



Nebraska Public Power District
Nebraska's Energy Leader

NLS2001050
May 14, 2001

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

Gentlemen:

Subject: Annual Radiological Environmental Operating Report
Cooper Nuclear Station, NRC Docket No. 50-298, DPR-46

In accordance with Cooper Nuclear Station Technical Specification 5.6.2, Nebraska Public Power District submits the Cooper Nuclear Station Annual Radiological Environmental Operating Report for the period of January 1, 2000, through December 31, 2000.

Per 10 CFR 50.4(b)(1), we are enclosing one copy of the report for your use, one copy to the Regional Office and one copy to the NRC Senior Resident Inspector.

Should you have any questions regarding this matter, please contact Michael Boyce at (402) 825-5100.

Sincerely,

J. H. Swailes
Vice President of Nuclear Energy

/dnm
Enclosure

cc: Regional Administrator w/enclosure
USNRC - Region IV

Senior Project Manager w/enclosure
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/enclosure
USNRC - Cooper Nuclear Station

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ATTACHMENT 3 LIST OF REGULATORY COMMITMENTS

Correspondence Number: NLS20010050

The following table identifies those actions committed to by the District in this document. Any other actions discussed in the submittal represent intended or planned actions by the District. They are described for information only and are not regulatory commitments. Please notify the NL&S Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITTED DATE OR OUTAGE
None	N/A

Cooper Nuclear Station

Annual Radiological Environmental Operating Report

Radiological Environmental Monitoring Program
January 1, 2000 - December 31, 2000



USNRC Docket Number 50-298



Nebraska Public Power District
Nebraska's Energy Leader

Prepared by

**TELEDYNE BROWN ENGINEERING
ENVIRONMENTAL SERVICES**

NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
Radiological Environmental Monitoring Program
2000 Annual Report
January 1, 2000 to December 31, 2000

Approved by


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PREFACE

This report covers the period of January 1 through December 31, 2000. Personnel of the Nebraska Public Power District made all sample collections. Analyses were performed and reports of analyses were prepared by Teledyne Brown Engineering - Environmental Services and forwarded to Nebraska Public Power District.

I. INTRODUCTION

I. INTRODUCTION

This report contains a complete tabulation of data collected during the period January through December 2000, for the operational Radiological Environmental Monitoring Program performed for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) by Teledyne Brown Engineering - Environmental Services.

Cooper Nuclear Station is located in Nemaha County in the southeast corner of Nebraska on the Missouri River. A portion of the site extends into Missouri. The reactor is a 778-megawatt (net electrical) boiling water reactor. Initial criticality was attained on February 21, 1974. The reactor reached 50 percent power on June 25, 1974 and 100 percent power on November 20, 1974.

Radiological environmental monitoring began in 1971 before the plant became operational and has continued to the present. The program monitors radiation levels in air, terrestrial and aquatic environments. All samples are collected by NPPD personnel. All are shipped for analysis to a contractor's laboratory where there exists special facilities required for measurements of extremely low levels of radioactivity. From 1971 through 1976 the contractor was Teledyne Isotopes, Westwood, New Jersey. NALCO Environmental Sciences assumed responsibility for the analyses effective January 1, 1977.

On November 1, 1978 Hazelton Environmental Sciences Corporation (HESC) assumed responsibility for the program. Prior to November 1, 1978 Hazelton Environmental Sciences operated as NALCO Environmental Sciences. Teledyne Isotopes (now trading as Teledyne Brown Engineering - Environmental Services) again assumed responsibility for the analyses effective January 1, 1979 through December 31, 2000.

The United States Nuclear Regulatory Commission (USNRC) regulations (10CFR50.34a) require that nuclear power plants be designed, constructed, and operated to keep levels of radioactive material in effluents to unrestricted areas as low as is reasonably achievable (ALARA). To ensure these criteria are met, the operating license for Nebraska Public Power District's Cooper Nuclear Station includes Technical Specifications which address the release of radioactive effluents. Inplant monitoring is used to ensure that these release limits are not exceeded. As a precaution against unexpected or undefined environmental processes which might allow undue accumulation of radioactivity in the environment, a program for monitoring the plant environs is also included in NPPD's CNS Technical Specifications.

A. Atmospheric Nuclear Tests

Three atmospheric nuclear detonations in the People's Republic of China influenced program results significantly in late 1976 and in 1977. Two of these detonations occurred in late 1976 (September 26 and November 17) and one in late 1977 (September 17). As a consequence of these tests elevated activities of gross beta in air particulate filters and I-131 in milk were observed throughout most of the United States.

No atmospheric nuclear tests have been conducted since 1977, thus no short-lived fission products were detected in air particulate samples. Also no I-131 was detected from radiogases from any sources.

On April 26, 1986 the fire and explosion of Chernobyl Reactor No. 4 in the Soviet Union resulted in the release of fission products to the atmosphere and worldwide fallout. Following the explosion, elevated levels of gross beta activities in air particulates and Iodine-131 in charcoal filters and milk samples were measured. Additionally, in 1986, Cesium-137 and the short-lived isotopes Iodine-131, Ruthenium-106, and Cesium-134 were detected in broadleaf vegetation. Similar results occurred in other areas of the United States and the entire Northern Hemisphere.

B. Program Objectives and Data Interpretation

The objective of the monitoring program is to detect and assess the impact of possible releases to the environs of radionuclides from the operations of the Cooper Nuclear Station. This objective requires measurements of low levels of radioactivity equal to or lower than pre-determined limits of detection. In addition the source of the environmental radiation must be established. Sources of environmental radiation include:

- (1) Natural background radiation from cosmic rays (Berillium-7).
- (2) Terrestrial, primordial radionuclides from the environment (potassium-40, Radium-226, Thorium-228).
- (3) Fallout from atmospheric nuclear tests such as the September 1977 detonation by the Peoples' Republic of China and the atmospheric weapons test of October 16, 1980 (fission products and fusion products).
- (4) Releases from nuclear power plants such as CNS (fission products and neutron activation products).
- (5) Fallout from the Chernobyl Nuclear Reactor Accident.
Radiation levels measured in the vicinity of an operating power station are compared with preoperational measurements at the same locations to distinguish power plant effects from other sources. Also, results of the monitoring program are related to events known to cause elevated levels of radiation in the environment, e.g., atmospheric nuclear detonations or abnormal plant releases.

II. SUMMARY

II. SUMMARY

Presented in this report are summaries and discussions of the data generated for the Radiological Environmental Monitoring Program (REMP) for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) for 2000.

A discussion of each type of sample analyzed and its impact, if any, on the environment is presented in Section IV. Included also are graphs of the isotopes of interest for the past several years and the statistical results for each quarter of the year.

Section VI is the Radiological Environmental Monitoring Program Summary. It contains the yearly summary of the program with the total number of samples of each type analyzed. It lists the yearly average and range for the control locations versus the indicator locations and the number of detections per total number of samples. It identifies the station with the highest yearly average, the distance and location of that station and provides the range of detection.

Part V, Table 3 presents the yearly summary of the program with the total number of samples of each type analyzed, the yearly average for all samples, the number of detections per total number of samples, the station with the highest average, the average of the control station, and the inclusive dates of the analyses.

Part VI is a discussion of each type of sample analyzed and its impact, if any, on the environment. Included also is a graph of the isotopes of interest since 1977 and the statistical results for each quarter of the year. This is followed by a complete tabulation of the data by sample type and station number.

The 2000 radiological environmental measurements for CNS indicate that there has been no residual fallout resulting from the explosion and fire at the Chernobyl Reactor in the Soviet Union which occurred on April 26, 1986. It may be concluded from all measurements taken that the operations of CNS had no detectable impact on the environment in the vicinity of the Cooper Nuclear Station.

III. SAMPLING AND ANALYSIS PROGRAM

III. SAMPLING AND ANALYSIS PROGRAM

The 2000 sampling and analysis program is described in Table 1. Teledyne Brown Engineering - Environmental Services has a comprehensive quality assurance/quality control program designed to assure the reliability of data obtained. The results for the 2000 Intercomparison Program conducted by the Analytic's, Inc. and Environmental Resource Associates are contained in Appendix B.

Sampling locations are indicated in the map labeled Figure 1. The sample types collected at each location and the approximate distance and direction from the reactor elevated release point are specified.

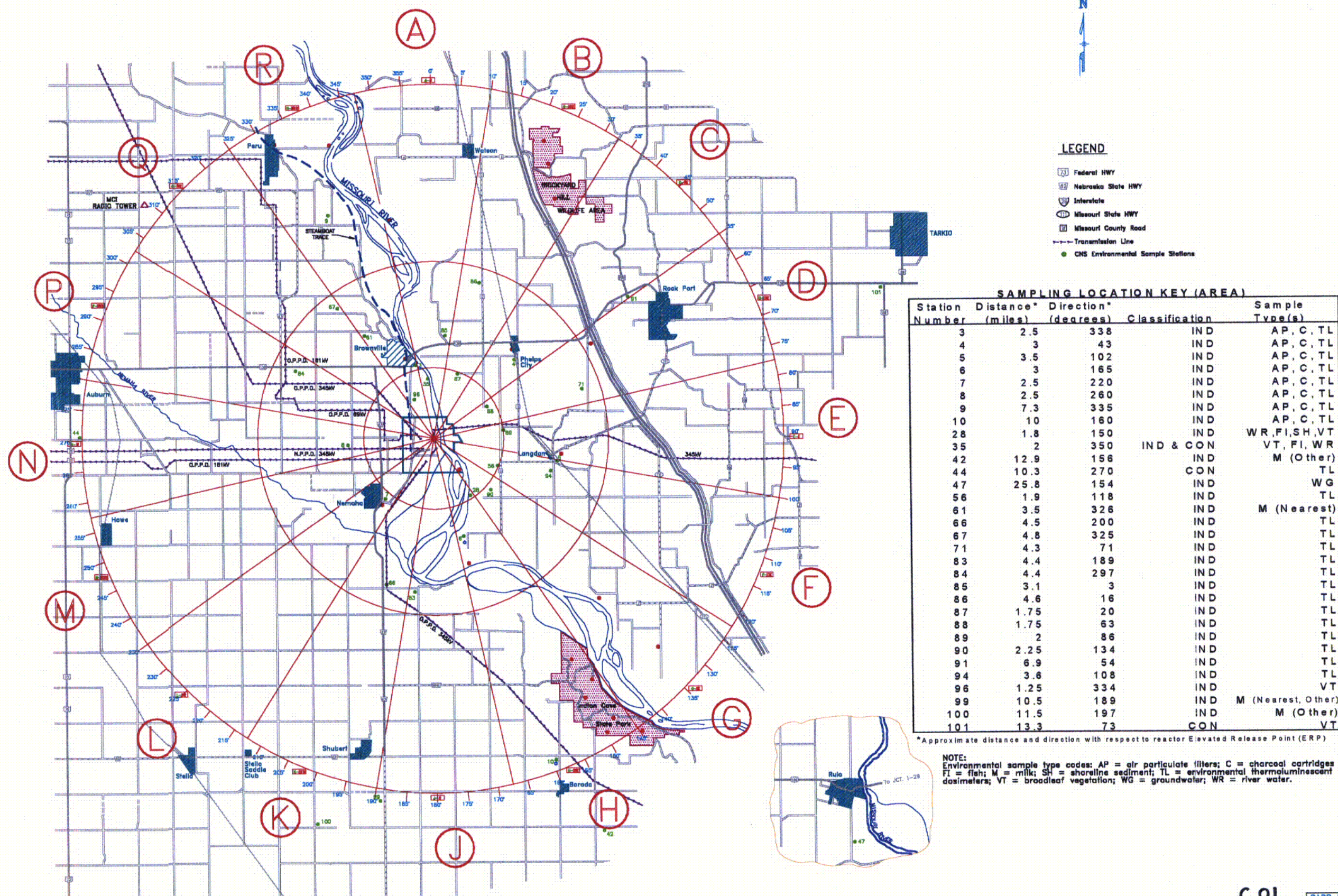
The annual land use census for 2000 is described in Appendix A. There were no milk animals found within three miles of CNS in 2000 and no evidence of potable water use from the river. The nearest garden to CNS is in sector D, 1.7 miles from CNS. Gardens were found in eight sectors during 1999 and in nine sectors during 2000. The nearest resident to CNS is in sector Q, 0.9 miles from CNS.

All of the required 2000 environmental monitoring, including sampling and analysis, was conducted as specified in Table D4.1-1 of the CNS Offsite Dose Assessment Manual (ODAM), except as noted in Appendix E, Exception Table.

TABLE 1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
Environmental Radiation Surveillance Program
Sampling Schedule and Analysis

Sample Type	Station	Frequency	Analyses
Airborne/ Particulate	1-10	Once per 7 days	Gross alpha, beta. Gamma Isotopic on quarterly composite of each station, and on each sample in which gross beta activity is > 10 times the yearly mean of control samples
Airborne/Iodine	1-10	Once per 7 days	I-131
Milk / Nearest Producer peak pasture only	61	Once per 15 days	I-131 (low level), Gamma Isotopic Sr-89, Sr-90, elem. Ca. on monthly composite
River Water	12, 28	Once per 31 days	Gross alpha, sus and dis Gross beta, sus and dis, Sr-89, Sr-90, Gamma Isotopic, Tritium on quarterly composite
Milk/ Nearest Producer Non-peak pasture	61, 99	Once per 31 days	I-131 (low level) Sr-89, Sr-90, elem. Ca., Gamma Isotopic
Food Products / Broadleaf Vegetation	28, 35, 96, 101	Monthly when available	I-131 (low level), Gamma Isotopic
Background Radiation Thermoluminescent Dosimeters	1-10, 20, 44, 56, 58, 59, 66, 67, 71, 79- 91, 94	Once per 92 days	TLD Readout (gamma dose)
Groundwater	11, 47	Once per 92 days	Gross Alpha, Beta, Gamma Isotopic, Tritium
Milk Other Producers	42, 99, 100	Once per 92 days	I-131 (low level) Sr-89, Sr-90, elem. Ca., Gamma Isotopic
Fish (Summer and Fall)	28, 35	Two times per year	Gross Beta, Sr-89, Sr-90, Gamma Isotopic on edible portions
Shoreline Sediment	28	Two times per year	Gamma Isotopic

Figure 1



C01

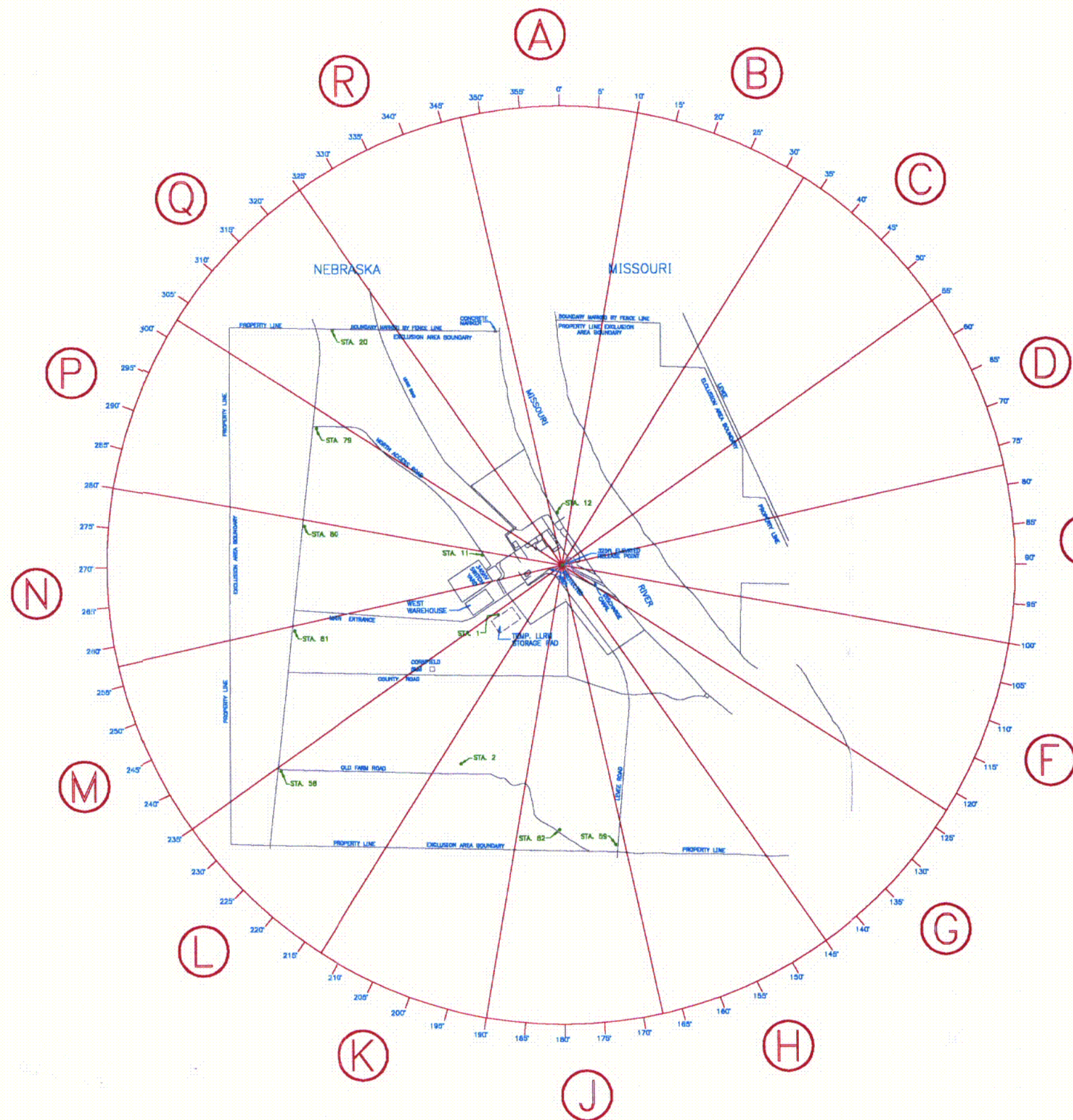
CADD DRAWING

SAMPLING STATIONS AREA

DATE	3-15-01
DESIGNED	DATE
APPROVED	DATE
FILED	DATE

Nebraska Public Power District

0



LEGEND

- Federal HWY
- Nebraska State HWY
- Interstate
- Missouri State HWY
- Missouri County Road
- Transmission Line
- CNS Environmental Sample Stations

SAMPLING LOCATION KEY (SITE)

Station Number	Distance* (miles)	Direction* (degrees)	Classification	Sample Type(s)
1	0.1	230	IND	AP, C, TL
2	0.75	210	IND	AP, C, TL
11	0.15	275	IND	WG
12	0.1	355	CON	WR
20	0.96	315	IND	TL
58	1.1	234	IND	TL
59	1	170	IND	TL
79	0.85	299	IND	TL
80	0.75	280	IND	TL
81	0.8	255	IND	TL
82	0.8	185	IND	TL

*Approximate distance and direction with respect to reactor Elevated Release Point (ERP)

NOTE:
Environmental sample type codes: AP = air particulate filters; C = charcoal cartridges
FI = fish; M = milk; SH = shoreline sediment; TL = environmental thermoluminescent
dosimeters; VT = broadleaf vegetation; WG = groundwater; WR = river water.

NO. REVISIONS

SIGNATURE						DATE	CADD DRAWING	
GROUP						TAC	3-15-00	
CHECKED						DATE	REVISION	
APPROVED						DATE	0	
FILMED						MAP OF SAMPLING STATIONS SITE		

IV. SUMMARY AND DISCUSSION OF 2000 ANALYTICAL RESULTS

IV. SUMMARY AND DISCUSSION OF 2000 ANALYTICAL RESULTS

Data from the radiological analyses of environmental media collected during 2000 are tabulated and discussed below. The procedures and specifications followed in the laboratory for these analyses are as required in the Teledyne Brown Engineering Quality Assurance manual and are explained in the Teledyne Brown Engineering Analytical Procedures. A synopsis of analytical procedures used for the environmental samples is provided in Appendix C. In addition to internal quality control measures performed by Teledyne, the laboratory also participates in an Interlaboratory Comparison Program. Participation in this program ensures that independent checks on the precision and accuracy of the measurements of radioactive material in environmental samples are performed. The results of the Interlaboratory Comparison are provided in Appendix B.

Radiological analyses of environmental media characteristically approach and frequently fall below the detection limits of state-of-the-art measurement methods. The "less than" values in the data tables were calculated from each specific analysis and are dependent on sample size, detector efficiency, length of counting time, chemical yield, when appropriate, and the radioactive decay factor from time of counting to time of collection. Teledyne Brown Engineering's analytical methods meet the Lower Limit of Detection (LLD) requirements given in Table 2 of the USNRC Branch Technical Position, Radiological Monitoring Acceptable Program (November 1979, Revision 1). Section C contains a discussion of the LLD formulas.

The following is a discussion and summary of the results of the environmental measurements taken during the 2000 reporting period

A. Airborne Particulates

Gross beta activity was observed in all of the indicator samples collected during 2000. The average concentration was 0.024 pCi/m^3 and a range of 0.002 to 0.093 pCi/m^3 . The result of the gross beta activities are presented in Section VII-1 and Trending Graph 1. The gross beta activities for 2000 were comparable to levels measured in the previous several years. Prior to that period the gross beta activities were higher due to atmospheric nuclear weapons testing performed in other countries.

Air particulate filters were collected weekly and composited by locations on a quarterly basis. They were analyzed by gamma ray spectroscopy. The results are presented in Section VII-2. Beryllium-7, which is produced continuously in the upper atmosphere by cosmic radiation, was measured in 38 of 40 composite samples. The indicator locations had an average concentration of 0.098 pCi/m^3 and a range of 0.050 to 0.146 pCi/m^3 . During the preoperational period, beryllium-7 was measured at comparable levels, as would be expected. Naturally occurring potassium-40 was detected in one sample with a concentration of 0.005 pCi/m^3 . All other gamma emitters were below the detection limits. Several nuclides have been plotted. The Environmental Measurements Laboratory of the US Department of Energy no longer reports measurements of cerium-144 because the artificial nuclides such as cerium-144 have reached the limits of detection by the analytical techniques now used.

B. *Airborne Iodine*

Charcoal cartridges used to collect airborne iodine were collected weekly and analyzed by gamma spectrometry for iodine-131. Stations 01 through 10 were monitored. The results are presented in Section VII-1. All results were below the required lower limit of detection.

C. *Fish*

Aquatic biota can be sensitive indicators of radionuclide accumulation in the environment because of their ability to concentrate certain chemical elements, which have radioactive isotopes. The results are presented in Table VII-3 and Trending Graph 2. Eight samples of fish were collected during the summer and fall of 2000. A middle-top feeding fish (carp) and a bottom feeding fish (catfish) were collected in June and October. These samples were analyzed for gross beta, strontium-89/90 and by gamma ray spectroscopy. As expected naturally occurring potassium-40 was detected in all samples. The average concentration at the control location was 3.33 pCi/gm (wet weight) and a range of 2.62 to 3.82 pCi/gm (wet weight). The average concentration for the five indicator samples was 2.94 pCi/gm (wet weight) with a range of 2.63 to 3.30 pCi/gm (wet weight). The fission product cesium-137 was not measured in any samples for 2000. Cobalt-60 was not measured in any samples for 2000. Strontium-89 was not detected during 2000. Strontium 90 was detected at a concentration of 0.02 pCi/gram (wet). All other gamma emitters were below their detection levels.

D. *Milk – Nearest Producer*

Milk samples are collected once every 15 days in peak pasture season and once every 31 days the rest of the year. The results are presented in Table VII-4 and Trending Graphs 3 and 4. Nineteen samples were analyzed by gamma ray spectroscopy. As expected, naturally occurring potassium-40 was measured in all samples with an average of 1306 pCi/liter and a range of 944 to 2150 pCi/liter.

The fission product cesium-137 was not detected during 2000. Strontium-89 was not detected in the 19 samples analyzed. Strontium-90 was detected in all samples monitored with an average level of 1.10 pCi/liter and a range of 0.64 to 1.6 pCi/liter. This is a normal environmental level. Elemental calcium was detected at an average concentration of 1.04 pCi/liter with a range of 0.75 to 1.3 pCi/liter. All other gamma emitters were below their detection levels.

E. Milk – Other Producers

Eight milk samples were collected from two locations of other producers during 2000 and results are presented in Table VII-5 and Trending Graphs 5 and 6. Station 99 and station 100 were sampled quarterly in 2000. Naturally occurring potassium-40 was detected in six of the seven samples analyzed with an average concentration of 1317 pCi/liter and a range of 1140 to 1510 pCi/liter. Strontium 89 was not detected during 2000. Strontium 90 was measured in seven of the eight samples with an average concentration of 1.24 pCi/liter with a range of 0.73 to 1.6 pCi/liter. Elemental calcium was measured in the eight samples with an average concentration of 1.51 pCi/liter and a range of 0.64 to 2.2 pCi/liter. All other gamma emitters were below their detection levels.

The levels of radioactivity of the nuclides iodine-131 and cesium-137 are plotted on Trending Graph 5. These graphs indicate there was no appreciable difference between the levels of activity of the nearest producer and the commercial producers. This indicates there is no effect on milk samples from the operation of the Cooper Nuclear Station.

F. Ground Water

Groundwater was collected from two stations quarterly and analyzed for gross beta and gross alpha activity, for tritium, and for gamma emitting radionuclides. Station 11 is located 0.15 miles from the plant and station 47 is 25.8 miles from the plant. The results are presented in Table VII-6 and Trending Graph 7.

The gross beta activity for the eight indicator samples had an average concentration of 9.39 pCi/liter and a range of 6.7 to 14 pCi/liter. This is statistically similar to past years. Gross alpha was not detected in any of the eight samples. Naturally occurring potassium-40 was measured in two of the eight samples with an average concentration of 80.4 pCi/liter and a range of 79.8 to 81 pCi/liter. There were other gamma emitters measured above their detection levels, but these were naturally occurring radium-226 and thorium-228. Gross alpha/gross beta and tritium levels have been plotted in Trending Graph 7.

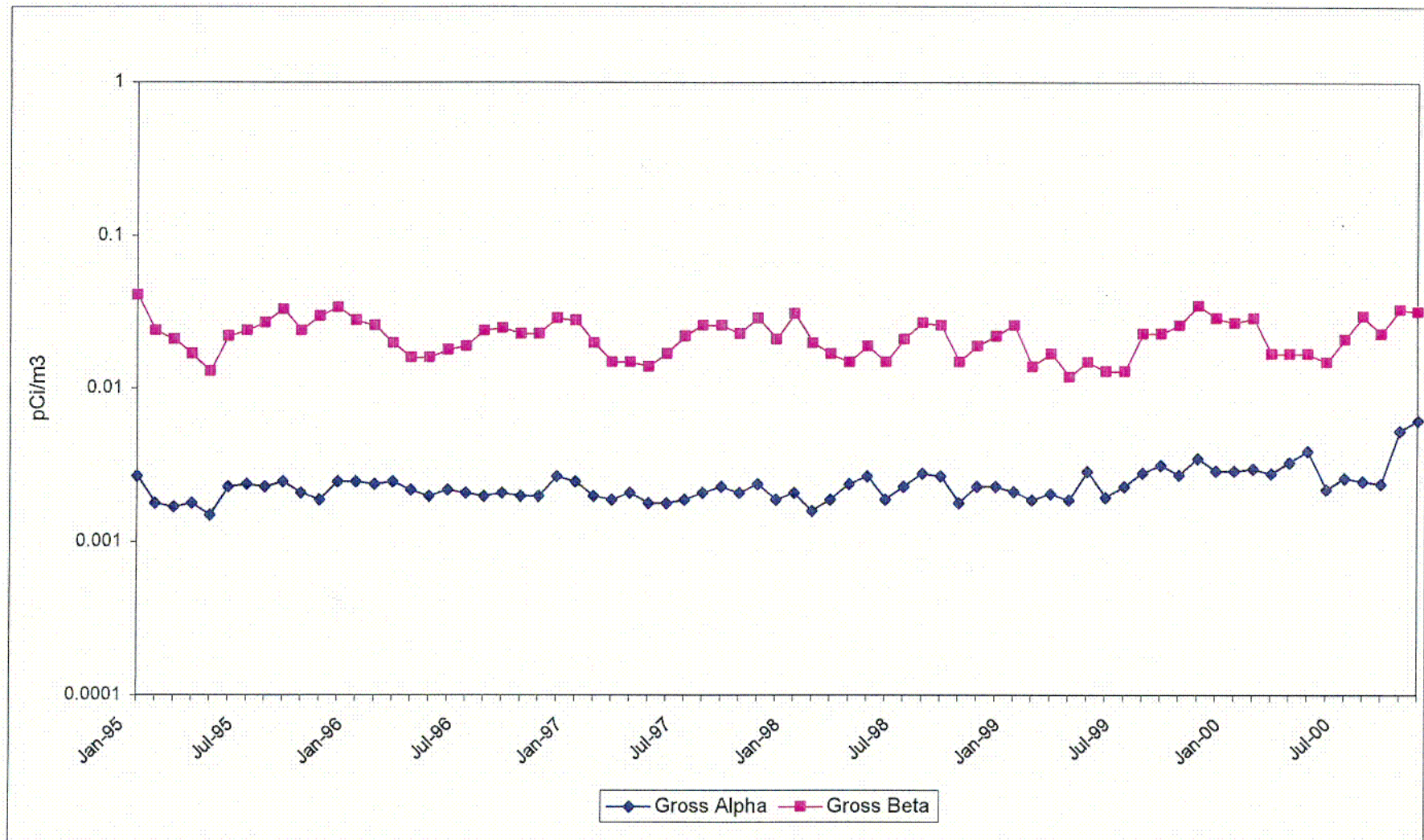
G. River Water

River water was collected monthly and monitored for gross beta and gross alpha, suspended and dissolved, strontium-89, strontium-90 plus gamma emitting isotopes. A quarterly composite was measured for tritium. The results are presented in table VII-7 and Trending Graph 8. There was no detection of potassium-40 above the normal level of detection. In fact, no gamma emitters were detected above their detection limits. Strontium-89 and strontium-90 were not measured during 2000 in the gamma spectrum analysis. Iodine-131 was detected in the radiochemical analysis, but it did not exceed NRC reporting levels.

Gross alpha (Dissolved) was measured in six of the twelve control samples with an average concentration of 2.80 pCi/liter and a range of 1.2 to 5.4 pCi/liter. Gross Alpha (Dissolved) was measured in eight of the twelve indicator samples with an average concentration of 3.53 pCi/liter and a range of 1.8 to 5.2 pCi/liter. Gross Alpha

