Duke Power Company
Catawba Nuclear Generation Department
4800 Concord Road
York, SC 29745

M. S. Tuckman
Vice President
(803)831-3205 Office
(803)831-3426 Fax

DUKE POWER

April 21, 1992

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414
Annual Environmental Operating Report
Calendar Year 1991

Attached is the 1991 Annual Environmental Operating Report which is required by the Environmental Protection Plan (Appendix B to the Catawba Facility Operating License). The report consists of the following attachments:

Attachment I "Summaries and Analysis of Results of Activities Required by the Environmental Protection Plan (EPP)",

Attachment II "Aerial Remote Sensing Report", and

Attachment III "Copy of Non-routine Event Reports Sent to the South Carolina Department of Health and Environment Control Concerning Diesel Fuel Contaminated Soil".

Also attached are the photographs from the 1991 aerial remote sensing study.

Very truly yours,

M. S. Tuckman

M. S. Tuckman

Attachments

CRL/AEOR1991

IE25

photos to Reg files

xc: S. D. Ebneter
Regional Administrator, Region II

R. E. Martin, ONRR

W. T. Orders
Senior Resident Inspector

ATTACHMENT I

Summaries and Analysis of Results of Activities
Required by the Environmental Protection Plan (EPP)

Summaries and Analysis of Results of Activities Required by the Environmental Protection Plan (EPP)

No observed non-radiological impacts on the environment due to the operation of Catawba Nuclear Station were noted during the reporting period. No evidence of trends toward irreversible damage to the environment were identified.

Section 4.2.1 - Aerial Remote Sensing

Pre-operational infrared photographs were obtained in 1983 and 1984. Operational data was obtained again in 1985, 1986, 1987, 1990, and 1991. The photographs of the 1991 aerial remote sensing and report are attached. Monitoring in 1991 did not indicate any adverse damage to vegetation in the vicinity of the Catawba site related to cooling tower operation. The next aerial remote sensing monitoring will be conducted in September or October 1993 per the required sampling program for assessment of vegetative communities near the cooling towers of Catawba Nuclear Station.

Section 5.4.1(1) - EPP Non-Compliance and Corrective Actions

1. A copy of nonroutine event reports, describing the detection of a small amount of diesel fuel contaminated soil in April 1991 and subsequent action taken, were forwarded to South Carolina Department of Health and Environmental Control, but not to the NRC at the same time.

   Corrective action

   Individuals responsible for submittal of reports were notified of the EPP requirements. A copy of these nonroutine event reports submitted to the State agency are attached.

Section 5.4.1(2) - Changes in Station Design or Operation, Tests, and Experiments which Involve a Potentially Significant Unreviewed Question

No station changes were identified that involved a potentially significant unreviewed environmental question.

Section 5.4.1(3) - Nonroutine Reports Submitted in Accordance with Subsection 5.4.2 of EPP.

1. The monthly NPDES monitoring report for March 1991, describing a nonroutine event (overflow from a manway discharged into the Standby Nuclear Service Water Pond), was submitted to South Carolina Department of Health and Environmental Control and to the NRC on April 26, 1991.

2. A report, describing the detection of a small amount of diesel fuel contaminated soil in April 1991 and subsequent action taken, were forwarded to South Carolina Department of Health and Environmental Control on April 18 and June 5, 1991.

3. A report, describing the discharge of chemical metal cleaning waste prior to a representative sample being taken, was submitted to South Carolina Department of Health and Environmental Control and to the NRC on May 9, 1991.

4. A report, describing the release of approximately 130 pounds of sodium hypochlorite to the ground in July 1991, was submitted to South Carolina Department of Health and Environmental Control and to the NRC on July 16, 1991.

Section 5.4.1(4) - NPDES Reports Related to Matters Identified in Section 2.1 of the EPP.

