
9520657	09/12/95	09/19/95	0.020 +/-0.002	< 0.018
9521111	09/19/95	09/26/95	0.013 +/-0.002	< 0.026
9522086	09/26/95	10/03/95	0.022 +/-0.002	< 0.041
9522231	10/03/95	10/10/95	0.011 +/-0.002	< 0.026
9522917	10/10/95	10/17/95	0.022 +/-0.002	< 0.025
9523329	10/17/95	10/24/95	0.013 +/-0.002	< 0.034
9523605	10/24/95	10/31/95	0.016 +/-0.002	< 0.023
9523892	10/31/95	11/07/95	0.013 +/-0.002	< 0.026
9524741	11/07/95	11/14/95	0.017 +/-0.002	< 0.030
9525273	11/14/95	11/21/95	0.022 +/-0.002	< 0.028
9525421	11/21/95	11/28/95	0.020 +/-0.002	< 0.029
9525808	11/28/95	12/05/95	0.021 +/-0.002	< 0.028
9526186	12/05/95	12/12/95	0.017 +/-0.002	< 0.024
9526743	12/12/95	12/19/95	0.014 +/-0.002	< 0.016
9600124	12/19/95	12/26/95	0.022 +/-0.002	< 0.039

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.4
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 04, MAY CEMETERY

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500310	12/27/94	01/03/95	0.014 +/-0.002	< 0.030
9500727	01/03/95	01/10/95	0.024 +/-0.002	< 0.028
9500935	01/10/95	01/17/95	0.003 +/-0.002	< 0.024
9501366	01/17/95	01/24/95	0.009 +/-0.002	< 0.024
9501913	01/24/95	01/31/95	0.008 +/-0.002	< 0.024
9502545	01/31/95	02/07/95	0.010 +/-0.002	< 0.021
9503001	02/07/95	02/14/95	0.008 +/-0.002	< 0.018
9503603	02/14/95	02/21/95	0.008 +/-0.002	< 0.023
9503871	02/21/95	02/28/95	0.007 +/-0.002	< 0.024
9504454	02/28/95	03/07/95	0.012 +/-0.002	< 0.030
9505247	03/07/95	03/14/95	0.011 +/-0.002	< 0.043
9505254	03/14/95	03/21/95	0.015 +/-0.002	< 0.023
9506114	03/21/95	03/28/95	0.009 +/-0.002	< 0.040
9506515	03/28/95	04/04/95	0.010 +/-0.002	< 0.034
9507032	04/04/95	04/11/95	0.006 +/-0.002	< 0.013
9507992	04/11/95	04/18/95	0.010 +/-0.002	< 0.041
9508204	04/18/95	04/25/95	0.005 +/-0.002	< 0.022
9508786	04/25/95	05/02/95	0.006 +/-0.002	< 0.019
9509335	05/02/95	05/09/95	0.004 +/-0.002	< 0.031
9509620	05/09/95	05/16/95	0.007 +/-0.002	< 0.029
9510366	05/16/95	05/23/95	0.010 +/-0.002	< 0.013
9510761	05/23/95	05/30/95	0.005 +/-0.002	< 0.023
9512225	05/30/95	06/06/95	0.003 +/-0.002	< 0.035
9512753	06/06/95	06/13/95	0.007 +/-0.002	< 0.015
9512760	06/13/95	06/20/95	0.006 +/-0.002	< 0.020
9513373	06/20/95	06/27/95	0.013 +/-0.002	< 0.019

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.4a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 04, MAY CEMETERY

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513905	06/27/95	07/04/95	0.011 +/-0.002	< 0.024
9514529	07/04/95	07/11/95	0.012 +/-0.002	< 0.029
9514975	07/11/95	07/18/95	0.014 +/-0.002	< 0.018
9515698	07/18/95	07/25/95	0.006 +/ 0.002	< 0.019
9516282	07/25/95	08/01/95	0.009 +/-0.002	< 0.020
9517034	08/01/95	08/08/95	0.012 +/-0.002	< 0.020
9518077	08/08/95	08/15/95	0.007 +/-0.002	< 0.037
9518380	08/15/95	08/22/95	0.012 +/-0.002	< 0.016
9518856	08/22/95	08/29/95	0.021 +/-0.002	< 0.015
9520272	08/29/95	09/05/95	0.017 +/-0.002	< 0.039
9520475	09/05/95	09/12/95	0.011 +/-0.002	< 0.040
9520658	09/12/95	09/19/95	0.017 +/-0.002	< 0.018
9521112	09/19/95	09/26/95	0.011 +/-0.002	< 0.026
9522087	09/26/95	10/03/95	0.019 +/-0.002	< 0.041
9522232	10/03/95	10/10/95	0.010 +/-0.002	< 0.026
9522918	10/10/95	10/17/95	0.018 +/-0.002	< 0.025
9523330	10/17/95	10/24/95	0.007 +/-0.002	< 0.034
9523606	10/24/95	10/31/95	0.012 +/-0.002	< 0.023
9523893	10/31/95	11/07/95	0.006 +/-0.002	< 0.026
9524742	11/07/95	11/14/95	0.016 +/-0.002	< 0.030
9525274	11/14/95	11/21/95	0.020 +/-0.002	< 0.028
9525422	11/21/95	11/28/95	0.023 +/-0.002	< 0.029
9525809	11/28/95	12/05/95	0.008 +/-0.002	< 0.028
9526187	12/05/95	12/12/95	0.015 +/-0.002	< 0.024
9523744	12/12/95	12/19/95	0.008 +/-0.002	< 0.016
9550125	12/19/95	12/26/95	0.012 +/-0.002	< 0.039