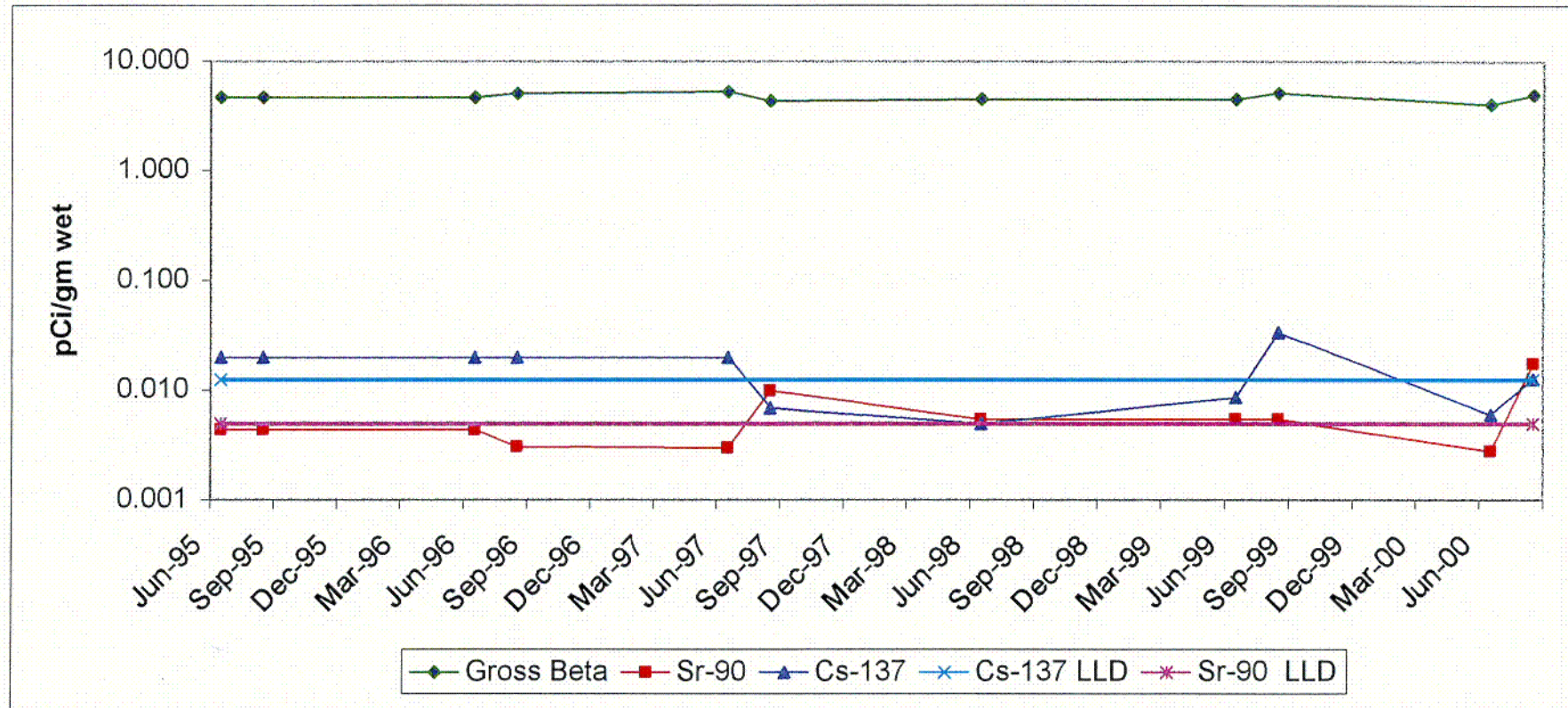
TRENDING GRAPH 1

GROSS ALPHA AND GROSS BETA IN AIR PARTICULATES
MONTHLY AVERAGE - ALL LOCATIONS



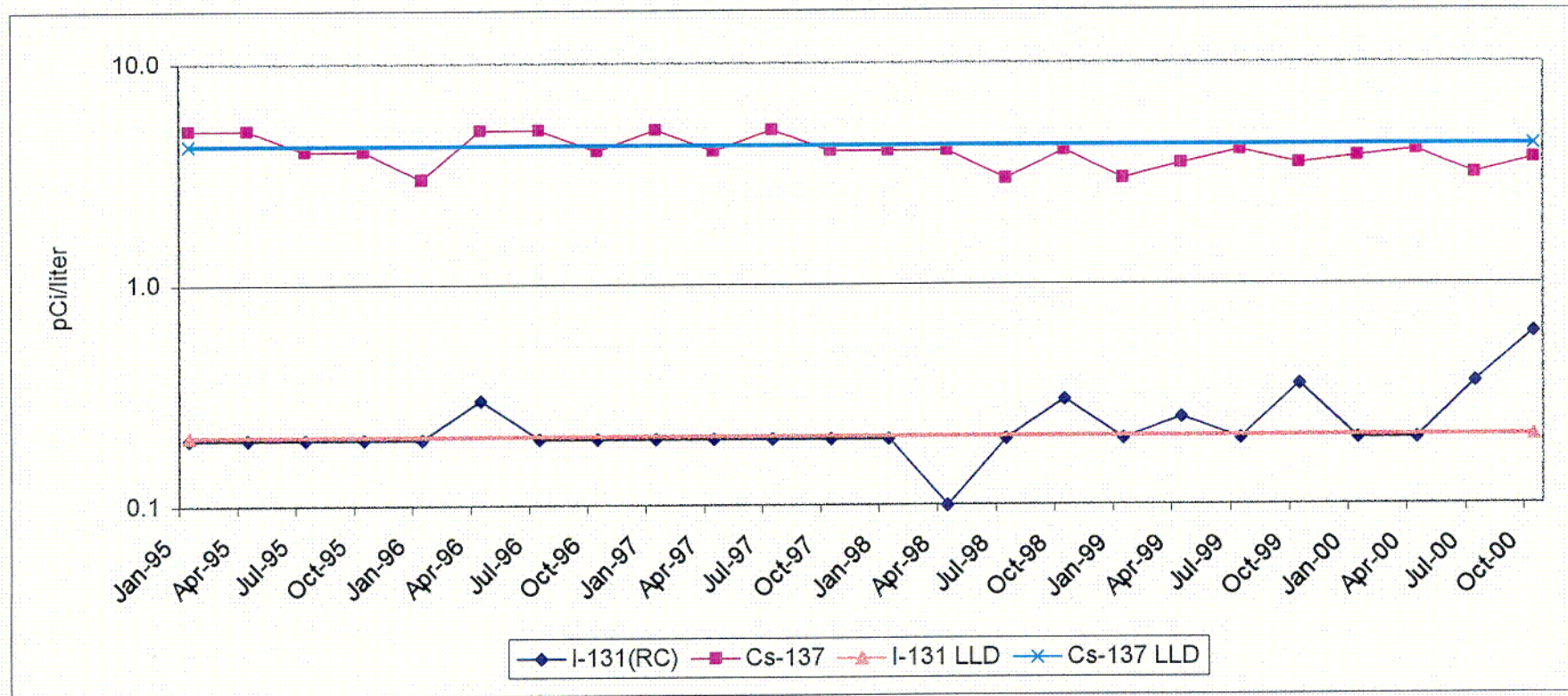
TRENDING GRAPH 2

GROSS BETA, STRONTIUM-90 AND CESIUM-137 IN FISH
ALL LOCATIONS



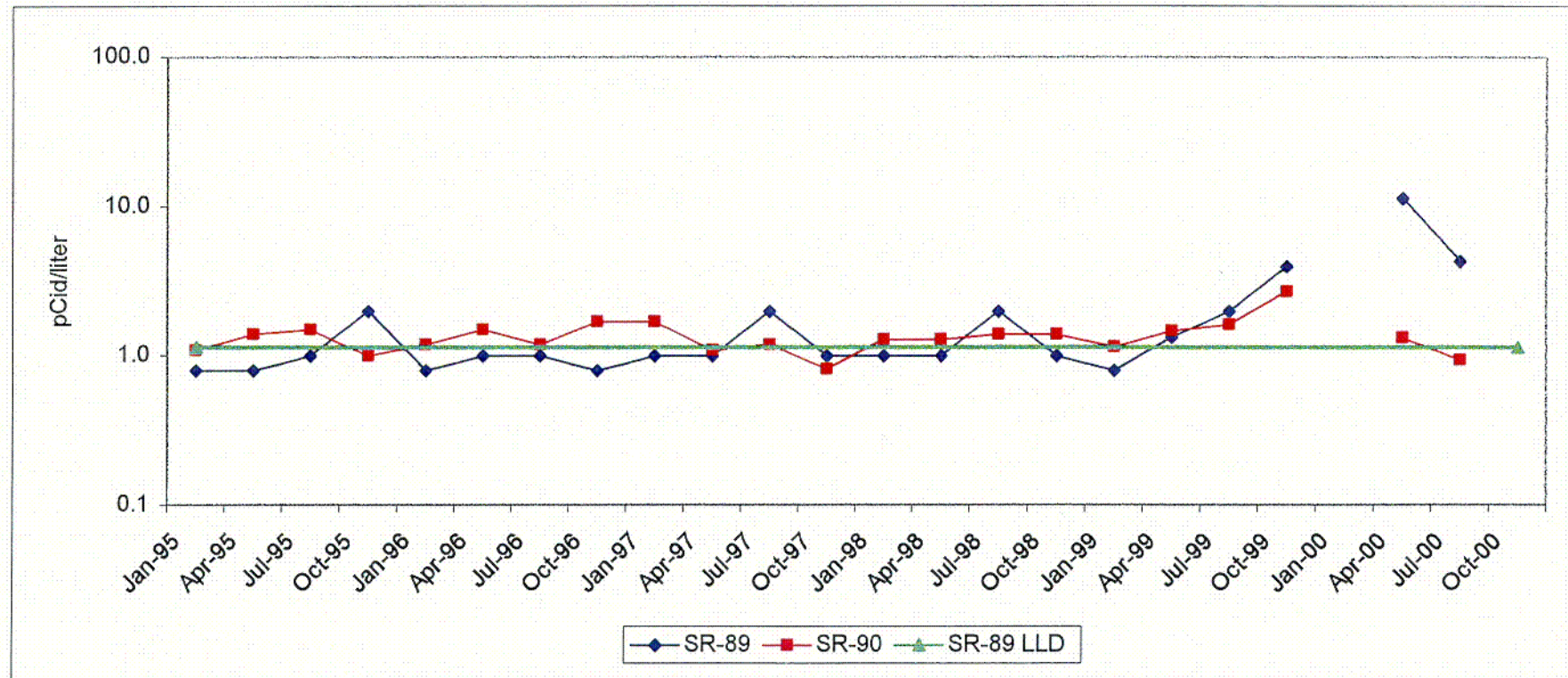
TRENDING GRAPH 3

IODINE-131 AND CESIUM-137 IN MILK - NEAREST PRODUCER
STATION 61



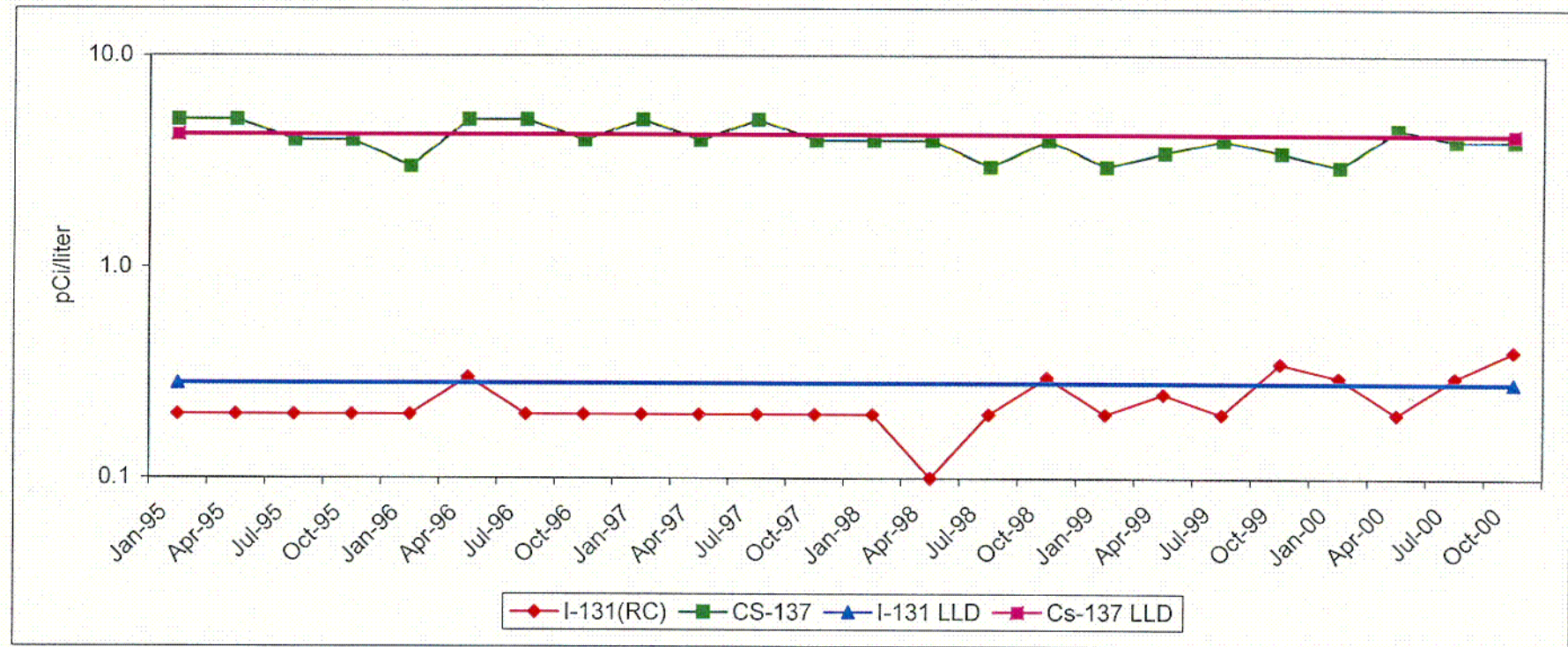
TRENDING GRAPH 4

STRONTIUM-89 AND 90 IN MILK - NEAREST PRODUCER
STATION 61



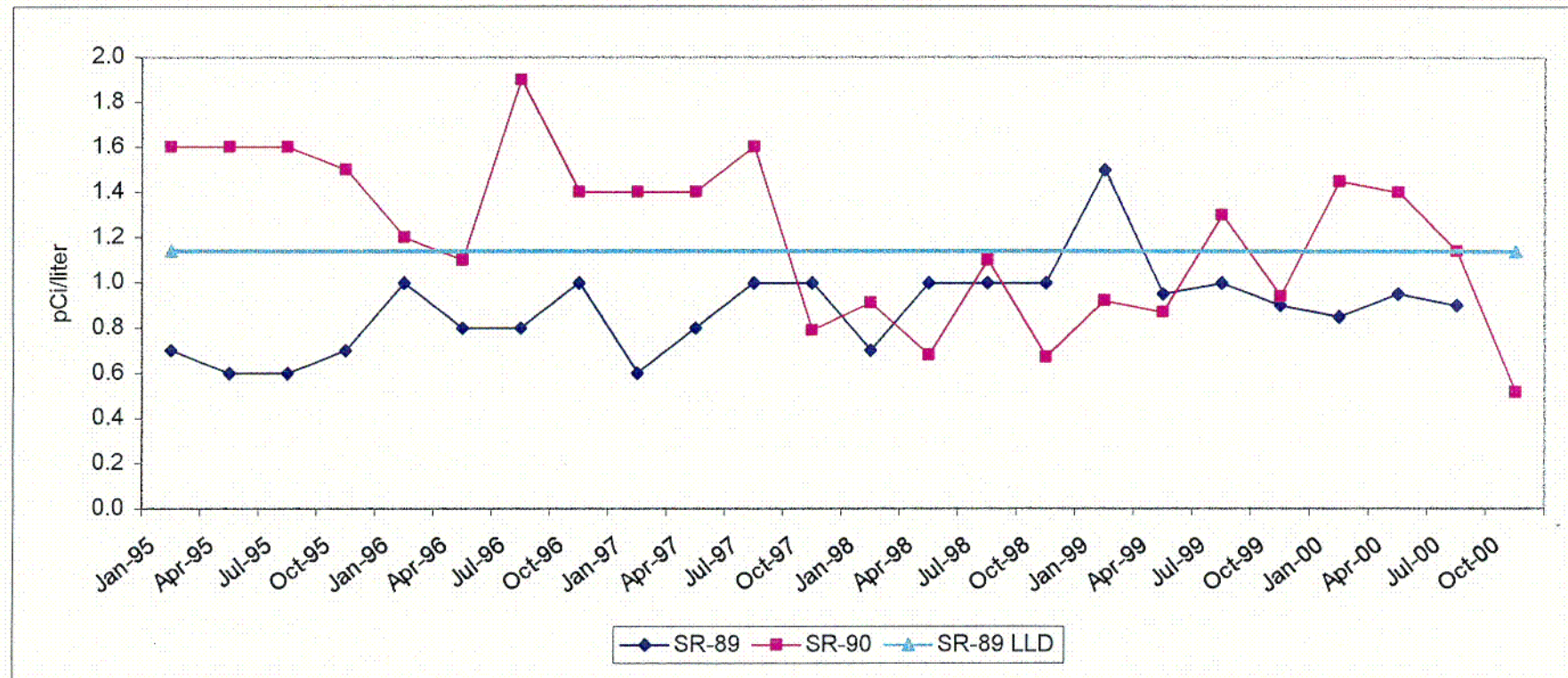
TRENDING GRAPH 5

IODINE-131 AND CESIUM-137 IN MILK - OTHER PRODUCERS QUARTERLY AVERAGE - ALL LOCATIONS



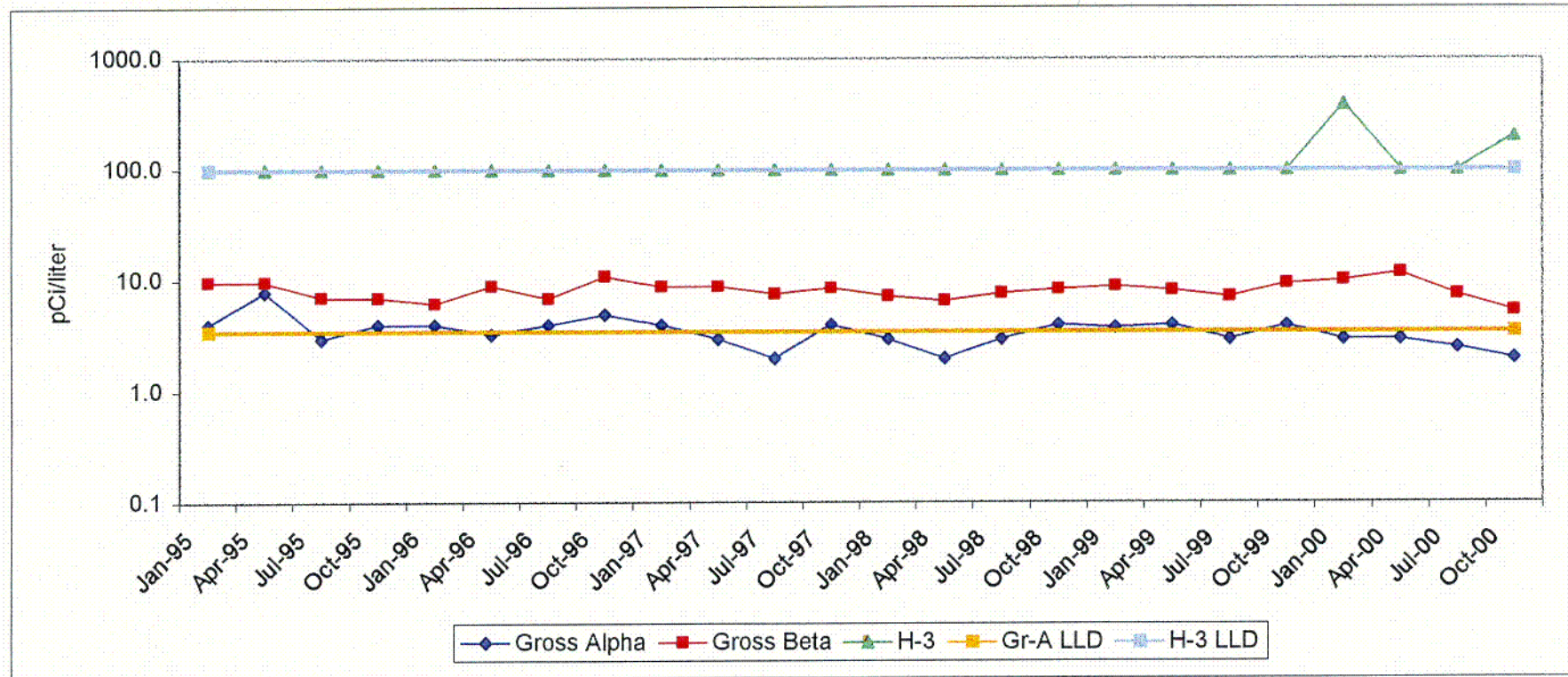
TRENDING GRAPH 6

STRONTIUM-89 AND 90 IN MILK - OTHER PRODUCERS
QUARTERLY AVERAGE - ALL LOCATIONS



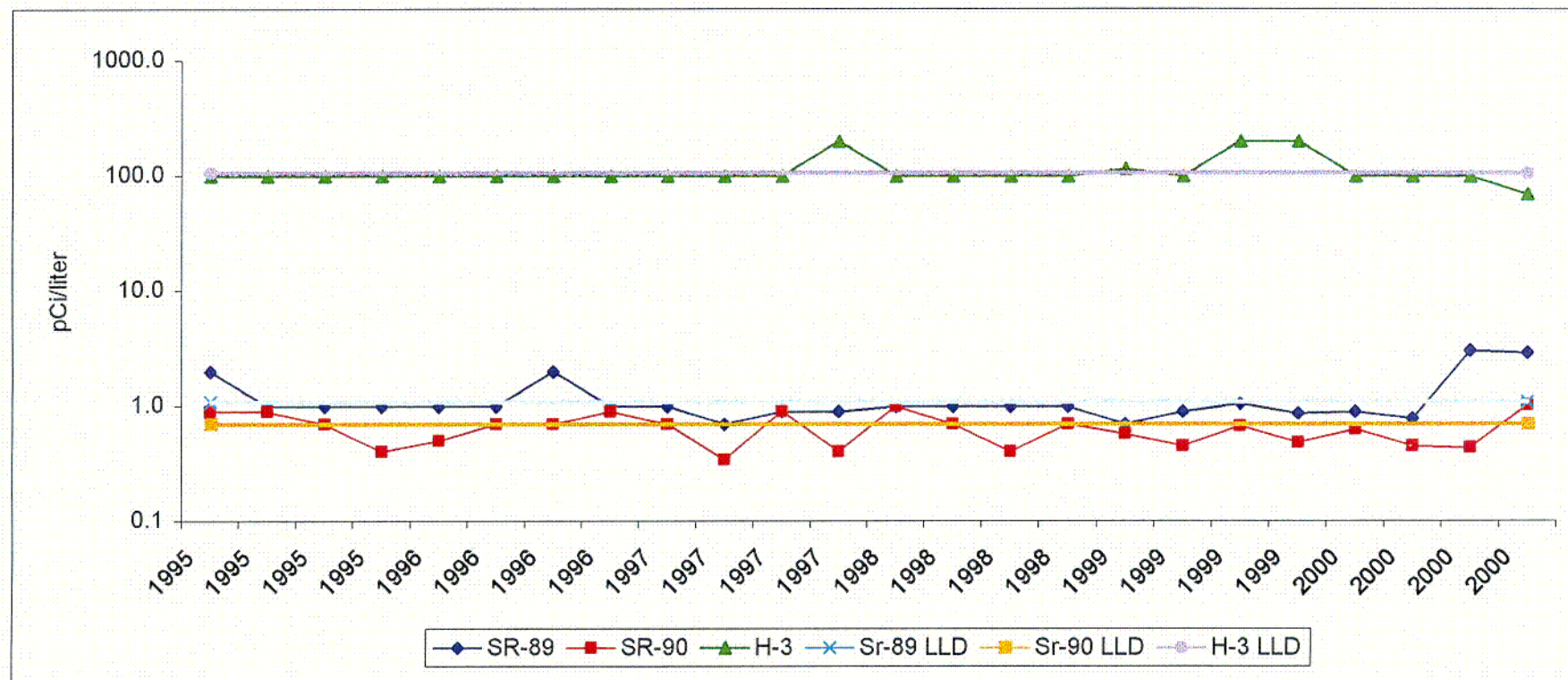
TRENDING GRAPH 7

GROSS ALPHA, BETA AND TRITIUM IN GROUND WATER QUARTERLY AVERAGE - ALL LOCATIONS



TRENDING GRAPH 8

STRONTIUM-89,90 AND TRITIUM IN RIVER WATER QUARTERLY AVERAGE - ALL LOCATIONS



(Suspended) was measured in seven of the twelve control samples with an average concentration of 0.83 pCi/liter and a range of 0.43 to 1.0 pCi/liter. Gross alpha (Suspended) was measured in eight of the twelve indicator samples with an average concentration of 2.03 pCi/liter and a range of 0.75 to 6.1 pCi/liter. All twelve of the control samples analyzed for gross beta (Dissolved) had measurable concentrations with an average of 7.99 pCi/liter and a range of 4.7 to 12 pCi/liter. All twelve indicator locations had an average concentration of 8.44 pCi/liter and a range of 5.7 to 9.4 pCi/liter. Gross beta (Suspended) was measured in ten of the twelve control samples with an average concentration of 2.83 pCi/liter and a range of 1.2 to 4.1 pCi/liter. Gross beta (Suspended) was measured in all ten indicator samples with an average concentration of 2.67 pCi/liter and a range of 1.7 to 3.9 pCi/liter. Tritium was not measured in 2000. Below are a comparison of the 1999 and 2000 results for gross alpha and gross beta. The average readings were similar to previous years but are within normal yearly fluctuations.

	1999 Average pCi/liter	2000 Average pCi/liter
Gross Alpha Dissolved	3.81	3.21
Gross Alpha Suspended	2.39	1.47
Gross Beta Dissolved	10.5	8.21
Gross Beta Suspended	6.67	2.75

The levels of activity continued to rise and fall within statistical limits depending on water levels and turbulence and were probably due to naturally occurring isotopes. Trending Graph 8 illustrates the level of activity for tritium, Sr-89 and Sr-90. Iodine-131 was detected in the radiochemical analysis, but it did not exceed NRC reporting levels.

H. Thermoluminescent Dosimeters

Thermoluminescent dosimeters (TLDs) determine environmental radiation doses and the results are presented in Table VII-8 and Trending Graph 9. Ambient radiation was monitored at 32 locations within a 10 mile radius of the Cooper Nuclear Station and collected quarterly. The quarterly averages for the indicator locations was 19.5 milliRoentgen/quarter and a range of 16.2 to 28.5 milliRoentgen/quarter. The control station 44, which is located 10.5 miles, 270 degrees had an average of 20.6 milliRoentgen/quarter and a range of 17.3 to 25.8 milliRoentgen/quarter. The highest station was Station 66 with an average of 21.9 milliRoentgen/quarter and a range of 19.8 to 26.4 milliRoentgen/quarter.

The gamma exposures monitored by thermoluminescent dosimeters from 1995 through 2000 are plotted. The data from year to year is in good agreement and indicates no adverse changes in radiation exposure to the population near the Cooper Nuclear Station.

I. Food – Broadleaf Vegetation

Seven food samples were collected from three locations. They were analyzed for iodine-131 by chemical separation and by gamma spectrometry. The results are presented in Table VII-9 and Trending Graph 10. Iodine-131 was not measured above the detection limits in the seven samples analyzed. As expected, naturally occurring potassium-40 was monitored in two of the two control samples with an average activity of 4.94 pCi/gm (wet weight) and a range of 4.09 to 5.78 pCi/gm (wet weight). Potassium-40 was detected in the five of the five indicator samples with an average concentration of 5.64 pCi/gm (wet weight) and a range of 4.67 to 6.96 pCi/kg (wet weight). Cosmogenic beryllium-7 was detected in one of the two control samples with a concentration of 0.25 pCi/kg (wet weight). The average at the indicator locations was 1.96 pCi/gm (wet weight) and a range of 0.246 to 2.88 pCi/gm (wet weight). All other gamma emitters were below the detection limits.

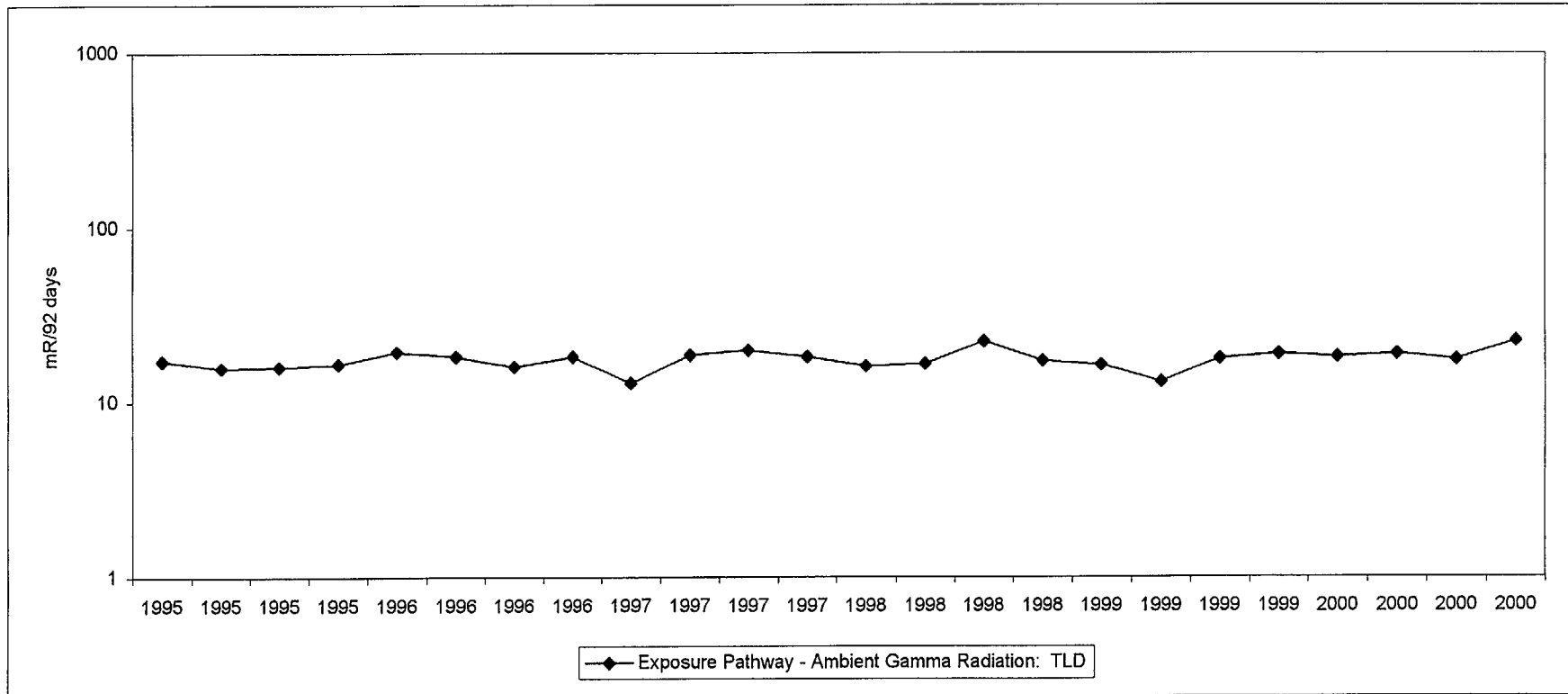
J. Shoreline Sediment

Sediment samples were collected during May and October from Station 28 and were analyzed by gamma spectrometry. The results are presented in Table VII-10 and Trending Graph 11. Two man-made and a number of naturally occurring radioisotopes were detected in these samples. Cesium-137 was detected in three of three samples with an average activity of 0.017 pCi/gm (dry weight) and a range of 0.015 to 0.021 pCi/gm (dry weight). As expected, naturally occurring potassium-40 was observed in the three samples with an average activity of 11.73 pCi/gm (dry weight) and a range from 10.1 to 13.9 pCi/gm (dry weight). Radium-226 was measured in two of the three samples with a concentration of 1.00 pCi/gm (dry weight) and a range of 0.51 to 1.49 pCi/gm (dry weight). Manganese-54 was measured in one of the three samples with a concentration of .016 pCi/gm (dry weight). Also, naturally occurring, thorium-232 was observed in the three samples with an average concentration of 0.69 pCi/gm (dry weight) and a range of 0.56 to 0.89 pCi/gm (dry weight). All other gamma emitters were below their detection limits.

The results of the analyses have been presented. Based on the evidence of the Radiological Environmental Monitoring Program, the Nebraska Public Power District, Cooper Nuclear Station is operating within regulatory limits.

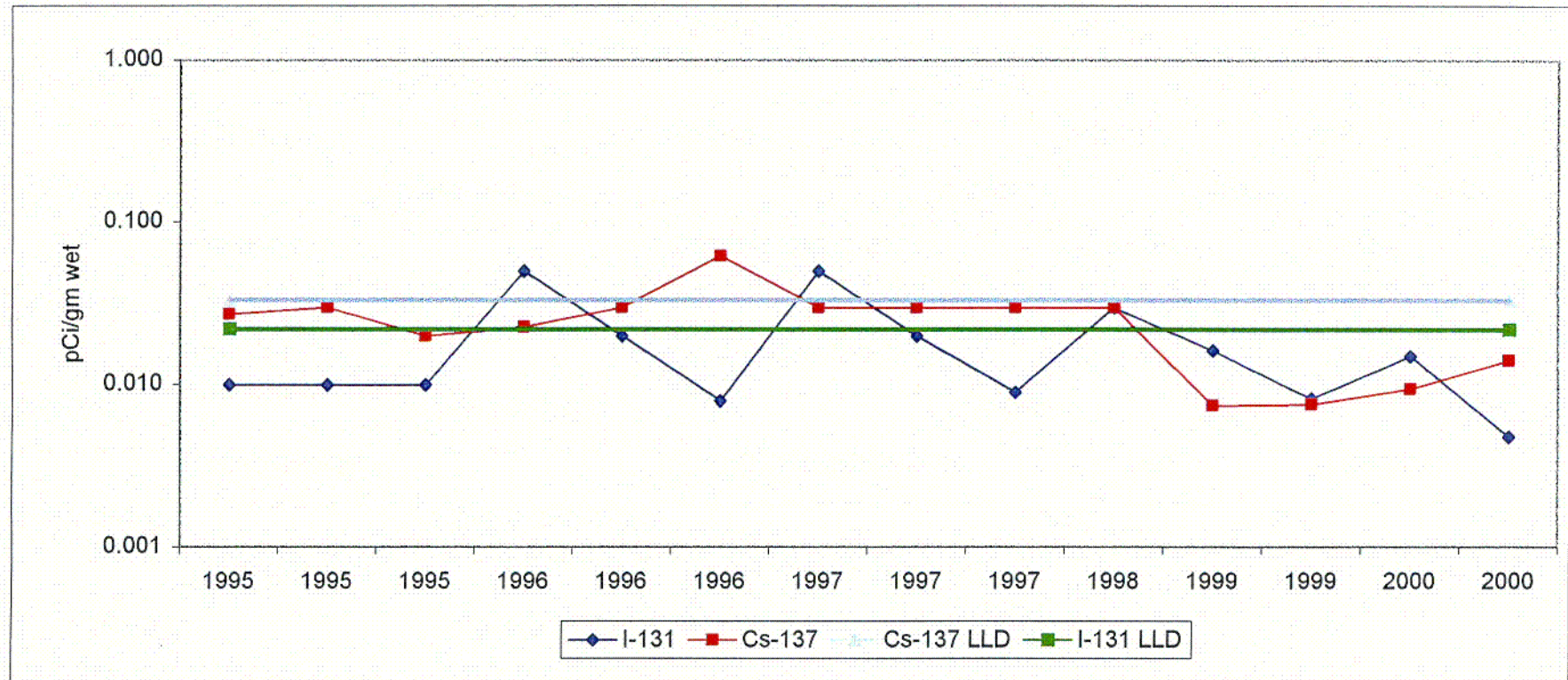
TRENDING GRAPH 9

AMBIENT RADIATION
THERMOLUMINESCENT DOSIMETRY
QUARTERLY AVERAGE - ALL LOCATIONS



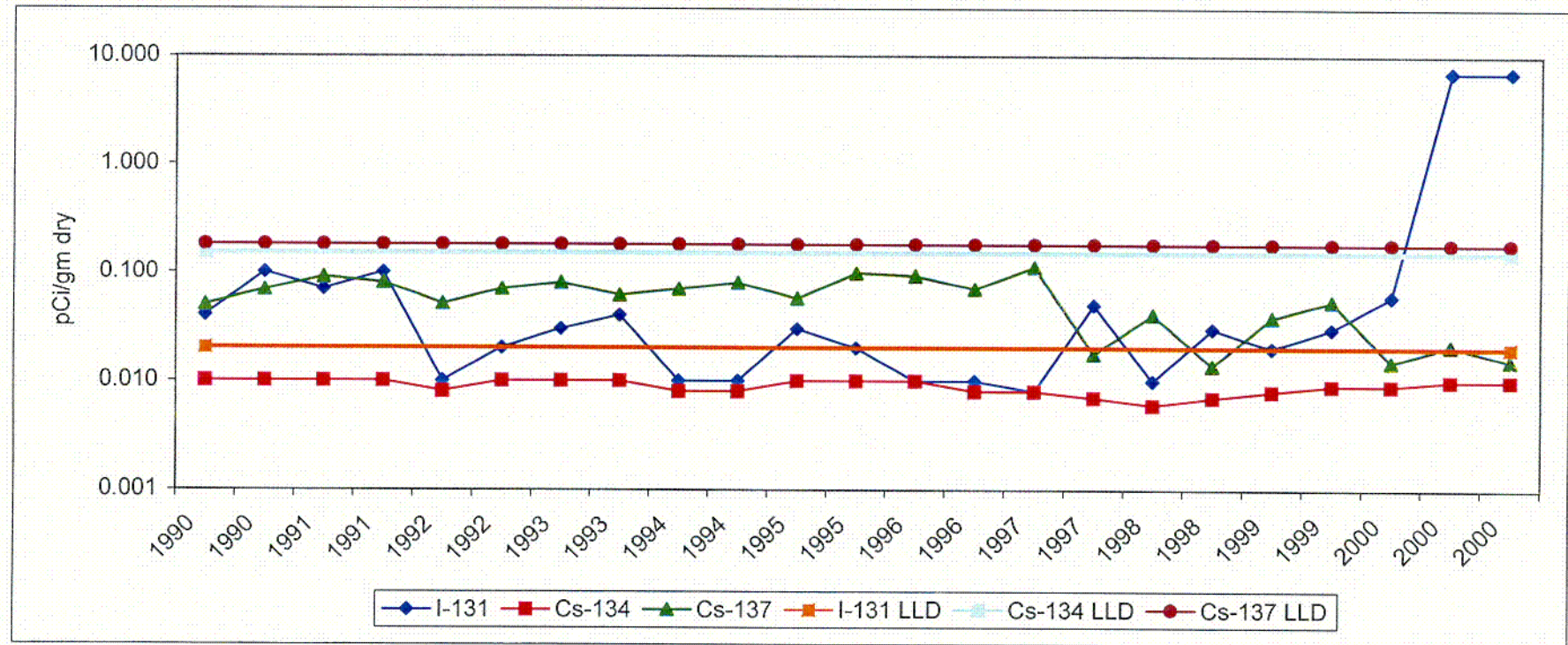
TRENDING GRAPH 10

IODINE-131 AND CESIUM-137 IN FOOD - BROADLEAF VEGETATION
ALL STATIONS



TRENDING GRAPH 11

IODINE-131, CESIUM-134, AND CESIUM-137 IN SHORELINE SEDIMENT STATION 28



V. CONCLUSIONS

V. CONCLUSIONS

The results of the 2000 Radiological Environmental Monitoring Program (REMP) for the Cooper Nuclear Station (CNS) of the Nebraska Public Power District (NPPD) have been presented. The report contains data tables, summaries, discussions of the data and trending graphs.

Naturally occurring radioactivity was observed in sample media in the expected activity ranges. Occasional samples of a few media showed the presence of man-made isotopes. They have been discussed individually in the text. Observed activities were at very low concentrations and had no significant dose consequence.

Section IV is a discussion of each type of sample analyzed and its impact, if any, on the environment. Included also are graphs of the isotopes of interest for the past several years.

Section VI presents the yearly summary of the program with the total number of samples of each type analyzed, the number of detection per total number of samples, the station with the highest average, the average of the control station, and the inclusive dates of the analyses. This is followed by a complete tabulation of the data by sample type and station number in Section VII.

The 2000 radiological environmental measurements for the Cooper Nuclear Station indicates that there has been no residual fallout resulting from the explosion and fire at Chernobyl Reactor in the Soviet Union which occurred on April 26, 1986. It may be concluded from all measurements taken that the operations of CNS had no detectable impact on the environment in the vicinity of the Cooper Nuclear Station.