1. Discharge Monitoring Reports Submitted to SCDHEC:

Date Submitted	Period Covered
February 27, 1991	January, 1991
March 27, 1991	February, 1991
April 26, 1991	March, 1991
May 24, 1991	April, 1991
June 27, 1991	May, 1991
July 26, 1991	June, 1991
August 21, 1991	July, 1991
September 27, 1991	August, 1991
October 28, 1991	September, 1991
November 27, 1991	October, 1991
January 7, 1992	November, 1991
January 28, 1992	December, 1991

ATTACHMENT II

Aerial Remote Sensing Report

CATAWBA NUCLEAR STATION VEGETATION MONITORING 1992

INTRODUCTION

The Catawba Nuclear Station Non-Radiological Environmental Protection Plan (NREP) requires that the Catawba site be monitored for possible effects of cooling tower drift on vegetation due to operation of Catawba Units 1 and 2. This monitoring began the first September following operation of Unit 1 and is to continue in alternate years for three monitoring periods following operation of Unit 2. Unit 1 generation began in January 1985. This report describes the results of the monitoring program through 1991.

The Catawba Environmental Report (ER) indicated that the area within the NE and SW sectors approximately 950 feet from the center of the cooling tower yard would receive maximum drift deposition. Total dissolved solids (TDS) in the drift were projected to be in the range of 350 to 500 mg/l, based on the influent makeup water TDS of 60 mg/l and an operating range of 7 to 10 cycles of concentration. In addition, sodium hypochlorite, organic biocides, and a dispersant are periodically used to treat cooling water.

Drift deposition rate calculations in the Catawba ER predicted total solids deposition rates of 2-3 kg/ha/month (2-3 lb/acre/month) based on 350 to 500 mg/l of TDS in drift. The Catawba FES indicates that thresholds for visible leaf damage in sensitive plants fall in the range of 10 to 20 kg/ha/month (9 to 18 lb/acre/month. Since these thresholds exceeded the projected solids deposition rates at the Catawba site by factors of approximately 5- to 10-fold, drift from the Catawba cooling towers was not expected to produce adverse impacts on site vegetation within or beyond the cooling tower yard or plant boundaries.

METHODS

The condition of Catawba Nuclear Station site vegetation has been monitored by color infrared aerial photography, supplemented by ground level visual inspection of site vegetation, since 1983. Aerial photography was performed in September 1983 and 1984 (preoperational), in September 1986 (first operational growing season), in September 1987 (second operational growing season), in January 1990 (due to Hurricane Hugo), and in September 1991. Ground level observations were made to support aerial photography. Conclusions based on inspections of the IR photographs and ground level observations through 1989 were presented in the Catawba 1989 Annual Environmental Operating Report (AEOL).

Aerial IR photography was obtained using Kodak IR Type 2443 film at 1:6000 (1 in = 500 ft) scale on 6 September 1983, on 2 September 1984, on 14 September 1985, on 14 September 19 , on 23 September 1987, on 3 January 1990, and on 14 September 1991.

Vegetation shown in the photographs within a radius of approximately 1 km of the cooling tower yard was inspected for evidence of dead or damaged foliage which could be related to cooling tower operation. Photographs were interpreted using information provided by Murtha (1972, 1984) as a guide.

RESULTS AND DISCUSSION

Operation of the Catawba Unit 1 cooling towers began in January 1985 (Table 1). Full scale operation of the cooling towers of both units began in mid-1986 (Table 2). Therefore, site vegetation experienced drift deposition from full two-unit operation during the 1987 growing season, except during outages (Tables 2 and 3). Drift deposition from two-unit operation continued from 1988 through 1991 (Tables 4 and 5).

Forested areas located within 1 km of the towers consist of mixed pine-hardwoods, loblolly pine plantations, mixed shortleaf-Virginia pine stands, and mixed hardwoods. These stands are described in Duke Power (1975).

Analysis of IR photography revealed no vegetation anomalies that could be attributed to operation of the cooling towers. Small openings in the forest canopies and individual tree mortalities were apparent from photographs of inside and outside the study area. These occurrences were primarily believed to be the result of damages from Hurricane Hugo and southern pine beetles. No color variations were observed that could be attributed to vegetation impacts to stands of trees, and there were no patterns observed in the distribution of tree mortalities that would indicate impacts to vegetation resulting from cooling tower drift. Color variations observed in the photographs were associated with differences in types of vegetation cover, not damaged foilage.