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.5
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 06, LOCAL OFFICE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500311	12/27/94	01/03/95	0.016 +/-0.002	< 0.030
9500728	01/03/95	01/10/95	0.028 +/-0.002	< 0.028
9500936	01/10/95	01/17/95	0.011 +/-0.002	< 0.024
9501367	01/17/95	01/24/95	0.011 +/-0.002	< 0.024
9501914	01/24/95	01/31/95	0.016 +/-0.002	< 0.024
9502546	01/31/95	02/07/95	0.013 +/-0.002	< 0.021
9503002	02/07/95	02/14/95	0.011 +/-0.002	< 0.018
9503604	02/14/95	02/21/95	0.013 +/-0.002	< 0.023
9503872	02/21/95	02/28/95	0.008 +/-0.002	< 0.024
9504455	02/28/95	03/07/95	0.012 +/-0.002	< 0.030
9505248	03/07/95	03/14/95	0.016 +/-0.002	< 0.043
9505255	03/14/95	03/21/95	0.018 +/-0.002	< 0.023
9506115	03/21/95	03/28/95	0.011 +/-0.002	< 0.040
9506516	03/28/95	04/04/95	0.013 +/-0.002	< 0.034
9507033	04/04/95	04/11/95	0.008 +/-0.002	< 0.013
9507993	04/11/95	04/18/95	0.012 +/-0.002	< 0.041
9508205	04/18/95	04/25/95	0.008 +/-0.002	< 0.022
9508787	04/25/95	05/02/95	0.008 +/-0.002	< 0.019
9509336	05/02/95	05/09/95	0.006 +/-0.002	< 0.031
9509621	05/09/95	05/16/95	0.009 +/-0.002	< 0.029
9510367	05/16/95	05/23/95	0.011 +/-0.002	< 0.013
9510762	05/23/95	05/30/95	0.007 +/-0.002	< 0.023
9512226	05/30/95	06/06/95	0.008 +/-0.002	< 0.035
9512754	06/06/95	06/13/95	0.011 +/-0.002	< 0.015
9512761	06/13/95	06/20/95	0.016 +/-0.002	< 0.020
9513374	06/20/95	06/27/95	0.018 +/-0.002	< 0.019

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.5a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 06, LOCAL OFFICE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513906	06/27/95	07/04/95	0.014 +/-0.002	< 0.024
9514530	07/04/95	07/11/95	0.017 +/-0.002	< 0.029
9514976	07/11/95	07/18/95	0.017 +/-0.002	< 0.018
9515699	07/18/95	07/25/95	0.010 +/-0.002	< 0.019
9516283	07/25/95	08/01/95	0.013 +/-0.002	< 0.020
9517035	08/01/95	08/08/95	0.009 +/-0.002	< 0.020
9518078	08/08/95	08/15/95	0.012 +/-0.002	< 0.037
9518381	08/15/95	08/22/95	0.017 +/-0.002	< 0.016
9518857	08/22/95	08/29/95	0.021 +/-0.002	< 0.015
9520273	08/29/95	09/05/95	0.017 +/-0.002	< 0.039
9520476	09/05/95	09/12/95	0.014 +/-0.002	< 0.040
9520659	09/12/95	09/19/95	0.023 +/-0.002	< 0.018
9521113	09/19/95	09/26/95	0.014 +/-0.002	< 0.026
9522088	09/26/95	10/03/95	0.021 +/-0.002	< 0.041
9522233	10/03/95	10/10/95	0.014 +/-0.002	< 0.026
9522919	10/10/95	10/17/95	0.023 +/-0.002	< 0.025
9523331	10/17/95	10/24/95	0.012 +/-0.002	< 0.034
9523607	10/24/95	10/31/95	0.015 +/-0.002	< 0.023
9523894	10/31/95	11/07/95	0.013 +/-0.002	< 0.026
9524743	11/07/95	11/14/95	0.018 +/-0.002	< 0.030
9525275	11/14/95	11/21/95	0.021 +/-0.002	< 0.028
9525423	11/21/95	11/28/95	0.032 +/-0.003	< 0.029
9525810	11/28/95	12/05/95	0.017 +/-0.002	< 0.028
9526188	12/05/95	12/12/95	0.017 +/-0.002	< 0.024
9526745	12/12/95	12/19/95	0.010 +/-0.002	< 0.016
9600126	12/19/95	12/27/95	0.018 +/-0.002	< 0.039

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.6
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 07, DANVILLE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9500312	12/27/94	01/03/95	0.022 +/-0.002	< 0.030
9500729	01/03/95	01/10/95	0.035 +/-0.003	< 0.028
9500937	01/10/95	01/17/95	0.015 +/-0.002	< 0.024
9501358	01/17/95	01/24/95	0.013 +/-0.002	< 0.024
9501915	01/24/95	01/31/95	0.020 +/-0.002	< 0.024
9502547	01/31/95	02/07/95	0.014 +/-0.002	< 0.021
9503003	02/07/95	02/14/95	0.016 +/-0.002	< 0.018
9503605	02/14/95	02/21/95	0.013 +/-0.002	< 0.023
9503873	02/21/95	02/28/95	0.011 +/-0.002	< 0.024
9504456	02/28/95	03/07/95	0.015 +/-0.002	< 0.030
9505249	03/07/95	03/14/95	0.021 +/-0.002	< 0.043
9505256	03/14/95	03/21/95	0.018 +/-0.002	< 0.023
9506116	03/21/95	03/28/95	0.014 +/-0.002	< 0.040
9506517	03/28/95	04/04/95	0.014 +/-0.002	< 0.034
9507034	04/04/95	04/11/95	0.013 +/-0.002	< 0.013
9507994	04/11/95	04/18/95	0.012 +/-0.002	< 0.041
9508206	04/18/95	04/25/95	0.007 +/-0.002	< 0.022
9508788	04/25/95	05/02/95	0.010 +/-0.002	< 0.019
9509337	05/02/95	05/09/95	0.011 +/-0.002	< 0.031
9509622	05/09/95	05/16/95	0.009 +/-0.002	< 0.029
9510368	05/16/95	05/23/95	0.013 +/-0.002	< 0.013
9510763	05/23/95	05/30/95	0.007 +/-0.002	< 0.023
9512227	05/30/95	06/06/95	0.009 +/-0.002	< 0.035
9512755	06/06/95	06/13/95	0.009 +/-0.002	< 0.015
9512762	06/13/95	06/20/95	0.019 +/-0.002	< 0.020
9513375	06/20/95	06/27/95	0.021 +/-0.002	< 0.019

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.6a
SAMPLE: AIR SAMPLES, (BETA, I-131)
COLLECTION: CONTINUOUS WITH WEEKLY EXCHANGE
UNITS: pCi/m^3