SECTION VI.
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
SUMMARY

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
 Reporting Period January 1, 2000 to December 31, 2000

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Locations Mean () (2) Range 2	No. of Reportable Occurrences
				Name	(Mean () (2) Range (2)		
Air Iodine (pCi/m ³)	I-131	489	0.07	-(0/489)		-(0/0)	0
			-			-	
Airborne Particulates (pCi/m ³)	Gross Beta 500 (Weekly)	0.01	0.024 (496/500) (0.002-0.093)	Sta. 9 7.3 mi.	0.028 (51/51) (0.012-0.068)	-(0/0) -	0
	Gross Alpha500 (Weekly)		0.003 (433/500) (0.00-0.03)	Sta. 5 0.25 mi.	0.004 (45/45) (0.013-0.03)	-(0/0) -	0
	Gamma	40					
	Be-7	40	0.098 (38/40) (0.050-0.146)	Sta. 9 7.3 mi.	0.121 (4/4) (0.088-0.145)	-(0/0) -	0
	K-40	40	0.0047 (1/40)	Sta. 9 7.3 mi.	0.0047 (1/4)	-(0/0) -	0

(1) Nominal Lower Limit of detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility		Cooper Nuclear Station			Docket No. 50-298		
Location of Facility		Nemaha, Nebraska			Reporting Period		
		(County, State)			January 1, 2000 to December 31, 2000		
Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Locations Mean () (2) Range 2	No. of Reportable Occurrences
				Name Distance and Direction	(Mean () (2) Range (2)		
Fish (pCi/gm wet)	Gr-Beta 8		4.60 (5/5) (3.6-5.8)	Sta. 28 1.8 mi.	4.60 (5/5) (3.6-5.8)	4.10 (3/3) (2.2-5.8)	0
	Sr-89 8		-(0/3)(a) -			-(0/2)(a) -	0
	Sr-90 8		.02 (1/5) -			-(0/3) -	0
	Gamma 8						
	K-40 8		2.94 (5/5) (2.63-3.3)	Sta. 35 2.0 mi.	3.33 (3/3) (2.63-3.82)	3.33 (3/3) (2.63-3.82)	0
	Co-60 8	0.13	-(0/5) -			-(0/3) -	0
	Cs-137 8	0.15	-(0/5) -			-(0/3) -	0
Milk Nearest Producers (pCi/liter)	Sr-89 5		-(0/5) -			-(0/0) -	0
	Sr-90 5		1.10 (5/5) (0.64-1.6)	Sta. 61 3.5 mi.	1.10 (5/5) (0.64-1.6)	-(0/0) -	0
	Ca (gm/liter) 5		1.04 (5/5) (0.75-1.3)	Sta. 61 3.5 mi.	1.04 (5/5) (0.75-1.3)	-(0/0) -	0
	Gamma 19						
	K-40 19		1306 (19/19) (944-2150)	Sta. 61 3.5 mi.	1306 (19/19) (944-2150)	-(0/0) -	0

(1) Nominal Lower Limit of detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
 Reporting Period January 1, 2000 to December 31, 2000

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed		Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	<u>Location with Highest Annual Mean</u>		Control Locations Mean () (2) Range 2	No. of Reportable Occurrences
					Name	(Mean () (2) Range (2)		
					Distance and Direction			
Milk Other Producers (pCi/liter)	Sr-89	6		-(0/6) -			-(0/0) -	0
	Sr-90	8		1.24 (7/8) (0.73-1.6)	Sta. 99 10.5 mi.	1.26 (4/4) (0.73-1.6)	-(0/0) -	0
	Ca	8		1.51 (8/8) (0.64-2.2)	Sta. 100 11.5 mi.	1.55 (4/4) (0.91-2.2)	-(0/0) -	0
	Gamma	7						
	K-40	7		1317 (6/7) (1140-1510)	Sta. 100 11.5 mi.	1230 (3/3) (1140-1310)	-(0/0) -	0
Groundwater (pCi/liter)	Gr-Alpha	8		-(0/0) -			-(0/0) -	0
	Gr-Beta	8	4	9.39 (7/8) (6.7-14.0)	Sta. 47 25.8 mi.	10.57 (3/4) (6.7-14.0)	-(0/0) -	0
	H-3	8	2000	580 (1/4) -	Sta. 11 0.15 mi.	580 (1/4) -	-(0/0) -	0
	Gamma	8						
	K-40	8		80.4 (2/8) (79.8-81)	Sta. 11 0.15 mi.	81.0 (1/4) -	-(0/0) -	0

(1) Nominal Lower Limit of detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298

Reporting Period January 1, 2000 to December 31, 2000

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	<u>Location with Highest Annual Mean</u> Name Distance and Direction	(Mean () (2) Range (2)	Control Locations Mean () (2) Range 2	No. of Reportable Occurrences
River Water (pCi/liter)	Gross Alpha 24 (Dissolved)		3.53 (8/12) (1.8-5.2)	Sta. 28 0.5 mi.	3.53 (8/12) (1.8-5.2)	2.80 (6/12) (1.2-5.4)	0
	Gross Alpha 24 (Suspended)		2.03 (8/12) (0.75-6.1)	Sta. 28 0.5 mi.	3.06 (7/12) (0.75-6.1)	0.83 (7/12) (0.43-1.0)	0
	Gross Beta 24 (Dissolved)		8.44 (12/12) (5.7-9.4)	Sta. 28 0.5 mi.	8.44 (12/12) (5.7-9.4)	7.99 (12/12) (4.7-12)	0
	Gross Beta 24 (Suspended)		2.67 (10/12) (1.7-3.9)	Sta. 35 2.0 mi.	3.00 (6/8) (2.5-3.8)	2.83 (10/12) (1.2-4.1)	0
	I-131 24		0.30 (2/12) (0.27-0.33)	Sta. 12 0.1 mi.	0.4 (1/4)	0.4 (1/12)	0
	Gamma 24						
	K-40 24		-(0/12) -	Sta. 35 2.0 mi.	123 (3/8) (54-195)	123 (3/8) (54-195)	0
	H-3 8		-(0/4) -	Sta. 35 2.0 mi	130 (1/4)	130 (1/4)	0
	Sr-89 24		-(0/12) -			-(0/12) -	0
	Sr-90 24		-(0/12) -	Sta. 35 2.0 mi.	0.59 (1/8)	0.59 (1/12)	0

(1) Nominal Lower Limit of detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
 Reporting Period January 1, 2000 to December 31, 2000

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	Location with Highest Annual Mean		Control Locations Mean () (2) Range 2	No. of Reportable Occurrences
				Name	(Mean () (2) Range (2)		
Direct Radiation (mR Standard Month)	Gamma 123 Dose Quarterly		19.5 (119/119) (16.2-28.5)	Sta. 66 2.0 mi.	21.9 (4/4) (19.8-26.4)	20.6 (4/4) (17.3-25.8)	0 0
Broadleaf/ Vegetation (pCi/gm wet)	Gamma 7						
	Be-7 7		1.96 (5/5) (0.246-2.88)	Sta. 96 1.0 mi.	2.50 (2/2)	0.25 (1/2)	0
	K-40 7		5.64 (5/5) (4.67-6.96)	Sta. 96 1.0 mi.	5.77 (2/2) (5.26-6.28)	4.94 (2/2) (4.09-5.78)	0
	Cs-137 7		-(0/5) -			-(0/2) -	0
	I-131 7		-(0/5) -			-(0/2) -	0

(1) Nominal Lower Limit of detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY

Name of Facility Cooper Nuclear Station
 Location of Facility Nemaha, Nebraska
 (County, State)

Docket No. 50-298
 Reporting Period January 1, 2000 to December 31, 2000

Medium of Pathway Sampled (Unit of Measurement)	Type & Total No. of Analyses Performed	Lower Limit of Detection (1) (LLD)	All Indicator Locations Mean (2) Range (2)	<u>Location with Highest Annual Mean</u>		Control Locations Mean () (2) Range 2	No. of Reportable Occurrences
				Name	(Mean () (2) Range (2))		
Shoreline Sediment (pCi/gm dry)	Gamma	3					
	Be-7	3	-(0/3)			-(0/0)	0
			-			-	
	K-40	3	11.73 (3/3) (10.1-13.9)	Sta. 28 1.8 mi.	11.73 (3/3) (10.1-13.9)	-(0/0)	0
						-	
	Mn-54	3	0.016 (1/3)	Sta. 28 1.8 mi.	0.016 (1/3)	-(0/0)	0
						-	
	Cs-137	3	0.017 (3/3) (0.0149-0.0212)	Sta. 28 1.8 mi.	0.017 (3/3) (0.0149-0.0212)	-(0/0)	0
						-	
	Ce-141	3	2.74 (1/3)	Sta. 28 1.8 mi.	2.74 (1/3)	-(0/0)	0
						-	
	Ra-226	3	1.00 (2/3) (0.505-1.49)	Sta. 28 1.8 mi.	1.00 (2/3) (0.505-1.49)	-(0/0)	0
						-	
	Th-228	3	0.69 (3/3) (0.561-0.888)	Sta. 28 1.8 mi.	0.69 (3/3) (0.561-0.888)	-(0/0)	0
						-	

(1) Nominal Lower Limit of detection (LLD).

(2) Mean and Range based upon detectable measurements only. Fraction of detectable measurements at specified location indicated in brackets ().

SECTION VII.
COMPLETE DATA TABLES

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 01

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)
		VOLUME	UNITS				
12/28	01/04	9.62 E 03	CU. FT.	4.0 ± 0.4 E-02	2.3 ± 1.3 E-03	01/13	L.T. 3. E-02
01/04	01/11	9.89 E 03	CU. FT.	1.5 ± 0.3 E-02	L. T. 2. E-03	01/14	L.T. 2. E-02
01/11	01/18	1.03 E 04	CU. FT.	3.2 ± 0.4 E-02	L. T. 2. E-03	01/28	L.T. 2. E-02
01/18	01/26	1.13 E 04	CU. FT.	4.1 ± 0.4 E-02	4.3 ± 1.5 E-03	02/11	L.T. 1. E-02
01/26	02/01	7.20 E 03	CU. FT.	3.6 ± 0.4 E-02	4.0 ± 1.9 E-03	02/25	L.T. 2. E-02
02/01	02/08	1.00 E 04	CU. FT.	2.0 ± 0.3 E-02	2.3 ± 1.4 E-03	02/16	L.T. 1. E-02
02/08	02/15	9.64 E 03	CU. FT.	2.7 ± 0.3 E-02	3.3 ± 1.4 E-03	03/08	L.T. 2. E-02
02/15	02/22	1.01 E 04	CU. FT.	3.9 ± 0.4 E-02	5.1 ± 1.7 E-03	03/09	L.T. 1. E-02
02/22	02/29	9.73 E 03	CU. FT.	1.6 ± 0.3 E-02	L.T. 1. E-03	03/09	L.T. 1. E-02
02/29	03/07	1.04 E 04	CU. FT.	1.1 ± 0.2 E-02	1.4 ± 1.0 E-03	03/31	L.T. 2. E-02
03/07	03/14	1.01 E 04	CU. FT.	9.2 ± 2.2 E-03	1.7 ± 1.1 E-03	04/13	L.T. 1. E-02
03/14	03/21	1.00 E 04	CU. FT.	1.3 ± 0.2 E-02	1.7 ± 1.3 E-03	04/13	L.T. 1. E-02
03/21	03/28	1.02 E 04	CU. FT.	1.2 ± 0.2 E-02	2.9 ± 1.6 E-03	05/02	L.T. 2. E-02
03/28	04/04	9.99 E 03	CU. FT.	6.8 ± 2.1 E-03	L.T. 2. E-03	05/02	L.T. 1. E-02
04/04	04/11	1.00 E 04	CU. FT.	9.6 ± 2.2 E-03	3.3 ± 1.6 E-03	05/03	L.T. 2. E-02
04/11	04/18	9.77 E 03	CU. FT.	8.7 ± 2.2 E-03	1.9 ± 1.1 E-03	05/05	L.T. 2. E-02
04/18	04/25	9.78 E 03	CU. FT.	1.6 ± 0.3 E-02	2.6 ± 1.5 E-03	05/12	L.T. 1. E-02
04/25	05/02	9.77 E 03	CU. FT.	3.0 ± 0.3 E-02	5.6 ± 1.9 E-03	05/26	L.T. 2. E-02
05/02	05/09	1.03 E 04	CU. FT.	2.1 ± 0.3 E-02	4.3 ± 1.7 E-03	06/02	L.T. 2. E-02
05/09	05/16	9.52 E 03	CU. FT.	2.2 ± 0.3 E-02	3.9 ± 1.7 E-03	06/02	L.T. 2. E-02
05/16	05/23	9.79 E 03	CU. FT.	1.7 ± 0.3 E-02	3.2 ± 1.5 E-03	06/02	L.T. 1. E-02
05/23	05/30	9.91 E 03	CU. FT.	1.6 ± 0.3 E-02	2.6 ± 1.4 E-03	06/02	L.T. 2. E-02
05/30	06/06	9.48 E 03	CU. FT.	1.7 ± 0.3 E-02	2.2 ± 1.2 E-03	06/23	L.T. 2. E-02
06/06	06/13	9.29 E 03	CU. FT.	2.3 ± 0.3 E-02	2.9 ± 1.5 E-03	07/05	L.T. 2. E-02
06/13	06/20	1.02 E 04	CU. FT.	1.1 ± 0.2 E-02	1.9 ± 1.1 E-03	07/05	L.T. 2. E-02
06/20	06/27	9.89 E 03	CU. FT.	2.1 ± 0.3 E-02	2.0 ± 1.3 E-03	07/21	L.T. 3. E-02

- (a) Sample not analyzed due to delay in counting.
(b) Sample not collected.
(c) Unable to determine volume.
(d) Pump failure. Sample invalid.
(e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 01

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)
		VOLUME	UNITS				
06/27	07/05	1.16	E 04	CU. FT	2.4 ± 0.3 E-02	2.8 ± 1.2 E-03	07/25 L.T. 1. E-02
07/05	07/11	8.57	E 03	CU. FT	2.3 ± 0.3 E-02	2.6 ± 1.4 E-03	07/26 L.T. 2. E-02
07/11	07/18	1.06	E 04	CU. FT	2.3 ± 0.3 E-02	2.3 ± 1.4 E-03	08/15 L.T. 2. E-02
07/18	07/25	9.56	E 03	CU. FT	2.3 ± 0.3 E-02	1.6 ± 1.3 E-03	08/01 L.T. 1. E-02
07/25	08/01	9.16	E 03	CU. FT	3.0 ± 0.4 E-02	2.3 ± 1.6 E-03	08/16 L.T. 3. E-02
08/01	08/08	7.97	E 03	CU. FT	4.1 ± 0.4 E-02	2.7 ± 1.8 E-03	08/15 L.T. 3. E-02
08/08	08/15	9.75	E 03	CU. FT	3.4 ± 0.4 E-02	2.3 ± 1.3 E-03	08/24 L.T. 3. E-02
08/15	08/22	9.79	E 03	CU. FT	3.1 ± 0.3 E-02	1.7 ± 1.3 E-03	08/29 L.T. 2. E-02
08/22	08/29	8.93	E 03	CU. FT	3.8 ± 0.4 E-02	2.5 ± 1.6 E-03	09/12 L.T. 4. E-02
08/29	09/05	9.20	E 03	CU. FT	3.2 ± 0.4 E-02	4.0 ± 2.0 E-03	09/16 L.T. 3. E-02
09/05	09/12	9.67	E 03	CU. FT	2.8 ± 0.3 E-02	2.3 ± 1.7 E-03	09/16 L.T. 4. E-02
09/12	09/19	1.00	E 04	CU. FT	2.9 ± 0.3 E-02	1.6 ± 1.2 E-03	09/28 L.T. 3. E-02
09/19	09/26	1.01	E 04	CU. FT	1.3 ± 0.2 E-02	L.T. 2. E-03	10/11 L.T. 3. E-02
09/26	10/03	1.02	E 04	CU. FT	2.9 ± 0.3 E-02	5.7 ± 2.0 E-03	10/06 L.T. 2. E-02
10/03	10/10	1.04	E 04	CU. FT	(e)	(e)	10/16 L.T. 2 E-02
10/10	10/16	8.23	E 03	CU. FT	3.0 ± 0.4 E-02	1.1 ± 0.3 E-02	12/08 L.T. 5. E-02
10/16	10/24	1.11	E 04	CU. FT.	4.3 ± 0.4 E-02	4.6 ± 1.7 E-03	11/17 L.T. 2. E-02
10/24	10/31	9.90	E 03	CU. FT	3.2 ± 0.4 E-02	3.7 ± 1.7 E-03	11/15 (a)
10/31	11/07	1.02	E 04	CU. FT	2.0 ± 0.3 E-02	6.5 ± 2.2 E-03	01/17 L.T. 2. E-02
11/07	11/13	8.86	E 03	CU. FT	1.7 ± 0.3 E-02	8.6 ± 2.3 E-03	03/09 L.T. 1. E-02
11/13	11/21	1.12	E 04	CU. FT	2.2 ± 0.3 E-02	2.9 ± 0.3 E-03	12/13 L.T. 2. E-02
11/21	11/28	1.01	E 04	CU. FT	4.6 ± 0.4 E-02	5.5 ± 2.0 E-03	12/08 L.T. 8. E-03
11/28	12/05	1.01	E 04	CU. FT	1.4 ± 0.4 E-02	3.1 ± 1.4 E-03	01/12 L.T. 1. E-02
12/05	12/12	1.01	E 04	CU. FT	2.1 ± 0.3 E-02	2.5 ± 1.2 E-03	12/22 L.T. 2. E-02
12/12	12/19	9.93	E 03	CU. FT	2.5 ± 0.3 E-02	8.8 ± 2.2 E-03	03/15 L.T. 3. E-02
12/19	12/26	1.01	E 04	CU. FT	2.4 ± 0.3 E-02	2.5 ± 1.4 E-03	01/19 L.T. 3. E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

STATION NUMBER 02												
COLL. START DATE	TIME STOP DATE	SAMPLE			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)		
		VOLUME		UNITS								
12/28	01/04	1.01	E 04	CU. FT.	3.8 ± 0.4	E-02	1.3 ± 1.0	E-03	01/13	L.T.	2.	E-02
01/04	01/11	9.89	E 03	CU. FT.	1.5 ± 0.3	E-02	1.9 ± 1.5	E-03	01/14	L.T.	2.	E-02
01/11	01/18	1.03	E 04	CU. FT.	2.1 ± 0.3	E-02	L.T. 2.	E-03	01/28	L.T.	2.	E-02
01/18	01/26	1.13	E 04	CU. FT.	2.7 ± 0.3	E-02	2.6 ± 1.3	E-03	02/11	L.T.	1.	E-02
01/26	02/01	8.83	E 04	CU. FT.	2.1± 0.3	E-02	2.1 ± 1.3	E-03	02/25	L.T.	2.	E-01
02/01	02/08	1.00	E 04	CU. FT.	3.3 ± 0.3	E-02	3.8 ± 1.7	E-03	02/16	L.T.	1.	E-02
02/08	02/15	7.21	E 03	CU. FT.	4.4 ± 0.5	E-02	5.6 ± 2.1	E-03	03/08	L.T.	2.	E-02
02/15	02/22	1.01	E 04	CU. FT.	3.7 ± 0.4	E-02	3.6 ± 1.5.	E-03	03/09	L.T.	1.	E-02
02/22	02/29	9.73	E 04	CU. FT.	1.4 ± 0.3	E-02	2.3 ± 1.4	E-03	03/09	L.T.	1.	E-02
02/29	03/07	1.02	E 04	CU. FT.	2.0 ± 0.3	E-02	2.2 ± 1.2	E-03	03/31	L.T.	2.	E-02
03/07	03/14	9.84	E 03	CU. FT.	2.1 ± 0.3	E-02	4.8 ± 1.7	E-03	04/13	L.T.	1.	E-02
03/14	03/21	1.00	E 04	CU. FT.	1.2 ± 0.2	E-02	2.3 ± 1.4	E-03	04/13	L.T.	1.	E-02
03/21	03/28	9.96	E 03	CU. FT.	1.8 ± 0.3	E-02	3.3 ± 1.7	E-03	05/02	L.T.	2.	E-02
03/28	04/04	9.62	E 03	CU. FT.	1.9 ± 0.3	E-02	2.1 ± 1.5	E-03	05/02	L.T.	1.	E-02
04/04	04/11	1.00	E 04	CU. FT.	1.9 ± 0.3	E-02	2.8 ± 1.6	E-03	05/03	L.T.	2.	E-02
04/11	04/18	9.78	E 03	CU. FT.	1.1 ± 0.2	E-02	1.7 ± 1.1	E-03	05/05	L.T.	2.	E-02
04/18	04/25	9.55	E 03	CU. FT.	2.6 ± 0.3	E-02	4.2 ± 1.8	E-03	05/12	L.T.	2.	E-02
04/25	05/02	9.89	E 03	CU. FT.	3.1 ± 0.3	E-02	3.4 ± 1.5.	E-03	05/26	L.T.	2.	E-02
05/02	05/09	1.03	E 04	CU. FT.	1.4 ± 0.2	E-02	2.8 ± 1.4	E-03	06/02	L.T.	2.	E-02
05/09	05/16	9.78	E 03	CU. FT.	2.0 ± 0.3	E-02	2.6 ± 1.4	E-03	06/02	L.T.	2.	E-02
05/16	05/23	9.85	E 03	CU. FT.	2.0 ± 0.3	E-02	3.0 ± 1.5	E-03	06/02	L.T.	1.	E-02
05/23	05/30	9.78	E 03	CU. FT.	2.2 ± 0.3	E-02	2.9 ± 1.5	E-03	06/02	L.T.	2.	E-02
05/30	06/06	9.81	E 03	CU. FT.	1.3 ± 0.2	E-02	2.4 ± 1.3	E-03	06/23	L.T.	2.	E-02
06/06	06/13	9.78	E 03	CU. FT.	1.9 ± 0.3	E-02	3.0 ± 1.5.	E-03	07/05	L.T.	1.	E-02
06/13	06/20	1.02	E 04	CU. FT.	1.2 ± 0.2	E-02	2.4 ± 1.2	E-03	07/05	L.T.	2.	E-02
06/20	06/27	9.88	E 03	CU. FT.	1.9 ± 0.3	E-02	4.4 ± 1.7	E-03	07/21	L.T.	3.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 02

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME UNITS		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)
06/27	07/05	1.17	E 04	CU. FT.	2.1 ± 0.3 E-02	3.5 ± 1.3 E-03	07/25 L.T. 1. E-02
07/05	07/11	8.57	E 03	CU. FT.	2.7 ± 0.3 E-02	2.0 ± 1.3 E-03	07/26 L.T. 2. E-02
07/11	07/18	1.03	E 04	CU. FT.	2.8 ± 0.3 E-02	3.2 ± 1.6 E-03	08/15 L.T. 2. E-02
07/18	07/25	9.77	E 03	CU. FT.	2.0 ± 0.3 E-02	2.9 ± 1.5 E-03	08/01 L.T. 1. E-02
07/25	08/01	7.64	E 03	CU. FT.	3.5 ± 0.4 E-02	L.T. 2. E-03	08/16 L.T. 3. E-02
08/01	08/08	9.40	E 03	CU. FT.	3.7 ± 0.4 E-02	3.2 ± 1.7 E-03	08/15 L.T. 2. E-02
08/08	08/15	9.78	E 03	CU. FT.	3.5 ± 0.4 E-02	2.1 ± 1.3 E-03	08/24 L.T. 3. E-02
08/15	08/22	1.00	E 04	CU. FT.	1.9 ± 0.3 E-02	L.T. 1. E-03	08/29 L.T. 2. E-02
08/22	08/29	1.01	E 04	CU. FT.	3.0 ± 0.3 E-02	3.4 ± 1.6 E-03	09/12 L.T. 4. E-02
08/29	09/05	9.94	E 03	CU. FT.	2.8 ± 0.3 E-02	2.0 ± 1.6 E-03	09/16 L.T. 3. E-02
09/05	09/12	1.00	E 04	CU. FT.	2.5 ± 0.3 E-02	3.5 ± 1.9 E-03	09/16 L.T. 3. E-02
09/12	09/19	1.00	E 04	CU. FT.	2.1 ± 0.3 E-02	1.7 ± 1.3 E-03	09/28 L.T. 3. E-02
09/19	09/26	1.01	E 04	CU. FT.	1.1 ± 0.2 E-02	L.T. 2. E-03	10/11 L.T. 3. E-02
09/26	10/03	1.02	E 04	CU. FT.	3.7 ± 0.4 E-02	7.5 ± 2.2 E-03	10/06 L.T. 2. E-02
10/03	10/10	1.01	E 04	CU. FT.	(e)	(e)	10/16 L.T. 2 E-02
10/10	10/16	8.20	E 03	CU. FT.	4.1 ± 0.4 E-02	1.3 ± 0.3 E-02	12/08 L.T. 5. E-02
10/16	10/24	1.19	E 04	CU. FT.	3.3 ± 0.3 E-02	5.4 ± 1.7 E-03	11/17 L.T. 2. E-01
10/24	10/31	9.91	E 03	CU. FT.	2.7 ± 0.4 E-02	1.4 ± 1.2 E-03	11/15 (a)
10/31	11/07	1.02	E 04	CU. FT.	2.2 ± 0.3 E-02	6.5 ± 2.2 E-03	01/17 L.T. 2. E-02
11/07	11/13	8.84	E 03	CU. FT.	2.4 ± 0.3 E-02	1.0 ± 0.3 E-02	03/09 L.T. 1. E-02
11/13	11/21	1.12	E 04	CU. FT.	2.0 ± 0.3 E-02	1.4 ± 1.0 E-03	12/13 L.T. 1. E-02
11/21	11/28	1.01	E 04	CU. FT.	5.4 ± 0.4 E-02	4.8 ± 1.9 E-03	12/08 L.T. 1. E-02
11/28	12/05	1.01	E 04	CU. FT.	1.9 ± 0.3 E-02	4.1 ± 1.6 E-03	01/12 L.T. 1. E-02
12/05	12/12	1.02	E 04	CU. FT.	2.0 ± 0.3 E-02	1.5 ± 1.0 E-03	12/22 L.T. 2 E-02
12/12	12/19	1.03	E 04	CU. FT.	1.7 ± 0.3 E-02	6.6 ± 1.9 E-03	03/15 L.T. 2. E-02
12/19	12/26	9.93	E 03	CU. FT.	3.4 ± 0.4 E-02	4.1 ± 1.6 E-03	01/19 L.T. 3. E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03												
COLL. START DATE	TIME STOP DATE	SAMPLE			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE		CHARCOAL FILTER I-131 (PCI/CU. M.)	
DATE	DATE	VOLUME	UNITS						DATE			
12/28	01/04	1.01	E 04	CU. FT.	2.4 ± 0.3	E-02	L.T. 1.	E-03	01/13	L.T. 2.	E-02	
01/04	01/11	9.99	E 03	CU. FT.	1.2 ± 0.2	E-02	L.T. 2.	E-03	01/14	L.T. 2.	E-02	
01/11	01/18	1.02	E 04	CU. FT.	1.5 ± 0.3	E-02	L.T. 2.	E-03	01/28	L.T. 2.	E-02	
01/18	01/26	1.15	E 04	CU. FT.	1.7 ± 0.2	E-02	1.8 ± 1.1	E-03	02/11	L.T. 1.	E-02	
01/26	02/01	8.69	E 03	CU. FT.	2.4 ± 0.3	E-02	3.5 ± 1.6	E-03	02/25	L.T. 2.	E-02	
02/01	02/08	9.91	E 03	CU. FT.	2.6 ± 0.3	E-02	3.2 ± 1.6	E-03	02/16	L.T. 1.	E-02	
02/08	02/15	1.02	E 04	CU. FT.	8.3 ± 2.1	E-03	9.0 ± 8.5	E-04	03/08	L.T. 1.	E-02	
02/15	02/22	1.01	E 04	CU. FT.	1.5 ± 0.3	E-02	1.4 ± 1.0	E-03	03/09.	L.T. 1.	E-02	
02/22	02/29	9.77	E 03	CU. FT.	1.0 ± 0.2	E-02	L.T. 1.	E-03	03/09	L.T. 1.	E-02	
02/29	03/07	1.04	E 04	CU. FT.	1.6 ± 0.3	E-02	2.6 ± 1.3	E-03	03/31	L.T. 2.	E-02	
03/07	03/14	1.02	E 04	CU. FT.	L.T. 2.	E-03	L.T. 8.	E-04	04/17	L.T. 1.	E-02	
03/14	03/21	1.00	E 04	CU. FT.	8.7 ± 2.2	E-03	2.3 ± 1.4	E-03	04/13	L.T. 1.	E-02	
03/21	03/28	1.01	E 04	CU. FT.	L.T. 2.	E-03	L.T. 2.	E-03	05/02	L.T. 2.	E-02	
03/28	04/04	1.02	E 04	CU. FT.	L.T. 2.	E-03	L.T. 2	E-03	05/02	L.T. 1.	E-02	
04/04	04/11	9.95	E 03	CU. FT.	4.2 ± 1.8	E-03	L.T. 1.	E-03	05/03	L.T. 2.	E-02	
04/11	04/18	9.89	E 03	CU. FT.	9.9 ± 2.2	E-03	2.8 ± 1.3	E-03	05/05	L.T. 2.	E-02	
04/18	04/25	9.85	E 03	CU. FT.	6.9 ± 2.0	E-03	L.T. 2.	E-03	05/12	L.T. 1.	E-02	
04/25	05/02	1.03	E 04	CU. FT.	1.4 ± 0.2	E-02	2.6 ± 1.3	E-03	05/26	L.T. 2.	E-02	
05/02	05/09	1.01	E 04	CU. FT.	8.1 ± 2.1	E-03	4.5 ± 1.7	E-03	06/02	L.T. 2.	E-02	
05/09	05/16	9.86	E 03	CU. FT.	1.7 ± 0.3	E-02	3.3 ± 1.6	E-03	06/02	L.T. 2.	E-02	
05/16	05/23	1.00	E 04	CU. FT.	1.8 ± 0.3	E-02	4.7 ± 1.8	E-03	06/02	L.T. 1.	E-02	
05/23	05/30	1.01	E 02	CU. FT.	1.3 ± 0.2	E-02	L.T. 1.	E-03	06/02	L.T. 2.	E-02	
05/30	06/06	1.02	E 04	CU. FT.	1.6 ± 0.3	E-02	2.2 ± 1.2	E-03	06/23	L.T. 2.	E-02	
06/06	06/13	9.88	E 03	CU. FT.	6.7 ± 2.0	E-03	2.0 ± 1.3	E-03	07/05	L.T. 1.	E-02	
06/13	06/20	1.02	E 04	CU. FT.	6.3 ± 2.1	E-03	1.0 ± 0.9	E-03	07/25	L.T. 2.	E-02	
06/20	06/27	9.79	E 03	CU. FT.	6.3 ± 2.1	E-03	1.3 ± 1.1	E-03	07/21	L.T. 3.	E-02	

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 03

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME UNITS		AP FILTER		AP FILTER		MID-COUNT DATE	CHARCOAL FILTER			
				GROSS BETA (PCI/CU.M.)		GROSS ALPHA (PCI/CU.M.)			I-131 (PCI/CU. M.)			
06/27	07/05	1.17	E 04	CU. FT	1.1 ± 0.2	E-02	2.2 ± 1.1	E-03	07/25	L.T.	1.	E-02
07/05	07/11	8.75	E 03	CU. FT.	1.7 ± 0.3	E-02	1.5 ± 1.1	E-03	07/26	L.T.	2.	E-02
07/11	07/18	1.02	E 04	CU. FT.	3.6 ± 1.8	E-03	L.T. 1.	E-03	08/15	L.T.	2.	E-02
07/18	07/25	(b)		CU. FT.	(b)		(b)			(b)		
07/25	08/01	2.01	E 04	CU. FT.	6.7 ± 1.3	E-03	L.T. 8.	E-04	08/16	L.T.	1	E-02
08/01	08/08	9.95	E 03	CU. FT.	2.1 ± 0.3	E-02	L.T. 1.	E-03	08/15	L.T.	2.	E-02
08/08	08/15	8.80	E 03	CU. FT.	1.3 ± 0.3	E-02	1.9 ± 1.3	E-03	08/24	L.T.	3.	E-02
08/15	08/22	9.85	E 03	CU. FT.	2.6 ± 0.3	E-02	L.T. 1.	E-03	08/29	L.T.	2.	E-02
08/22	08/29	9.48	E 03	CU. FT.	3.1 ± 0.3	E-02	2.7 ± 1.6	E-03	09/12	L.T.	4.	E-02
08/29	09/05	9.93	E 03	CU. FT.	3.6 ± 0.4	E-02	L.T. 2.	E-03	09/16	L.T.	3.	E-02
09/05	09/12	9.94	E 03	CU. FT.	1.8 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	4.	E-02
09/12	09/19	9.92	E 03	CU. FT.	3.1 ± 0.3	E-02	2.1 ± 1.4.	E-03	09/28	L.T.	3.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.3 ± 0.2	E-02	L.T. 2.	E-03	10/11	L.T.	3.	E-02
09/26	10/03	1.04	E 04	CU. FT	3.2 ± 0.3	E-02	4.8 ± 1.8	E-03	10/06	L.T.	2.	E-02
10/03	10/10	10.0	E 04	CU. FT.	(e)		(e)		10/16	L.T.	2.	E-02
10/10	10/16	8.22	E 03	CU. FT.	2.7 ± 0.4	E-02	8.9 ± 2.8.	E-03	12/08	L.T.	5.	E-02
10/16	10/24	1.11	E 04	CU. FT.	5.0 ± 0.4	E-02	6.7 ± 1.9	E-03	11/17	L.T.	2	E-02
10/24	10/31	9.50	E 03	CU. FT.	2.2 ± 0.4	E-02	1.8 ± 1.3	E-03	11/15	(a)		
10/31	11/07	9.88	E 03	CU. FT.	1.7 ± 0.3	E-02	6.7 ± 2.2	E-03	01/17	L.T.	2.	E-02
11/07	11/13	8.82	E 03	CU. FT.	2.1 ± 0.3	E-02	8.6 ± 2.3	E-03	03/09	L.T.	1.	E-02
11/13	11/21	1.12	E 04	CU. FT.	4.4 ± 0.4	E-02	5.3 ± 1.7	E-03	12/13	L.T.	2.	E-02
11/21	11/28	9.16	E 03	CU. FT.	9.3 ± 0.6	E-02	8.3 ± 2.5	E-03	12/08	L.T.	2.	E-02
11/28	12/05	1.01	E 04	CU. FT.	2.8 ± 0.3	E-02	4.9 ± 1.7	E-03	01/12	L.T.	1.	E-02
12/05	12/12	1.02	E 04	CU. FT.	3.7 ± 0.3	E-02	2.2 ± 1.6	E-03	12/22	L.T.	2.	E-02
12/12	12/19	1.03	E 04	CU. FT.	4.8 ± 0.4	E-02	1.8 ± 0.3	E-02	03/15	L.T.	2.	E-02
12/19	12/26	9.93	E 03	CU. FT.	6.0 ± 0.5	E-02	7.6 ± 2.1	E-03	01/19	LT	3.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 04											
COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE		CHARCOAL FILTER I-131 (PCI/CU. M.)	
VOLUME	UNITS										
12/28	01/04	1.01	E 04	CU. FT.	1.9 ± 0.3	E-02	L.T. 1. E-03	01/13		L.T. 2.	E-02
01/04	01/11	1.00	E 04	CU. FT.	1.7 ± 0.3	E-02	L.T. 2. E-03	01/14		L.T. 2.	E-02
01/11	01/18	1.03	E 04	CU. FT.	1.9 ± 0.3	E-02	L.T. 2. E-03	01/28		L.T. 2.	E-02
01/18	01/26	1.14	E 04	CU. FT.	2.3 ± 0.3	E-02	2.2 ± 1.2 E-03	02/11		L.T. 1.	E-02
01/26	02/01	8.69	E 03	CU. FT.	2.5 ± 0.3	E-02	4.4 ± 1.7 E-03	02/25		L.T. 2.	E-02
02/01	02/08	9.91	E 03	CU. FT.	1.9 ± 0.3	E-02	3.2 ± 1.6 E-03	02/16		L.T. 1.	E-02
02/08	02/15	5.74	E 03	CU. FT.	1.7 ± 0.4	E-02	3.2 ± 1.9 E-03	03/08		L.T. 3.	E-02
02/15	02/22	1.01	E 04	CU. FT.	3.3 ± 0.3	E-02	3.6 ± 1.5 E-03	03/09		L.T. 1.	E-02
02/22	02/29	9.76	E 03	CU. FT.	1.6 ± 0.3	E-02	2.5 ± 1.5 E-03	03/09		L.T. 1.	E-02
02/29	03/07	1.04	E 04	CU. FT.	1.5 ± 0.2	E-02	2.5 ± 1.2 E-03	03/31		L.T. 2.	E-02
03/07	03/14	1.02	E 04	CU. FT.	1.6 ± 0.3	E-02	3.5 ± 1.4 E-03	04/13		L.T. 1.	E-02
03/14	03/21	1.01	E 04	CU. FT.	1.1 ± 0.2	E-02	1.8 ± 1.3 E-03	04/13		L.T. 1.	E-02
03/21	03/28	1.02	E 04	CU. FT.	1.4 ± 0.3	E-02	2.8 ± 1.6 E-03	05/02		L.T. 2.	E-02
03/28	04/04	1.00	E 04	CU. FT.	1.2 ± 0.2	E-02	2.0 ± 1.4 E-03	05/02		L.T. 1.	E-02
04/04	04/11	1.00	E 04	CU. FT.	4.9 ± 1.9	E-03	L.T. 1. E-03	05/03		L.T. 2.	E-02
04/11	04/18	9.19	E 03	CU. FT.	1.5 ± 0.3	E-02	2.2 ± 1.2 E-03	05/05		L.T. 2.	E-02
04/18	04/25	9.91	E 03	CU. FT.	9.4 ± 2.2	E-03	2.7 ± 1.5 E-03	05/12		L.T. 1.	E-02
04/25	05/02	1.02	E 04	CU. FT.	2.3 ± 0.3	E-02	2.9 ± 1.4 E-03	05/26		L.T. 2.	E-02
05/02	05/09	1.02	E 04	CU. FT.	1.8 ± 0.3	E-02	3.1 ± 1.5 E-03	06/02		L.T. 2.	E-02
05/09	05/16	9.84	E 03	CU. FT.	1.7 ± 0.3	E-02	3.0 ± 1.5 E-03	06/02		L.T. 2.	E-02
05/16	05/23	9.90	E 03	CU. FT.	2.0 ± .03	E-02	3.2 ± 1.5 E-03	06/02		L.T. 1.	E-02
05/23	05/30	1.01	E 04	CU. FT.	1.7 ± 0.3	E-02	3.2 ± 1.5 E-03	06/02		L.T. 2.	E-02
05/30	06/06	1.02	E 04	CU. FT.	1.7 ± 0.3	E-02	1.8 ± 1.1 E-03	06/23		L.T. 2.	E-02
06/06	06/13	9.90	E 03	CU. FT.	2.1 ± 0.3	E-02	2.4 ± 1.4 E-03	07/05		L.T. 1.	E-02
06/13	06/20	1.02	E 04	CU. FT.	1.1 ± 0.2	E-02	1.2 ± 0.9 E-03	07/05		L.T. 2.	E-02
06/20	06/27	9.86	E 03	CU. FT.	2.0 ± 0.3	E-02	2.4 ± 0.3 E-03	07/21		L.T. 3.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 04