Ground inspection of vegetation in the 1-kilometer study area revealed four types of damage to vegetation: Hurricane Hugo damage, southern pine beetle damage, insect damage to apical twigs, and needle-tip necrosis. In September 1989, Hurricane Hugo passed through the study area, leaving up-rooted, crown-damaged, and trunk-broken conifers and decidiuous trees. This damage remains, resulting in open canopies and fallen trees that are apparent in the infrared photographs.

In 1987 and 1988, loblolly, Virginia, and shortleaf pines in the study area were killed following infestations of the southern pine beetle. An especially heavy infestation occurred within the eastern part of the 1-kilometer study area in 1987; this area was logged in 1988 to control the infestation, and a salvage harvest was performed in this area following Hurricane Hugo. "Pockets" of dead pines resulting from this infestation can still be seen inside and outside of the study area. Some trees within 200 feet of the cooling towers died from southern pine beetle attack. The frequency of occurrence of the infestation in this area was no higher than that of areas not exposed to cooling tower drift; therefore, no association could be made between the beetle damage and cooling tower drift.

As mentioned in the 1989 report, needle-tip necrosis or "needle scorch" was observed on loblolly pines in 1987 on the north side of the cooling towers and at a distance of about 200 feet from the edge of the towers. This condition was only apparent on pines closest to the towers, and new growth did not exhibit these symptoms. Young vegetation of these trees examined later in the growing season was healthy.

In 1991, needle scorch on loblolly pine, Virginia pine, shortleaf pine, and eastern red cedar was observed in areas bordering the cooling tower yard. Browning of about 50% of the surface area of the needles of pines and minor tip browning on cedars was observed on trees that were within 500 feet of the edge of the closest tower. There appears to be some sheltering related to the positioning of trees relative to cooling tower drift. Conifers primarily exposed to drift on the north to northeast side of the towers were largely affected, whereas trees immediately behind them that did not occupy the canopy or were in the sheltered understory did not normally exhibit symptoms. The north to northeast side of the tower is the area most affected, where a relatively high percentage of the trees has symptoms. Northeast is the predominant wind direction during the growing season, while winds generally blow toward the southwest during the winter and fall. Areas to the east and south of the towers had a low prevalence of symptoms. No symptoms were observed on trees greater than 500 feet from the edge of a tower. Mortalities of conifers in this area were believed to be those resulting from past southern pine beetles attacks, and no recent mortalities were observed. A few dead deciduous trees were observed in the 500 foot area around the towers, but the cause was unknown.

Insect damage to the main apical twigs of young pines was observed in an area to the southeast, and to a much less extent to the northwest, of the towers and about 500 to 1200 feet from the edge of the towers. This damage occurred in a majority of the young pines 10-15 feet tall. While this area is not sheltered from the cooling tower drift, this symptom is likely unrelated to the cooling towers. These pines are located in a retired laydown yard which has poor spoil soils. Adjacent stands of similar age pines on relatively undisturbed soil had no damage.

Damage to vegetation which can be directly attributed to cooling tower drift was needle-tip necrosis. This symptom is characteristic of various pollutants, but in this case the damage is likely caused by the deposition of chlorine with the cooling tower drift. Sodium hypochlorite is used to treat cooling water and would be the likely source of the chlorine.

The next scheduled IR photography will be for September 1993. Vegetation inspections will be performed to document the seasonal changes in needle-tip necrosis, and to monitor the stands close to the towers to see if mortalities result.

Table 1. Evaporative losses for Catawba Nuclear Station cooling towers, 1985 (millions of gallons, MG).

MONTH	UNIT 1, MG
January	26.64
February	32.58
March	247.09
April	215.71
May	0.19
June	160.87
July	459.48
August	548.03
September	563.83
October	240.42
November	108.54
December	427.60

Table 2. Evaporative losses for Catawba Nuclear Station cooling tower: 1986 (millions of gallons, MG).