LOCATION: 07, DANVILLE

LAB NO.	BEGIN DATE	END DATE	GROSS BETA	I-131
REQ'D LLD			0.01	0.07
9513907	06/27/95	07/04/95	0.017 +/-0.002	< 0.024
9514531	07/04/95	07/11/95	0.018 +/-0.002	< 0.029
9514977	07/11/95	07/18/95	0.024 +/-0.002	< 0.018
9515700	07/18/95	07/25/95	0.012 +/-0.002	< 0.019
9515284	07/25/95	08/01/95	0.016 +/-0.002	< 0.020
9517036	08/01/95	08/08/95	0.012 +/-0.002	< 0.020
9518079	08/08/95	08/15/95	0.017 +/-0.002	< 0.037
9518382	08/15/95	08/22/95	0.021 +/-0.002	< 0.016
9518858	08/22/95	08/29/95	0.031 +/-0.003	< 0.015
9520274	08/29/95	09/05/95	0.023 +/-0.002	< 0.039
9520477	09/05/95	09/12/95	0.015 +/-0.002	< 0.040
9520660	09/12/95	09/19/95	0.022 +/-0.002	< 0.018
9521114	09/19/95	09/26/95	0.019 +/-0.002	< 0.026
9522089	09/26/95	10/03/95	0.024 +/-0.002	< 0.041
9522234	10/03/95	10/10/95	0.019 +/-0.002	< 0.026
9522920	10/10/95	10/17/95	0.028 +/-0.003	< 0.025
9523332	10/17/95	10/24/95	0.019 +/-0.002	< 0.034
9523608	10/24/95	10/31/95	0.016 +/-0.002	< 0.023
9523895	10/31/95	11/07/95	0.017 +/-0.002	< 0.026
9524744	11/07/95	11/14/95	0.018 +/-0.002	< 0.030
9525276	11/14/95	11/21/95	0.031 +/-0.002	< 0.028
9525424	11/21/95	11/28/95	0.026 +/-0.002	< 0.029
9525811	11/28/95	12/05/95	0.025 +/-0.002	< 0.028
9526189	12/05/95	12/12/95	0.016 +/-0.002	< 0.024
9526746	12/12/95	12/19/95	0.015 +/-0.002	< 0.016
9600127	12/19/95	12/26/95	0.017 +/-0.002	< 0.039

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 1.7
SAMPLE: AIR SAMPLES, (GAMMA)
COLLECTION: QUARTERLY COMPOSITE OF WEEKLY SAMPLES
UNITS: pCi/m^3

LOCATION	LAB NO.	BEGIN DATE	END DATE	Cs-134	Cs-137
	REQ'D LLD			0.01	0.01
01, MET TOWER	9506191	12/27/94	03/28/95	< 0.0013	< 0.0009
	9513522	03/28/95	06/27/95	< 0.0007	< 0.0005
	9521989	06/27/95	09/26/95	< 0.0010	< 0.0006
	9600202	09/26/95	12/26/95	< 0.0011	< 0.0012
02, SW OF SITE	9506192	12/27/94	03/28/95	< 0.0014	< 0.0009
	9513523	03/28/95	06/27/95	< 0.0009	< 0.0007
	9521990	06/27/95	09/26/95	< 0.0010	< 0.0007
	9600203	09/26/95	12/26/95	< 0.0009	< 0.0009
03, N OF SITE	9506193	12/27/94	03/28/95	< 0.0014	< 0.0010
	9513524	03/28/95	06/27/95	< 0.0008	< 0.0007
	9521991	06/27/95	09/26/95	< 0.0009	< 0.0006
	9600204	09/26/95	12/26/95	< 0.0008	< 0.0007
04, MAY CEMETERY	9506194	12/27/94	03/28/95	< 0.0012	< 0.0010
	9513525	03/28/95	06/27/95	< 0.0009	< 0.0008
	9521992	06/27/95	09/26/95	< 0.0010	< 0.0008
	9600205	09/26/95	12/26/95	< 0.0012	< 0.0013
06, LOCAL OFFICE	9506195	12/27/94	03/28/95	< 0.0014	< 0.0012
	9513526	03/28/95	06/27/95	< 0.0008	< 0.0008
	9521993	06/27/95	09/26/95	< 0.0010	< 0.0010
	9600206	09/26/95	12/27/95	< 0.0011	< 0.0009
07, DANVILLE	9506196	12/27/94	03/28/95	< 0.0011	< 0.0011
	9513527	03/28/95	06/27/95	< 0.0012	< 0.0011
	9521994	06/27/95	09/26/95	< 0.0010	< 0.0008
	9600207	09/26/95	12/26/95	< 0.0011	< 0.0012

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.1
SAMPLE: MILK SAMPLES, (I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 19, ARK. TECH.

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		1.0	15	18	15	15
9500497	01/10/95	< 0.8	< 3	< 3	< 12	< 2
9502198	02/07/95	< 0.8	< 4	< 3	< 12	< 3
9504185	03/07/95	< 0.5	< 3	< 3	< 10	< 3
9506928	04/11/95	< 0.7	< 3	< 2	< 9	< 2
9509316	05/09/95	< 0.7	< 3	< 2	< 9	< 2
9511101	06/06/95	< 0.6	< 3	< 3	< 10	< 3
9513054	06/27/95	< 0.3	< 3	< 3	< 9	< 3
9515340	07/25/95	< 0.5	< 2	< 2	< 6	< 2
9518070	08/22/95	< 0.6	< 2	< 2	< 5	< 2
9520479	09/19/95	< 0.6	< 2	< 2	< 8	< 2
9522797	10/17/95	< 0.7	< 2	< 2	< 8	< 2
9524391	11/14/95	< 0.8	< 3	< 3	< 9	< 3
9525927	12/12/95	< 0.6	< 3	< 2	< 10	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.2
SAMPLE: MILK SAMPLES, (I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 37, STEUBER DAIRY