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME UNITS			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)		
06/27	07/05	1.17	E 04	CU. FT.	2.2 ± 0.3	E-02	3.2 ± 1.3	E-03	07/25	L.T.	1.	E-02
07/05	07/11	8.90	E 03	CU. FT.	3.1 ± 0.4	E-02	3.8 ± 1.6	E-03	07/26	L.T.	2.	E-02
07/11	07/18	1.02	E 04	CU. FT.	1.6 ± 0.3	E-02	1.5 ± 1.3	E-03	08/15	L.T.	2.	E-02
07/18	07/25	9.66	E 03	CU. FT.	1.8 ± 0.3	E-02	2.6 ± 1.5	E-03	08/01	L.T.	1.	E-02
07/25	08/01	7.62	E 03	CU. FT.	3.3 ± 0.4	E-02	3.6 ± 2.0	E-03	08/16	L.T.	3.	E-02
08/01	08/08	9.78	E 03	CU. FT.	3.9 ± 0.4	E-02	4.8 ± 1.9	E-03	08/15	L.T.	2.	E-02
08/08	08/15	9.94	E 03	CU. FT.	3.7 ± 0.4	E-02	1.8 ± 1.2	E-03	08/24	L.T.	3.	E-02
08/15	08/22	1.00	E 04	CU. FT.	2.2 ± 0.3	E-02	L.T.	1.	08/29	L.T.	2.	E-02
08/22	08/29	9.51	E 03	CU. FT.	4.2 ± 0.4	E-02	4.0 ± 1.8	E-03	09/12	L.T.	4.	E-02
08/29	09/05	9.90	E 03	CU. FT.	4.1 ± 0.4	E-02	2.6 ± 1.7	E-03	09/16	L.T.	3.	E-02
09/05	09/12	9.96	E 03	CU. FT.	2.7 ± 0.3	E-02	L.T.	2.	09/16	L.T.	4.	E-02
09/12	09/19	1.00	E 04	CU. FT.	2.8 ± 0.3	E-02	1.4 ± 1.2	E-03	09/28	L.T.	2.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.5 ± 0.3	E-02	L.T.	2.	10/11	L.T.	3.	E-02
09/26	10/03	1.03	E 04	CU. FT.	4.0 ± 0.4	E-02	4.3 ± 1.8	E-03	10/06	L.T.	2.	E-02
10/03	10/10	1.02	E 04	CU. FT.	(e)		(e)		10/16	L.T.	2	E-02
10/10	10/16	8.23	E 03	CU. FT.	3.0 ± 0.4	E-02	7.2 ± 2.6	E-03	12/08	L.T.	5.	E-02
10/16	10/24	1.10	E 04	CU. FT.	5.0 ± 0.4	E-02	5.6 ± 1.8	E-03	11/17	L.T.	2	E-02
10/24	10/31	1.00	E 04	CU. FT.	1.7 ± 0.3	E-02	2.2 ± 1.4	E-03	11/15	(a)		
10/31	11/07	9.93	E 03	CU. FT.	1.3 ± 0.2	E-02	5.8 ± 2.1	E-03	01/17	L.T.	2.	E-02
11/07	11/13	8.84	E 03	CU. FT.	2.1 ± 0.3	E-01	9.8 ± 2.5	E-03	03/09	L.T.	1.	E-02
11/13	11/21	1.12	E 04	CU. FT.	1.9 ± 0.3	E-02	2.9 ± 1.3	E-03	12/13	L.T.	2.	E-02
11/21	11/28	1.01	E 04	CU. FT.	5.2 ± 0.4	E-02	5.5 ± 2.0	E-03	12/08	L.T.	1	E-02
11/28	12/05	1.01	E 04	CU. FT.	1.0 ± 0.2	E-02	1.7 ± 1.1	E-03	01/12	L.T.	1.	E-02
12/05	12/12	1.01	E 04	CU. FT.	1.1 ± 0.3	E-02	1.0 ± 1.6	E-03	12/09	L.T.	2.	E-02
12/12	12/19	1.04	E 04	CU. FT.	3.3 ± 0.3	E-02	1.2 ± 1.3	E-03	12/18	L.T.	2.	E-02
12/19	12/26	8.54	E 03	CU. FT.	1.9 ± 0.4	E-02	2.1 ± 1.7	E-03	12/24	L.T.	3.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 05												
COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE		CHARCOAL FILTER I-131 (PCI/CU. M.)		
DATE	DATE	VOLUME	UNITS					DATE				
12/28	01/04	1.01	E 04	CU. FT.	3.5 ± 0.3	E-02	1.3 ± 1.0	E-03	01/13	L.T.	2.	E-02
01/04	01/11	1.00	E 04	CU. FT.	1.7 ± 0.3	E-02	L.T. 2.	E-03	01/14	L.T.	1.	E-02
01/11	01/18	9.99	E 03	CU. FT.	3.6 ± 0.4	E-02	3.5 ± 1.9	E-03	01/28	L.T.	1.	E-02
01/18	01/26	1.14	E 04	CU. FT.	3.3 ± 0.3	E-02	3.6 ± 1.4	E-03	02/11	L.T.	9.	E-03
01/26	02/01	8.69	E 03	CU. FT.	2.1 ± 0.3	E-02	2.1 ± 1.3	E-03	02/25	L.T.	1.	E-02
02/01	02/08	9.95	E 03	CU. FT.	2.8 ± 0.3	E-02	3.3 ± 1.6	E-03	02/16	L.T.	1.	E-02
02/08	02/15	9.19	E 03	CU. FT.	4.1 ± 0.4	E-02	3.3 ± 1.5	E-03	03/08	L.T.	1.	E-02
02/15	02/22	1.01	E 04	CU. FT.	3.7 ± 0.4	E-02	3.0 ± 1.3	E-03	03/09	L.T.	1.	E-02
02/22	02/29	9.76	E 04	CU. FT.	1.1 ± 0.2	E-02	1.6 ± 1.3	E-03	03/09	L.T.	1.	E-02
02/29	03/07	1.04	E 02	CU. FT.	1.8 ± 0.3	E-02	2.6 ± 1.3	E-03	03/31	L.T.	1.	E-02
03/07	03/14	1.02	E 04	CU. FT.	1.7 ± 0.3	E-02	3.0 ± 1.3	E-03	04/13	L.T.	1.	E-02
03/14	03/21	1.01	E 04	CU. FT.	1.8 ± 0.3	E-02	2.2 ± 1.4	E-03	04/13	L.T.	1.	E-02
03/21	03/28	1.02	E 04	CU. FT.	1.8 ± 0.3	E-02	2.8 ± 1.6	E-03	05/02	L.T.	2.	E-02
03/28	04/04	1.00	E 04	CU. FT.	1.3 ± 0.2	E-02	2.0 ± 1.4	E-03	05/02	L.T.	1.	E-02
04/04	04/11	9.87	E 03	CU. FT.	1.4 ± 0.3	E-02	4.6 ± 1.9	E-03	05/03	L.T.	1.	E-02
04/11	04/18	9.35	E 03	CU. FT.	1.6 ± 0.3	E-02	2.7 ± 1.3	E-03	05/05	L.T.	1.	E-02
04/18	04/25	9.90	E 03	CU. FT.	1.9 ± 0.3	E-02	3.2 ± 1.6	E-03	05/12	L.T.	1.	E-02
04/25	05/02	1.02	E 04	CU. FT.	2.4 ± 0.3	E-02	3.7 ± 1.5	E-03	05/26	L.T.	2.	E-02
05/02	05/09	1.02	E 04	CU. FT.	2.1 ± 0.3	E-02	4.0 ± 1.6	E-03	06/02	L.T.	2.	E-02
05/09	05/16	9.84	E 03	CU. FT.	2.0 ± 0.3	E-02	3.0 ± 1.5	E-03	06/02	L.T.	1.	E-02
05/16	05/23	9.88	E 03	CU. FT.	2.0 ± 0.3	E-02	3.2 ± 1.5	E-03	06/02	L.T.	1.	E-02
05/23	05/30	1.01	E 04	CU. FT.	1.6 ± 0.3	E-02	1.5 ± 1.2	E-03	06/02	L.T.	2.	E-02
05/30	06/06	9.92	E 03	CU. FT.	1.6 ± 0.3	E-02	2.6 ± 1.3	E-03	06/23	L.T.	1.	E-02
06/06	06/13	9.93	E 03	CU. FT.	1.8 ± 0.3	E-02	1.7 ± 1.2	E-03	07/05	L.T.	1.	E-02
06/13	06/20	1.02	E 04	CU. FT.	1.2 ± 0.2	E-02	1.8 ± 1.1	E-03	07/05	L.T.	1.	E-02
06/20	06/27	9.83	E 03	CU. FT.	1.8 ± 0.3	E-02	2.5 ± 1.4	E-03	07/21	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 05

STATION NUMBER 05												
COLL. START DATE	TIME STOP DATE	SAMPLE			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)		
		VOLUME		UNITS								
06/27	07/05	1.17	E 04	CU. FT.	2.3 ± 0.3	E-02	2.8 ± 1.2	E-03	07/25	L.T.	9.	E-03
07/05	07/11	8.35	E 03	CU. FT.	3.3 ± 0.4	E-02	4.7 ± 1.8.	E-03	07/26	L.T.	1.	E-02
07/11	07/18	1.02	E 04	CU. FT.	2.6 ± 0.3	E-02	3.5 ± 1.6	E-03	08/15	L.T.	1.	E-02
07/18	07/25	9.66	E 03	CU. FT.	2.2 ± 0.3	E-02	2.0 ± 1.4	E-03	08/01	L.T.	1.	E-02
07/25	08/01	9.78	E 03	CU. FT.	2.6 ± 0.3	E-02	L.T. 2.	E-03	08/16	L.T.	2.	E-02
08/01	08/08	9.63	E 03	CU. FT.	3.6 ± 0.4	E-02	2.8 ± 1.6	E-03	08/15	L.T.	2.	E-02
08/08	08/15	1.00	E 04	CU. FT.	3.4 ± 0.3	E-02	2.4 ± 1.3	E-03	08/24	L.T.	1.	E-02
08/15	08/22	9.52	E 03	CU. FT.	3.0 ± 0.3	E-02	L.T. 1.	E-03	08/29	L.T.	2.	E-02
08/22	08/29	4.71	E 03	CU. FT.	(c)		(c)			(c)		
08/29	09/05	9.68	E 03	CU. FT.	4.1 ± 0.4	E-02	3.2 ± 1.8	E-03	09/16	L.T.	2.	E-02
09/05	09/12	9.93	E 03	CU. FT.	2.5 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	2.	E-02
09/12	09/19	9.98	E 03	CU. FT.	2.8 ± 0.3	E-02	1.4 ± 1.2	E-03	09/28	L.T.	2.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.6 ± 0.3	E-02	L.T. 2.	E-03	10/11	L.T.	2.	E-02
09/26	10/03	1.01	E 04	CU. FT.	3.3 ± 0.3	E-02	5.2 ± 1.9	E-03	10/06	L.T.	2.	E-02
10/03	10/10	1.02	E 04	CU. FT.	(e)		(e)		10/16	L.T.	2	E-02
10/10	10/16	8.21	E 03	CU. FT.	3.2 ± 0.4	E-02	9.3 ± 2.8	E-03	12/08	L.T.	3.	E-02
10/16	10/24	1.15	E 04	CU. FT.	4.5 ± 0.4	E-02	4.8 ± 1.6	E-03	11/17	L.T.	1.	E-01
10/24	10/31	1.01	E 04	CU. FT.	2.6 ± 0.4	E-02	2.5 ± 1.5	E-03	11/15	(a)		
10/31	11/07	9.92	E 03	CU. FT.	2.0 ± 0.3	E-02	8.8 ± 2.5	E-03	01/17	L.T.	8.	E-03
11/07	11/13	8.83	E 03	CU. FT.	2.6 ± 0.3	E-02	8.9 ± 2.4	E-03	03/09	L.T.	8.	E-03
11/13	11/21	1.12	E 04	CU. FT.	3.6 ± 0.3	E-02	4.3 ± 1.6	E-03	12/13	L.T	2.	E-02
11/21	11/28	1.01	E 04	CU. FT.	5.7 ± 0.4	E-02	7.7 ± 2.3	E-03	12/08	L.T.	1.	E-02
11/28	12/05	1.01	E 04	CU. FT.	2.6 ± 0.3	E-02	5.6 ± 1.8	E-03	01/12	L.T.	8.	E-03
12/05	12/12	1.02	E 04	CU. FT.	3.0 ± 0.3	E-02	2.7 ± 1.3	E-03	12/22	L.T.	1.	E-02
12/12	12/19	1.03	E 04	CU. FT.	4.7 ± 0.4	E-02	1.9 ± 0.3	E-02	03/15	L.T.	2.	E-02
12/19	12/26	9.98	E 03	CU. FT.	3.8 ± 0.4	E-02	3.9 ± 1.6	E-03	01/19	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 06												
COLL. START DATE	TIME STOP DATE	SAMPLE			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)		
		VOLUME		UNITS								
12/28	01/04	1.01	E 04	CU. FT.	2.8 ± 0.3	E-02	1.3 ± 1.0	E-03	01/13	L.T.	2.	E-02
01/04	01/11	1.00	E 04	CU. FT.	1.3 ± 0.2	E-02	L.T. 2.	E-03	01/14	L.T.	1.	E-02
01/11	01/18	1.03	E 04	CU. FT.	2.3 ± 0.3	E-02	L.T. 2.	E-03	01/28	L.T.	2.	E-02
01/18	01/26	1.14	E 03	CU. FT.	2.4 ± 0.3	E-02	1.9 ± 1.1	E-03	02/11	L.T.	2.	E-02
01/26	02/01	8.69	E 03	CU. FT.	3.0 ± 0.4	E-02	4.1 ± 1.7	E-03	02/25	L.T.	3.	E-02
02/01	02/08	9.95	E 03	CU. FT.	2.5 ± 0.3	E-02	1.9 ± 1.4	E-03	02/16	L.T.	2.	E-02
02/08	02/15	9.79	E 03	CU. FT.	2.6 ± 0.2	E-02	3.5 ± 1.5	E-03	03/08	L.T.	2.	E-02
02/15	02/22	1.01	E 04	CU. FT.	2.5 ± 0.3	E-02	2.2 ± 1.2	E-03	03/09	L.T.	2.	E-02
02/22	02/29	9.77	E 03	CU. FT.	1.1 ± 0.2	E-02	L.T. 1.	E-03	03/09	L.T.	2.	E-02
02/29	03/07	1.04	E 04	CU. FT.	L.T. 2.	E-03	1.0 ± 0.9	E-03	03/31	L.T.	2.	E-02
03/07	03/14	(d)			(d)		(d)			(d)		
03/14	03/21	(d)			(d)		(d)			(d)		
03/21	03/28	(d)			(d)		(d)			(d)		
03/28	04/04	(d)			(d)		(d)			(d)		
04/04	04/11	9.76	E 03	CU. FT.	1.4 ± 0.3	E-02	4.5 ± 1.9	E-03	05/03	L.T.	2.	E-02
04/11	04/18	9.90	E 03	CU. FT.	1.5 ± 0.3	E-02	3.0 ± 1.4	E-03	05/05	L.T.	2.	E-02
04/18	04/25	9.92	E 03	CU. FT.	1.4 ± 0.2	E-02	3.1 ± 1.6	E-03	05/12	L.T.	2.	E-02
04/25	05/02	1.02	E 04	CU. FT.	2.1 ± 0.3	E-02	3.9 ± 1.6	E-03	05/26	L.T.	2.	E-02
05/02	05/09	9.85	E 03	CU. FT.	2.1 ± 0.3	E-02	3.9 ± 1.7	E-03	06/02	L.T.	2.	E-02
05/09	05/16	9.85	E 03	CU. FT.	1.4 ± 0.2	E-02	1.9 ± 1.3	E-03	06/02	L.T.	3.	E-02
05/16	05/23	1.00	E 04	CU. FT.	1.3 ± 0.2	E-02	1.3 ± 1.1	E-03	06/02	L.T.	2.	E-02
05/23	05/30	1.01	E 04	CU. FT.	1.1 ± 0.2	E-02	1.4 ± 1.1	E-03	06/02	L.T.	2.	E-02
05/30	06/06	1.01	E 04	CU. FT.	1.1 ± 0.2	E-02	1.9 ± 1.1	E-03	06/23	L.T.	4.	E-02
06/06	06/13	1.00	E 04	CU. FT.	8.1 ± 2.1	E-03	L.T. 1.	E-03	07/05	L.T.	2.	E-02
06/13	06/20	1.02	E 04	CU. FT.	1.1 ± 0.2	E-02	1.0 ± 0.9	E-03	07/05	L.T.	2.	E-02
06/20	06/27	9.83	E 03	CU. FT.	1.3 ± 0.2	E-02	1.3 ± 1.1	E-03	07/21	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 06

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME UNITS			AP FILTER		AP FILTER		MID-COUNT DATE	CHARCOAL FILTER		
					GROSS BETA (PCI/CU.M.)		GROSS ALPHA (PCI/CU.M.)			I-131 (PCI/CU. M.)		
06/27	07/05	1.17	E 04	CU. FT.	1.6 ± 0.2	E-02	1.6 ± 0.9	E-03	07/25	L.T.	2.	E-02
07/05	07/11	8.79	E 03	CU. FT.	1.1 ± 0.2	E-02	1.5 ± 1.1	E-03	07/26	L.T.	2.	E-02
07/11	07/18	1.02	E 04	CU. FT.	1.1 ± 0.2	E-02	1.9 ± 1.4	E-03	08/15	L.T.	2.	E-02
07/18	07/25	9.66	E 03	CU. FT.	1.5 ± 0.3	E-02	L.T. 1.	E-03	08/01	L.T.	2.	E-02
07/25	08/01	1.01	E 04	CU. FT.	2.0 ± 0.3	E-02	1.7 ± 1.3	E-03	08/16	L.T.	2.	E-02
08/01	08/08	9.94	E 03	CU. FT.	2.8 ± 0.3	E-02	2.3 ± 1.5	E-03	08/15	L.T.	4.	E-02
08/08	08/15	1.00	E 04	CU. FT.	2.4 ± 0.3	E-02	2.1 ± 1.2	E-03	08/24	L.T.	3.	E-02
08/15	08/22	9.94	E 03	CU. FT.	1.8 ± 0.3	E-02	1.4 ± 1.2	E-03	08/29	L.T.	3.	E-02
08/22	08/29	1.02	E 04	CU. FT.	2.8 ± 0.3	E-02	1.7 ± 1.3	E-03	09/12	L.T.	2.	E-02
08/29	09/05	9.94	E 03	CU. FT.	2.0 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	3.	E-02
09/05	09/12	9.93	E 03	CU. FT.	1.8 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	2.	E-02
09/12	09/19	1.00	E 04	CU. FT.	2.3 ± 0.3	E-02	2.0 ± 1.3	E-03	09/28	L.T.	3.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.1 ± 0.2	E-02	L.T. 2.	E-03	10/11	L.T.	3.	E-02
09/26	10/03	1.04	E 04	CU. FT.	2.3 ± 0.3	E-02	4.0 ± 1.7	E-03	10/06	L.T.	3.	E-02
10/03	10/10	1.02	E 02	CU. FT.	(e)		(e)		10/16	L.T.	2.	E-02
10/10	10/16	8.20	E 03	CU. FT.	2.2 ± 0.3	E-02	6.9 ± 2.5	E-03	12/08	L.T.	4.	E-02
10/16	10/24	1.13	E 04	CU. FT.	5.6 ± 0.4	E-02	5.2 ± 1.7	E-03	11/17	L.T.	2.	E-02
10/24	10/31	1.00	E 04	CU. FT.	2.9 ± 0.4	E-02	2.5 ± 1.5	E-03	11/15	(a)		
10/31	11/07	9.55	E 03	CU. FT.	1.9 ± 0.3	E-02	4.1 ± 1.9	E-03	01/17	L.T.	1.	E-02
11/07	11/13	8.83	E 03	CU. FT.	1.6 ± 0.3	E-02	5.8 ± 1.9	E-03	03/09	L.T.	1.	E-02
11/13	11/21	1.02	E 04	CU. FT.	2.4 ± 0.3	E-02	3.1 ± 1.5	E-03	11/21	L.T.	2.	E-02
11/21	11/28	8.91	E 03	CU. FT.	5.1 ± 0.5	E-02	5.2 ± 2.2	E-03	12/08	L.T.	1.	E-02
11/28	12/05	(d)			(d)		(d)			(d)		
12/05	12/12	(d)			(d)		(d)			(d)		
12/12	12/19	1.01	E 04	CU. FT.	3.7 ± 0.4	E-02	2.7 ± 1.5	E-03	12/18	L.T.	2.	E-02
12/19	12/26	8.56	E 03	CU. FT.	2.5 ± 0.4	E-02	L.T. 3.5	E-03	12/24	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY – AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 07												
COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE		CHARCOAL FILTER I-131 (PCI/CU. M.)		
VOLUME	UNITS											
12/28	01/04	1.01	E 04	CU. FT.	5.5 ± 0.4	E-02	1.4 ± 1.1	E-03	01/13	L.T.	2.	E-02
01/04	01/11	9.68	E 03	CU. FT.	2.2 ± 0.3	E-02	L.T. 2.	E-03	01/14	L.T.	1.	E-02
01/11	01/18	1.00	E 04	CU. FT.	5.4 ± 0.5	E-02	3.7 ± 2.0	E-03	01/28	L.T.	2.	E-02
01/18	01/26	1.10	E 04	CU. FT.	3.4 ± 0.3	E-02	3.0 ± 1.3	E-03	02/11	L.T.	2.	E-02
01/26	02/01	8.74	E 03	CU. FT.	3.1 ± 0.4	E-02	3.9 ± 1.6	E-03	02/25	L.T.	3.	E-02
02/01	02/08	9.71	E 03	CU. FT.	3.9 ± 0.4	E-02	3.8 ± 1.8	E-03	02/16	L.T.	2.	E-02
02/08	02/15	1.00	E 04	CU. FT.	4.8 ± 0.4	E-02	3.5 ± 1.5	E-03	03/08	L.T.	2.	E-02
02/15	02/22	1.01	E 04	CU. FT.	5.5 ± 0.4	E-02	3.6 ± 1.5	E-03	03/09	L.T.	2.	E-02
02/22	02/29	9.73	E 03	CU. FT.	1.4 ± 0.3	E-02	2.2 ± 1.4	E-03	03/09	L.T.	2.	E-02
02/29	03/07	1.02	E 04	CU. FT.	2.3 ± 0.3	E-02	2.1 ± 1.1	E-03	03/31	L.T.	2.	E-02
03/07	03/14	1.02	E 04	CU. FT.	8.0 ± 2.1	E-03	2.1 ± 1.1	E-03	04/13	L.T.	2.	E-02
03/14	03/21	1.00	E 04	CU. FT.	2.4 ± 0.3	E-02	3.5 ± 1.7	E-03	04/13	L.T.	2.	E-02
03/21	03/28	1.01	E 04	CU. FT.	1.7 ± 0.3	E-02	3.1 ± 1.6	E-03	05/02	L.T.	1.	E-02
03/28	04/04	9.82	E 03	CU. FT.	2.8 ± 0.3	E-02	3.7 ± 1.8	E-03	05/02	L.T.	2.	E-02
04/04	04/11	9.82	E 03	CU. FT.	1.9 ± 0.3	E-02	3.3 ± 1.7	E-03	05/03	L.T.	2.	E-02
04/11	04/18	9.65	E 03	CU. FT.	2.4 ± 0.3	E-02	2.6 ± 1.3	E-03	05/05	L.T.	2.	E-02
04/18	04/25	9.97	E 03	CU. FT.	2.5 ± 0.3	E-02	3.4 ± 1.7	E-03	05/12	L.T.	2.	E-02
04/25	05/02	1.02	E 04	CU. FT.	2.3 ± 0.3	E-02	3.5 ± 1.5	E-03	05/26	L.T.	2.	E-02
05/02	05/09	1.03	E 04	CU. FT.	2.0 ± 0.3	E-02	3.2 ± 1.5	E-03	06/02	L.T.	2.	E-02
05/09	05/16	9.79	E 03	CU. FT.	1.4 ± 0.2	E-02	3.0 ± 1.5	E-03	06/02	L.T.	3.	E-02
05/16	05/23	1.00	E 04	CU. FT.	1.5 ± 0.3	E-02	3.7 ± 1.6	E-03	06/02	L.T.	2.	E-02
05/23	05/30	1.01	E 04	CU. FT.	1.3 ± 0.2	E-02	2.9 ± 1.5	E-03	06/02	L.T.	2.	E-02
05/30	06/06	1.00	E 04	CU. FT.	9.5 ± 2.3	E-03	1.7 ± 1.1	E-03	06/23	L.T.	4.	E-02
06/06	06/13	1.00	E 04	CU. FT.	1.4 ± 0.2	E-02	3.4 ± 1.5	E-03	07/05	L.T.	2.	E-02
06/13	06/20	1.02	E 04	CU. FT.	1.0 ± 0.2	E-02	1.5 ± 1.0	E-03	07/05	L.T.	2.	E-02
06/20	06/27	9.85	E 03	CU. FT.	1.1 ± 0.2	E-02	L.T. 1.	E-03	07/21	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 07

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER		AP FILTER		MID-COUNT DATE	CHARCOAL FILTER		
		VOLUME	UNITS		GROSS BETA (PCI/CU.M.)		GROSS ALPHA (PCI/CU.M.)		I-131 (PCI/CU. M.)		
06/27	07/05	1.16	E 04	CU. FT.	9.3 ± 2.0	E-03	3.5 ± 1.3	E-03	07/25	L.T.	2. E-02
07/05	07/11	8.57	E 03	CU. FT.	1.9 ± 0.3	E-02	1.5 ± 1.1	E-03	07/26	L.T.	2. E-02
07/11	07/18	1.03	E 04	CU. FT.	8.8 ± 2.2	E-03	L.T. 1.	E-03	08/15	L.T.	2. E-02
07/18	07/25	9.77	E 03	CU. FT.	1.3 ± 0.3	E-02	2.7 ± 1.5	E-03	08/01	L.T.	2. E-02
07/25	08/01	1.04	E 04	CU. FT.	1.2 ± 0.2	E-02	L.T. 2.	E-03	08/16	L.T.	2. E-02
08/01	08/08	9.84	E 03	CU. FT.	1.8 ± 0.3	E-02	1.7 ± 1.3	E-03	08/15	L.T.	4. E-02
08/08	08/15	1.00	E 04	CU. FT.	1.2 ± 0.2	E-02	1.2 ± 1.0	E-03	08/24	L.T.	2. E-02
08/15	08/22	1.00	E 04	CU. FT.	1.5 ± 0.3	E-02	L.T. 1.	E-03	08/29	L.T.	3. E-02
08/22	08/29	1.01	E 04	CU. FT.	2.2 ± 0.3	E-02	2.7 ± 1.5	E-03	09/12	L.T.	2. E-02
08/29	09/05	9.94	E 03	CU. FT.	1.7 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	3. E-02
09/05	09/12	1.00	E 04	CU. FT.	1.5 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	2. E-02
09/12	09/19	1.00	E 04	CU. FT.	1.5 ± 0.2	E-02	1.7 ± 1.3	E-03	09/28	L.T.	3. E-02
09/19	09/26	1.01	E 04	CU. FT.	8.3 ± 2.1	E-03	L.T. 2.	E-03	10/11	L.T.	3. E-02
09/26	10/03	1.02	E 04	CU. FT.	2.1 ± 0.3	E-02	3.2 ± 1.6	E-03	10/06	L.T.	3. E-02
10/03	10/10	1.04	E 04	CU. FT.	(e)		(e)		10/16	L.T.	2 E-02
10/10	10/16	8.23	E 03	CU. FT.	1.2 ± 0.3	E-02	4.8 ± 2.2	E-03	12/08	L.T.	4. E-02
10/16	10/24	1.19	E 04	CU. FT.	1.6 ± 0.2	E-02	1.4 ± 1.1	E-03	11/17	L.T.	2. E-02
10/24	10/31	9.90	E 03	CU. FT.	1.6 ± 0.3	E-02	1.2 ± 1.1	E-03	11/15	(a)	
10/31	11/07	1.01	E 04	CU. FT.	2.7 ± 0.3	E-02	6.6 ± 2.2	E-03	01/17	L.T.	1. E-02
11/07	11/13	8.87	E 03	CU. FT.	2.0 ± 0.3	E-02	8.4 ± 2.3	E-03	03/09	L.T.	1. E-02
11/13	11/21	1.12	E 04	CU. FT.	3.6 ± 0.3	E-02	3.3 ± 1.4	E-03	12/13	L.T.	1. E-02
11/21	11/28	1.01	E 04	CU. FT.	5.9 ± 0.5	E-02	3.9 ± 1.8	E-03	12/08	L.T.	8. E-03
11/28	12/05	1.01	E 04	CU. FT.	1.7 ± 0.3	E-02	3.2 ± 1.4	E-03	01/12/01	L.T.	1. E-02
12/05	12/12	1.02	E 04	CU. FT.	3.2 ± 0.3	E-02	3.7 ± 1.5	E-03	12/18	L.T.	2. E-02
12/12	12/19	5.74	E 03	CU. FT.	5.8 ± 0.6	E-02	2.3 ± 0.5	E-02	03/15/01	L.T.	4. E-03
12/19	12/26	9.68	E 03	CU. FT.	3.6 ± 0.4	E-02	4.7 ± 1.8	E-03	01/19/01	L.T.	4. E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 08

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)	AP FILTER GROSS ALPHA (PCI/CU.M.)	MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)	
		VOLUME	UNITS					
12/28	01/04	1.01	E 04	CU. FT.	5.7 ± 1.9 E-03	L.T. 1. E-03	01/13	L.T. 2. E-02
01/04	01/11	9.92	E 03	CU. FT.	1.4 ± 0.3 E-02	L.T. 2. E-03	01/14	L.T. 1. E-02
01/11	01/18	9.55	E 03	CU. FT.	3.9 ± 0.4 E-02	3.2 ± 1.9 E-03	01/28	L.T. 2. E-02
01/18	01/26	1.12	E 04	CU. FT.	3.4 ± 0.3 E-02	3.8 ± 1.5 E-03	02/11	L.T. 2. E-02
01/26	02/01	8.63	E 03	CU. FT.	2.4 ± 0.3 E-02	3.2 ± 1.5 E-03	02/25	L.T. 3. E-02
02/01	02/08	1.00	E 04	CU. FT.	2.6 ± 0.3 E-02	2.6 ± 1.5 E-03	02/16	L.T. 2. E-02
02/08	02/15	1.03	E 04	CU. FT.	2.3 ± 0.3 E-02	1.7 ± 1.0 E-03	03/08	L.T. 2. E-02
02/15	02/22	1.01	E 04	CU. FT.	4.7 ± 0.4 E-02	2.5 ± 1.2 E-03	03/09	L.T. 2. E-02
02/22	02/29	9.74	E 03	CU. FT.	1.0 ± 0.2 E-02	1.6 ± 1.3 E-03	03/09	L.T. 2. E-02
02/29	03/07	7.03	E 03	CU. FT.	4.5 ± 0.5 E-02	6.1 ± 2.3 E-03	03/31	L.T. 3. E-02
03/07	03/14	1.02	E 04	CU. FT.	1.6 ± 0.3 E-02	3.0 ± 1.3. E-03	04/13	L.T. 2. E-03
03/14	03/21	1.00	E 04	CU. FT.	2.9 ± 0.3 E-02	4.7 ± 1.9 E-03	04/13	L.T. 2. E-02
03/21	03/28	9.88	E 03	CU. FT.	2.5 ± 0.3 E-02	4.6 ± 1.9 E-03	05/02	L.T. 1. E-02
03/28	04/04	1.00	E 04	CU. FT.	1.9 ± 0.3 E-02	2.7 ± 1.6 E-03	05/02	L.T. 2. E-02
04/04	04/11	9.76	E 03	CU. FT.	1.5 ± 0.3 E-02	5.7 ± 2.0 E-03	05/03	L.T. 2. E-02
04/11	04/18	9.91	E 03	CU. FT.	2.4 ± 0.3 E-02	3.8 ± 1.5 E-03	05/05	L.T. 2. E-02
04/18	04/25	9.90	E 03	CU. FT.	2.0 ± 0.3 E-02	2.4 ± 1.5 E-03	05/12	L.T. 2. E-02
04/25	05/02	1.02	E 04	CU. FT	3.6 ± 0.4 E-02	4.9 ± 1.7 E-03	05/26	L.T. 2. E-02
05/02	05/09	1.03	E 04	CU. FT.	1.2 ± 0.2 E-02	4.1 ± 1.7. E-03	06/02	L.T. 2. E-02
05/09	05/16	9.82	E 03	CU. FT.	1.1 ± 0.2 E-02	L.T. 1. E-03	06/02	L.T. 3. E-02
05/16	05/23	1.00	E 04	CU. FT.	1.3 ± 0.2 E-02	4.0 ± 1.7 E-03	06/02	L.T. 2. E-02
05/23	05/30	1.01	E 04	CU. FT.	1.1 ± 0.2 E-02	1.4 ± 1.1 E-03	06/02	L.T. 2. E-02
05/30	06/06	1.03	E 04	CU. FT.	1.2 ± 0.2 E-02	3.1 ± 1.3 E-03	06/23	L.T. 4. E-02
06/06	06/13	9.78	E 03	CU. FT.	1.2 ± 0.2 E-02	1.4 ± 1.2 E-03	07/05	L.T. 2. E-02
06/13	06/20	(b)			(b)	(b)		(b)
06/20	06/27	2.00	E 04	CU. FT.	1.2 ± 0.2 E-02	1.8 ± 0.8. E-03	07/21	L.T. 2. E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 08

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME UNITS			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)		
06/27	07/05	1.17	E 04	CU. FT.	2.2 ± 0.3	E-02	3.0 ± 1.2	E-03	07/25	L.T.	2.	E-02
07/05	07/11	8.50	E 03	CU. FT.	2.0 ± 0.3	E-02	1.2 ± 1.1	E-03	07/26	L.T.	2.	E-02
07/11	07/18	1.04	E 04	CU. FT.	1.4 ± 0.2	E-02	2.3 ± 1.4	E-03	08/15	L.T.	2	E-02
07/18	07/25	9.68	E 03	CU. FT.	1.6 ± 0.3	E-02	1.8 ± 1.3	E-03	08/01	L.T.	2.	E-02
07/25	08/01	9.85	E 03	CU. FT.	1.9 ± 0.3	E-02	L.T. 2.	E-03	08/16	L.T.	2.	E-02
08/01	08/08	9.38	E 03	CU. FT.	3.3 ± 0.4	E-02	2.6 ± 1.6	E-03	08/15	L.T.	4.	E-02
08/08	08/15	9.91	E 03	CU. FT.	1.8 ± 0.3	E-02	1.3 ± 1.1	E-03	08/24	L.T.	2.	E-02
08/15	08/22	1.00	E 04	CU. FT.	1.5 ± 0.3	E-02	1.6 ± 1.2	E-03	08/29	L.T.	3.	E-02
08/22	08/29	9.26	E 03	CU. FT.	3.8 ± 0.4	E-02	2.7 ± 1.6	E-03	09/12	L.T.	3.	E-02
08/29	09/05	9.94	E 03	CU. FT.	1.6 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	3.	E-02
09/05	09/12	1.00	E 04	CU. FT.	1.6 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	2.	E-02
09/12	09/19	1.00	E 04	CU. FT.	1.7 ± 0.3	E-02	L.T. 1.	E-03	09/28	L.T.	3.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.0 ± 0.2	E-02	L.T. 2.	E-03	10/11	L.T.	3.	E-02
09/26	10/03	1.03	E 04	CU. FT.	2.6 ± 0.3	E-02	2.8 ± 1.5	E-03	10/06	L.T.	3.	E-02
10/03	10/10	1.03	E 04	CU. FT.	(e)		(e)		10/16	L.T.	2	E-02
10/10	10/16	8.20	E 03	CU. FT.	3.0 ± 0.4	E-02	1.0 ± 0.3	E-02	12/08	L.T.	4.	E-02
10/16	10/24	9.69	E 03	CU. FT.	5.7 ± 0.5	E-02	5.0 ± 1.9	E-03	11/17	L.T.	2	E-02
10/24	10/31	1.00	E 04	CU. FT.	3.1 ± 0.4	E-02	2.4 ± 1.4	E-03	11/15	(a)		
10/31	11/07	9.55	E 03	CU. FT.	2.5 ± 0.3	E-02	6.1 ± 2.2	E-03	01/17	L.T.	1.	E-02
11/07	11/13	8.66	E 03	CU. FT.	2.3 ± 0.3	E-02	1.2 ± 0.3	E-02	03/09	L.T.	1.	E-02
11/13	11/21	1.12	E 04	CU. FT.	2.3 ± 0.3	E-02	2.1 ± 1.2	E-03	12/13	L.T.	2.	E-02
11/21	11/28	1.01	E 04	CU. FT.	3.4 ± 0.4	E-02	3.5 ± 1.7	E-03	12/08	L.T.	7.	E-03
11/28	12/05	1.01	E 04	CU. FT.	1.1 ± 0.2	E-02	2.9 ± 1.3	E-03	01/12	L.T.	1.	E-02
12/05	12/12	1.01	E 04	CU. FT.	1.4 ± 0.3	E-02	1.4 ± 1.0	E-03	01/12	L.T.	2.	E-02
12/12	12/19	1.03	E 04	CU. FT.	2.2 ± 0.3	E-02	5.3 ± 1.7	E-03	03/15	L.T.	2.	E-02
12/19	12/26	9.92	E 03	CU. FT.	1.6 ± 0.3	E-02	1.8 ± 1.2	E-03	01/19	L.T.	3.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 09