MONTH	UNIT 1, MG	UNIT 2, MG
January	455.1	
February	518.4	
March	462.1	
April	524.1	
May	492.9	
June	97.1	
July	322.0	48.2
August	71.2	395.2
September	0.0	0.0
October	0.0	0.0
November	159.0	149.0
December	547.4	620.0

Table 3. Evaporative losses for Catawba Nuclear Station cooling towers, 1987 (millions of gallons, MG).

MONTH	UNIT 1, MG	UNIT 2, MG
January	407.1	539.6
February	512.5	441.4
March	294.0	468.9
April	530.1	359.5
May	502.0	575.3
June	550.2	527.2
July	435.5	600.8
August	502.5	179.5
September	554.6	471.9
October	13.2	665.8
November	1.8	501.7
December	6.6	317.6

Table 4. Evaporative losses for Catawba Nuclear Station cooling towers, 1988 (millions of gallons, MG).

MONTH	UNIT 1, MG	UNIT 2, MG
January	296.3	0.0
February	478.5	31.3
March	450.7	233.3
April	554.6	435.4
May	566.2	481.9
June	552.3	477.4
July	568.7	494.9
August	122.5	640.0
September	536.5	515.1
October	573.1	631.9
November	356.5	511.3
December	0.0	649.0

Table 5. Evaporative losses for Catawba Nuclear Station Cooling Towers, (millions of gallons, MG).

Month	Unit 1, MG			Unit 2, MG		
	1989	1990	1991	1989	1990	1991
Jan	3.1	434.0	330.1	538.1	569.5	538.5
Feb	309.4	0.0	493.6	502.8	583.1	593.7
Mar	503.2	6.7	232.0	97.7	652.6	657.3
Apr	449.5	37.0	0.0	17.1	624.8	460.3
May	573.1	575.4	1.9	46.6	640.9	613.1
Jun	449.9	296.9	171.1	318.5	113.4	559.1
Jul	580.1	580.1	513.4	655.7	0.0	582.4
Aug	566.1	575.4	603.5	631.6	37.5	608.2
Sep	525.1	552.3	530.8	593.2	59.3	352.2
Oct	499.1	480.6	573.1	610.5	601.1	205.3
Nov	347.4	554.6	565.9	606.9	636.1	0.0
Dec	551.3	582.4	528.6	631.6	648.9	94.8

REFERENCES

Duke Power Company. 1975. Catawba Nuclear Station Terrestrial Studies (Submitted to U.S. Atomic Energy Commission Directorate of Licensing, January 31, 1975).

Murtha, P. A. 1972. A Guide to Air Photo Interpretation of Forest Damage in Canada. Canadian Forestry Service Publication No. 1292. Canadian Forestry Service, Ottawa. 62 pp.

Murtha, P. A. 1984. Vegetation Damage Detection and Assessment: The Photographic Approach. Pp. 337-354 in: Renewable Management Application of Remote Sensing. Proceedings of the RNRF Symposium on the Application of Remote Sensing to Resource Management, Seattle, Washington, American Society of Photogrammetry, Falls Church, VA.

ATTACHMENT III

Copy of Non-routine Event Reports Sent to the
South Carolina Department of Health and Environment Control
Concerning Diesel Fuel Contaminated Soil

DUKE POWER

SECTION
FILE

April 18, 1991

S.C. Department of Health and
Environmental Control (DHEC)
Ground-Water Protection Division
2600 Bull Street
Columbia, SC 29201

ATTENTION: Mark Berenbrok

SUBJECT: Catawba Nuclear Station
Groundwater Monitoring Well
File: CN-705.05

Dear Mr. Berenbrok:

At Catawba Nuclear Station on April 15, 1991 a small amount of diesel fuel contaminated soil was found while drilling a cathodic protection well. We request authorization to install a groundwater monitoring well at the location where we were planning on putting a cathodic protection well. This well will help us to more thoroughly investigate this soil contamination problem. A site map and schematic drawing are attached.