LAB NO	COLLECTION DATE	I-131	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		1.0	15	18	15	15
9500399	01/06/95	< 0.7	< 3	< 2	< 14	< 3
9501909	02/01/95	< 0.8	< 3	< 3	< 12	< 3
9503889	03/02/95	< 0.7	< 4	< 3	< 12	< 3
9505686	03/29/95	< 0.5	< 3	< 2	< 8	< 2
9508524	05/02/95	< 0.5	< 2	< 2	< 7	< 2
9510347	05/25/95	< 0.5	< 2	< 2	< 8	< 2
9512699	06/21/95	< 0.8	< 2	< 2	< 7	< 2
9514970	07/19/95	< 0.5	< 2	< 2	< 6	< 2
9517783	08/18/95	< 0.6	< 3	< 3	< 14	< 3
9519964	09/13/95	< 0.5	< 3	< 3	< 8	< 2
9522438	10/13/95	< 0.7	< 2	< 2	< 9	< 2
9523837	11/08/95	< 0.6	< 3	< 3	< 12	< 3
9525607	12/06/95	< 0.8	< 2	< 3	< 11	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.3
SAMPLE: MILK SAMPLES, (I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 42, HUDSON DAIRY *

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		1.0	15	18	15	15
9500498	01/10/95	< 0.7	< 3	5 +/- 2	< 13	< 3
9502199	02/07/95	< 0.5	< 3	< 3	< 9	< 2
9504186	03/07/95	< 0.6	< 3	< 2	< 9	< 3
9506929	04/11/95	< 0.5	< 3	< 3	< 9	< 3
9509317	05/09/95	< 0.8	< 3	< 3	< 10	< 3
9511102	06/06/95	< 0.5	< 3	< 2	< 10	< 2
9513055	06/27/95	< 0.5	< 3	< 2	< 9	< 2
9515341	07/25/95	< 0.5	< 3	< 2	< 8	< 2
9518071	08/22/95	< 0.8	< 2	< 2	< 8	< 2
9520480	09/19/95	< 0.8	< 2	< 1	< 5	< 1
9522798	10/17/95	< 0.7	< 2	< 1	< 5	< 2
9524392	11/14/95	< 0.9	< 3	< 4	< 15	< 4

* Discontinued milking operations and replaced by Ragsdale Dairy in December 1995.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 2.4
SAMPLE: MILK SAMPLES, (I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 49, RYLEE DAIRY *

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		1.0	15	18	15	15
9505632	03/27/95	< 0.5	< 3	< 2	< 9	< 2
9508794	05/02/95	< 0.9	< 3	< 3	< 15	< 3
9510741	05/31/95	< 0.3	< 3	< 2	< 10	< 2
9513246	06/27/95	< 0.5	< 3	< 2	< 7	< 2
9514971	07/19/95	< 0.6	< 2	< 2	< 9	< 2
9517782	08/18/95	< 0.7	< 2	< 2	< 8	< 2
9519965	09/13/95	< 0.5	< 3	< 3	< 11	< 3
9522439	10/13/95	< 0.8	< 2	3 +/- 2	< 9	< 3
9523838	11/08/95	< 0.8	< 3	3 +/- 2	< 9	< 2
9525733	12/07/95	< 0.7	< 3	3 +/- 2	< 11	< 3

* Replaced the Gibson Dairy which discontinued milking operations.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO.: 2.5
SAMPLE: MILK SAMPLES, (I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 50, RAGSDALE DAIRY *

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		1.0	15	18	15	15
9525928	12/12/95	< 0.6	< 2	< 2	< 7	< 2

* Replaced the Hudson Dairy which discontinued milking operations.

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 3.1
SAMPLE: DRINKING WATER, (BETA, I-131, GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 14, CITY WATER

LAB NO.	COLLECTION DATE	BETA	I-131	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		4.0	1.0	15	30	15	15	30	15	15	10	18	15	15
9500683	01/11/95	< 2.4	< 0.6	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 11	< 2
9502217	02/07/95	< 1.8	< 0.5	< 3	< 4	< 3	< 3	< 5	< 6	< 3	< 3	< 3	< 10	< 3
9504196	03/07/95	< 1.8	< 0.9	< 3	< 3	< 3	< 2	< 6	< 6	< 3	< 3	< 3	< 11	< 3
9506501	04/06/95	< 2.3	< 0.9	< 3	< 4	< 2	< 3	< 6	< 6	< 3	< 3	< 3	< 11	< 4
9508795	05/04/95	< 2.3	< 0.5	< 3	< 4	< 3	< 3	< 7	< 6	< 3	< 3	< 3	< 12	< 4
9510607	05/31/95	7.1 +/- 1.5	< 0.3	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 7	< 2
9513544	06/26/95	< 2.0	< 0.6	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 10	< 3
9515527	07/25/95	< 1.9	< 0.8	< 1	< 2	< 1	< 2	< 3	< 3	< 1	< 2	< 1	< 6	< 2
9518316	08/24/95	1.9 +/- 1.3	< 0.6	< 1	< 1	< 1	< 1	< 2	< 3	< 1	< 1	< 1	< 4	< 2
9520459	09/19/95	1.4 +/- 1.3	< 0.6	< 1	< 2	< 2	< 1	< 3	< 3	< 2	< 2	< 2	< 6	< 2
9522770	10/18/95	1.6 +/- 1.2	< 0.5	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 7	< 2
9524495	11/14/95	< 2.6	< 0.9	< 3	< 5	< 3	< 3	< 6	< 5	< 3	< 3	< 3	< 14	< 3
9525976	12/13/95	< 1.7	< 0.6	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 8	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 3.2
SAMPLE: DRINKING WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: 14, CITY WATER

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			1000
9504197	01/11/95	03/07/95	< 300
9513578	04/06/95	06/29/95	< 320
9520470	07/25/95	09/19/95	< 320
9525977	10/18/95	12/13/95	< 290

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.1
SAMPLE: SURFACE WATER, (GAMMA)
COLLECTION: MONTHLY COMPOSITE
UNITS: pCi/L