COLL. START DATE	TIME STOP DATE	SAMPLE		AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)			
		VOLUME	UNITS									
12/28	01/04	1.01	E 04	CU. FT.	3.1 ± 0.3	E-02	2.9 ± 1.4	E-03	01/13	L.T.	2.	E-02
01/04	01/11	9.93	E 03	CU. FT.	2.4 ± 0.3	E-02	2.3 ± 1.6	E-03	01/14	L.T.	1.	E-02
01/11	01/18	1.02	E 04	CU. FT.	4.4 ± 0.4	E-02	2.0 ± 1.6	E-03	01/28	L.T.	2.	E-02
01/18	01/26	1.13	E 03	CU. FT.	3.8 ± 0.3	E-02	4.3 ± 1.5	E-03	02/11	L.T.	2.	E-02
01/26	02/01	8.57	E 03	CU. FT.	2.6 ± 0.3	E-02	4.7 ± 1.8	E-03	02/25	L.T.	3.	E-02
02/01	02/08	9.74	E 03	CU. FT.	3.0 ± 0.3	E-02	3.1 ± 1.6	E-03	02/16	L.T.	2.	E-02
02/08	02/15	8.44	E 03	CU. FT.	5.0 ± 0.4	E-02	6.4 ± 2.1	E-03	03/08	L.T.	3.	E-02
02/15	02/22	1.01	E 04	CU. FT.	3.9 ± 0.4	E-02	3.4 ± 1.4	E-03	03/09	L.T.	2.	E-02
02/22	02/29	9.75	E 03	CU. FT.	1.2 ± 0.3	E-02	2.0 ± 1.4	E-03	03/09	L.T.	2.	E-02
02/29	03/07	1.04	E 04	CU. FT.	2.2 ± 0.3	E-02	3.7 ± 1.4	E-03	03/31	L.T.	2.	E-02
03/07	03/14	1.02	E 04	CU. FT.	2.4 ± 0.3	E-02	3.7 ± 1.5	E-03	04/13	L.T.	2.	E-02
03/14	03/21	1.01	E 04	CU. FT.	1.6 ± 0.3	E-02	2.2 ± 1.4	E-03	04/13	L.T.	2.	E-02
03/21	03/28	1.02	E 04	CU. FT.	1.4 ± 0.2	E-02	3.0 ± 1.6	E-03	05/02	L.T.	2.	E-02
03/28	04/04	1.00	E 04	CU. FT.	1.6 ± 0.3	E-02	2.5 ± 1.5	E-03	05/02	L.T.	2.	E-02
04/04	04/11	1.00	E 04	CU. FT.	1.6 ± 0.3	E-02	3.7 ± 1.7	E-03	05/03	L.T.	2.	E-02
04/11	04/18	9.91	E 03	CU. FT.	1.9 ± 0.3	E-02	3.4 ± 1.4	E-03	05/05	L.T.	2.	E-02
04/18	04/25	9.65	E 03	CU. FT.	2.0 ± 0.3	E-02	4.4 ± 1.9	E-03	05/12	L.T.	2.	E-02
04/25	05/02	1.02	E 04	CU. FT.	2.4 ± 0.3	E-02	3.7 ± 1.5	E-03	05/26	L.T.	2.	E-02
05/02	05/09	1.03	E 04	CU. FT.	2.3 ± 0.3	E-02	1.9 ± 1.2	E-03	05/06	L.T.	2.	E-02
05/09	05/16	9.65	E 03	CU. FT.	2.2 ± 0.3	E-02	5.9 ± 2.0	E-03	06/02	L.T.	3.	E-02
05/16	05/23	1.00	E 04	CU. FT.	1.9 ± 0.3	E-02	2.7 ± 1.4	E-03	06/02	L.T.	2.	E-02
05/23	05/30	1.01	E 04	CU. FT.	1.6 ± 0.3	E-02	2.0 ± 1.3	E-03	06/02	L.T.	2.	E-02
05/30	06/06	1.02	E 04	CU. FT.	1.6 ± 0.3	E-02	1.3 ± 1.0	E-03	06/23	L.T.	4.	E-02
06/06	06/13	9.83	E 03	CU. FT.	2.1 ± 0.3	E-02	2.9 ± 1.5	E-03	07/05	L.T.	2.	E-02
06/13	06/20	1.04	E 04	CU. FT.	1.5 ± 0.3	E-02	2.9 ± 1.3	E-03	07/05	L.T.	2.	E-02
06/20	06/27	9.70	E 03	CU. FT.	1.8 ± 0.3	E-02	1.9 ± 1.3	E-03	07/21	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 09

COLL. START DATE	TIME STOP DATE	SAMPLE VOLUME UNITS			AP FILTER		AP FILTER		MID-COUNT DATE	CHARCOAL FILTER		
					GROSS BETA (PCI/CU.M.)		GROSS ALPHA (PCI/CU.M.)			I-131 (PCI/CU. M.)		
06/27	07/05	1.18	E 04	CU. FT.	2.6 ± 0.3	E-02	2.6 ± 1.2	E-03	07/25	L.T.	2.	E-02
07/05	07/11	8.47	E 03	CU. FT.	2.7 ± 0.3	E-02	3.2 ± 1.5	E-03	07/26	L.T.	2.	E-02
07/11	07/18	1.04	E 04	CU. FT.	2.8 ± 0.3	E-02	3.1 ± 1.6	E-03	08/15	L.T.	2.	E-02
07/18	07/25	9.65	E 03	CU. FT.	2.0 ± 0.3	E-02	L.T. 1.	E-03	08/01	L.T.	2.	E-02
07/25	08/01	9.87	E 03	CU. FT.	2.5 ± 0.3	E-02	L.T. 2.	E-03	08/16	L.T.	2.	E-02
08/01	08/08	9.94	E 03	CU. FT.	3.8 ± 0.4	E-02	2.8 ± 1.6	E-03	08/15	L.T.	4.	E-02
08/08	08/15	9.92	E 03	CU. FT.	3.6 ± 0.4	E-02	2.8 ± 1.4	E-03	08/24	L.T.	2.	E-02
08/15	08/22	1.00	E 04	CU. FT.	2.7 ± 0.3	E-02	2.3 ± 1.4	E-03	08/29	L.T.	3.	E-02
08/22	08/29	9.39	E 03	CU. FT.	4.6 ± 0.4	E-02	3.6 ± 1.8	E-03	09/12	L.T.	2.	E-02
08/29	09/05	9.75	E 03	CU. FT.	4.1 ± 0.4	E-02	L.T. 2.	E-03	09/16	L.T.	3.	E-02
09/05	09/12	1.00	E 04	CU. FT.	2.6 ± 0.3	E-02	L.T. 2.	E-03	09/16	L.T.	2.	E-02
09/12	09/19	1.00	E 04	CU. FT.	2.6 ± 0.3	E-02	1.7 ± 1.3	E-03	09/28	L.T.	3.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.6 ± 0.3	E-02	L.T. 2.	E-03	10/11	L.T.	3.	E-02
09/26	10/03	1.03	E 04	CU. FT.	3.5 ± 0.3	E-02	4.0 ± 1.7	E-03	10/06	L.T.	3.	E-02
10/03	10/10	1.01	E 04	CU. FT.	(e)		(e)		10/16	L.T.	2	E-02
10/10	10/16	8.21	E 03	CU. FT.	3.2 ± 0.4	E-02	8.6 ± 2.8	E-03	12/08	L.T.	4.	E-02
10/16	10/24	1.13	E 04	CU. FT.	4.6 ± 0.4	E-02	5.8 ± 1.8	E-03	11/17	L.T.	2.	E-02
10/24	10/31	1.01	E 04	CU. FT.	2.7 ± 0.4	E-02	3.0 ± 1.6	E-03	11/15	(a)		
10/31	11/07	9.74	E 03	CU. FT.	2.2 ± 0.3	E-02	7.4 ± 2.3	E-03	01/17	L.T.	1.	E-02
11/07	11/13	8.83	E 03	CU. FT.	2.7 ± 0.4	E-02	1.2 ± 0.3	E-02	03/09	L.T.	1.	E-02
11/13	11/21	1.12	E 04	CU. FT.	4.5 ± 0.4	E-02	4.1 ± 1.5	E-03	12/13	L.T.	2.	E-02
11/21	11/28	1.01	E 04	CU. FT.	6.8 ± 0.5	E-02	4.9 ± 2.0	E-03	12/08	L.T.	8.	E-02
11/28	12/05	1.01	E 04	CU. FT.	1.9 ± 0.3	E-02	5.2 ± 1.7	E-03	01/12	L.T.	1.	E-02
12/05	12/12	1.02	E 04	CU. FT.	3.2 ± 0.3	E-02	2.4 ± 1.2	E-03	12/22	L.T.	2.	E-02
12/12	12/19	1.01	E 04	CU. FT.	4.8 ± 0.4	E-02	1.6 ± 0.3	E-03	03/15	L.T.	2.	E-02
12/19	12/26	9.93	E 03	CU. FT.	3.4 ± 0.4	E-02	4.1 ± 1.6	E-03	01/19	L.T.	3.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 10

COLL. START DATE	TIME STOP DATE	SAMPLE			AP FILTER GROSS BETA		AP FILTER GROSS ALPHA		MID-COUNT DATE	CHARCOAL FILTER I-131		
		VOLUME		UNITS	(PCI/CU.M.)		(PCI/CU.M.)			(PCI/CU. M.)		
12/28	01/04	1.01	E 04	CU. FT.	3.4 ± 0.3	E-02	2.3 ± 1.3	E-03	01/13	L.T.	2.	E-02
01/04	01/11	9.87	E 03	CU. FT.	1.5 ± 0.3	E-02	2.4 ± 1.6	E-03	01/14	L.T.	1.	E-02
01/11	01/18	1.03	E 04	CU. FT.	2.8 ± 0.4	E-02	2.5 ± 1.7	E-03	01/28	L.T.	1.	E-02
01/18	01/26	1.13	E 04	CU. FT.	2.9 ± 0.3	E-02	4.3 ± 0.3	E-03	02/11	L.T.	1.	E-02
01/26	02/01	8.72	E 03	CU. FT.	2.6 ± 0.3	E-02	3.8 ± 1.6	E-03	02/25	L.T.	2.	E-02
02/01	02/08	1.00	E 04	CU. FT.	2.9 ± 0.3	E-02	2.0 ± 1.4	E-03	02/16	L.T.	1.	E-02
02/08	02/15	1.03	E 04	CU. FT.	3.0 ± 0.3	E-02	4.1 ± 1.5	E-03	03/08	L.T.	2.	E-02
02/15	02/22	1.01	E 04	CU. FT.	3.0 ± 0.3	E-02	3.2 ± 1.4	E-03	03/09	L.T.	2.	E-02
02/22	02/29	9.73	E 03	CU. FT.	1.4 ± 0.3	E-02	L.T.	1. E-03	03/09	L.T.	1.	E-02
02/29	03/07	1.04	E 04	CU. FT.	2.0 ± 0.3	E-02	3.0 ± 1.3	E-03	03/31	L.T.	2.	E-02
03/07	03/14	1.02	E 04	CU. FT.	1.8 ± 0.3	E-02	3.2 ± 1.4	E-03	04/13	L.T.	1.	E-02
03/14	03/21	1.00	E 04	CU. FT.	1.3 ± 0.3	E-02	2.5 ± 1.5	E-03	04/13	L.T.	2.	E-02
03/21	03/28	1.01	E 04	CU. FT.	1.5 ± 0.3	E-02	4.3 ± 1.8	E-03	05/02	L.T.	1.	E-02
03/28	04/04	1.00	E 04	CU. FT.	1.4 ± 0.3	E-02	3.0 ± 1.6	E-03	05/02	L.T.	2.	E-02
04/04	04/11	1.00	E 04	CU. FT.	1.3 ± 0.2	E-02	2.6 ± 1.5	E-03	05/03	L.T.	1.	E-02
04/11	04/18	9.83	E 03	CU. FT.	1.3 ± 0.2	E-02	2.1 ± 1.2	E-03	05/05	L.T.	1.	E-02
04/18	04/25	9.97	E 03	CU. FT.	1.8 ± 0.3	E-02	3.3 ± 1.6	E-03	05/12	L.T.	1.	E-02
04/25	05/02	1.02	E 04	CU. FT.	2.3 ± 0.3	E-02	3.6 ± 1.5	E-03	05/26	L.T.	1.	E-02
05/02	05/09	1.03	E 04	CU. FT.	2.4 ± 0.3	E-02	4.3 ± 1.7	E-03	06/02	L.T.	1.	E-02
05/09	05/16	9.79	E 03	CU. FT.	2.2 ± 0.3	E-02	4.8 ± 1.8	E-03	06/02	L.T.	2.	E-02
05/16	05/23	9.92	E 03	CU. FT.	2.1 ± 0.3	E-02	3.0 ± 1.5	E-03	06/02	L.T.	1.	E-02
05/23	05/30	1.01	E 04	CU. FT.	1.9 ± 0.3	E-02	2.1 ± 1.3	E-03	06/02	L.T.	1.	E-02
05/30	06/06	1.00	E 04	CU. FT.	2.2 ± 0.3	E-02	3.5 ± 1.5	E-03	06/23	L.T.	2.	E-02
06/06	06/13	1.00	E 04	CU. FT.	2.2 ± 0.3	E-02	4.0 ± 1.6	E-03	07/05	L.T.	1.	E-02
06/13	06/20	1.02	E 04	CU. FT.	1.6 ± 0.3	E-02	1.0 ± 0.9	E-03	07/05	L.T.	2.	E-02
06/20	06/27	9.88	E 03	CU. FT.	1.9 ± 0.3	E-02	2.4 ± 1.4	E-03	07/21	L.T.	2.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-1
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
AIR PARTICULATE & CHARCOAL FILTERS

STATION NUMBER 10

STATION NUMBER 10												
COLL. START DATE	TIME STOP DATE	SAMPLE			AP FILTER GROSS BETA (PCI/CU.M.)		AP FILTER GROSS ALPHA (PCI/CU.M.)		MID-COUNT DATE	CHARCOAL FILTER I-131 (PCI/CU. M.)		
		VOLUME		UNITS								
06/27	07/05	1.16	E 04	CU. FT.	2.7 ± 0.3	E-02	2.3 ± 1.1	E-03	07/25	L.T.	1.	E-02
07/05	07/11	8.57	E 03	CU. FT.	4.0 ± 0.4	E-02	5.2 ± 1.9	E-03	07/26	L.T.	1.	E-02
07/11	07/18	1.03	E 04	CU. FT.	2.9 ± 0.3	E-02	3.6 ± 1.6	E-03	08/15	L.T.	1.	E-02
07/18	07/25	9.53	E 03	CU. FT.	2.3 ± 0.3	E-02	3.0 ± 1.6	E-03	08/01	L.T.	1.	E-02
07/25	08/01	(c)			(c)		(c)			(c)		
08/01	08/08	9.94	E 03	CU. FT.	3.7 ± 0.4	E-02	3.3 ± 1.6	E-03	08/15	L.T.	2.	E-02
08/08	08/15	1.00	E 04	CU. FT.	3.9 ± 0.4	E-02	2.5 ± 1.3	E-03	08/24	L.T.	1.	E-02
08/15	08/22	9.94	E 03	CU. FT.	3.3 ± 0.3	E-02	2.3 ± 1.4	E-03	08/29	L.T.	2.	E-02
08/22	08/29	1.01	E 04	CU. FT.	4.4 ± 0.4	E-02	3.1 ± 1.6	E-03	09/12	L.T.	2.	E-02
08/29	09/05	9.94	E 03	CU. FT.	3.8 ± 0.4	E-02	3.0 ± 1.8	E-03	09/16	L.T.	2.	E-02
09/05	09/12	1.00	E 04	CU. FT.	3.1 ± 0.3	E-02	2.4 ± 1.7	E-03	09/16	L.T.	2.	E-02
09/12	09/19	1.00	E 04	CU. FT.	3.4 ± 0.3	E-02	3.8 ± 1.7	E-03	09/28	L.T.	2.	E-02
09/19	09/26	1.01	E 04	CU. FT.	1.8 ± 0.3	E-02	3.5 ± 1.8	E-03	10/11	L.T.	2.	E-02
09/26	10/03	9.69	E 03	CU. FT.	4.1 ± 0.4	E-02	3.2 ± 1.7	E-03	10/06	L.T.	2.	E-02
10/03	10/10	1.03	E 04	CU. FT.	(e)		(e)		10/16	L.T.	1.	E-02
10/10	10/16	8.24	E 04	CU. FT.	4.1 ± 0.4	E-02	1.2 ± 0.3	E-02	12/08	L.T.	3.	E-02
10/16	10/24	1.14	E 04	CU. FT.	4.8 ± 0.4	E-02	6.8 ± 1.9	E-03	11/17	L.T.	1.	E-02
10/24	10/31	9.93	E 03	CU. FT.	3.4 ± 0.4	E-02	2.4 ± 1.4	E-03	11/15	(a)		
10/31	11/07	1.02	E 04	CU. FT.	2.2 ± 0.3	E-02	9.3 ± 2.5	E-03	01/17	L.T.	7.	E-03
11/07	11/13	7.61	E 03	CU. FT.	2.1 ± 0.4	E-02	1.2 ± 0.3	E-02	03/09	L.T.	9.	E-03
11/13	11/21	1.12	E 04	CU. FT.	2.7 ± 0.3	E-02	3.0 ± 1.4	E-03	12/13	L.T.	2.	E-02
11/21	11/28	1.00	E04	CU. FT	3.7 ± 0.4	E-02	4.0 ± 1.8	E-03	12/08	L.T.	7.	E-03
11/28	12/05	1.01	E 04	CU. FT.	1.3 ± 0.3	E-02	2.6 ± 1.3	E-03	01/12	L.T.	1.	E-02
12/05	12/12	1.02	E 04	CU. FT.	2.4 ± 0.3	E-02	1.7 ± 1.1	E-03	12/22	L.T.	1.	E-02
12/12	12/19	1.03	E 04	CU. FT.	3.2 ± 0.3	E-02	1.1 ± 0.2	E-02	03/15	L.T.	1.	E-02

- (a) Sample not analyzed due to delay in counting.
- (b) Sample not collected.
- (c) Unable to determine volume.
- (d) Pump failure. Sample invalid.
- (e) Sample lost.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 01

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	8.57±1.43 E-02	1.16±0.16 E-01	1.26±0.26 E-01	6.56±0.93 E-02
K-40	L.T. 8. E-03	L.T. 8 E-03	L.T. 6. E-03	L.T. 7. E-03
MN-54	L.T. 6. E-04	L.T. 5. E-04	L.T. 1. E-03	L.T. 5. E-04
CO-58	L.T. 9. E-04	L.T. 1. E-03	L.T. 5. E-03(b)	L.T. 1. E-03
FE-59	L.T. 3. E-03	L.T. 5. E-03	L.T. 3. E 02(b)	L.T. 6. E-03
CO-60	L.T. 5. E-04	L.T. 5. E-04	L.T. 8. E 04	L.T. 4. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 3. E 03	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 4. E-03
RU-106	L.T. 4. E-03	L.T. 5. E-03(a)	L.T. 1. E-02(b)	L.T. 4. E-03
I-131	L.T. 9. E-01	L.T. 2. E 00(a)	L.T. 1. E 03	L.T. 2. E 02
CS-134	L.T. 6. E-04	L.T. 5. E-04	L.T. 8. E-04	L.T. 4. E-04
CS-137	L.T. 5. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 3. E-04
BA-140	L.T. 6. E-02	L.T. 9. E-02	L.T. 3. E 02(b)	L.T. 2. E 00
CE-141	L.T. 4. E-03	L.T. 4. E-03(a)	L.T. 9. E-02(b)	L.T. 1. E-02
CE-144	L.T. 3. E-03	L.T. 9. E-03	L.T. 6. E-03(b)	L.T. 2. E-03
RA-226	L.T. 8. E-03	L.T. 9. E-03	L.T. 1. E-03	L.T. 7. E-03
TH-228	L.T. 8. E-04	L.T. 8. E-04	L.T. 1. E-03	L.T. 5. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
(b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)
 STATION NUMBER 02

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.26±1.28 E-02	1.22±0.14 E-01	1.23±0.26 E-01	5.79±0.95 E-02
K-40	L.T. 6. E-03	L.T. 7. E-03	L.T. 7. E-03	L.T. 8. E-03
MN-54	L.T. 4. E-04	L.T. 5. E-04	L.T. 1. E-03	L.T. 5. E-04
CO-58	L.T. 1. E-03	L.T. 8. E-04	L.T. 5. E-03(b)	L.T. 1. E-03
FE-59	L.T. 4. E-03	L.T. 3. E-03	L.T. 4. E-02(b)	L.T. 7. E-03
CO-60	L.T. 5. E-04	L.T. 5. E-04	L.T. 8. E-04	L.T. 4. E-04
ZN-65	L.T. 1. E-03	L.T. 9. E-04	L.T. 3. E-03	L.T. 1. E-03
ZR-95	L.T. 9. E-04	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 4. E-03
RU-106	L.T. 4. E-03	L.T. 4. E-03(a)	L.T. 1. E-02(b)	L.T. 4. E-03
I-131	L.T. 8. E-01	L.T. 2. E 00(a)	L.T. 1. E 03	L.T. 2. E 02
CS-134	L.T. 5. E-04	L.T. 4. E-04	L.T. 8. E-04	L.T. 3. E-04
CS-137	L.T. 4. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 4. E-04
BA-140	L.T. 4. E-02	L.T. 4. E-02	L.T. 3. E 02(b)	L.T. 2. E 00
CE-141	L.T. 4. E-03	L.T. 5. E-03	L.T. 9. E-02(b)	L.T. 8. E-03
CE-144	L.T. 3. E-03	L.T. 3. E-03(a)	L.T. 6. E-03(b)	L.T. 2. E-03
RA-226	L.T. 1. E-02	L.T. 1. E-02	L.T. 1. E-03	L.T. 8. E-03
TH-228	L.T. 8. E-04	L.T. 9. E-04	L.T. 1. E-03	L.T. 7. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
 (b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 03

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	5.04±1.06 E-02	6.54±1.28 E-02	1.04±0.24 E-01	1.03±0.12 E-01
K-40	L.T. 8. E-03	L.T. 2. E-02	L.T. 5. E-03	L.T. 1. E-02
MN-54	L.T. 4. E-04	L.T. 6. E-04	L.T. 1. E-03	L.T. 5. E-04
CO-58	L.T. 9. E-04	L.T. 1. E-03	L.T. 5. E-03(b)	L.T. 2. E-03
FE-59	L.T. 4. E-03	L.T. 6. E-03	L.T. 3. E-02(b)	L.T. 8. E-03
CO-60	L.T. 5. E-04	L.T. 7. E-04	L.T. 7. E-04	L.T. 4. E-04
ZN-65	L.T. 1. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 5. E-03
RU-106	L.T. 4. E-03	L.T. 5. E-03(a)	L.T. 9. E-03(b)	L.T. 4. E-03
I-131	L.T. 1. E 00	L.T. 2. E 00(a)	L.T. 1. E 05	L.T. 2. E 02
CS-134	L.T. 5. E-04	L.T. 6. E-04	L.T. 8. E-04	L.T. 4. E 04
CS-137	L.T. 4. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 4. E-04
BA-140	L.T. 7. E-02	L.T. 1. E-01(a)	L.T. 3. E 02(b)	L.T. 2. E 00
CE-141	L.T. 3. E-03	L.T. 4. E-03(a)	L.T. 9. E-02(b)	L.T. 1. E-02
CE-144	L.T. 2. E-03	L.T. 3. E-03	L.T. 7. E-03(b)	L.T. 2. E-03
RA-226	L.T. 6. E-03	L.T. 8. E-03	L.T. 1. E-03	L.T. 9. E-03
TH-228	L.T. 6. E-04	L.T. 8. E-04	L.T. 1. E-03	L.T 5. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
(b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)
 STATION NUMBER 04

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	7.30±1.05 E-02	8.76±1.20 E-02	1.27±0.28 E-01	6.39±0.84 E-02
K-40	L.T. 9. E-03	L.T. 8. E-03	L.T. 7. E-03	L.T. 7. E-03
MN-54	L.T. 5. E-04	L.T. 5. E-04	L.T. 1. E-03	L.T. 4. E-04
CO-58	L.T. 9. E-04	L.T. 8. E-04	L.T. 6. E-03(b)	L.T. 1. E-03
FE-59	L.T. 5. E-03	L.T. 4. E-03	L.T. 4. E-02(b)	L.T. 6. E-03
CO-60	L.T. 4. E-04	L.T. 4. E-04	L.T. 8. E-04	L.T. 7. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 3. E-03	L.T. 9. E-04
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 1. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 4. E-03
RU-106	L.T. 4. E-03	L.T. 4. E-03(a)	L.T. 1. E-02(b)	L.T. 3. E-03
I-131	L.T. 8. E-01	L.T. 1. E 00(a)	L.T. 1. E 04	L.T. 1. E 02
CS-134	L.T. 5. E-04	L.T. 5. E-04	L.T. 9. E-04	L.T. 3. E-04
CS-137	L.T. 5. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 4. E-04
BA-140	L.T. 7. E-02	L.T. 1. E-01(a)	L.T. 4. E 02(b)	L.T. 1. E 00
CE-141	L.T. 3. E-03	L.T. 4. E-03(a)	L.T. 9. E-02(b)	L.T. 7. E-03
CE-144	L.T. 2. E-03	L.T. 3. E-03	L.T. 6. E-03(b)	L.T. 2. E-03
RA-226	L.T. 6. E-03	L.T. 8. E-03	L.T. 1. E-03	L.T. 5. E-03
TH-228	L.T. 6. E-04	L.T. 8. E-04	L.T. 1. E-03	L.T. 4. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
 (b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 05

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	1.08±0.15 E-01	1.17±0.14 E-01	1.13±0.48 E-01	8.86±1.05 E-02
K-40	L.T. 8. E-03	L.T. 9. E-03	L.T. 6. E-03	L.T. 8. E-03
MN-54	L.T. 5. E-04	L.T. 5. E-04	L.T. 1. E-03	L.T. 5. E-04
CO-58	L.T. 8. E-04	L.T. 1. E-03	L.T. 5. E-03(b)	L.T. 1. E-03
FE-59	L.T. 4. E-03	L.T. 5. E-03	L.T. 3. E-02(b)	L.T. 7. E-03
CO-60	L.T. 6. E-04	L.T. 5. E-04	L.T. 7. E-04	L.T. 3. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 3. E-03	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 4. E-03
RU-106	L.T. 4. E-03	L.T. 5. E-03(a)	L.T. 9. E-03(b)	L.T. 4. E-03
I-131	L.T. 1. E 00	L.T. 1. E 00(a)	L.T. 1. E 05	L.T. 2. E 02
CS-134	L.T. 4. E-04	L.T. 5. E-04	L.T. 8. E-04	L.T. 4. E-04
CS-137	L.T. 5. E-04	L.T. 4. E-04	L.T. 7 E-04	L.T. 3. E-04
BA-140	L.T. 7. E-02	L.T. 8. E-02	L.T. 3. E 02(b)	L.T. 2. E 00
CE-141	L.T. 4. E-03	L.T. 3. E-03	L.T. 9. E-02(b)	L.T. 8. E-03
CE-144	L.T. 3. E-03	L.T. 2. E-03	L.T. 6. E-03(b)	L.T. 2. E-03
RA-226	L.T. 8. E-03	L.T. 6. E-03	L.T. 1. E-03	L.T. 7. E-03
TH-228	L.T. 8. E-04	L.T. 7. E-04	L.T. 1. E-03	L.T. 7. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
(b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)
 STATION NUMBER 06

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	6.21±1.41 E-02	8.63±1.62 E-02	7.84±1.62 E-02	8.67±1.34 E-02
K-40	L.T. 9. E-03	L.T. 3. E-02	L.T. 5. E-03	L.T. 1. E-02
MN-54	L.T. 5. E-04	L.T. 7. E-04	L.T. 8. E-04	L.T. 6. E-04
CO-58	L.T. 1. E-03	L.T. 1. E-03	L.T. 4. E-03(b)	L.T. 2. E-03
FE-59	L.T. 3. E-03	L.T. 6. E-03	L.T. 3. E-02(b)	L.T. 9. E-03
CO-60	L.T. 6. E-04	L.T. 8. E-04	L.T. 5. E-04	L.T. 5. E-04
ZN-65	L.T. 1. E-03	L.T. 2. E-03	L.T. 2. E-03	L.T. 2. E-03
ZR-95	L.T. 1. E-03	L.T. 2. E-03	L.T. 9. E-03(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 3. E-03	L.T. 2. E-02(b)	L.T. 6. E-03
RU-106	L.T. 5. E-03	L.T. 7. E-03(a)	L.T. 7. E-03(b)	L.T. 5. E-03
I-131	L.T. 1. E 00	L.T. 2. E 00(a)	L.T. 8. E 04	L.T. 2. E 02
CS-134	L.T. 6. E-04	L.T. 8. E-04	L.T. 6. E-04	L.T. 5. E-04
CS-137	L.T. 5. E-04	L.T. 7. E-04	L.T. 5. E-04	L.T. 5. E-04
BA-140	L.T. 8. E-02	L.T. 1. E-02(a)	L.T. 3. E 02(b)	L.T. 2. E 00
CE-141	L.T. 6. E-03	L.T. 7. E-03(a)	L.T. 7. E-02(b)	L.T. 1. E-02
CE-144	L.T. 4. E-03	L.T. 5. E-03(a)	L.T. 5. E-03(b)	L.T. 3. E-03
RA-226	L.T. 1. E-02	L.T. 1. E-02	L.T. 9. E-04	L.T. 1. E-02
TH-228	L.T. 1. E-03	L.T. 1. E-03	L.T. 8. E-04	L.T. 1. E-03

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
 (b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 07

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	1.29±0.14 E-01	1.16±0.17 E-01	L.T. 9. E-02	6.77±0.93 E-02
K-40	L.T. 9. E-03	L.T. 2. E-02	L.T. 6. E-03	L.T. 8. E-03
MN-54	L.T. 5. E-04	L.T. 8. E-04	L.T. 1. E-03	L.T. 5. E-04
CO-58	L.T. 8. E-04	L.T. 1. E-03	L.T. 5. E-03(b)	L.T. 1. E-03
FE-59	L.T. 3. E-03	L.T. 7. E-03(a)	L.T. 4. E-02(b)	L.T. 7. E-03
CO-60	L.T. 5. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 3. E-04
ZN-65	L.T. 1. E-03	L.T. 2. E-03	L.T. 3. E-03	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 2. E-03	L.T. 1. E-02(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 3. E-03	L.T. 3. E-02(b)	L.T. 4. E-03
RU-106	L.T. 5. E-03	L.T. 6. E-03(a)	L.T. 9. E-03(b)	L.T. 4. E-03
I-131	L.T. 9. E-01	L.T. 2. E 00(a)	L.T. 1. E 05	L.T. 1. E 02
CS-134	L.T. 5. E-04	L.T. 6. E-04	L.T. 8. E-04	L.T. 3. E-04
CS-137	L.T. 7. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 3. E-04
BA-140	L.T. 6. E-02	L.T. 1. E-01(a)	L.T. 3. E 02(b)	L.T. 2. E 00
CE-141	L.T. 3. E-03	L.T. 5. E-03(a)	L.T. 9. E-02(b)	L.T. 8. E-03
CE-144	L.T. 3. E-03	L.T. 4. E-03(a)	L.T. 7. E-03(b)	L.T. 2. E-03
RA-226	L.T. 8. E-03	L.T. 9. E-03	L.T. 1. E-03	L.T. 8. E-03
TH-228	L.T. 7. E-04	L.T. 9. E-04	L.T. 9. E-04	L.T. 5. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
(b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 08

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	1.15±0.13 E-01	1.13±0.14 E-01	L.T. 1. E-01	6.50±1.35 E-02
K-40	L.T. 9 E-03	L.T. 7. E-03	L.T. 8. E-03	L.T. 1. E-02
MN-54	L.T. 5. E-04	L.T. 4. E-04	L.T. 1. E-03	L.T. 6. E-04
CO-58	L.T. 9. E-04	L.T. 9. E-04	L.T. 6. E-03(b)	L.T. 2. E-03
FE-59	L.T. 4. E-03	L.T. 4. E-03	L.T. 4. E-02(b)	L.T. 8. E-03
CO-60	L.T. 5. E-04	L.T. 5. E-04	L.T. 8. E-04	L.T. 5. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 3. E-03	L.T. 1. E-03
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 2. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 6. E-03
RU-106	L.T. 5. E-03	L.T. 5. E-03(a)	L.T. 10. E-03(b)	L.T. 5. E-03
I-131	L.T. 8. E-01	L.T. 2. E 00(a)	L.T. 1. E 05	L.T. 2. E 02
CS-134	L.T. 5. E-04	L.T. 5. E-04	L.T. 9. E-04	L.T. 5. E-04
CS-137	L.T. 5. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 4. E-04
BA-140	L.T. 8. E-02	L.T. 1. E-01(a)	L.T. 4. E 02(b)	L.T. 3. E 00
CE-141	L.T. 3. E-03	L.T. 4. E-03(a)	L.T. 9. E-02(b)	L.T. 1. E-01
CE-144	L.T. 2. E-03	L.T. 3. UE-03	L.T. 6. E-03(b)	L.T. 2. E-03
RA-226	L.T. 6. E-03	L.T. 9. E-03	L.T. 1. E-03	L.T. 9. E-03
TH-228	L.T. 7. E-04	L.T. 8. E-04	L.T. 1. E-03	L.T. 7. E-04

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
(b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
(PCI/CU. M.)
STATION NUMBER 09

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	1.27±0.17 E-01	1.22±0.15 E-01	1.45±0.56 E-01	8.84±1.31 E-02
K-40	L.T. 2. E-02	4.71±2.58 E-03	L.T. 6. E-03	L.T. 8. E-03
MN-54	L.T. 7. E-04	L.T. 4. E-04	L.T. 1. E-03	L.T. 1. E-03
CO-58	L.T. 1. E-03	L.T. 7. E-04	L.T. 5. E-03(b)	L.T. 3. E-03
FE-59	L.T. 5. E-03	L.T. 4. E-03	L.T. 3. E-02(b)	L.T. 1. E-02
CO-60	L.T. 7. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 8. E-04
ZN-65	L.T. 2. E-03	L.T. 9. E-04	L.T. 3. E-03	L.T. 2. E-03
ZR-95	L.T. 2. E-03	L.T. 9. E-04	L.T. 1. E-02(b)	L.T. 3. E-03
RU-103	L.T. 3. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 9. E-03
RU-106	L.T. 7. E-03	L.T. 4. E-03(a)	L.T. 9. E-03(b)	L.T. 8. E-03
I-131	L.T. 1. E 00	L.T. 2. E 00(a)	L.T. 1. E 05	L.T. 3. E 02
CS-134	L.T. 8. E-04	L.T. 4. E-04	L.T. 8. E-04	L.T. 7. E-04
CS-137	L.T. 7. E-04	L.T. 4. E-04	L.T. 7. E-04	L.T. 7. E-04
BA-140	L.T. 8. E-02	L.T. 8. E-02	L.T. 3. E 02(b)	L.T. 3. E 00
CE-141	L.T. 4. E-03	L.T. 5. E-03(a)	L.T. 9. E-02(b)	L.T. 2. E-02
CE-144	L.T. 3. E-03	L.T. 3. E-03	L.T. 6. E-03(b)	L.T. 6. E-03
RA-226	L.T. 9. E-03	L.T. 1. E-02	L.T. 1. E-03	L.T. 1. E-02
TH-228	L.T. 9. E-04	L.T. 8. E-04	L.T. 1. E-03	L.T. 1. E-03

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
(b) Due to delay in counting, LLDs were not met.