LOCATION: 08, DISCHARGE BAY

LAB NO.	BEGIN DATE	END DATE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD			15	30	15	15	30	15	15	15	18	15	15
9501687	12/31/94	01/31/95	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 10	< 3
9503704	01/31/95	02/28/95	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 10	< 3
9506175	02/28/95	03/31/95	< 2	< 3	< 2	< 3	< 5	< 5	< 2	< 2	< 2	< 10	< 3
9508523	03/31/95	04/30/95	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9510605	04/30/95	05/31/95	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 10	< 2
9513540	05/31/95	06/30/95	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 9	< 2
9515731	06/30/95	07/31/95	< 2	< 2	< 1	< 2	< 2	< 4	< 1	< 2	< 2	< 5	< 2
9518945	07/31/95	08/31/95	< 1	< 2	< 1	< 2	< 2	< 3	< 1	< 2	< 1	< 5	< 2
9521268	08/31/95	09/30/95	< 1	. 1	< 1	< 1	< 2	< 3	< 1	< 1	< 1	< 5	< 2
9523362	09/30/95	10/31/95	< 3	< 5	< 3	< 3	< 5	< 4	< 3	< 3	< 3	< 12	< 4
9525428	10/31/95	11/30/95	< 2	< 5	< 2	< 2	< 5	< 4	< 2	< 2	< 2	< 12	< 3
9600133	11/30/95	12/31/95	< 2	< 5	< 2	< 2	< 5	< 4	< 2	< 2	< 2	< 12	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.2
SAMPLE: SURFACE WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: 08, DISCHARGE BAY

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9506177	12/31/94	03/31/95	430 +/- 190
9513566	03/31/95	06/30/95	< 320
9521270	06/30/95	09/30/95	640 +/- 180
9600135	09/30/95	12/31/95	570 +/- 180

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.3
SAMPLE: SURFACE WATER, (GAMMA)
COLLECTION: MONTHLY COMPOSITE
UNITS: pCi/L

LOCATION: 10, INTAKE CANAL

LAB NO.	BEGIN DATE	END DATE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD			15	30	15	15	30	15	15	15	18	15	15
9501691	12/31/94	01/31/95	< 2	< 3	< 2	< 3	< 6	< 6	< 2	< 3	< 2	< 10	< 3
9503705	01/31/95	02/28/95	< 2	< 3	< 2	< 3	< 5	< 5	< 2	< 2	< 2	< 9	< 3
9506176	02/28/95	03/31/95	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 10	< 3
9508522	03/31/95	04/30/95	< 2	< 4	< 2	< 3	< 5	< 5	< 3	< 3	< 3	< 11	< 4
9510606	04/30/95	05/31/95	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 8	< 3
9513541	05/31/95	06/30/95	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 3	< 12	< 2
9515732	06/30/95	07/31/95	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 7	< 2
9518946	07/31/95	08/31/95	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 8	< 2
9521269	08/31/95	09/30/95	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9523363	09/30/95	10/31/95	< 3	< 5	< 3	< 3	< 7	< 5	< 3	< 3	< 3	< 14	< 3
9525429	10/31/95	11/30/95	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 9	< 2
9600134	11/30/95	12/31/95	< 2	< 3	< 3	< 2	< 5	< 6	< 2	< 3	< 3	< 12	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.4
SAMPLE: SURFACE WATER, (H-3)
COLLECTION: QUARTERLY COMPOSITE
UNITS: pCi/L

LOCATION: 10, INTAKE CANAL

LAB NO.	BEGIN DATE	END DATE	H-3
REQ'D LLD			2000
9506178	12/31/94	03/31/95	< 310
9513567	03/31/95	06/30/95	< 320
9521271	06/30/95	09/30/95	< 290
9600136	09/30/95	12/31/95	< 290

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.5
SAMPLE: SURFACE WATER, SPLIT W/ADH, (H-3,GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 08, DISCHARGE BAY

LAB NO.	COLLECTION DATE	H-3	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		2000	15	30	15	15	30	15	15	15	18	15	15
9501118	01/19/95	< 310	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 12	< 3
9502875	02/14/95	< 310	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 8	< 2
9504597	03/14/95	< 300	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 8	< 2
9506240	04/05/95	< 300	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 8	< 2
9509590	05/16/95	< 300	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 3	< 2	< 10	< 2
9511994	06/13/95	< 320	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 7	< 2
9514763	07/18/95	3020 +/- 220	< 1	< 1	< 1	< 1	< 2	< 3	< 1	< 1	< 1	< 5	< 1
9517354	08/15/95	< 320	< 2	< 2	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 8	< 2
9519441	09/05/95	2680 +/- 220	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9521855	10/05/95	< 280	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 10	< 3
9523883	11/07/95	< 320	< 2	< 2	< 2	< 2	< 3	< 3	< 2	< 2	< 2	< 7	< 2
9526527	12/19/95	1860 +/- 200	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 2	< 2	< 9	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 4.6
SAMPLE: SURFACE WATER, SPLIT W/ADH, (H-3,GAMMA)
COLLECTION: MONTHLY
UNITS: pCi/L

LOCATION: 16, PINEY CREEK

LAB NO.	COLLECTION DATE	H-3	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		2000	15	30	15	15	30	1/	15	15	18	15	15
9501119	01/19/95	< 310	< 2	< 3	< 2	< 2	< 5	< 6	< 3	< 3	< 2	< 13	< 3
9502876	02/14/95	< 310	< 3	< 4	< 3	< 3	< 5	< 6	< 3	< 3	< 3	< 10	< 3
9504598	03/14/95	< 300	< 2	< 3	< 2	< 3	< 5	< 5	< 2	< 3	< 2	< 9	< 3
9506241	04/05/95	< 300	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9509591	05/16/95	< 300	< 2	< 4	< 2	< 3	< 6	< 6	< 3	< 3	< 3	< 9	< 3
9511995	06/13/95	< 320	< 3	< 3	< 2	< 3	<	< 6	< 3	< 3	< 3	< 9	< 3
9514764	07/18/95	< 320	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9517355	08/15/95	< 320	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 9	< 3
9519442	09/05/95	< 320	< 2	< 3	< 2	< 2	< 4	< 5	< 2	< 2	< 2	< 8	< 2
9521856	10/05/95	< 280	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2
9523884	11/07/95	< 320	< 2	< 5	< 2	< 2	< 5	< 4	< 2	< 2	< 3	< 12	< 4
9526528	12/19/95	< 290	< 3	< 5	< 3	< 3	< 6	< 5	< 3	< 3	< 3	< 14	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.1
SAMPLE: GROUND WATER, (H-3, GAMMA)
COLLECTION: QUARTERLY
UNITS: pCi/L

LOCATION: 32, STEWART RESIDENCE

LAB NO.	COLLECTION DATE	H-3	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		2000	15	30	15	15	30	15	15	15	18	15	15
9500686	01/11/95	< 310	< 2	< 3	< 2	< 2	< 5	< 5	< 3	< 2	< 2	< 14	< 3
9506244	04/05/95	< 300	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 10	< 3
9513542	06/29/95	< 320	< 1	< 1	< 1	< 1	< 2	< 3	< 1	< 1	< 1	< 5	< 2
9520460	09/19/95	< 320	< 3	< 3	< 3	< 2	< 5	< 6	< 3	< 3	< 3	< 11	< 2
9525978	12/13/95	< 290	< 2	< 2	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 7	< 2

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 5.2
SAMPLE: GROUND WATER, (H-3, GAMMA)
COLLECTION: QUARTERLY
UNITS: pCi/L

LOCATION: 33, OUITA RECREATION AREA

LAB NO.	COLLECTION DATE	H-3	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
REQ'D LLD		2000	15	30	15	15	30	15	15	15	18	15	15
9500687	01/11/95	< 310	< 2	< 3	< 2	< 2	< 5	< 5	< 3	< 2	< 2	< 14	< 3
9506245	04/05/95	< 300	< 2	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 2	< 10	< 2
9513543	06/29/95	< 320	< 2	< 3	< 2	< 3	< 5	< 5	< 2	< 3	< 2	< 11	< 4
9520461	09/19/95	< 320	< 2	< 3	< 2	< 2	< 4	< 5	< 3	< 3	< 2	< 10	< 2
9525979	12/13/95	< 290	< 2	< 3	< 2	< 2	< 5	< 5	< 2	< 3	< 2	< 9	< 3

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 6.1
SAMPLE: FISH SAMPLES, (GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/kg

LOCATION : 08, DISCHARGE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137
REQ'D LLD			130	260	130	130	260	130	150
9506120	03/19/95	CATFISH	< 8	< 13	< 8	< 8	< 21	< 10	< 8
9506121	03/24/95	BASS & CRAPPIE	< 10	< 18	< 11	< 10	< 27	< 12	< 12
9521678	09/12/95	CATFISH	< 4	< 10	< 6	< 5	< 11	< 6	7 +/- 4
9521679	09/12/95	BASS & CRAPPIE	< 6	< 12	< 7	< 7	< 14	< 7	14 +/- 5

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 6.2
SAMPLE: FISH SAMPLES, (GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/kg

LOCATION : 10, INTAKE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137
REQ'D LLD			130	260	130	130	260	130	150
9506118	03/20/95	CATFISH	< 10	< 17	< 9	< 8	< 23	< 10	< 10
9506119	03/22/95	BASS & CRAPPIE	< 11	< 19	< 12	< 13	< 29	< 10	< 11
9521676	09/22/95	CATFISH	< 9	< 18	< 11	< 12	< 25	< 11	< 11
9521677	09/22/95	BASS & CRAPPIE	< 7	< 11	< 7	< 7	< 15	< 7	< 6

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 6.3
SAMPLE: FISH SAMPLES SPLIT W/ADH, (GAMMA)
COLLECTION: VARIES
UNITS: pCi/kg

LOCATION : 08, DISCHARGE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137
REQ'D LLD			130	260	130	130	260	130	150
9510562	05/25/95	FISH FILLETS	< 7	< 12	< 7	< 8	< 17	< 9	14 +/- 7
9522799	10/11/95	FISH FILLETS	< 7	< 13	< 7	< 9	< 18	< 8	15 +/- 8

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 6.4
SAMPLE: FISH SAMPLES SPLIT W/ ADH, (GAMMA)
COLLECTION: VARIES
UNITS: pCi/kg

LOCATION : 10, INTAKE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Cs-134	Cs-137
REQ'D LLD			130	260	130	130	260	130	150
9510563	05/25/95	FISH FILLETS	< 6	< 9	< 6	< 6	< 15	< 7	< 7

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 7.1
SAMPLE: SEDIMENT, (GAMMA)
COLLECTION: SEMIANNUALLY
UNITS: pCi/kg

LOCATION	LAB NO.	COLLECTION DATE	Mn-54	Co-58	Co-60	Ag-110m	Cs-134	Cs-137
	REQ'D LLD		N/A	N/A	N/A	N/A	150	180
08, DISCHARGE	9506172	03/23/95	45 +/- 3	19 +/- 9	152 +/- 12	< 43	< 20	1299 +/- 19
	9521674	10/04/95	54 +/- 6	45 +/- 6	132 +/- 8	< 27	85 +/- 5	1141 +/- 44
10, INTAKE	9506173	03/23/95	29 +/- 9	< 13	21 +/- 10	< 52	< 20	390 +/- 20
	9521673	10/04/95	< 15	< 15	< 13	< 54	< 18	250 +/- 18
16, PINEY CREEK	9506174	03/23/95	< 7	< 8	< 7	< 24	< 8	< 6
	9521675	10/04/95	< 12	< 29	< 23	< 21	< 26	< 23

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.1
SAMPLE: VEGETATION: FOOD PRODUCTS, (GAMMA)
COLLECTION: AT TIME OF HARVEST.
UNITS: pCi/kg

LOCATION: 38, R. JONES RESIDENCE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9509556	05/11/95	TUBULAR VEGETATION	< 16	< 10	< 10

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.2
SAMPLE: VEGETATION: FOOD PRODUCTS (GAMMA)
COLLECTION: AT TIME OF HARVEST.
UNITS: pCi/kg

LOCATION: 40, HOLLIS RESIDENCE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9514340	07/13/95	POTAOTES	< 5	< 6	< 5
9514341	07/13/95	APPLES	< 8	< 7	< 7
9514342	07/13/95	SQUASH	< 8	< 9	< 9
9514343	07/13/95	CABBAGE	< 8	< 9	< 7

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.3
SAMPLE: VEGETATION: FOOD PRODUCTS (GAMMA)
COLLECTION: AT TIME OF HARVEST.
UNITS: pCi/kg

LOCATION: 48, COCHRAN RESIDENCE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9514490	07/13/95	PUMPKIN	< 14	< 11	< 10
9514491	07/13/95	POTATOES	< 12	< 13	< 11
9514492	07/13/95	TOMATOES	< 8	< 7	< 6
9514493	07/13/95	SQUASH & BEANS	< 12	< 11	< 10

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.4
SAMPLE: VEGETATION: FOOD PRODUCTS SPLIT W/ADH (GAMMA)
COLLECTION: VARIES
UNITS: pCi/kg