VII-2
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AIRBORNE
COMPOSITE AIR PARTICULATE FILTERS
 (PCI/CU. M.)
 STATION NUMBER 10

DATE COLLECTED:	12/28-03/28	03/28-06/27	06/27-09/26	09/26-12/26
GAMMA SPECTRUM ANALYSIS:				
BE-7	9.64±1.32 E-02	1.04±0.13 E-01	1.46±0.22 E-01	8.51±1.34 E-02
K-40	L.T. 8. E-03	L.T. 1. E-02	L.T. 4. E-03	L.T. 8. E-03
MN-54	L.T. 5. E-04	L.T. 5. E-04	L.T. 9. E-04	L.T. 1. E-03
CO-58	L.T. 9. E-04	L.T. 1. E-03	L.T. 5. E-03(b)	L.T. 3. E-03
FE-59	L.T. 3. E-03	L.T. 4. E-03	L.T. 3. E-02(b)	L.T. 1. E-02
CO-60	L.T. 4. E-04	L.T. 6. E-04	L.T. 7. E-04	L.T. 9. E-04
ZN-65	L.T. 1. E-03	L.T. 1. E-03	L.T. 2 E-03	L.T. 2. E-03
ZR-95	L.T. 1. E-03	L.T. 1. E-03	L.T. 1. E-02(b)	L.T. 4. E-03
RU-103	L.T. 2. E-03	L.T. 2. E-03	L.T. 3. E-02(b)	L.T. 1. E-02
RU-106	L.T. 4. E-03	L.T. 4. E-03(a)	L.T. 8. E-03(b)	L.T. 9. E-03
I-131	L.T. 1. E 00	L.T. 1. E 00(a)	L.T. 1. E 05	L.T. 4. E 02
CS-134	L.T. 5. E-04	L.T. 5. E-04	L.T. 7. E-04	L.T. 8. E-04
CS-137	L.T. 6. E-04	L.T. 5. E-04	L.T. 6. E-04	L.T. 8. E-04
BA-140	L.T. 6. E-02	L.T. 9. E-02	L.T. 3. E 02	L.T. 4. E 00
CE-141	L.T. 4. E-03	L.T. 3. E-03	L.T. 2. E-01(b)	L.T. 2. E-02
CE-144	L.T. 3. E-03	L.T. 2. E-03	L.T. 6. E-03(b)	L.T. 6. E-03
RA-226	L.T. 8. E-03	L.T. 7. E-03	L.T. 1. E-03	L.T. 2. E-02
TH-228	L.T. 8. E-04	L.T. 7. E-04	L.T. 1. E-03	L.T. 1. E-03

(a) Equipment malfunction caused a delay in counting. LLDs were not met.
 (b) Due to delay in counting, LLDs were not met.

VII-3
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
FISH
(PCI/GM WET)
STATION NUMBER 28

DATE COLLECTED:

	CARP 06/27		CATFISH 06/27		CARP QA 06/27		CARP 10/19		CATFISH 10/19	
RADIOCHEMICAL ANALYSIS:										
GR-B	4.5 ± 0.1	E 00	3.6 ± 0.1	E 00	4.2 ± 0.1	E 00	5.5 ± 0.2	E 00	5.2 ± 0.1	E 00
SR-89	L.T. 1.	E-02	L.T. 2.	E-02	L.T. 2.	E-02	(a)		(a)	
SR-90	L.T. 2.	E-03	L.T. 3.	E-03	L.T. 4.	E-03	2.0 ± 0.5	E-02	L.T. 3.	E-03
GAMMA SPECTRUM ANALYSIS:										
BE-7	L.T. 1.	E-01	L.T. 7.	E-02	L.T. 7.	E-02	L.T. 2.	E-01	L.T. 2.	E 00
K-40	3.20 ± 0.13	E 00	3.30 ± 0.30	E 00	2.63 ± 0.15	E 00	2.74 ± 0.10	E 00	2.84 ± 0.21	E 00
MN-54	L.T. 5.	E-03	L.T. 7.	E-03	L.T. 7.	E-03	L.T. 4.	E-03	L.T. 3.	E-01
CO-58	L.T. 1.	E-02	L.T. 7.	E-03	L.T. 8.	E-03	L.T. 1.	E-02	L.T. 3.	E-02
FE-59	L.T. 5.	E-02	L.T. 2.	E-02	L.T. 2.	E-02	L.T. 6.	E-02	L.T. 1.	E-01
CO-60	L.T. 4.	E-03	L.T. 7.	E-03	L.T. 6.	E-03	L.T. 3.	E-03	L.T. 5.	E-01
ZN-65	L.T. 1.	E-02	L.T. 2.	E-02	L.T. 2.	E-02	L.T. 9.	E-03	L.T. 3.	E-02
ZR-95	L.T. 2.	E-02	L.T. 8.	E-03	L.T. 1.	E-02	L.T. 1.	E-02	L.T. 8.	E-02
RU-103	L.T. 3.	E-02	L.T. 9.	E-03	L.T. 1.	E-02	L.T. 4.	E-02	L.T. 1.	E-01
RU-106	L.T. 4.	E-02	L.T. 6.	E-02	L.T. 5.	E-02	L.T. 3.	E-02	L.T. 4.	E-01
I-131	L.T. 9.	E 01	L.T. 4.	E-02	L.T. 1.	E-01	L.T. 3.	E 03	L.T. 3.	E-01
CS-134	L.T. 4.	E-03	L.T. 7.	E-03	L.T. 6.	E-03	L.T. 3.	E-03	L.T. 3.	E 04
CS-137	L.T. 4.	E-03	L.T. 7.	E-03	L.T. 6.	E-03	L.T. 4.	E-03	L.T. 3.	E-02
BA-140	L.T. 7.	E-00	L.T. 2.	E-02	L.T. 1.	E-01	L.T. 2.	E 01	L.T. 2.	E-02
CE-141	L.T. 7.	E-02	L.T. 2	E-02	L.T. 2.	E-02	L.T. 9.	E-02	L.T. 2.	E 02
CE-144	L.T. 4.	E-02	L.T. 5.	E-02	L.T. 4.	E-02	L.T. 2.	E-02	L.T. 1.	E 00
RA-226	L.T. 9.	E-03	L.T. 1.	E-01	L.T. 1.	E-02	L.T. 8.	E-02	L.T. 3.	E-01
TH-228	L.T. 1.	E-02	L.T. 1.	E-02	L.T. 1.	E-02	L.T. 5.	E-03	L.T. 4.	E-02

(a) Sr 89 not analyzed due to delay in analyzing sample.
(b) Not available.

VII-3
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
FISH
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED:	6/28 CARP		06/28 CATFISH		6/28 CATFISH (b)		10/19 CARP		10/19 CATFISH (b)
RADIOCHEMICAL ANALYSIS:									
GR-B	2.2 ± 0.1	E 00	5.8 ± 0.1	E 00			4.3 ± 0.2	E 00	
SR-89	L.T. 1.	E-02	L.T. 1.	E-02			(a)		
SR-90	L.T. 2.	E-03	L.T. 3	E-03			L.T. 3.	E-02	
GAMMA SPECTRUM ANALYSIS:									
BE-7	L.T. 8.	E-02	L.T. 5.	E-02			L.T. 2.	E-01	
K-40	3.82 ± 0.20	E 00	3.56 ± 0.20	E 00			2.62 ± 0.10	E 00	
MN-54	L.T. 8.	E-03	L.T. 5.	E-03			L.T. 4.	E-03	
CO-58	L.T. 9.	E-03	L.T. 6.	E-03			L.T. 1.	E-02	
FE-59	L.T. 2.	E-02	L.T. 2.	E-02			L.T. 7.	E-02	
CO-60	L.T. 9.	E-03	L.T. 5.	E-03			L.T. 6.	E-03	
ZN-65	L.T. 2.	E-02	L.T. 1.	E-02			L.T. 9.	E-03	
ZR-95	L.T. 2.	E-02	L.T. 1.	E-02			L.T. 1.	E-02	
RU-103	L.T. 1.	E-02	L.T. 7.	E-03			L.T. 4.	E-02	
RU-106	L.T. 7.	E-02	L.T. 4.	E-02			L.T. 3.	E-02	
I-131	L.T. 5.	E-02	L.T. 6.	E-02			L.T. 3.	E 03	
CS-134	L.T. 8.	E-03	L.T. 4.	E-03			L.T. 3.	E-03	
CS-137	L.T. 9.	E-03	L.T. 4.	E-03			L.T. 4.	E-03	
BA-140	L.T. 1.	E-01	L.T. 8.	E-02			L.T. 2.	E 01	
CE-141	L.T. 2.	E-02	L.T. 1.	E-02			L.T. 9.	E-02	
CE-144	L.T. 5.	E-02	L.T. 2.	E-02			L.T. 2.	E-02	
RA-226	L.T. 2.	E-02	L.T. 9.	E-03			L.T. 8.	E-02	
TH-228	L.T. 1.	E-02	L.T. 3.	E-03			L.T. 5.	E-03	

(a) Sr 89 not analyzed due to delay in analyzing sample.
(b) Not available.

VII-4
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 61

DATE COLLECTED:	01/04/00	02/01/00	03/07/00	03/07/000 QA	4/04/00
RADIOCHEMICAL ANALYSIS:					
SR-89					L.T. 2. E 00(a,c)
SR-90					1.2±0.2 E 00(a)
I-131	L.T.2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T.1. E-01
CA (gm/liter)					1.3±0.1 E 00(a)
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	1.30±0.13 E 03	1.24±0.12E 03	1.15±0.11 E 03	1.19±0.12E 03	9.44±0.94E 02
MN-54	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00
CO-58	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 7. E 00	L.T. 1. E 01	L.T. 8. E 00	L.T. 6. E 00	L.T. 8. E 00
CO-60	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
ZN-65	L.T. 7. E 00	L.T. 1. E 01	L.T. 8. E 00	L.T. 7. E 00	L.T. 8. E 00
ZR-95	L.T. 3. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00
RU-103	L.T. 3. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 4. E 00	L.T. 6. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 7. E 00
CS-134	L.T. 3. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
CS-137	L.T. 3. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
BA-140	L.T. 3. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 6. E 00
CE-141	L.T. 5. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 5. E 00	L.T. 6. E 00
CE-144	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01
RA-226	L.T. 6. E 01	L.T. 9. E 01	L.T. 9. E 01	L.T. 7. E 01	L.T. 7. E 01
TH-228	L.T. 5. E 00	L.T. 7. E 00	L.T. 7. E 00	L.T. 6. E 00	L.T. 7. E 00

- (a) Monthly composite not analyzed. A quarterly composite for Sr89/90 & Ca was analyzed.
 (b) Monthly composite.
 (c) Due to delay in analyzing, the LLD was not met.
 (d) Not analyzed. Sample not received from the sub contract laboratory.

VII-4
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK NEAREST PRODUCER
(PCI/LITER)
STATION NUMBER 61

DATE COLLECTED:	05/02/00	06/06/00	06/06/00 QA	06/20/00	07/05/00
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 2. E 00(b,c)			L.T. 3. E 01(b,c)	
SR-90	1.2 ± 0.2 E 00(b)			1.6 ± 0.7 E 00(b,c)	
I-131	L.T. 3. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01
CA (gm/liter)	1.3 ± 0.1 E 00(b)			9.6 ± 0.1 E-01(b)	
GAMMA SPECTRUM ANALYSIS:					
BE-7	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	1.30±0.13 E 03	1.38±0.14E 03	1.24±0.12 E 03	1.26±0.13E 03	1.50±0.15 E 03
MN-54	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
CO-58	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 1. E 01	L.T. 1. E 01	L.T. 9. E 00	L.T. 1. E 01	L.T. 1. E 01
CO-60	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 1. E 01	L.T. 9. E 00	L.T. 7. E 00	L.T. 9. E 00	L.T. 9. E 00
ZR-95	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 8. E 00	L.T. 8. E 00	L.T. 7. E 00	L.T. 8. E 00	L.T. 7. E 00
CS-134	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 6. E 00	L.T. 5. E 00	L.T. 5. E 00	L.T. 6. E 00	L.T. 5. E 00
CE-141	L.T. 7. E 00	L.T. 8. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 6. E 00
CE-144	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 8. E 01	L.T. 9. E 01	L.T. 7. E 01	L.T. 7. E 01	L.T. 6. E 01
TH-228	L.T. 7. E 00	L.T. 7. E 00	L.T. 6. E 00	L.T. 5. E 00	L.T. 6. E 00

- (a) Monthly composite not analyzed. A quarterly composite for Sr89/90 & Ca was analyzed.
- (b) Monthly composite.
- (c) Due to delay in analyzing, the LLD was not met.
- (d) Not analyzed. Sample not received from the sub contract laboratory.

VII-4
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 MILK NEAREST PRODUCER
 (PCI/LITER)
 STATION NUMBER 61

DATE COLLECTED:	07/18/00	08/01/00	08/15/00	08/29/00	09/12/00
RADIOCHEMICAL ANALYSIS:					
SR-89	L.T. 1. E 00(b)			L.T. 6. E 00 (b,c)	
SR-90	6.4 ± 1.8 E-01(b)			8.8 ± 1.8E-01 (b)	
I-131	L.T. 2. E-01	L.T. 3. E-01	L.T. 9. E-01	L.T. 2. E-01	L.T. 4. E-01
CA (gm/liter)	8.7 ± 0.9 E-01(b)			7.5 ± 0.7E-01 (b)	

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 1. E 02	L.T. 3. E 01
K-40	1.17±0.12 E 03	1.31±0.13E 03	1.36±0.14E 03	2.15±0.08E 03	1.25±0.13 E 03
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
CO-58	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 8. E 00	L.T. 3. E 00
FE-59	L.T. 9. E 00	L.T. 9. E 00	L.T. 9. E 00	L.T. 3. E 01	L.T. 1. E 01
CO-60	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00
ZN-65	L.T. 8. E 00	L.T. 7. E 00	L.T. 8. E 00	L.T. 8. E 00	L.T. 7. E 00
ZR-95	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 01	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 01	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 7. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 4. E 04	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00
CS-137	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
BA-140	L.T. 5. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 03 (c)	L.T. 8. E 00
CE-141	L.T. 8. E 00	L.T. 6. E 00	L.T. 5. E 00	L.T. 7. E 01	L.T. 6. E 00
CE-144	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01	L.T. 4. E 01	L.T. 2. E 01
RA-226	L.T. 8. E 01	L.T. 7. E 01	L.T. 7. E 01	L.T. 1. E 01	L.T. 6. E 01
TH-228	L.T. 7. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 3. E 01	L.T. 6. E 00

- (a) Monthly composite not analyzed. A quarterly composite for Sr89/90 & Ca was analyzed.
 (b) Monthly composite.
 (c) Due to delay in analyzing, the LLD was not met.
 (d) Not analyzed. Sample not received from the sub contract laboratory.

VII-4
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 MILK NEAREST PRODUCER
 (PCI/LITER)
 STATION NUMBER 61

DATE COLLECTED:	09/26/00	10/03/00	11/07/00	12/05/00
RADIOCHEMICAL ANALYSIS:				
SR-89	L.T. 6. E 00 (b,c)	(d)	(d)	(d)
SR-90	1.2 ± 0.3 E 00(b,c)	(d)	(d)	(d)
I-131	L.T. 3. E-01	L.T. 4. E-01	L.T. 8. E-01	L.T. 6. E-01
CA (gm/liter)	8.1 ± 0.8 E-01 (b)	8.7 ± 0.9 E-01	8.8 ± 0.9 E-01	8.6 ± 0.9 E-01
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 4. E 01	L.T. 4. E 01	L.T. 2. E 01	L.T. 4. E 01
K-40	1.29±0.13 E 03	1.28±0.13 E 03	1.30±0.10 E 03	1.2 ± 0.20 E 03
MN-54	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 00	L.T. 7. E 00
CO-58	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00
FE-59	L.T. 1. E 01	L.T. 1. E 01	L.T. 7. E 00	1.7 ± 0.90 E 01
CO-60	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 00	L.T. 3. E 00
ZN-65	L.T. 8. E 00	L.T. 1. E 01	L.T. 8. E 00	L.T. 2. E 01
ZR-95	L.T. 4. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 1. E 01
RU-103	L.T. 5. E 00	L.T. 5. E 00	L.T. 5. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01	L.T. 2. E 01	L.T. 5. E 00
I-131	L.T. 2. E 01	L.T. 7. E 00	L.T. 3. E 01 (c)	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 4. E 00	L.T. 2. E 00	L.T. 4. E 00
CS-137	L.T. 4. E 00	L.T. 4. E 00	L.T. 2. E 00	L.T. 5. E 00
BA-140	L.T. 9. E 00	L.T. 6. E 00	L.T. 1. E 01	L.T. 2. E 01
CE-141	L.T. 9. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 9. E 01
CE-144	L.T. 3. E 01	L.T. 3. E 01	L.T. 1. E 01	L.T. 5. E 01
RA-226	L.T. 8. E 01	L.T. 7. E 01	1.50±0.30 E 02	L.T. 2. E 02
TH-228	L.T. 7. E 00	L.T. 7. E 00	L.T. 3. E 01	L.T. 6. E 02

- (a) Monthly composite not analyzed. A quarterly composite for Sr89/90 & Ca was analyzed.
 (b) Monthly composite.
 (c) Due to delay in analyzing, the LLD was not met.
 (d) Not analyzed. Sample not received from the sub contract laboratory.

VII-5
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK OTHER PRODUCER
(PCI/LITER)
STATION NUMBER 99

DATE COLLECTED:	01/11/00	04/11/00	07/11/00	10/10/00
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RADIOCHEMICAL ANALYSIS:

SR-89	L.T. 8. E-01	L.T. 9. E-01	L.T. 1. E 00	(b)
SR-90	1.6 ± 0.2 E 00(c)	1.2 ± 0.3 E 00(c)	1.5 ± 0.2 E 00(c)	7.3 ± 3.1 E-01
I-131	L.T. 3. E-01	L.T. 2. E-01	L.T. 3. E-01	L.T. 4. E-01
CA (gm/liter)	1.9 ± 0.2 E 00	1.7 ± 0.2 E 00	1.6 ± 0.2 E 00	6.4 ± 0.6 E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 2. E 01	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01
K-40	1.31±0.13 E 03	1.51±0.15 E 03	L.T. 2. E 02	1.39±0.14 E 03
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 7. E 00	L.T. 8. E 00	L.T. 1. E 01	L.T. 1. E 01
CO-60	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 8. E 00	L.T. 8. E 00	L.T. 9. E 00	L.T. 9. E 00
ZR-95	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 3. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01
I-131	L.T. 4. E 00	L.T. 6. E 00	L.T. 9. E 00	L.T. 7. E 00
CS-134	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 4. E 00	L.T. 5. E 00	L.T. 7. E 00	L.T. 5. E 00
CE-141	L.T. 6. E 00	L.T. 5. E 00	L.T. 7. E 00	L.T. 6. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01	L.T. 3. E 01	L.T. 2. E 01
RA-226	L.T. 8. E 01	L.T. 7. E 01	L.T. 7. E 01	L.T. 7. E 01
TH-228	L.T. 7. E 00	L.T. 6. E 00	L.T. 6. E 00	L.T. 6. E 00

- (a) Due to system malfunction, the gamma data was lost.
- (b) Not analyzed due to delay in analyzing.
- (c) Due to delay in analysis, LLDs were not met.

VII-5
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
MILK OTHER PRODUCER
(PCI/LITER)
STATION NUMBER 100

DATE COLLECTED: 01/11/00
RADIOCHEMICAL ANALYSIS:

	01/11/00	04/11/00	07/11/00	10/10/00
SR-89	L.T. 9. E-01	L.T. 1. E 00	L.T. 8. E-01	(b)
SR-90	1.3 ± 0.2 E 00	1.6 ± 0.4 E 00(c)	7.8 ± 1.6 E-01	L.T. 3. E-01
I-131	L.T. 3. E-01	L.T. 2. E-01	L.T. 3. E-01	(b)
CA (gm/liter)	2.2 ± 0.2 E 00	1.4 ± 0.1 E 00	1.7 ± 0.2 E 00	9.1 ± 0.9 E-01

GAMMA SPECTRUM ANALYSIS:

	01/11/00	04/11/00	07/11/00	10/10/00
BE-7	L.T. 2. E 01	L.T. 5. E 01	(a)	L.T. 3. E 01
K-40	1.31±0.13 E 03	1.24±0.12 E 03	(a)	1.14±0.11 E 03
MN-54	L.T. 3. E 00	L.T. 5. E 00	(a)	L.T. 4. E 00
CO-58	L.T. 3. E 00	L.T. 5. E 00	(a)	L.T. 4. E 00
FE-59	L.T. 7. E 01	L.T. 1. E 01	(a)	L.T. 1. E 01
CO-60	L.T. 3. E 00	L.T. 5. E 00	(a)	L.T. 4. E 00
ZN-65	L.T. 8. E 01	L.T. 1. E 01	(a)	L.T. 8. E 00
ZR-95	L.T. 3. E 00	L.T. 5. E 00	(a)	L.T. 4. E 00
RU-103	L.T. 3. E 00	L.T. 6. E 00	(a)	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01	(a)	L.T. 3. E 01
I-131	L.T. 4. E 00	L.T. 8. E 00	(a)	L.T. 7. E 00
CS-134	L.T. 4. E 00	L.T. 5. E 00	(a)	L.T. 4. E 00
CS-137	L.T. 3. E 00	L.T. 5. E 00	(a)	L.T. 4. E 00
BA-140	L.T. 4. E 00	L.T. 7. E 00	(a)	L.T. 5. E 00
CE-141	L.T. 6. E 00	L.T. 8. E 00	(a)	L.T. 6. E 00
CE-144	L.T. 2. E 01	L.T. 3. E 01	(a)	L.T. 2. E 01
RA-226	L.T. 8. E 01	L.T. 9. E 01	(a)	L.T. 7. E 01
TH-228	L.T. 7. E 00	L.T. 8. E 00	(a)	L.T. 6. E 00

- (a) Due to system malfunction, the gamma data was lost.
(b) Not analyzed due to delay in analyzing.
(c) Due to delay in analysis, LLDs were not met.

VII-6
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - GROUND
(PCI/LITER)
STATION NUMBER 11

DATE COLLECTED:	01/18/00	04/18/00	07/18/00	10/16/00
RADIOCHEMICAL ANALYSIS:				
GR-A	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 2 E 00
GR-B	9.2 ± 3.1E 00	9.7 ± 1.6E 00	8.4 ± 1.6E 00	6.7 ± 2.6 E 00
I-131	L.T. 2. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 7. E-01
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 3. E 01
K-40	L.T. 6. E 01	L.T. 5. E 01	L.T. 4. E 01	8.10 ± 2.60 E 01
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 2. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 2. E 00
FE-59	L.T. 7. E 00	L.T. 9. E 00	L.T. 5. E 00	L.T. 2. E 00
CO-60	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 2. E 00
ZN-65	L.T. 9. E 00	L.T. 6. E 00	L.T. 5. E 00	L.T. 3. E 00
ZR-95	L.T. 4. E 00	L.T. 3. E 00	L.T. 5. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 2. E 00
RU-106	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 3. E 01
I-131	L.T. 4. E 00	L.T. 1. E 01	L.T. 5. E 00	L.T. 2. E 01
CS-134	L.T. 4. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 1. E 01
CS-137	L.T. 4. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 2. E 00
BA-140	L.T. 5. E 00	L.T. 8. E 00	L.T. 1. E 01	L.T. 3. E 01
CE-141	L.T. 6. E 00	L.T. 8. E 00	L.T. 4. E 00	L.T. 6. E 00
CE-144	L.T. 2. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 2. E 01
RA-226	L.T. 7. E 01	L.T. 8. E 01	1.66 ± 0.23E 01	L.T. 5. E 01
TH-228	L.T. 7. E 00	L.T. 6. E 00	L.T. 4. E 00	L.T. 2. E 01
TRITIUM ANALYSIS:				
H-3	5.8 ± 1.2E 02	L.T. 1. E 02	L.T. 1. E 02	L.T. 2. E 02

VII-6
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - GROUND
(PCI/LITER)
STATION NUMBER 47

DATE COLLECTED:	1/18/000	4/18/00	07/18/00	10/16/00
RADIOCHEMICAL ANALYSIS:				
GR-A	L.T. 3. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 2. E 00
GR-B	1.1 ± 0.2 E 01	1.4 ± 0.2 E 01	6.7 ± 1.4 E 00	L.T. 4. E 00
I-131	L.T. 2. E-01	L.T. 1. E-01	L.T. 2. E-01	L.T. 8. E-01
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01
K-40	L.T. 5. E 01	L.T. 4. E 01	7.98 ± 5.83 E 01	L.T. 6. E 01
MN-54	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 1. E 00
FE-59	L.T. 7. E 00	L.T. 8. E 00	L.T. 9. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 00
ZN-65	L.T. 7. E 00	L.T. 6. E 00	L.T. 9. E 00	L.T. 5. E 00
ZR-95	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 5. E 00
RU-103	L.T. 3. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 3. E 00
RU-106	L.T. 3. E 01	L.T. 2. E 01	L.T. 4. E 01	L.T. 2. E 01
I-131	L.T. 4. E 00	L.T. 1. E 01	L.T. 9. E 00	L.T. 2. E 01
CS-134	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 00
CS-137	L.T. 4. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 2. E 00
BA-140	L.T. 8. E 00	L.T. 3. E 00	L.T. 2. E 01	L.T. 4. E 01
CE-141	L.T. 6. E 00	L.T. 8. E 00	L.T. 8. E 00	L.T. 1. E 01
CE-144	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01	L.T. 3. E 01
RA-226	L.T. 7. E 01	L.T. 7. E 01	9.33 ± 3.38 E 00	L.T. 8. E 01
TH-228	L.T. 7. E 00	L.T. 5. E 00	6.50 ± 3.29 E 00	L.T. 3. E 02
TRITIUM ANALYSIS:				
H-3	L.T. 2. E 02	L.T. 1. E 02	L.T. 1. E 02	L.T. 2. E 02

VII-7
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 12

DATE COLLECTED:	01/04/00	02/01/00	03/07/00	04/04/00
RADIOCHEMICAL ANALYSIS:				
SR-89	L.T. 6. E-01	L.T. 2. E 00(a)	L.T. 6. E-01	L.T. 7. E-01
SR-90	L.T. 1. E 00(a)	L.T. 7. E-01	L.T. 3. E-01	L.T. 4. E-01
GR-A (Dissolved)	L.T. 2. E 00	2.9 ± 2.4 E 00	L.T. 2. E 00	L.T. 3. E 00
GR-A (Suspended)	1.0 ± 0.6 E 00	4.3 ± 3.5 E-01	8.5 ± 6.7 E-01	L.T. 1. E 00
GR-B (Dissolved)	7.1 ± 1.5 E 00	1.2 ± 0.2 E 01	6.4 ± 1.3 E 00	7.9 ± 2.0 E 00
GR-B (Suspended)	3.1 ± 0.7 E 00	1.2 ± 0.6 E 00	4.1 ± 0.8 E 00	1.9 ± 1.0 E 00
I-131	4.0 ± 1.0 E-01	L.T. 2. E-01	L.T. 2. E-01	L.T. 2. E-01
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01
K-40	L.T. 5. E 01	L.T. 1. E 02	L.T. 9. E 01	L.T. 6. E 01
MN-54	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 7. E 00	L.T. 9. E 00	L.T. 7. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 5. E 00	L.T. 3. E 00	L.T. 4. E 00
ZN-65	L.T. 7. E 00	L.T. 9. E 00	L.T. 7. E 00	L.T. 8. E 00
ZR-95	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01	L.T. 3. E 01
I-131	L.T. 7. E 00	L.T. 8. E 00	L.T. 5. E 00	L.T. 1. E 01
CS-134	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00
CS-137	L.T. 4. E 00	L.T. 5. E 00	L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 5. E 00	L.T. 6. E 00	L.T. 4. E 00	L.T. 7. E 00
CE-141	L.T. 8. E 00	L.T. 8. E 00	L.T. 5. E 00	L.T. 9. E 00
CE-144	L.T. 3. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 3. E 01
RA-226	L.T. 8. E 01	L.T. 8. E 01	L.T. 7. E 01	L.T. 8. E 01
TH-228	L.T. 7. E 00	L.T. 7. E 00	L.T. 6. E 00	L.T. 7. E 00
TRITIUM ANALYSIS:				
H-3	01/06-03/07			04/04-06/06
	L.T. 1. E 02			L.T. 1. E 02

VII-7
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 28

DATE COLLECTED:	01/04/00	02/01/00	03/07/00	04/04/00
RADIOCHEMICAL ANALYSIS:				
SR-89	L.T. 6. E-01	L.T. 1. E 00	L.T. 6. E-01	L.T. 7. E-01
SR-90	L.T. 1. E 00(a)	L.T. 4. E-01	L.T. 8. E-01	L.T. 4. E-01
GR-A (Dissolved)	L.T. 2. E 00	3.0 ± 2.4 E 00	3.6 ± 2.3 E 00	5.2 ± 3.7 E 00
GR-A (Suspended)	1.2 ± 0.6 E 00	1.0 ± 0.5 E 00	1.4 ± 0.7 E 00	3.0 ± 1.9 E 00
GR-B (Dissolved)	7.2 ± 1.4 E 00	9.3 ± 1.7 E 00	7.6 ± 1.5 E 00	8.8 ± 2.9 E 00
GR-B (Suspended)	2.9 ± 0.7 E 00	1.8 ± 0.6 E 00	2.8 ± 0.7 E 00	3.9 ± 2.0 E 00
I-131	3.3 ± 0.9 E-01	L.T. 2. E-01	2.7 ± 1.1 E-01	L.T. 3. E-01
GAMMA SPECTRUM ANALYSIS:				
BE-7	L.T. 3. E 01	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01
K-40	L.T. 5. E 01	L.T. 9. E 01	L.T. 1. E 02	L.T. 6. E 01
MN-54	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00
CO-58	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 3. E 00
FE-59	L.T. 6. E 00	L.T. 7. E 00	L.T. 8. E 00	L.T. 7. E 00
CO-60	L.T. 3. E 00	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00
ZN-65	L.T. 6. E 00	L.T. 7. E 00	L.T. 8. E 00	L.T. 8. E 00
ZR-95	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-106	L.T. 2. E 01	L.T. 3. E 01	L.T. 4. E 01	L.T. 3. E 01
I-131	L.T. 5. E 00	L.T. 7. E 00	L.T. 6. E 00	L.T. 1. E 01
CS-134	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00
CS-137	L.T. 3. E 00	L.T. 4. E 00	L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 4. E 00	L.T. 6. E 00	L.T. 5. E 00	L.T. 7. E 00
CE-141	L.T. 6. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 9. E 00
CE-144	L.T. 2. E 01	L.T. 2. E 01	L.T. 3. E 01	L.T. 3. E 01
RA-226	L.T. 7. E 01	L.T. 7. E 01	L.T. 8. E 01	L.T. 4. E 00
TH-228	L.T. 6. E 00	L.T. 6. E 00	L.T. 7. E 00	L.T. 7. E 00
TRITIUM ANALYSIS:				
H-3	01/06-03/07 L.T. 1. E 02			04/07-06/01 L.T. 1. E 02

VII-7
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 28

DATE COLLECTED:	05/02/00	06/06/00	07/05/00	08/02/00
RADIOCHEMICAL ANALYSIS:				
SR-89	L.T. 1. E 00	L.T. 6. E-01	L.T. 1. E 00	L.T. 1. E 00
SR-90	L.T. 5. E-01	L.T. 3. E-01	L.T. 4. E-01	L.T. 4. E-01
GR-A (Dissolved)	L.T. 3. E 00	5.0 ± 2.5 E 00	L.T. 2. E 00	1.8 ± 1.8 E 00
GR-A (Suspended)	L.T. 6. E-01	1.3 ± 0.7 E 00	7.5 ± 6.4 E-01	1.5 ± 1.0 E 00
GR-B (Dissolved)	9.2 ± 1.6 E 00	9.4 ± 1.6 E 00	9.2 ± 1.5 E 00	9.3 ± 1.5 E 00
GR-B (Suspended)	1.7 ± 0.6 E 00	3.2 ± 0.8 E 00	3.3 ± 0.7 E 00	2.8 ± 0.8 E 00
I-131	L.T. 3. E-01	L.T. 3. E-01	L.T. 3. E-01	L.T. 2. E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 2. E 01	L.T. 2. E 01	L.T. 4. E 01	L.T. 3. E 01
K-40	L.T. 6. E 01	L.T. 4. E 01	L.T. 1. E 02	L.T. 4. E 01
MN-54	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 2. E 00
CO-58	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 3. E 00
FE-59	L.T. 7. E 00	L.T. 5. E 00	L.T. 1. E 01	L.T. 8. E 00
CO-60	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 3. E 00
ZN-65	L.T. 4. E 00	L.T. 3. E 00	L.T. 9. E 00	L.T. 5. E 00
ZR-95	L.T. 3. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 3. E 00
RU-103	L.T. 3. E 00	L.T. 2. E 00	L.T. 5. E 00	L.T. 4. E 00
RU-106	L.T. 2. E 01	L.T. 1. E 01	L.T. 4. E 01	L.T. 2. E 01
I-131	L.T. 2. E 01	L.T. 1. E 01	L.T. 1. E 01	L.T. 1. E 01
CS-134	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 3. E 00
CS-137	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 3. E 00
BA-140	L.T. 8. E 00	L.T. 7. E 00	L.T. 1. E 01	L.T. 7. E 00
CE-141	L.T. 5. E 00	L.T. 3. E 00	L.T. 7. E 00	L.T. 7. E 00
CE-144	L.T. 1. E 01	L.T. 1. E 01	L.T. 2. E 01	L.T. 2. E 01
RA-226	L.T. 4. E 01	L.T. 3. E 01	L.T. 7. E 01	L.T. 7. E 01
TH-228	L.T. 3. E 00	L.T. 2. E 00	L.T. 6. E 00	L.T. 6. E 00

TRITIUM ANALYSIS:
H-3

07/05-09/06
L.T. 1. E 02

VII-7
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 28

DATE COLLECTED:	09/06/00	10/03/00	11/07/00	12/05/00
RADIOCHEMICAL ANALYSIS:				
Sr-89	L.T. 5. E 00(a)	L.T. 4. E 00(a)	L.T. 4. E 00(a)	L.T. 7. E-01
SR-90	L.T. 4. E-01	L.T. 4. E-01	L.T. 2. E 00(a)	L.T. 5. E-01
GR-A (Dissolved)	L.T. 4. E 00	2.5 ± 2.2 E 00	4.6 ± 1.2 E 00	2.5 ± 1.0 E 00
GR-A (Suspended)	L.T. 8. E-01	6.1 ± 5.8 E-01	L.T. 6. E 01	L.T. 4. E-01
GR-B (Dissolved)	8.0 ± 1.7 E 00	8.5 ± 2.1 E 00	9.1 ± 1.8 E 00	5.7 ± 0.8 E 00
GR-B (Suspended)	2.0 ± 0.8 E 00	2.3 ± 1.1 E 00	L.T. 4. E 01	L.T. 8. E-01
I-131	L.T. 3. E-01	L.T. 2. E-01	L.T. 9. E-01	L.T. 4. E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 5. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 5. E 01
K-40	L.T. 3. E 01	L.T. 8. E 01	L.T. 4. E 01	L.T. 1. E 02
MN-54	L.T. 2. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 4. E 00
CO-58	L.T. 4. E 00	L.T. 3. E 00	L.T. 3. E 00	L.T. 3. E 00
FE-59	L.T. 1. E 01	L.T. 8. E 00	L.T. 7. E 00	L.T. 9. E 00
CO-60	L.T. 2. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 2. E 00
ZN-65	L.T. 4. E 00	L.T. 7. E 00	L.T. 1. E 01	L.T. 1. E 01
ZR-95	L.T. 8. E 00	L.T. 4. E 00	L.T. 5. E 00	L.T. 7. E 00
RU-103	L.T. 9. E 00	L.T. 4. E 00	L.T. 3. E 00	L.T. 5. E 00
RU-106	L.T. 2. E 01	L.T. 3. E 01	L.T. 2. E 01	L.T. 4. E 01
I-131	L.T. 1. E 04	L.T. 9. E 00	L.T. 3. E 01	L.T. 1. E 01
CS-134	L.T. 2. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 3. E 00
CS-137	L.T. 2. E 00	L.T. 3. E 00	L.T. 2. E 00	L.T. 6. E 00
BA-140	L.T. 1. E 03	L.T. 6. E 00	L.T. 1. E 01	L.T. 2. E 01
CE-141	L.T. 2. E 01	L.T. 6. E 00	L.T. 7. E 00	L.T. 1. E 01
CE-144	L.T. 1. E 01	L.T. 2. E 01	L.T. 1. E 01	L.T. 4. E 01
RA-226	L.T. 4. E 00	L.T. 6. E 01	L.T. 7. E 01	L.T. 1. E 02
TH-228	L.T. 2. E 00	L.T. 1. E 01	L.T. 1. E 01	L.T. 6. E 02

TRITIUM ANALYSIS:

H-3	10/03-12/05
	L.T. 7. E 01

VII-7
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 35

DATE COLLECTED:	05/02/00	06/06/00	7/05/00	08/02/00
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RADIOCHEMICAL ANALYSIS:

SR-89	L.T. 7. E-01	L.T. 1. E 00	L.T. 8. E 01	L.T. 7. E-01
SR-90	L.T. 3. E-01	L.T. 8. E-01	L.T. 9. E-01	L.T. 2. E-01
GR-A (Dissolved)	L.T. 1. E 00	L.T. 2. E 00	2.7 ± 2.3 E 00	2.1 ± 2.8 E 00
GR-A (Suspended)	L.T. 4. E 00	5.2 ± 4.5 E-01	1.0 ± 0.7 E 00	1.0 ± 0.8 E 00
GR-B (Dissolved)	7.8 ± 1.1 E 00	8.2 ± 1.5 E 00	9.5 ± 1.5 E 00	9.6 ± 1.6 E 00
GR-B (Suspended)	3.8 ± 1.2 E 00	2.5 ± 0.7 E 00	2.9 ± 0.7 E 00	2.5 ± 0.8 E 00
I-131	L.T. 2. E-01	L.T. 3. E-01	L.T. 3. E-01	L.T. 2. E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 1. E 01	L.T. 2. E 01	L.T. 4. E 01	L.T. 3. E 00
K-40	L.T. 2. E 01	L.T. 2. E 01	L.T. 7. E 01	L.T. 5. E 00
MN-54	L.T. 1. E 00	L.T. 1. E 00	L.T. 3. E 00	L.T. 3. E 00
CO-58	L.T. 1. E 00	L.T. 1. E 00	L.T. 4. E 00	L.T. 4. E 00
FE-59	L.T. 4. E 00	L.T. 4. E 00	L.T. 9. E 00	L.T. 9. E 00
CO-60	L.T. 1. E 00	L.T. 1. E 00	L.T. 3. E 00	L.T. 3. E 00
ZN-65	L.T. 2. E 00	L.T. 3. E 00	L.T. 7. E 00	L.T. 7. E 00
ZR-95	L.T. 1. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 4. E 00
RU-103	L.T. 2. E 00	L.T. 2. E 00	L.T. 4. E 00	L.T. 5. E 00
RU-106	L.T. 1. E 01	L.T. 1. E 01	L.T. 3. E 01	L.T. 3. E 00
I-131	L.T. 1. E 01	L.T. 1. E 01	L.T. 1. E 01	L.T. 2. E 00
CS-134	L.T. 1. E 00	L.T. 1. E 00	L.T. 4. E 00	L.T. 4. E 00
CS-137	L.T. 1. E 00	L.T. 1. E 00	L.T. 4. E 00	L.T. 4. E 00
BA-140	L.T. 5. E 00	L.T. 6. E 00	L.T. 8. E 00	L.T. 1. E 00
CE-141	L.T. 3. E 00	L.T. 5. E 00	L.T. 6. E 00	L.T. 1. E 00
CE-144	L.T. 1. E 01	L.T. 1. E 01	L.T. 2. E 01	L.T. 3. E 00
RA-226	L.T. 3. E 01	L.T. 3. E 01	L.T. 7. E 01	L.T. 9. E 00
TH-228	L.T. 3. E 00	L.T. 3. E 00	L.T. 6. E 00	L.T. 7. E 00

VII-7
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - WATERBORNE
WATER - RIVER
(PCI/LITER)
STATION NUMBER 35

DATE COLLECTED: 09/06/00 10/03/00 11/07/00 12/05/00

RADIOCHEMICAL ANALYSIS:

SR-89	L.T. 6.	E-01	L.T. 4.	E 00(a)	L.T. 5.	E 00(a)	L.T. 9.	E-01
SR-90	L.T. 3.	E-01	5.9 ± 2.7	E-01	L.T. 2.	E 00(a)	L.T. 6.	E-01
GR-A (Dissolved)	L.T. 4.	E 00	1.2 ± 0.8	E 00	5.4 ± 2.4	E 00 (b)	2.5 ± 0.9	E 00
GR-A (Suspended)	L.T. 1.	E 00	9.8 ± 6.5	E-01	L.T. 7.	E 01 (b)	L.T. 3.	E-01
GR-B (Dissolved)	5.8 ± 1.6	E 00	4.7 ± 1.3	E 00	1.1 ± 0.2	E 01 (b)	5.9 ± 0.7	E 00
GR-B (Suspended)	3.7 ± 1.0	E 00	2.6 ± 1.1	E 00	L.T. 5.	E 01 (b)	L.T. 7.	E-01
I-131	L.T. 3.	E-01	L.T. 2.	E-01	L.T. 8.	E-01	L.T. 3.	E-01

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 8.28	E 01	L.T. 2.	E 01	L.T. 2.	E 01	L.T. 3.	E 01
K-40	1.95 ± 0.4	E 02	L.T. 4.	E 01	5.4 ± 1.8	E 01	1.2 ± 0.4	E 02
MN-54	L.T. 4.0	E 00	L.T. 2.	E 00	L.T. 2.	E 00	L.T. 2.	E 00
CO-58	L.T. 7.	E 00	L.T. 2.	E 00	L.T. 2.	E 00	L.T. 2.	E 00
FE-59	L.T. 3.	E 01	L.T. 6.	E 00	L.T. 6.	E 00	L.T. 4.	E 00
CO-60	L.T. 3.	E 00	L.T. 2.	E 00	L.T. 2.	E 00	L.T. 1.	E 00
ZN-65	L.T. 8.	E 00	L.T. 4.	E 00	L.T. 4.	E 00	L.T. 3.	E 00
ZR-95	L.T. 1.	E 01	L.T. 2.	E 00	L.T. 4.	E 00	L.T. 3.	E 00
RU-103	L.T. 2.	E 01	L.T. 3.	E 00	L.T. 3.	E 00	L.T. 2.	E 00
RU-106	L.T. 3.	E 01	L.T. 2.	E 01	L.T. 2.	E 01	L.T. 3.	E 01
I-131	L.T. 2.	E 04	L.T. 7.	E 00	L.T. 3.	E 01	L.T. 5.	E 00
CS-134	L.T. 3.	E 00	L.T. 2.	E 00	L.T. 2.	E 00	L.T. 2.	E 00
CS-137	L.T. 3.	E 00	L.T. 3.	E 00	L.T. 2.	E 00	L.T. 2.	E 00
BA-140	L.T. 2.	E 03	L.T. 5.	E 00	L.T. 1.	E 01	L.T. 1.	E 01
CE-141	L.T. 3.	E 01	L.T. 6.	E 00	L.T. 8.	E 00	L.T. 4.	E 00
CE-144	L.T. 2.	E 01	L.T. 2.	E 01	L.T. 1.	E 01	L.T. 2.	E 01
RA-226	L.T. 7.	E 00	L.T. 6.	E 01	L.T. 7.	E 01	L.T. 8.	E 01
TH-228	L.T. 5.	E 00	L.T. 5.	E 00	L.T. 7.	E 00	L.T. 3.	E 02

TRITIUM ANALYSIS: 07/05-09/06 10/03-12/05

H-3 L.T. 1. E 02 1.3 ± 0.5 E 02

(a) Due to delay in analysis, LLDs were not met.

(b) Sample invalid due to high concentration of solids in the sample which raised the detection limit.

VII-8
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD
milliRoentgen/Quarter

Sample Nuclide	Station Number	First Quarter 01/05-04/04	Second Quarter 04/04-07/18	Third Quarter 07/18-10/03	Fourth 10/03-01/05/01	QuarterAverage ± 1 std dev.
TLD (Gamma)	01	17.0 ± 0.7	17.1 ± 1.1	17.0 ± 0.9	(a)	17.0 ± 0.1
	02	19.9 ± 0.8	20.8 ± 0.6	17.8 ± 1.6	25.5 ± 1.6	21.0 ± 3.3
	03	17.7 ± 0.9	17.4 ± 1.0	16.5 ± 0.8	(a)	17.2 ± 0.6
	04	17.6 ± 0.7	18.7 ± 1.6	16.4 ± 0.8	28.5 ± 0.5	20.3 ± 5.6
	05	17.4 ± 0.9	18.4 ± 0.9	16.4 ± 0.8	23.2 ± 0.9	18.9 ± 3.0
	06	17.5 ± 0.7	18.0 ± 1.5	16.5 ± 0.7	24.8 ± 0.5	19.2 ± 3.8
	07	17.5 ± 1.2	17.6 ± 1.4	16.6 ± 0.6	21.1 ± 2.0	18.2 ± 2.0
	08	18.0 ± 0.9	18.9 ± 0.8	17.9 ± 1.1	(a)	18.3 ± 0.6
	09	16.6 ± 0.6	17.1 ± 1.2	16.2 ± 0.8	19.8 ± 1.8	17.4 ± 1.6
	10	17.6 ± 1.7	17.3 ± 0.9	16.9 ± 0.3	21.0 ± 1.4	18.2 ± 1.9
	20	18.1 ± 0.9	18.2 ± 1.3	18.1 ± 1.2	26.6 ± 2.1	20.3 ± 4.2
	44	20.1 ± 0.7	17.3 ± 0.9	19.1 ± 1.6	25.8 ± 3.5	20.6 ± 3.7
	56	18.1 ± 0.5	19.0 ± 1.0	18.5 ± 1.5	18.6 ± 0.7	18.6 ± 0.4
	58	18.2 ± 1.1	18.7 ± 1.3	18.0 ± 0.9	22.9 ± 1.4	19.5 ± 2.3
	59	19.0 ± 0.3	19.1 ± 1.9	19.2 ± 0.7	25.2 ± 1.4	20.6 ± 3.1
	66	19.8 ± 1.4	21.4 ± 1.2	20.0 ± 0.9	26.4 ± 1.1	21.9 ± 3.1
	67	20.6 ± 1.1	21.2 ± 1.0	19.1 ± 0.9	24.6 ± 2.3	21.4 ± 2.3
	71	19.6 ± 1.0	19.0 ± 1.2	18.7 ± 1.4	24.0 ± 0.3	20.3 ± 2.5
	79	19.0 ± 0.7	19.1 ± 1.1	18.6 ± 1.1	20.4 ± 1.9	19.3 ± 0.8
	80	18.9 ± 0.9	18.9 ± 1.6	18.9 ± 1.0	22.7 ± 1.8	19.9 ± 1.9
	81	19.5 ± 0.8	19.5 ± 0.4	18.4 ± 0.8	20.1 ± 1.5	19.4 ± 0.7
	82	18.9 ± 1.0	18.2 ± 1.7	18.8 ± 0.7	21.3 ± 2.2	19.3 ± 1.4
	83	19.6 ± 1.3	19.5 ± 0.9	19.0 ± 1.1	21.0 ± 1.6	19.8 ± 0.9
	84	20.3 ± 1.0	20.1 ± 0.9	19.3 ± 1.0	21.0 ± 2.0	20.2 ± 0.7
	85	18.2 ± 1.1	(a)	17.5 ± 0.9	22.2 ± 1.3	19.2 ± 2.4

(a) Sample not received.

TABLE VII-8
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - AMBIENT GAMMA RADIATION: TLD
milliRoentgen/Quarter

Sample Nuclide	Station Number	First Quarter 01/05-04/04	Second Quarter 04/04-07/18	Third Quarter 07/18-10/03	Fourth 10/01-01/15/01	QuarterAverage ± 1 std dev.
TLD	86	19.0 ± 0.7	21.3 ± 0.6	18.4 ± 1.0	21.7 ± 1.8	20.1 ± 1.6
	87	18.8 ± 0.9	22.9 ± 1.0	17.2 ± 0.9	22.9 ± 0.1	20.5 ± 2.9
	88	17.9 ± 0.9	20.9 ± 1.6	17.3 ± 0.8	21.3 ± 1.9	19.4 ± 2.0
	89	18.8 ± 0.8	20.6 ± 1.3	(a)	24.5 ± 1.3	21.3 ± 2.9
	90	18.8 ± 1.0	19.3 ± 1.5	18.4 ± 1.1	25.8 ± 0.4	20.6 ± 3.5
	91	16.7 ± 0.6	18.6 ± 1.0	16.8 ± 0.7	19.4 ± 0.9	17.9 ± 1.3
	94	19.1 ± 0.9	19.9 ± 1.0	17.9 ± 0.8	22.2 ± 1.4	19.8 ± 1.8
Average/Quarter		18.5 ± 1.0 mR/92 days	19.2 ± 1.4 mR/72 days	17.9 ± 1.0 mR/92 days	22.8 ± 2.5 mR/91 days	
Average/Day		0.20 ± 0.01 mR/day	0.21 ± 0.02 mR/day	0.19 ± 0.01 mR/day	0.25±0.03 mR/day	
Range		(16.6-20.6) mR/92 days	(17.1-22.9) mR/72 days	(16.2-20.0) mR/92 days	(18.6-28.5) mR/92 days	
Detection/Total		31/31	30/30	30/30	28/28	

(a) Sample not received.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED	05/23/00		05/23/00		05/23/00
			QA		
RADIOCHEMICAL ANALYSIS:					
I-131	L.T. 1.	E-02	L.T. 2.	E-02	(a)
GAMMA SPECTRUM ANALYSIS:					
BE-7	2.51 ± 0.79	E-01	L.T. 1.	E-01	(a)
K-40	5.78 ± 0.58	E 00	4.09 ± 0.41	E 00	(a)
MN-54	L.T. 1.	E-02	L.T. 9.	E-03	(a)
CO-58	L.T. 1.	E-02	L.T. 1.	E-02	(a)
FE-59	L.T. 3.	E-02	L.T. 3.	E-02	(a)
CO-60	L.T. 1.	E-02	L.T. 9.	E-03	(a)
ZN-65	L.T. 2.	E-02	L.T. 2.	E-02	(a)
ZR-95	L.T. 1.	E-02	L.T. 1.	E-02	(a)
RU-103	L.T. 1.	E-02	L.T. 1.	E-02	(a)
RU-106	L.T. 9.	E-02	L.T. 8.	E-02	(a)
I-131	L.T. 4.	E-02	L.T. 4.	E-02	(a)
CS-134	L.T. 1.	E-02	L.T. 1.	E-02	(a)
CS-137	L.T. 1.	E-02	L.T. 9.	E-03	(a)
BA-140	L.T. 2.	E-02	L.T. 2.	E-02	(a)
CE-141	L.T. 2.	E-02	L.T. 2.	E-02	(a)
CE-144	L.T. 5.	E-02	L.T. 6.	E-02	(a)
RA-226	L.T. 2.	E-01	L.T. 1.	E-01	(a)
TH-228	L.T. 2.	E-02	L.T. 1.	E-02	(a)

(a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED	06/13/00	06/13/00	06/13/00
RADIOCHEMICAL ANALYSIS:			
I-131	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:			
BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED	06/13/00	07/12/00	07/12/00
	QA		
RADIOCHEMICAL ANALYSIS:			
I-131	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:			
BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED	07/12/00	08/15/00	08/15/00
RADIOCHEMICAL ANALYSIS:			
I-131	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:			
BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

(a) Sample not available.

(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED	08/15/00	09/19/00	09/19/00
RADIOCHEMICAL ANALYSIS:			
I-131	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:			
BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

(a) Sample not available.

(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 35

DATE COLLECTED 09/19/00
 RADIOCHEMICAL ANALYSIS:

I-131 (a)

GAMMA SPECTRUM ANALYSIS:

BE-7	(a)
K-40	(a)
MN-54	(a)
CO-58	(a)
FE-59	(a)
CO-60	(a)
ZN-65	(a)
ZR-95	(a)
RU-103	(a)
RU-106	(a)
I-131	(a)
CS-134	(a)
CS-137	(a)
BA-140	(a)
CE-141	(a)
CE-144	(a)
RA-226	(a)
TH-228	(a)

- (a) Sample not available.
 (b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96

DATE COLLECTED:	05/23/00	05/23/00	05/23/00
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RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96

DATE COLLECTED:	06/13/00	06/13/00	06/13/00
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RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION - TERRESTRIAL, BROADLEAF
 (PCI/GM WET)
 STATION NUMBER 96

DATE COLLECTED	07/12/00 VT1-96	07/12/00	07/12/00
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RADIOCHEMICAL ANALYSIS:

I-131	L.T. 6. E-03	L.T. 5 E-03	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	2.11 ± 0.13 E 00	2.88 ± 0.15 E 00	(a)
K-40	5.26 ± 0.25 E 00	6.28 ± 0.26 E 00	(a)
MN-54	L.T. 9. E-03	L.T. 8. E-03	(a)
CO-58	L.T. 9. E-03	L.T. 8. E-03	(a)
FE-59	L.T. 2. E-02	L.T. 2. E-02	(a)
CO-60	L.T. 1. E-02	L.T. 8. E-03	(a)
ZN-65	L.T. 2. E-02	L.T. 2. E-02	(a)
ZR-95	L.T. 2. E-02	L.T. 1. E-02	(a)
RU-103	L.T. 9. E-03	L.T. 8. E-03	(a)
RU-106	L.T. 7. E-02	L.T. 6. E-02	(a)
I-131	L.T. 2. E-02	L.T. 2. E-02	(a)
CS-134	L.T. 7. E-03	L.T. 6. E-03	(a)
CS-137	L.T. 7. E-03	L.T. 7. E-03	(a)
BA-140	L.T. 4. E-02	L.T. 4. E-02	(a)
CE-141	L.T. 1. E-02	L.T. 1. E-02	(a)
CE-144	L.T. 5. E-02	L.T. 4. E-02	(a)
RA-226	4.99 ± 0.65 E-02	L.T. 2. E-01	(a)
TH-228	1.04 ± 0.63 E-02	L.T. 1. E-02	(a)

- (a) Sample not available.
 (b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96

DATE COLLECTED:	08/15/00	08/15/00	08/15/00
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RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96

DATE COLLECTED:	08/15/00	09/19/00	09/19/00
	QA		

RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 96

DATE COLLECTED 09/19/00
RADIOCHEMICAL ANALYSIS:

I-131 (a)

GAMMA SPECTRUM ANALYSIS:

BE-7	(a)
K-40	(a)
MN-54	(a)
CO-58	(a)
FE-59	(a)
CO-60	(a)
ZN-65	(a)
ZR-95	(a)
RU-103	(a)
RU-106	(a)
I-131	(a)
CS-134	(a)
CS-137	(a)
BA-140	(a)
CE-141	(a)
CE-144	(a)
RA-226	(a)
TH-228	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 101

DATE COLLECTED:	05/23/00	05/23/00	05/23/00
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RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

(a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 101

DATE COLLECTED:	06/13/00	06/13/00	06/13/00
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RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 101

DATE COLLECTED	07/12/00		07/12/00		07/12/00	
RADIOCHEMICAL ANALYSIS:						
I-131	L.T. 5	E-03	L.T. 4.	E-03	L.T. 4.	E-03
GAMMA SPECTRUM ANALYSIS:						
BE-7	2.22 ± 0.14	E 00	2.46 ± 0.31	E-01	2.33 ± 0.18	E 00
K-40	6.96 ± 0.36	E 00	5.05 ± 0.21	E 00	4.67 ± 0.37	E 00
MN-54	L.T. 2.	E-02	L.T. 6.	E-03	L.T. 2.	E-02
CO-58	L.T. 2.	E-02	L.T. 7.	E-03	L.T. 3.	E-02
FE-59	L.T. 4.	E-02	L.T. 2.	E-02	L.T. 6.	E-02
CO-60	L.T. 2.	E-02	L.T. 7.	E-03	L.T. 3.	E-02
ZN-65	L.T. 4.	E-02	L.T. 2.	E-02	L.T. 6.	E-02
ZR-95	L.T. 3.	E-02	L.T. 1.	E-02	L.T. 5.	E-02
RU-103	L.T. 2.	E-02	L.T. 7.	E-03	L.T. 3.	E-02
RU-106	L.T. 1.	E-01	L.T. 6.	E-02	L.T. 2.	E-01
I-131	L.T. 3.	E-02	L.T. 2.	E-02	L.T. 5.	E-02
CS-134	L.T. 2.	E-02	L.T. 5.	E-03	L.T. 2.	E-02
CS-137	L.T. 2.	E-02	L.T. 7.	E-03	L.T. 3.	E-02
BA-140	L.T. 9.	E-02	L.T. 4.	E-02	L.T. 1.	E-01
CE-141	L.T. 3.	E 02	L.T. 1.	E-02	L.T. 4.	E-02
CE-144	L.T. 1.	E-01	L.T. 4.	E-02	L.T. 1.	E-01
RA-226	L.T. 3.	E-02	L.T. 1.	E-01	L.T. 5.	E-02
TH-228	L.T. 3.	E-02	L.T. 9.	E-03	L.T. 4.	E-02

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
EXPOSURE PATHWAY - INGESTION
VEGETATION - TERRESTRIAL, BROADLEAF
(PCI/GM WET)
STATION NUMBER 101

DATE COLLECTED:	08/15/00	08/15/00	08/15/00
RADIOCHEMICAL ANALYSIS:			
I-131	(a)	(a)	(a)
GAMMA SPECTRUM ANALYSIS:			
BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
(b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION - TERRESTRIAL, BROADLEAF
 (PCI/GM WET)
 STATION NUMBER 101

DATE COLLECTED:	09/19/00	09/19/00	09/19/00
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RADIOCHEMICAL ANALYSIS:

I-131	(a)	(a)	(a)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(a)	(a)	(a)
K-40	(a)	(a)	(a)
MN-54	(a)	(a)	(a)
CO-58	(a)	(a)	(a)
FE-59	(a)	(a)	(a)
CO-60	(a)	(a)	(a)
ZN-65	(a)	(a)	(a)
ZR-95	(a)	(a)	(a)
RU-103	(a)	(a)	(a)
RU-106	(a)	(a)	(a)
I-131	(a)	(a)	(a)
CS-134	(a)	(a)	(a)
CS-137	(a)	(a)	(a)
BA-140	(a)	(a)	(a)
CE-141	(a)	(a)	(a)
CE-144	(a)	(a)	(a)
RA-226	(a)	(a)	(a)
TH-228	(a)	(a)	(a)

- (a) Sample not available.
 (b) Due to delay in counting, sample results are not available.

VII-9
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - INGESTION
 VEGETATION - TERRESTRIAL, BROADLEAF
 (PCI/GM WET)
 STATION NUMBER 89

DATE COLLECTED:	09/19/00	09/19/00
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RADIOCHEMICAL ANALYSIS:

I-131	(b)	(b)
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GAMMA SPECTRUM ANALYSIS:

BE-7	(b)	(b)
K-40	(b)	(b)
MN-54	(b)	(b)
CO-58	(b)	(b)
FE-59	(b)	(b)
CO-60	(b)	(b)
ZN-65	(b)	(b)
ZR-95	(b)	(b)
RU-103	(b)	(b)
RU-106	(b)	(b)
I-131	(b)	(b)
CS-134	(b)	(b)
CS-137	(b)	(b)
BA-140	(b)	(b)
CE-141	(b)	(b)
CE-144	(b)	(b)
RA-226	(b)	(b)
TH-228	(b)	(b)

- (a) Sample not available.
 (b) Due to delay in counting, sample results are not available.

VII-10
NEBRASKA PUBLIC POWER DISTRICT
 COOPER NUCLEAR STATION
 EXPOSURE PATHWAY - AIRBORNE
 SHORELINE SEDIMENT
 (PCI/GM DRY)
 STATION NUMBER 28

DATE COLLECTED: 05/02/00

10/03/00

10/03/00

QA

GAMMA SPECTRUM ANALYSIS:

BE-7	L.T. 7.	E-02	L.T. 2.	E-01	L.T. 2.	E-01
K-40	1.39 ± 0.14	E 01	1.12 ± 0.04	E 01	1.01 ± 0.04	E 01
MN-54	1.64 ± 0.44	E-02	L.T. 8.	E-03	L.T. 1.	E-02
CO-58	L.T. 3.	E-02	L.T. 7.	E-02	L.T. 2.	E-02
CO-60	L.T. 7.	E-03	L.T. 1.	E-02	L.T. 1.	E-02
ZN-65	L.T. 2.	E-02	L.T. 3.	E-02	L.T. 3.	E-02
ZR-95	L.T. 1.	E-02	L.T. 4.	E-02	L.T. 4.	E-02
RU-103	L.T. 9.	E-03	L.T. 3.	E-02	L.T. 4.	E-02
RU-106	L.T. 6.	E-02	L.T. 1.	E-01	L.T. 1.	E-01
I-131	L.T. 6.	E-02	L.T. 7.	E 00(a)	L.T. 7.	E 00(a)
CS-134	L.T. 9.	E-03	L.T. 1.	E-02	L.T. 1.	E-02
CS-137	1.49 ± 0.43	E-02	2.12 ± 0.40	E-02	1.54 ± 0.54	E-02
BA-140	L.T. 3.	E-02	L.T. 2.	E 00	L.T. 2.	E 00
CE-141	2.74 ± 1.28	E-02	L.T. 8.	E-02	L.T. 8.	E-02
CE-144	L.T. 5.	E-02	L.T. 8.	E-02	L.T. 8.	E-02
RA-226	1.49 ± 0.15	E 00	L.T. 3.	E-02	5.05 ± 0.15	E-01
TH-228	8.88 ± 0.89	E-01	5.61 ± 0.19	E-01	6.35 ± 0.23	E-01

VIII. REFERENCES

VIII. REFERENCES

1. Nebraska Public Power District, Cooper Nuclear Station Environmental Radiation Monitoring Program, Annual Report, January 1, 1982-December 31, 1982 (prepared by Teledyne Isotopes).
2. Nebraska Public Power District, Cooper Nuclear Station Environmental Radiation Monitoring Program, Annual Report, January 1, 1983-December 31, 1983 (prepared by Teledyne Isotopes).
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4. U.S. Department of Energy; EML 440 March 1985; EML-444 April 1989; Environmental Measurements Laboratory, US Department of Energy, New York, New York 10014.
5. U.S. Environmental Protection Agency; Environmental Radiation Data, Report 35, July -- September 1983, Report 39, July -- September 1985; Report 40, October -- December 1984; Report 41, January -- March 1985. Report 42, April -- June 1985; Report 43, July-September 1985, Report 44-45, October-March 1986; Report 46, April-June 1986; Report 47, July-September 1986; Report 48, October-December 1986; Report 49, January-March 1987. Environmental Radiation Facility, Montgomery, Alabama.
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7. U.S. Nuclear Regulatory Commission, 1975, Regulatory Guide 4.8, Environmental Technical Specifications for Nuclear Power Plants.
8. U.S. Regulatory Commission, Branch Technical Position, Radiological Monitoring Acceptable Program (November, 1979, Revision 1).

APPENDIX A
LAND USE CENSUS

ANNUAL CNS LAND USE CENSUS

Conducted June 29, 2000
0-3 miles

Cooper Nuclear Station (CNS) Offsite Dose Assessment Manual (ODAM) requires an annual land use census. This census identifies the location of the nearest garden that is greater than 500 square feet in area and yields leafy green vegetables, the nearest milk animal, and the location of the nearest resident in each of the 16 meteorological sectors within 3 miles of CNS.

In accordance with the CNS ODAM, a land use census was performed on June 29, 2000. The nearest residence was found in sector Q, 0.9 miles from CNS, and the nearest garden was found in sector D, 1.7 miles from CNS.

No milk animals were found within 3 miles of CNS and there was no evidence of potable water use from the Missouri River within three miles downstream of CNS.

ANNUAL CNS LAND USE CENSUS

June 29, 2000

0-3 Miles

SECTOR	NEAREST RESIDENT Distance	Direction in Degrees	NEAREST GARDEN Distance	Direction in Degrees	NEAREST MILK ANIMAL
A	3.0 Miles	1.0°	3.0 Miles	1.0°	NONE
B	2.7 Miles	13.0°	NONE	--	NONE
C	NONE	--	NONE	--	NONE
D	1.7 Miles	62.0°	1.7 Miles	62.0°	NONE
E	1.8 Miles	92.0°	2.0 Miles	85.0°	NONE
F	2.3 Miles	112.0°	2.3 Miles	112.0°	NONE
G	NONE	--	NONE	--	NONE
H	NONE	--	NONE	--	NONE
J	NONE	--	NONE	--	NONE
K	2.2 Miles	210.0°	NONE	--	NONE
L	1.3 Miles	231.0°	2.2 Miles	227.0°	NONE
M	1.2 Miles	252.0°	1.9 Miles	241.0°	NONE
N	1.0 Miles	265.0°	NONE	--	NONE
P	1.7 Miles	294.0°	2.4 Miles	293.0°	NONE
Q	0.9 Miles	307.0°	2.9 Miles	314.0°	NONE
R	1.9 Miles	336.0°	1.9 Miles	336.0°	NONE

APPENDIX B
SUMMARY OF INTERLABORATORY COMPARISONS

INTERLABORATORY COMPARISON PROGRAM

The US Environmental Protection Agency (EPA) discontinued their Interlaboratory Comparison Program in December 1998.

Since the EPA is no longer involved in the program, there are no “approved” laboratories for Intercomparison Studies; however, Teledyne Brown Engineering participates in the Analytics, Inc. and Environmental Resource Associates (ERA) programs to the fullest extent possible. That is, we participate in the program for all radioactive isotopes prepared and at the maximum frequency of availability.

The National Institute of Standards and Technology (NIST) is the approval authority for laboratory providers participating in Intercomparison Study Programs; however, at this time, there are no approved laboratories for environmental and/or radiochemical isotope analyses.

Trending graphs are provided in this section for the EPA Program and for Analytics when there were at least two sets of data points to plot.

ANALYTICS CROSS CHECK COMPARISON PROGRAM 2000

Sample Date (b)	Media	Nuclide	Teledyne Brown Engineering Result (a)		Analytics Result		Ratio
03/20/00	Milk	I-131	18 ±	1	20 ±	1	0.90
		Cr-51	381 ±	38	387 ±	19	0.98
		Cs-134	132 ±	13	143 ±	7	0.92
		Cs-137	128 ±	13	114 ±6	1.12	
		Co-58	89 ±	9	79 ±4	1.13	
		Mn-54	195 ±	20	176 ±9	1.11	
		Fe-59	161 ±	16	144 ±7	1.12	
		Zn-65	171 ±	17	165 ±8	1.04	
		Co-60	179 ±	18	176 ±9	1.02	
03/20/00	Milk	Sr-89	13 ±	3	25 ±1	0.52	(c)
		Sr-90	16 ±	1	19 ±1	0.84	
06/19/00	Air Filter	Ce-141	143 ±	8	132 ±7	1.08	
		Cr-51	229 ±	17	198 ±10	1.16	
		Cs-134	74 ±	4	81 ±4	0.91	
		Cs-137	143 ±	8	115 ±6	1.24	
		Co-58	89 ±	5	77 ±4	1.16	
		Mn-54	102 ±	6	84 ±4	1.21	
		Fe-59	98 ±	6	75 ±4	1.31	
		Zn-65	188 ±	11	139 ±7	1.35	
		Co-60	113 ±	7	104 ±5	1.09	
06/19/00	Cartridge	I-131	106 ±	6	88 ±	4	1.20
06/19/00	Air Filter	Sr-90	88 ±	5	96 ±	5	0.92
06/19/00	Air Filter	Gross Alpha	103 ±	6	93 ±	5	1.11
		Gross Beta	210 ±	6	193 ±	10	1.09
09/18/00	Milk	I-131	97 ±	10	87 ±	4	1.11
		Ce-141	83 ±	8	77 ±	4	1.08
		Cr-51	323 ±	40	304 ±	15	1.06
		Cs-134	98 ±	10	102 ±	5	0.96
		Cs-137	117 ±	12	107 ±	5	1.09
		Co-58	64 ±	6	60 ±	3	1.07
		Mn-54	99 ±	10	88 ±	4	1.13
		Fe-59	132 ±	13	119 ±	6	1.11
		Zn-65	218 ±	22	196 ±	10	1.11
		Co-60	209 ±	21	197 ±	10	1.06

ANALYTICS CROSS CHECK COMPARISON PROGRAM 2000 (cont.)

Sample Date (b)	Media	Nuclide	Teledyne Brown Engineering Result (a)		Analytics Result		Ratio
09/18/00	Milk	Sr-89	14 ±	1	15 ±	1	0.93
		Sr-90	18 ±	1	14 ±	1	1.29

Footnotes:

- (a) Teledyne Results - counting error is two standard deviations. Units are pCi/liter for water and milk. For gamma results, if two standard deviations are less than 10%, then a 10% error is reported. Units are total pCi for air particulate filters.
- (b) Ratio of Teledyne Brown Engineering to Analytics results.
- (c) Caused by incorrect rinsing of the strontium extraction column. Additional training was conducted and was documented in the analyst's training file. Subsequent tests on two milk samples spiked with Sr-89 produced correct results.

**ERA* STATISTICAL SUMMARY
PROFICIENCY TESTING (PT) PROGRAM – 2000**

DATE	NUCLIDE	ERA Known Value (pCi/l)(a)	TBE Result (b) (pCi/l)	Expected Dev. Known (c) (pCi/l)	Control Limits (d) (pCi/l)	Warning Limits (e) (pCi/l)	Performance Evaluation (f)
2/10/00	Gr-A	58.4	83.6	14.6	33.3-83.5	41.5-75.3	NA (g)
2/10/00	Gr-B	16.8	15.4	5.00	8.10-25.5	9.1-28.5	A
2/24/00	U(NAT)	6.07	5.77	3.00	0.870-11.3	2.61-9.53	A
2/24/00	Ra-226	8.26	7.20	1.24	6.11-10.4	6.83-9.69	A
2/24/00	Ra-228	2.25	2.37	0.56	1.28-3.22	1.60-2.90	A
2/24/00	Gr-A	25.4	14.0	6.35	14.5-36.3	18.1-45.2	NA
2/24/00	Gr-B	42.1	34.0	5.00	33.4-50.8	36.3-47.9	CE
2/25/00	Ba-133	98.2	91.7	9.82	81.5-115	86.9-110	A
2/25/00	Co-60	99.6	101	5.00	90.9-108	93.8-105	A
2/25/00	Cs-134	49.2	48.0	5.00	40.5-57.9	43.3-55.0	A
2/25/00	Cs-137	209	76.3	10.4	191-227	197-221	NA
2/26/00	Sr-89	16.4	15.7	5.00	7.70-25.1	10.6-22.2	A
2/26/00	Sr-90	28.9	29.0	5.00	20.2-37.6	23.1-34.7	A
2/26/00	Co-60	64.4	68.3	5.00	55.7-73.1	58.6-70.2	A
2/26/00	Cs-134	12.3	12.0	5.00	3.60-21.1	6.53-18.1	A
2/26/00	Cs-137	72.2	76.3	5.00	63.5-80.9	66.4-78.0	A
3/01/00	H-3	23800	22300	12380	21100-26500	23561-29591	A

**ERA* STATISTICAL SUMMARY
PROFICIENCY TESTING (PT) PROGRAM - 2000**

DATE	NUCLIDE	ERA Known Value (pCi/l)(a)	TBE Result (b) (pCi/l)	Expected Dev. Known (c) (pCi/l)	Control Limits (d) (pCi/l)	Warning Limits (e) (pCi/l)	Performance Evaluation (f)
5/18/00	Sr-89	22.5	18.3	5.00	13.8-31.2	16.7-28.3	A
5/18/00	Sr-90	9.6	8.33	5.00	0.9-18.3	3.83-15.4	A
5/23/00	I-131	19.9	2.03	3.00	14.7-25.1	16.4-23.4	NA
9/01/00	Ra-226	13.0	9.70	1.15	7.41-18.6	9.25-16.8	A
9/01/00	U (NAT)	63.4	57.0	4.44	52.6-74.2	56.1-70.7	A
9/01/00	Ra-228	2.83	2.99	0.7	2.21-3.77	2.47-3.51	A
9/01/00	Ra-228	13.0	10.0	3.25	7.41-16.8	9.25-16.8	A
9/01/00	Sr-90	26.2	28.6	1.40	17.5-34.9	20.4-32.0	A
9/01/00	Gr-A	7.17	6.90	1.11	1.12-15.9	1.40-12.9	A
9/01/00	Gr-B	87.5	88.8	9.76	70.2-105	76.0-99.0	A
9/01/00	H-3	8320	8740	174	6910-9730	7360-9280	A

Footnotes:

- * All ERA samples are water.
- (a) The ERA Known Value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
- (b) Average \pm 1 sigma.
- (c) Established per the guidelines contained in the EPA's National Standards for Water Proficiency Testing Criteria Document, December 1998, as applicable.
- (d) Established per the guidelines contained in the EPA's National Standards for Water Proficiency Testing Criteria Document, December 1998, as applicable.
- (e) Established per the guidelines contained in the EPA's National Standards for Water Proficiency Testing Criteria Document, December 1998, as applicable.
- (f) A= Acceptable. Reported Result falls within the Warning Limits.
NA = Not Acceptable. Reported Result falls outside of the Control Limits.
CE = Check for Error. Reported Result falls within the Control Limits and outside of the Warning Limit.
- (g) For Westwood, NJ results outside control limits, an investigation was not instituted. After the relocation to Knoxville, TN, it was determined that the vast majority of outlying results were caused by analyst error or equipment failure. These possibilities were eliminated by the relocation.

APPENDIX C
SYNOPSIS OF ANALYTICAL PROCEDURES

ANALYTICAL PROCEDURES SYNOPSIS

Appendix C is a synopsis of the analytical procedures performed during 2000 on samples collected for the Nebraska Public Power Nuclear Plant's Radiological Environmental Monitoring Program. All analyses have been mutually agreed upon by Nebraska Public Power District and Teledyne Brown Engineering and include those recommended by the USNRC Branch Technical Position, Rev. 1, November 1979.

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GROSS BETA ANALYSIS OF SAMPLES

Air Particulates

After a delay of five or more days, allowing for the radon-222 and radon-220 (thoron) daughter products to decay, the filters are counted in a gas-flow proportional counter. An unused air particulate filter, supplied by the customer, is counted as the blank.