LOCATION: 108, J.T. SHIVERS RESIDENCE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9511993	06/13/95	LETTUCE	< 8	< 7	< 7
9523463	10/31/95	GREENS	< 20	< 21	< 26

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.5
SAMPLE: VEGETATION: FOOD PRODUCTS (GAMMA)
COLLECTION: AT TIME OF HARVEST.
UNITS: pCi/kg

LOCATION: 108, J.T. SHIVERS RESIDENCE

LAB NO.	COLLECTION DATE	SAMPLE TYPE	I-131	Cs-134	Cs-137
REQ'D LLD			60	60	80
9514625	07/14/95	SQUASH	< 11	< 9	< 8
9514626	07/14/95	TOMATOES	< 14	< 9	< 8

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.6
SAMPLE: VEGETATION: BROADLEAF, (GAMMA)
COLLECTION: AT TIME OF HARVEST.
UNITS: pCi/kg

LOCATION: 13, W OF SITE

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137
REQ'D LLD		60	60	80
9511117	06/06/95	< 38	< 34	< 27
9513909	07/05/95	< 39	< 35	< 32
9517364	08/11/95	< 42	< 29	< 29

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT

TABLE NO. : 8.7
SAMPLE: VEGETATION: BROADLEAF, (GAMMA)
COLLECTION: AT TIME OF HARVEST.
UNITS: pCi/kg

LOCATION: 45, E OF SITE

LAB NO.	COLLECTION DATE	I-131	Cs-134	Cs-137
REQ'D LLD		60	60	80
9511118	06/06/95	< 50	< 44	< 44
9513910	07/05/95	< 35	< 33	< 30
9517363	08/11/95	< 55	< 36	< 31

EPA CROSS CHECK RESULTS

EPA PREP DATE	DATE RESULTS ISSUED	MEDIA	NUCLIDE	EPA RESULTS	ESI, SYSTEM CHEMISTRY RESULTS	NORM DEV. KNOWN
09/30/94	02/06/95	MILK GAMMA (pCi/L)	I-131	75.0	71.67	-0.72
			Cs-137	59.0	62.67	1.27
			K (Total)	1715.0	1653.33	-1.24
10/28/94	02/13/95	WATER (pCi/L)	Gross Beta	23.0	19.00	-1.39
11/04/94	02/14/95	WATER* (pCi/L)	Co-60	59.0	69.33	3.58*
			Zn-65	100.0	128.33	4.91*
			Cs-134	24.0	27.33	1.15
			Cs-137	49.0	60.33	3.93*
			Ba-133	73.0	97.00	5.94*
02/03/95	04/21/95	WATER (pCi/L)	I-131	100.0	100.00	0.00
03/10/95	05/18/95	WATER (pCi/L)	Tritium	7435.00	7030.00	-0.94
04/18/95	08/16/95	BLIND B (pCi/L)	Co-60	29.0	29.33	0.12
			Cs-134	20.0	18.67	-0.46
			Cs-137	11.0	11.00	0.00
			Gross Beta	86.8	77.93	-1.50
06/09/95	Unofficial	WATER (pCi/L)	Co-60	40.0	39.66	-0.12
			Zn-65	76.0	80.00	0.87
			Cs-134	50.0	45.00	-1.73
			Cs-137	35.0	35.66	0.23
			Ba-133	79.0	76.66	-0.51
07/21/95	10/31/95	WATER (pCi/L)	Gross Beta	19.4	23.4	1.37
08/04/95	10/02/95	WATER (pCi/L)	Tritium	4872.0	4823.33	-0.17

* Each isotope measured by ESI was 14-33% higher than values reported by the U.S. EPA. When EPA published the results on 2/14/95, the ESI cross-check sample had been disposed of. Because the EPA sample was inadvertently disposed, no follow-up action could be taken on that particulate sample. Since all measurements made by ESI were higher than the EPA values, it appears that a dilution error when preparing the sample was the cause for the discrepancy between ESI values and the EPA values. A new liquid standard was purchased from Analytics, Inc. in March 1995 and new efficiency curves were calculated using a 3.5 liter Marinelli geometry. There were no appreciative differences between the efficiency curves calculated before and after the Nov 4, 1994 cross-check sample was analyzed. A 3.5L resin standard prepared by Analytics, Inc. was analyzed, resulting in efficiency curves which were approximately 90 percent as efficient as deionized water. These results are theoretically in agreement since the Analytics, Inc. resin standard has a density of 1.15 kg/L. No data from gamma spectroscopy would be affected by this apparent dilution error.

ATTACHMENT II

1995 Environmental Thermoluminescent Dosimetry Report

TABLE 1

0 - 2 MILE TLD RESULTS FOR 1995

Station	1st Qtr (mrem)	2nd Qtr (mrem)	3rd Qtr (mrem)	4th Qtr (mrem)	Annual Mean (mrem)
1	17.0	21.0	16.0	16.0	**17.5**
2	17.0	22.0	16.0	16.0	**17.8**
3	15.0	19.0	15.0	14.0	**15.8**
4	15.0	18.0	14.0	15.0	**15.5**
108	16.0	39.0	16.0	16.0	**21.8**
109 *	19.0	40.0	(1)	16.0	**25.0**
110	17.0	22.0	16.0	16.0	**17.8**
113	15.0	19.0	15.0	15.0	**16.0**
114	16.0	21.0	16.0	15.0	**17.0**
115	17.0	21.0	16.0	15.0	**17.3**
116	16.0	34.0	15.0	15.0	**20.0**
MEAN	**16.4**	**25.1**	**15.5**	**15.4**	

* Station with highest annual mean.

(1) TLD missing in field.

TABLE 2

2 - 5 MILE TLD RESULTS FOR 1995

Station	1st Qtr (mrem)	2nd Qtr (mrem)	3rd Qtr (mrem)	4th Qtr (mrem)	Annual Mean (mrem)
111	14.0	20.0	13.0	13.0	**15.0**
112	17.0	23.0	16.0	16.0	**18.0**
119 *	16.0	42.0	15.0	15.0	**22.0**
120	14.0	20.0	13.0	14.0	**15.3**
121	15.0	18.0	15.0	14.0	**15.5**
122	15.0	19.0	14.0	13.0	**15.3**
123	15.0	17.0	13.0	13.0	**14.5**
124	17.0	21.0	17.0	16.0	**17.8**
130	14.0	17.0	14.0	14.0	**14.8**
131	15.0	17.0	13.0	13.0	**14.5**
133	12.0	15.0	11.0	11.0	**12.3**
134	15.0	19.0	15.0	14.0	**15.8**
135	15.0	18.0	(1)	(1)	**16.5**
136	15.0	18.0	16.0	14.0	**15.8**
141	13.0	15.0	12.0	13.0	**13.3**
MEAN	**14.8**	**19.9**	**14.1**	**13.8**	

* Station with highest annual mean.