Calculations of the results, the two sigma error and the lower limit of detection (LLD):

$$\text{RESULT (pCi/m}^3\text{)} = ((S/T) - (B/t))/(2.22 V E)$$

$$\text{TWO SIGMA ERROR (pCi/m}^3\text{)} = 2((S/T^2) + (B/t^2))^{1/2}/(2.22 V E)$$

$$\text{LLD (pCi/m}^3\text{)} = 4.66 (B^{1/2})/(2.22 V E t)$$

where:

- S = Gross counts of sample including blank
- B = Counts of blank
- E = Counting efficiency
- T = Number of minutes sample was counted
- t = Number of minutes blank was counted
- V = Sample aliquot size (cubic meters)

DETERMINATION OF GROSS BETA ACTIVITY IN WATER SAMPLES

Introduction

The procedures described in this section are used to measure the overall radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

One liter of the sample is evaporated on a hot plate. A smaller volume may be used if the sample has a significant salt content as measured by a conductivity meter. If requested by the customer, the sample is filtered through No. 54 filter paper before evaporation, removing particles greater than 30 microns in size.

After evaporating to a small volume in a beaker, the sample is rinsed into a 2-inch diameter stainless steel planchette which is stamped with a concentric ring pattern to distribute residue evenly. Final evaporation to dryness takes place under heat lamps.

Residue mass is determined by weighing the planchette before and after mounting the sample. The planchette is counted for beta activity on an automatic proportional counter. Results are calculated using empirical self-absorption curves which allow for the change in effective counting efficiency caused by the residue mass.

Detection Capability

Detection capability depends upon the sample volume actually represented on the planchette, the background and the efficiency of the counting instrument, and upon self-absorption of beta particles by the mounted sample. Because the radioactive species are not identified, no decay corrections are made and the reported activity refers to the counting time.

The minimum detectable level (MDL) for water samples is nominally 1.6 picoCuries per liter for gross beta at the 4.66 sigma level (1.0 pCi/l at the 2.83 sigma level), assuming that 1 liter of sample is used and that ½ gram of sample residue is mounted on the planchette. These figures are based upon a counting time of 50 minutes and upon representative values of counting efficiency and background of 0.2 and 1.2 cpm, respectively

The MDL becomes significantly lower as the mount weight decreases because of reduced self-absorption. At a zero mount weight, the 4.66 sigma MDL for gross beta is 0.9 picoCuries per liter. These values reflect a beta counting efficiency of 0.38.

ANALYSIS OF SAMPLES FOR TRITIUM
(Liquid Scintillation)

Water

Ten milliliters of water are mixed with 10 ml of a liquid scintillation "cocktail" and then the mixture is counted in an automatic liquid scintillator.

Calculation of the results, the two sigma error and the lower limit detection (LLD) in pCi/l:

$$\text{RESULT} = (N-B)/(2.22 \text{ V E})$$

$$\text{TWO SIGMA ERROR} = 2((N + B)/\bullet t)^{1/2}/(2.22 \text{ V E})$$

$$\text{LLD} = 4.66 (B/\bullet t)^{1/2}/(2.22 \text{ V E})$$

where:

N	=	the gross cpm of the sample
B	=	the background of the detector in cpm
2.22	=	conversion factor changing dpm to pCi
V	=	volume of the sample in ml
E	=	efficiency of the detector
•t	=	counting time for the sample

ANALYSIS OF SAMPLES FOR STRONTIUM-89 AND -90

Water

Stable strontium carrier is added to 1 liter of sample and the volume is reduced by evaporation. Strontium is precipitated as $\text{Sr}(\text{NO}_3)_2$ using nitric acid. A barium scavenge and an iron (ferric hydroxide) scavenge are performed followed by addition of stable yttrium carrier and a minimum of 5 day period for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Strontium-89 activity is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Milk

Stable strontium carrier is added to 1 liter of sample and the sample is first evaporated, then ashed in a muffle furnace. The ash is dissolved and strontium is precipitated as phosphate, then is dissolved and precipitated as $\text{Sr}(\text{NO}_3)_2$ using fuming (90%) nitric acid. A barium chromate scavenge and an iron (ferric hydroxide) scavenge are then performed. Stable yttrium carrier is added and the sample is allowed to stand for a minimum of 5 days for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and then re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Strontium-89 is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Soil and Sediment

The sample is first dried under heat lamps and an aliquot is taken. Stable strontium carrier is added and the sample is leached in hydrochloric acid. The mixture is filtered and strontium is precipitated from the liquid portion as phosphate. Strontium is precipitated as $\text{Sr}(\text{NO}_3)_2$ using fuming (90%) nitric acid. A barium chromate scavenge and an iron (ferric hydroxide) scavenge are then performed. Stable yttrium carrier is added and the sample is allowed to stand for a minimum of 5 days for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Strontium-89 is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Organic Solids

A wet portion of the sample is dried and then ashed in a muffle furnace. Stable strontium carrier is added and the ash is leached in hydrochloric acid. The sample is filtered and strontium is precipitated from the liquid portion as phosphate. Strontium is precipitated as $\text{Sr}(\text{NO}_3)_2$ using

counted in a low level beta counter to infer strontium-90 activity. Strontium-89 activity is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is counted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

Air Particulates

Stable strontium carrier is added to the sample and it is leached in nitric acid to bring deposits into solution. The mixture is then filtered and the filtrate is reduced in volume by evaporation. Strontium is precipitated as $\text{Sr(NO}_3)_2$ using fuming (90%) nitric acid. A barium scavenge is used to remove some interfering species. An iron (ferric hydroxide) scavenge is performed, followed by addition of stable yttrium carrier and a 7 to 10 day period for yttrium ingrowth. Yttrium is then precipitated as hydroxide, dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer strontium-90 activity. Strontium-89 activity is determined by precipitating SrCO_3 from the sample after yttrium separation. This precipitate is counted on a nylon planchette and is covered with 80 mg/cm^2 aluminum absorber for low level beta counting.

Calculations of the result, two sigma errors and lower limits of detection (LLD) are expressed in activity of pCi/volume or pCi/mass:

$$\text{RESULT Sr-89} = (N/Dt - B_C - B_A) / (2.22 \text{ V } Y_S \text{ DF}_{\text{Sr-89}} E_{\text{Sr-89}})$$

$$\text{TWO SIGMA ERROR Sr-89} = 2(N/Dt + B_C + B_A) / (\bullet t)^{1/2} / (2.22 \text{ V } Y_S \text{ DF}_{\text{Sr-89}} E_{\text{Sr-89}})$$

$$\text{LLD Sr-89} = 4.66(B_C + B_A) / (\bullet t)^{1/2} / (2.22 \text{ V } Y_S \text{ DF}_{\text{Sr-89}} E_{\text{Sr-89}})$$

$$\text{RESULT Sr-90} = (N/\bullet t - B) / (2.22 \text{ V } Y_1 Y_2 \text{ DF IF E})$$

$$\text{TWO SIGMA ERROR Sr-90} = 2(N/\bullet t + B) / (\bullet t)^{1/2} / (2.22 \text{ V } Y_1 Y_2 \text{ DF IF E})$$

$$\text{LLD Sr-90} = 4.66(B/\bullet t)^{1/2} / (2.22 \text{ V } Y_1 Y_2 \text{ IF DF E})$$

WHERE:	N	=	total counts from sample
	$\bullet t$	=	counting time for sample (min)
	B_C	=	background rate of counter (cpm) using absorber configuration
	2.22	=	dpm /pCi
	V	=	volume or weight of sample analyzed
	B_A	=	background addition from Sr-90 and ingrowth of Y-90

B_C	=	$0.016(K) + (K) E_{Y/abs}(IG_{Y-90})$
Y_s	=	chemical yield of strontium
DF_{SR-89}	=	decay factor from the mid collection date to the counting date for SR-89
E_{SR-89}	=	efficiency of the counter for SR-89 with the 80 mg/cm. Sq. aluminum absorber
K	=	$(N \bullet t - B_C)_{Y-90} / E_{Y-90} IF_{Y-90} DF_{Y-90} Y_1$
DF_{Y-90}	=	the decay factor for Y-90 from the "milk" time to the mid count time
E_{Y-90}	=	efficiency of the counter for Y-90
IF_{Y-90}	=	ingrowth factor for Y-90 from scavenge time to milking time
IG_{Y-90}	=	the ingrowth factor for Y-90 into the strontium mount from the "milk" time to the mid count time
0.016	=	the efficiency of measuring SR-90 through a No. 6 absorber
$E_{Y/abs}$	=	the efficiency of counting Y-90 through a No. 6 absorber
B	=	background rate of counter (cpm)
Y_1	=	chemical yield of yttrium
Y_2	=	chemical yield of strontium
DF	=	decay factor of yttrium from the radiochemical milking time to the mid count time
IF	=	ingrowth factor for Y-90 from scavenge time to the radiochemical milking time

ANALYSIS OF SAMPLES FOR IODINE-131

Milk or Water

Two liters of sample are first equilibrated with stable iodide carrier. A batch treatment with anion exchange resin is used to remove iodine from the sample. The iodine is then stripped from the resin with sodium hypochlorite solution, is reduced with hydroxylamine hydrochloride and is extracted into carbon tetrachloride as free iodine. It is then back-extracted as iodide into sodium bisulfite solution and is precipitated as palladium iodide. The sodium bisulfite solution and is precipitated as palladium iodide. The precipitate is weighed for chemical yield and is mounted on a nylon planchette for low level beta counting. The chemical yield is corrected by measuring the stable iodide content of the milk or the water with a specific ion electrode.

Calculations of results, two sigma error and the lower limit of detection (LLD) in pCi/l:

$$\begin{aligned}\text{RESULT} &= (N/\bullet t - B)/(2.22 E V Y DF) \\ \text{TWO SIGMA ERROR} &= 2((N/\bullet t + B)/\bullet t)^{1/2}/(2.22 E V Y DF) \\ \text{LLD} &= 4.66(B/\bullet t)^{1/2}/(2.22 E V Y DF)\end{aligned}$$

where:	N	=	total counts from sample (counts)
	•t	=	counting time for sample (min)
	B	=	background rate of counter (cpm)
	2.22	=	dpm/pCi
	V	=	volume or weight of sample analyzed
	Y	=	chemical yield of the mount or sample counted
	DF	=	decay factor from the collection to the counting date
	E	=	efficiency of the counter for I-131, corrected for self absorption effects by the formula
	E	=	$E_s(\exp(-0.0061M)/(\exp(-0.0061M_s))$
	E _s	=	efficiency of the counter determined from an I-131 standard mount
	M _s	=	mass of PdI ₂ on the standard mount, mg
	M	=	mass of PDI ₂ on the sample mount, mg

GAMMA SPECTROMETRY OF SAMPLES

Milk and Water

A 1.0 liter Marinelli beaker is filled with a representative aliquot of the sample. The sample is then counted for approximately 1000 minutes with a shielded Ge(Li) detector coupled to a mini-computer-based data acquisition system which performs pulse height analysis.

Dried Solids Other Than Soils and Sediments

A large quantity of the sample is dried at a low temperature, less than 100°C. As much as possible (up to the total sample) is loaded into a tared 1-liter Marinelli and weighed. The sample is then counted for approximately 1000 minutes with a shielded Ge(Li) detector coupled to a mini-computer-based data acquisition system which performs pulse height analysis.

Fish

As much as possible (up to the total sample) of the edible portion of the sample is loaded into a tared Marinelli and weighed. The sample is then counted for approximately 1000 minutes with a shielded Ge(Li) detector coupled to a mini-computer-based data acquisition system which performs pulse height analysis.

Soils and Sediments

Soils and sediments are dried at a low temperature, less than 100°C. The soil or sediment is loaded fully into a tared, standard 300 cc container and weighed. The sample is then counted for approximately six hours with a shielded Ge(Li) detector coupled to a mini-computer-based data acquisition system which performs pulse height and analysis.

Charcoal Cartridges (Air Iodine)

Charcoal cartridges are counted up to five at a time, with one positioned on the face of a Ge(Li) detector and up to four on the side of the Ge(Li) detector. Each Ge(Li) detector is calibrated for both positions. The detection limit for I-131 of each charcoal cartridge can be determined (assuming no positive I-131) uniquely from the volume of air which passed through it. In the event I-131 is observed in the initial counting of a set, each charcoal cartridge is then counted separately, positioned on the face of the detector.

Air Particulate

The thirteen airborne particulate filters for a quarterly composite for each field station are aligned one in front of another and then counted for at least six hours with a shielded Ge(Li) detector coupled to a mini-computer-based data acquisition system which performs pulse height analysis.

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

The calculation of results, two sigma error and the lower limit of detection (LLD) in pCi/volume of pCi/mass:

$$\text{RESULT} = (S-B)/(2.22 \ t \ E \ V \ F \ DF)$$

$$\text{TWO SIGMA ERROR} = 2(S+B)^{1/2}/(2.22 \ t \ E \ V \ F \ DF)$$

$$\text{LLD} = 4.66(B)^{1/2}/(2.22 \ t \ E \ V \ F \ DF)$$

where:

S	=	Area, in counts, of sample peak and background (region of spectrum of interest)
B	=	Background area, in counts, under sample peak, determined by a linear interpolation of the representative backgrounds on either side of the peak
t	=	length of time in minutes the sample was counted
2.22	=	dpm/pCi
E	=	detector efficiency for energy of interest and geometry of sample
V	=	sample aliquot size (liters, cubic meters, kilograms, or grams)
F	=	fractional gamma abundance (specific for each emitted gamma)
DF	=	decay factor from the mid-collection date to the counting date

ADDENDUM TO GAMMA SPEC PROCEDURE

Ba-140 (half-life \approx 12.8d) decays to La-140 (half-life \sim 40 hrs) and the daughter radionuclide, La-140 approaches \sim 90 % of the Ba-140 activity within \sim 6 days. The La-140 photon energy at 1596 KeV is used to quantify the Ba-140 activity due to its high photon emission probability yield (96%) producing a higher count rate when present and therefore, a smaller associated counting error.

Zr-95 (half-life = \sim 65d) decays to Nb-95 (half-life = \sim 35d). The photon energy of Nb-95 (\sim 765 KeV) is used to quantify Zr-95 because of the high photon emission probability yield (\sim 100%) yielding a higher count rate and an associated lower counting error. The daughter radionuclide, Nb-95 approaches the Zr-95 activity after a time period of \sim 65 days, an estimated time interval occurring between sample exposure, collection and shipping, and analysis.

ENVIRONMENTAL DOSIMETRY

Teledyne Brown Engineering uses a $\text{CaSO}_4:\text{Dy}$ thermoluminescent dosimeter (TLD) which the company manufactures. This material has a high light output, negligible thermally induced signal loss (fading), and negligible self dosing. The energy response curve (as well as all other features) satisfies NRC Reg. Guide 4.13. Transit doses are accounted for by use of separate TLDs.

Following the field exposure period the TLDs are placed in a Teledyne Brown Engineering Model 8300. One fourth of the rectangular TLD is heated at a time and the measured light emission (luminescence) is recorded. The TLD is then annealed and exposed to a known Cs-137 dose; each area is then read again. This provides a calibration of each area of each TLD after every field use. The transit controls are read in the same manner.

Calculations of results and the two sigma error in net milliRoentgen (mR):

$$\text{RESULT} = D = (D_1 + D_2 + D_3 + D_4)/4$$

$$\text{TWO SIGMA ERROR} = 2((D_1 - D)^2 + (D_2 - D)^2 + (D_3 - D)^2 + (D_4 - D)^2 / 3)^{1/2}$$

WHERE:

D_1	=	the net mR of area 1 of the TLD, and similarly for D_2 , D_3 , and D_4
D_1	=	$I_1 K / R_1 - A$
I_1	=	the instrument reading of the field dose in area 1
K	=	the known exposure by the Cs-137 source
R_1	=	the instrument reading due to the Cs-137 dose on area 1
A	=	average dose in mR, calculated in similar manner as above, of the transit control TLDs
D	=	the average net mR of all 4 areas of the TLD.

In June of 2000, clients were notified that TBE would no longer be a provider of environmental TLD service. TBE made arrangements with a qualified vendor of this service to combine this monitoring for our clients. This vendor is Proxtronic, Inc. located in Burke, VA. This vendor was selected because 1) NU-AP accredited laboratory 2) They have been identified by the Nuclear Utility Procurement Issues committee (NUPIC) as an approved supplier and 3) They have had their Quality Assurance Program reviewed and approved by TBE. TBE uses Proxtronic for all its TLD monitoring needs.

LLD FORMULAS

The LLD formulas in Section C are consistent with the LLD discussion in the ODAM. The term s_b in the ODAM equals $\sqrt{B/t}$ by Poisson statistics, where B = blank counts and t = blank counting intervals. The decay factor term $e^{-\lambda \Delta t}$ in the ODAM is the same as the DF terms in Section C, but does not appear in certain analyses such as gross beta because decay does not apply. In the tritium analysis, decay is not considered because of the relatively long half-life.

Efficiencies and volumes are consistent between the two documents, Chemical yields appear in Section C where applicable but do not apply to other analyses such as tritium and gross beta.

APPENDIX D
DETECTION LIMITS AND REPORTING LEVELS

NEBRASKA PUBLIC POWER – COOPER NUCLEAR STATION
DETECTION LIMITS AND REPORTING LEVELS

Isotope	ODAM LLD	Rept. Level
<u>Water – pCi/liter</u>		
Gross Beta	4	N/A
H-3	2000	30,000
Mn-54	15	1000
Fe-59	30	400
Co-58	15	1000
Co-60	15	300
Zn-65	30	300
Zr-95	30	400
Nb-95	15	400
I-131	1	2
Cs-134	15	30
Cs-137	18	50
Ba-140	60	200
La-140	15	200
<u>Air Filter – pCi/m3</u>		
Gross Beta	0.01	N/A
I-131	0.07	0.9
Cs-134	0.05	10
Cs-137	0.06	20
<u>Fish - pCi/Kg-wet</u>		
Mn-54	130	30,000
Fe-59	260	10,000
Co-58	130	30,000
Co-60	130	10,000
Zn-65	260	20,000
Cs-134	130	1,000
Cs-137	150	2,000
<u>Milk – pCi/liter</u>		
I-131	1	3
Cs-134	15	60
Cs-137	18	70
Ba-140	60	300
La-140	15	300

NEBRASKA PUBLIC POWER – COOPER NUCLEAR STATION
DETECTION LIMITS AND REPORTING LEVELS

Isotope	ODAM LLD	Rept. Level
<u>Vegetation – pCi/Kg-wet</u>		
I-131	60	100
Cs-134	60	1,000
Cs-137	80	2,000
<u>Sediment – pCi/Kg-dry</u>		
Cs-134	150	N/A
Cs-137	180	N/A

APPENDIX E
REMP SAMPLING AND ANALYTICAL EXCEPTIONS

EXCEPTIONS

Appendix E contains the exceptions to the 2000 REMP Program. Where possible, causes of the deviation have been corrected to prevent recurrence. Several samples were unavailable due to seasonal unavailability. All deviations from the sampling schedule have been documented on the data tables. Data Tables are in Section VII.

Exceptions for Scheduled REMP Sampling and Analysis During 2000, NPPD Cooper Nuclear Station

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
6	Airborne	Air particulate & Charcoal Filter	03/07/00-03/14/00 03/14/00-03/21/00 03/21/00-03/28/00 03/28/00-04/04/00	Sample not available; pump out of service	Equipment repaired and returned to normal service; no further action necessary
8	Airborne	Air particulate & Charcoal Filter	06/13/00-06/20/00	Station not accessible due to poor road conditions	Regular sampling resumed when conditions allowed; no further action necessary
3	Airborne	Air particulate & Charcoal Filter	07/18/01-07/25/00	Station not accessible due to poor road conditions	Regular sampling resumed when conditions allowed; no further action necessary
10	Airborne	Air particulate & Charcoal Filter	07/25/00-08/01/00	Possible meter failure; air volume not known	Equipment repaired and returned to normal service; no further action necessary
5	Airborne	Air particulate & Charcoal Filter	08/22/00-08/29/00	Possible meter failure; air volume not known	Equipment repaired and returned to normal service; no further action necessary
1 - 10	Airborne	Air particulate	10/03/00-10/10/00	Laboratory lost samples	Laboratory provided documentation that samples were lost; no further action necessary
1 - 10	Airborne	Charcoal Filter	10/24/01-10/31/00	Laboratory held samples too long before analyzing	Laboratory provided documentation that samples were held too long; no further action necessary
6	Airborne	Air particulate & Charcoal Filter	11/28/00-12/05/00	Sample not available; pump out of service	Equipment repaired and returned to normal service; no further action necessary
6	Airborne	Air particulate & Charcoal Filter	12/05/00-12/12/00	Sample not available; pump out of service	Equipment repaired and returned to normal service; no further action necessary

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
1-10	Airborne	Composite Air Particulate	03/28/00-06/27/00	Equipment malfunction caused a delay in counting, LLDs were not met	Laboratory documented that new equipment was installed; no further action necessary
1-10	Airborne	Composite Air Particulate	06/27/00-09/26/00	Due to delay in counting, LLDs were not met	Laboratory provided documentation of delay; no further action necessary
85	Ambient Gamma	TLD	04/04/00-07/18/00	Sample missing	TLD's for next sampling period were placed at sites; no further action necessary
89	Ambient Gamma	TLD	07/18/00-10/03/00	Sample missing	TLD's for next sampling period were placed at sites; no further action necessary
1,3,8	Ambient Gamma	TLD	10/03/00-01/05/00	Sample missing	TLD's for next sampling period were placed at sites; no further action necessary
28 & 35	Aquatic	Fish	10/19/00	Laboratory held samples too long before analyzing	Laboratory provided documentation of delay; no further action necessary
35	Aquatic	Fish	06/28/00 10/19/00	Bottom feeder not available	Attributable to natural seasonal variations, no further action required
35	Aquatic	River water	11/07/00	Sample invalid due to high level of suspended solids	Laboratory provided documentation; no further action necessary
12,28,35	Aquatic	River water	1/04/00, 2/01/00 9/06/00 10/03/00 11/07/00	LLDs were not met due to delays in analysis	Laboratory provided documentation; no further action necessary
28	Aquatic	Shoreline sediment	10/03/00	I-131 exceeded LLD due to delay in analysis	Laboratory provided documentation; no further action necessary

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
96	Ingestion	Broadleaf vegetation	05/23/00, 06/13/00 07/12/00 08/15/00 09/19/00	Insufficient vegetation; no sample	Attributable to natural seasonal variations and mowing; no further action necessary
101	Ingestion	Broadleaf vegetation	05/23/00 06/13/00 08/15/00 09/19/00	Insufficient vegetation; no sample	Attributable to natural seasonal variations and mowing; no further action necessary
89	Ingestion	Broadleaf vegetation	09/19/00	Laboratory held samples too long before analyzing	Laboratory provided documentation that samples were held too long, no further action necessary.
35	Ingestion	Broadleaf vegetation	05/23/00, 06/13/00 07/12/00 08/15/00 09/19/00	Insufficient vegetation; no sample	Attributable to natural seasonal variations and mowing; no further action necessary
100	Ingestion	Milk – Other producer	07/11/00	Not analyzed due to delay in analyzing	Laboratory provided documentation that sample was lost; no further action necessary
61	Ingestion	Milk – Nearest producer	04/04/00 05/02/00 06/20/00 08/29/00 09/26/00	Laboratory held samples too long before analyzing	Laboratory provided documentation that samples were held too long; no further action necessary
99, 100	Ingestion	Milk – Other producer	10/10/00	Laboratory lost samples	Laboratory provided documentation that samples were lost; no further action necessary
61	Ingestion	Milk – Nearest producer	01/04/00-04/04/00	Laboratory performed quarterly composite rather than monthly composites	Laboratory realized error and began doing monthly composites 05/02/00; no further action necessary

Station(s)	Pathway	Sample	Collection Period	Exception/Reason	Actions Taken and Replacement Samples, Where Applicable
99,100	Ingestion	Milk – Other Producer	1/11/00 04/11/00 07/11/00	SR-90 exceeded LLD due to delay in analysis	Laboratory provided documentation; no further action necessary
61	Ingestion	Milk – Nearest producer	11/07/00	Laboratory held samples too long before analyzing	Laboratory provided documentation that samples were held too long; no further action necessary
61	Ingestion	Milk - Nearest	10/03/00 11/07/00 12/05/00	Sample not analyzed, sample not received from subcontractor	Laboratory provided documentation; no further action necessary

APPENDIX F
SUMMARY OF DOSES TO A MEMBER OF THE PUBLIC OFF-SITE

Summary of Doses to Maximum Individual at the Site Boundary, Resulting from Exposure to
Radioactivity Discharged in Liquid Effluents, January-December 2000, Cooper Nuclear Station

Dose to Individual, mrem								
Period and Pathway	Skin	Bone	Liver	Total Body	Thyroid	Kidney	Lung	GI-LLI
<u>1st Quarter</u>	3.92 E-06	3.71 E-03	9.45 E-04	1.28 E-03	3.38 E-06	3.13 E-04	1.03 E-04	7.93 E-04
<u>2nd Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
<u>3rd Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
<u>4th Quarter</u>	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
 Totals for 2000	 3.92 E-06	 3.71 E-03	 9.45 E-04	 1.28 E-03	 3.38 E-06	 3.13 E-04	 1.03 E-04	 7.93 E-04

Summary of Gaseous Effluent Dose Calculations
DOSES TO MAXIMUM INDIVIDUAL (MREM), JANUARY-DECEMBER 2000

DOSES TO MAXIMUM INDIVIDUAL (MREM), JANUARY-DECEMBER 2000

COOPER NUCLEAR STATION JANUARY-DECEMBER 2000
SPECIAL LOCATION # 1 SITE BOUNDARY
AT 0.67 MILES N

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.05E-02	3.82E-02	8.56E-02	2.90E-02	2.92E-02	1.41E-01	3.00E-02	6.37E-02
TEEN	3.15E-02	4.00E-02	1.21E-01	2.92E-02	2.96E-02	1.84E-01	3.07E-02	6.37E-02
CHILD	3.55E-02	3.75E-02	2.51E-01	2.95E-02	3.01E-02	3.24E-01	3.05E-02	6.37E-02
INFANT	3.05E-02	2.95E-02	6.49E-02	3.06E-02	3.09E-02	6.52E-01	3.04E-02	6.37E-02

COOPER NUCLEAR STATION JANUARY-DECEMBER 2000
SPECIAL LOCATION # 2 NEAR RESIDENCE
AT 0.90 MILES NW

PATHWAY	T.BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.92E-02	3.17E-02	4.66E-02	2.88E-02	2.89E-02	8.86E-02	2.93E-02	6.95E-02
TEEN	2.96E-02	3.22E-02	5.75E-02	2.89E-02	2.91E-02	1.12E-01	2.95E-02	6.95E-02
CHILD	3.09E-02	3.14E-02	9.85E-02	2.91E-02	2.94E-02	1.87E-01	2.95E-02	6.95E-02
INFANT	2.94E-02	2.89E-02	4.04E-02	2.97E-02	2.98E-02	3.63E-01	2.95E-02	6.95E-02

APPENDIX G
REMP SAMPLE STATION DESCRIPTIONS

REMP SAMPLE STATION DESCRIPTIONS

The following page contains descriptions of the CNS REMP Sample Stations that were active or were used for part or all of 2000. There were no changes to the CNS REMP Sample Stations from the previous year.

REMP SAMPLE STATION DESCRIPTIONS
SAMPLE TYPES AND SAMPLE LOCATIONS

Sample
Station (a)

Sample Description – Type and Location

No. 1

Type: (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: Outside the northwest edge of fence, east of the gate to the LLRW storage pad on the CNS site, NW ¼, S32, T5N, R16E, Nemaha County, Nebraska.

No. 2

Type: (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: North side of county road to the south portion of CNS site, SW ¼, S32, T5N, R16E, Nemaha County, Nebraska.

No. 3

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: Located on the north side of the Brownsville State Recreation Park access road near water gauging station, SE ¼, S18, T5N, R16E, Nemaha County, Nebraska.

No. 4

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: Located ½ mile south of Phelps City, Missouri, on west side of highway "U", NE ¼, S2, T64N, R42W, Atchison County, Missouri.

No. 5

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: Located ¼ mile south and ¼ mile east of Langdon, Missouri, on north side of road, west of railroad tracks, SW ¼, T64N, R41W, Atchison County, Missouri.

No. 6

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: One mile west of the end of Missouri State Highway "U", SW corner of the intersection, NW ¼, S34, T64N, R42W, Atchison County, Missouri.

Sample
Station

Sample Description – Type and Location

No 7

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: 300 yards east of Highway 67 on north side of road, SW ¼, S6, T4N, R16E, Nemaha, Nebraska.

No. 8

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: ½ mile north, ¾ mile west and ¾ mile north of Nemaha, on west side of road adjacent to transmission line, NE ¼, S35, T5N, R15E, Nemaha County, Nebraska.

No. 9

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: Four miles north of Highway 136, on Highway 67. Then 1 mile east of Highway 67 and ½ mile north on west side of road, SW ¼, S26, T6N, R15E, Nemaha County, Nebraska.

No. 10

Type (1) Air Particulate and Charcoal Filters
(2) Environmental Thermoluminescent Dosimetry

Location: One mile north of Barada, Nebraska, in SW corner of intersection, NE ¼, S14, T3N, R16E, Richardson County, Nebraska.

No. 11

Type: (1) Water – Ground

Location: Plant well water supply header at well pits, NW ¼, S32, T5N, R16E, Nemaha County, Nebraska.

No. 12

Type: (1) Water – River

Location: Sample (1) taken from the Missouri River immediately upstream from the Plant Intake Structure (River Mile 532.5). During periods when unsafe conditions warrant, Station 35 may be used as an alternate upstream collection site.

Sample
Station

Sample Description – Type and Location

No.20

Type: (1) Environmental Thermoluminescent Dosimetry

Location: On NNW boundary of NPPD property, east side of county road, SE , S30, T5N, R16E, Nemaha County, Nebraska.

No.28

Type (1) Water – River, (2) Fish
(3) Sediment from Shoreline
(4) Food Products – Broadleaf Vegetation

Location: Samples (1), (3), and (4) are taken from the Missouri River or its shore downstream near River Mile 530, Sample (2) is taken from the Missouri River ½ to 3 miles downstream of the plant site.

No. 35

Type (1) Fish
(2) Water – River (Alternate Site)
(3) Food Products – Broadleaf Vegetation

Location: Sample (1) will be taken from the Missouri River about 1 to 3 miles above the CNS intake structure. During periods when unsafe conditions warrant, Station 35 may be used as an alternate to Station 12 (upstream collection site) for sample type (2). Sample (3) is taken about ¼ mile south of the Brownville State Recreation Area in Sector A.

No. 42

Type: (1) Milk – Other Producer

Location: One mile south, 1 ¼ miles east of Barada, Nebraska, south side of county road, NW ¼, S30, T3N, R17E, Richardson County, Nebraska.

No. 44

Type: (1) Environmental Thermoluminescent Dosimetry

Location: ¼ mile south of Auburn Country Club on Highway 75, then ½ mile east of Highway 75 at fence line north of county road, SE1/4, S27, T5N, R14E, Nemaha County, Nebraska.

No. 47

Type: (1) Water – Ground

Location: At Falls City Municipal water supply well approximately 2 miles south of Rulo, Nebraska, east side of road, out of main header flow meter, SW ¼, S20, T1N, R18E, Richardson County, Nebraska.

<u>Sample Station</u>	<u>Sample Description – Type and Location</u>
No. 56	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: 1 ¼ miles SW of Langdon, Missouri, on Highway “U”, on the right side of the highway, NW ¼, S23, T64N, R42W, Atchison County, Missouri.</p>
No. 58	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: Three miles south of Brownville, Nebraska, on county road, at the SE corner of the intersection with the farm road leading to Sample Station No. 2, SE1/4, S31, T5N, R16E, Nemaha County, Nebraska.</p>
No. 59	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: One mile SSE of the CNS Elevated Release Point, in the vicinity of the levee at the south boundary of NPPD property, SE ¼, S32, T5N, R16E, Nemaha County, Nebraska.</p>
No. 61	<p>Type (1) Milk – Nearest Producer</p> <p>Location: One mile west of Brownville, Nebraska, on Highway 136, then 1 mile north on the county road, turn right and proceed approximately ½ mile east on south side of road, NW1/4, S13, T5N, R15E, Nemaha County, Nebraska.</p>
No. 66	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: Two miles south of Nemaha, Nebraska, on Highway 67 – east side of road, NW1/4, S19, T4N, R16E, Nemaha County, Nebraska.</p>
No. 67	<p>Type: (1) Environmental Thermoluminescent Dosimetry</p> <p>Location: 2 miles west of Brownville, Nebraska, on Highway 136, then north 1 ½ miles on county road and east ½ mile, on north side of road, NE1/4, S11, T5N, R15E, Nemaha County, Nebraska.</p>

Sample
Station

Sample Description – Type and Location

- No. 71 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: Two miles east of Phelps City, Missouri, on Highway 36, then south 1 ½ miles on county road and west ¼ mile, SE1/4, S6, T64N, R41W, Atchison County, Missouri.
- No. 79 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: 1 7/8 miles south of Brownville, NE, on east side of paved road, NPPD property, SE1/4, S30, T5N, R16E, Nemaha County, Nebraska.
- No. 80 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: 2 1/8 miles south of Brownville, on east side of paved road, NPPD property, NE1/4, S31, T5N, R16E, Nemaha County, Nebraska.
- No. 81 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: 2 3/8 miles south of Brownville, Nebraska, in the NE corner of the intersection of the paved county road and CNS access road, NPPD property, NE1/4, S31, T5N, R16E, Nemaha County, Nebraska.
- No. 82 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: 7/8 mile south of CNS in a field, on NPPD property, SW1/4, S32, T5N, R16E, Nemaha County, Nebraska.
- No. 83 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: 2 ¼ miles south of Nemaha, Nebraska, on Highway 67, then east 1 mile to the junction of the driveway and county road (east side of drive), NE1/4, S19, T4N, R16E, Nemaha County, Nebraska.
- No. 84 Type: (1) Environmental Thermoluminescent Dosimetry
- Location: 2 ½ miles west of Brownville, NE, south side of Highway 136 west of Locust Grove School, NW1/4, S22, T5N, R15E, Nemaha County, Nebraska.

Sample
Station

Sample Description – Type and Location

No. 85

Type: (1) Environmental Thermoluminescent Dosimetry

Location: One mile east of Brownville, Nebraska, on Highway 136, then north $\frac{1}{4}$ mile on the east side of the county road, NE1/4, S33, T65N, R42W, Atchison County, Missouri.

No. 86

Type: (1) Environmental Thermoluminescent Dosimetry

Location: One mile west of Phelps City, Missouri, on Highway 136, then north $1\frac{1}{2}$ miles on Highway "D" on west side, SE1/4, S22, T65N, R42W, Atchison County, Missouri.

No. 87

Type: (1) Environmental Thermoluminescent Dosimetry

Location: One mile west of Phelps City, Missouri, on Highway 136, then south $\frac{1}{2}$ mile on county road and $\frac{3}{4}$ mile west on county road to the end of the road, NW1/4, S3, T64N, R42W, Atchison County, Missouri.

No. 88

Type: (1) Environmental Thermoluminescent Dosimetry

Location: One mile west of Phelps City, Missouri, on Highway 136, then south 2 miles at the end of the county road, NW1/4, S11, T64N, R42W, Atchison County, Missouri.

No. 89

Type: (1) Environmental Thermoluminescent Dosimetry

Location: $2\frac{1}{2}$ miles south of Phelps City, Missouri, on Highway "U", then $\frac{1}{2}$ mile west in the SE corner of the county road intersection, NE1/4, S14, T64N, R42W, Atchison County, Missouri.

No. 90

Type: (1) Environmental Thermoluminescent Dosimetry

Location: $1\frac{1}{2}$ miles west and $\frac{3}{4}$ mile south of Langdon, Missouri, on Highway "U", then $\frac{1}{4}$ mile west, SW1/4, S23, T64N, R42W, Atchison County, Missouri.

Sample
Station

Sample Description – Type and Location

- No. 91 Type: (1) Environmental Thermoluminescent Dosimetry
Location: ½ mile west of Rockport, Missouri, on the south side of the intersection of U.S. Highway 136 and U.S. Highway 275, at the south side of the water tower, NW1/4, S28, T65N, R41W, Atchison County, Missouri.
- No. 94 Type: (1) Environmental Thermoluminescent Dosimetry
Location: ¼ mile of Langdon, Missouri, on the west side of the road, NE1/4, S24, T64N, R42W, Atchison County, Missouri.
- No. 96 Type: (1) Food products – Broadleaf Vegetation
Location: Approximately 1 mile south of Brownville, Nebraska, along the paved road, in the road ditch in Sector R, SW1/4, S19, T5N, R16E, Nemaha County, Nebraska.
- No. 99 Type: (1) Milk (Nearest and Other Producer)
Location: 1 ¼ mile south of Shubert, Nebraska, on the west side of Highway 67, NE1/4, S24, T3N, R15E, Richardson County, Nebraska.
- No. 100 Type (1) Milk (Other Producer)
Location: Two miles south and 1 mile west of Shubert, Nebraska, SW1/4, S23, T3N, R15E, Richardson County, Nebraska.
- No. 101 Type: (1) Food Products – Broadleaf Vegetation
Location: 5 ½ miles east and ½ mile north of Rock Port, Missouri, near the junction of Highway 136 and Highway 59, in Sector D, encompasses portions of several sections, Athison County, Missouri.

- (a) Sample station numbers missing form the sequence are for inactive or discontinued sampling locations.