(1) TLD missing in field.

ATTACHMENT III

Statistical Analyses

Statistical Analyses

Calculation of the mean, standard deviation and "t" values are as follows:

Mean: $\overline{X} =$ Xi / n

where: $\overline{X}$ = Mean of sample results

Xi = Sum of individual results

n = Number of samples

Standard Deviation = $\sqrt{\frac{\sum (X - \overline{X})^2}{n-1}}$

where: Sd = Standard deviation

X = Individual sample result

$\overline{X}$ = Mean of sample results

n = Number of samples

"t" Value = $\frac{(\overline{x} - \overline{y})}{\sqrt{\frac{(n_x - 1)s_x^2 + (n_y - 1)s_y^2}{n_x + n_y - 2}} \sqrt{\frac{1}{n_x} + \frac{1}{n_y}}}$

where: t = Calculated "t" value

$\overline{X}$ = Mean of first data set

$\overline{y}$ = Mean of second data set

n_X = Number of variables in first data set

s_X = Standard deviation of first data set

n_y = Number of variables in second data set

s_y = Standard deviation of second data set

Statistical Analyses

- Calculated "t" values were compared to tabular "t" values obtained from the CRC Standard Mathematical Tables, 26th Edition (1981) to test the hypothesis that the true mean of the first population is equal to the true mean of the second population. For purposes of this report, the "t" test was only performed for air samples and TLDs, due to the large sample population size involved.

- Samples types other than those presented below were not statistically analyzed due to the small population sample sizes.

Air Samples

Parameter	Station 1	Station 2	Station 3	Station 4	Station 7
Gross Beta Mean (10E-3 pCi/m^3)	15.7 (16)	14.1 (14)	14.1 (14)	10.8 (11)	17.3 (17)
Gross Beta Standard Deviation (10E-3 pCi/m^3)	6.0	5.0	6.0	5.0	6.0
Number in Sample	52	52	51	52	52
Calculated "t" Value to Comparison with Control Station (7)	1.360	2.955	2.719	6.001	N/A
Tabular "t" Value at 95% Confidence (t, 0.025, n)	1.986	1.986	1.986	1.986	N/A
Statistical Conclusion	Identical	Lower	Lower	Lower	N/A

Statistical Analyses

TLDs

Parameter	0 - 2 Miles	2 - 5 Miles	> 5 Miles
Mean (mrem/Qtr)	18.1	15.7	16.8
Standard Deviation (mrem/Qtr)	5.8	4.3	5.6
Number in Sample	43	58	68
Calculated "t" Value to Comparison with Stations Located >5 Miles	1.175	1.220	N/A
Tabular "t" Value at 95% Confidence (t, 0.025, n)	1.983	1.978	N/A
Statistical Conclusion	Identical	Identical	N/A

ATTACHMENT IV

Sediment Dose Calculations

Sediment Dose Calculations

- Dose calculation for the discharge sediment was performed using generalized equation found in Regulatory Guide 1.109, Appendix A as follows:

R = (40) × (C) × (U) × (D) × (W)

where:

R = Annual dose to skin or total body in mrem/year;

40 = Area-mass conversion factor given in Appendix A of Regulatory Guide 1.109 in Kg/m^2;

C = 1995 maximum radionuclide concentration in pCi/kg;

U = Maximum exposure time given in Table E-5 of Regulatory Guide 1.109 (67 hours for teenager);

D = External dose conversion factor for standing on contaminated ground given in Table E-6 of Regulatory Guide 1.109 in mrem/hr per pCi/m^2, and

W = Shore-width factor (0.1) given in Table A-2 of Regulatory Guide 1.109.

(Dose from Sediment in Millirem/Year)

Radionuclide	1995 Maximum Concentration	Conversion Factor For Skin	Total Skin Dose	Conversion Factor For Total Body	Total Body Dose
Mn-54	54	6.80 E-09	9.84 E-05	5.80 E-09	8.39 E-05
Co-58	45	8.20 E-09	9.89 E-05	7.00 E-09	8.44 E-05
Co-60	152	2.00 E-08	8.15 E-04	1.70 E-08	6.93 E-04
Cs-134	85	1.40 E-08	3.19 E-04	1.20 E-08	2.73 E-04
Cs-137	1299	4.90 E-09	1.71 E-03	4.20 E-09	1.46 E-03
TOTAL			**3.04 E-03**		**2.59 E-03**

TABLE 3

>5 MILE TLD RESULTS FOR 1995

Station	1st Qtr (mrem)	2nd Qtr (mrem)	3rd Qtr (mrem)	4th Qtr (mrem)	Annual Mean (mrem)
5	17.0	37.0	16.0	16.0	21.5
6	16.0	19.0	15.0	15.0	16.3
7	16.0	19.0	16.0	15.0	16.5
117	13.0	18.0	12.0	13.0	14.0
118	16.0	19.0	15.0	15.0	16.3
125	12.0	17.0	12.0	12.0	13.3
126	15.0	20.0	15.0	13.0	15.8
127	16.0	38.0	16.0	14.0	21.0
128	16.0	45.0	17.0	15.0	23.3
129	16.0	21.0	16.0	15.0	17.0
132	(1)	19.0	15.0	14.0	16.0
137	17.0	21.0	17.0	15.0	17.5
138	13.0	16.0	12.0	12.0	13.3
139	(1)	(1)	15.0	(1)	15.0
140	16.0	20.0	16.0	14.0	16.5
142	15.0	17.0	13.0	14.0	14.8
143	15.0	20.0	15.0	16.0	16.5
144	15.0	20.0	14.0	15.0	16.0
MEAN	**15.3**	**22.7**	**14.8**	**14.3**	

(1) TLD missing in field.