If you have any questions about this, please contact me at (704) 373-2758.

J. S. Carter, Technical System Manager
Nuclear Environmental Compliance

Alan Nietering

Alan Nietering
Nuclear Production Engineer

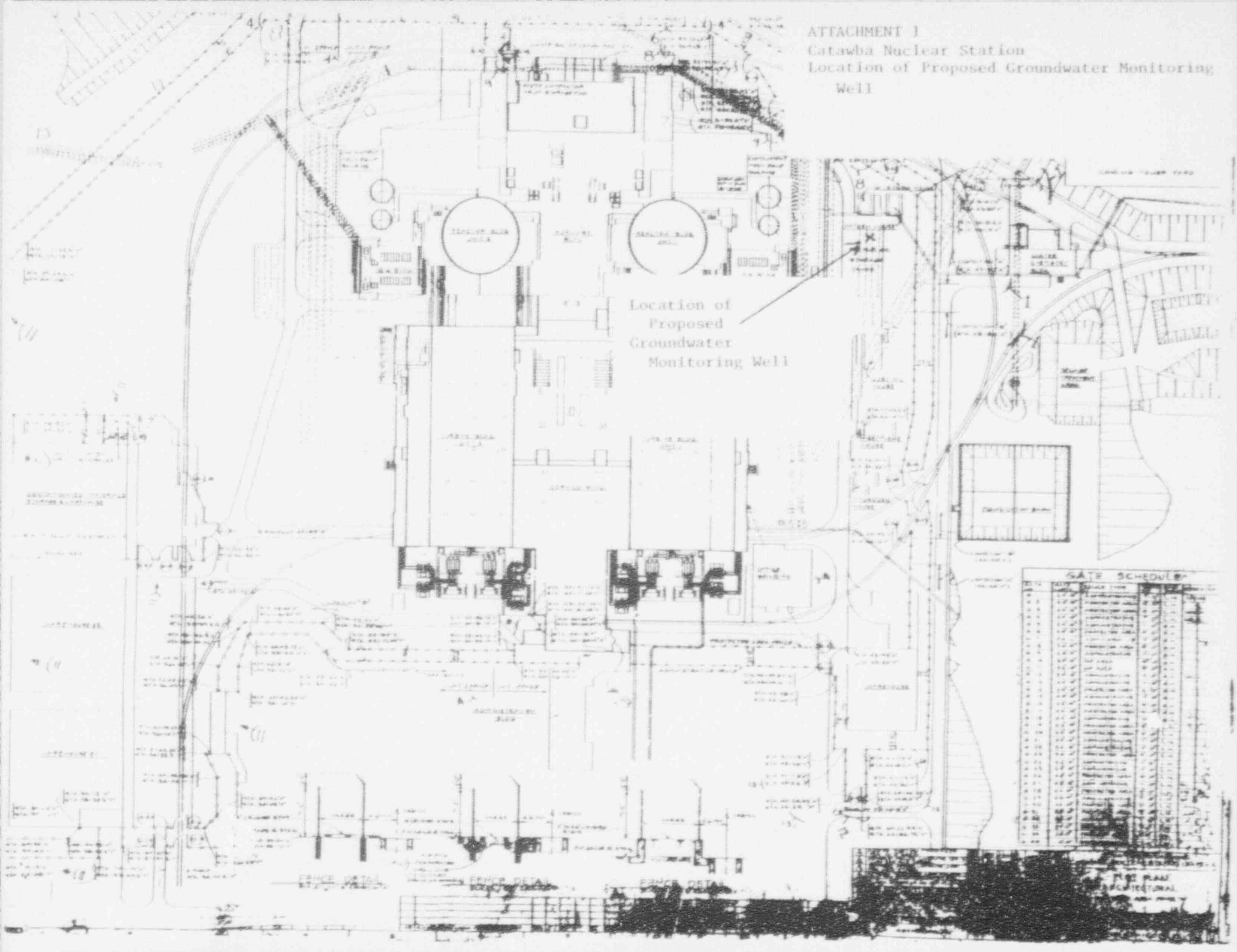
\ARN

Attachments

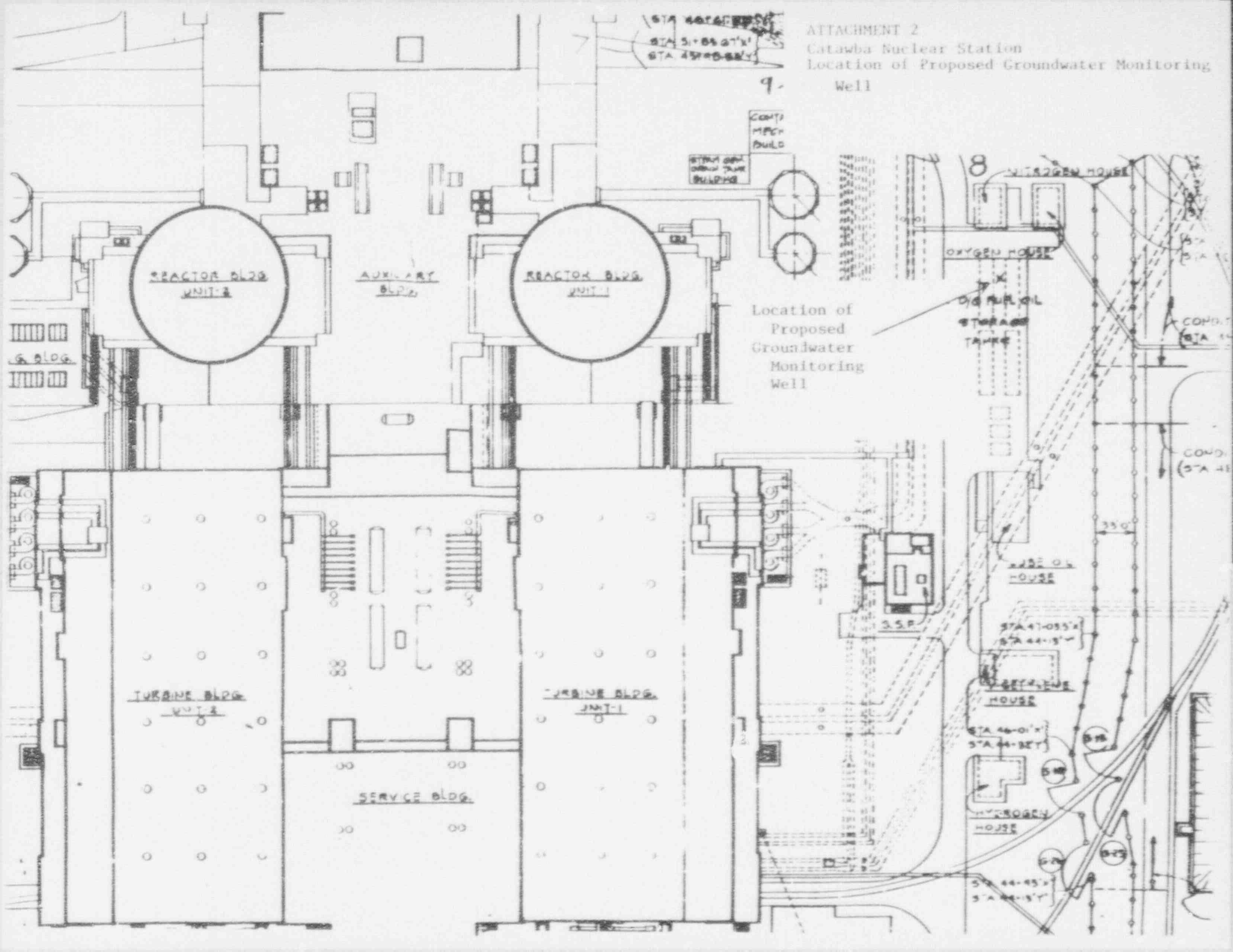
ATTACHMENT 1

Catawba Nuclear Station

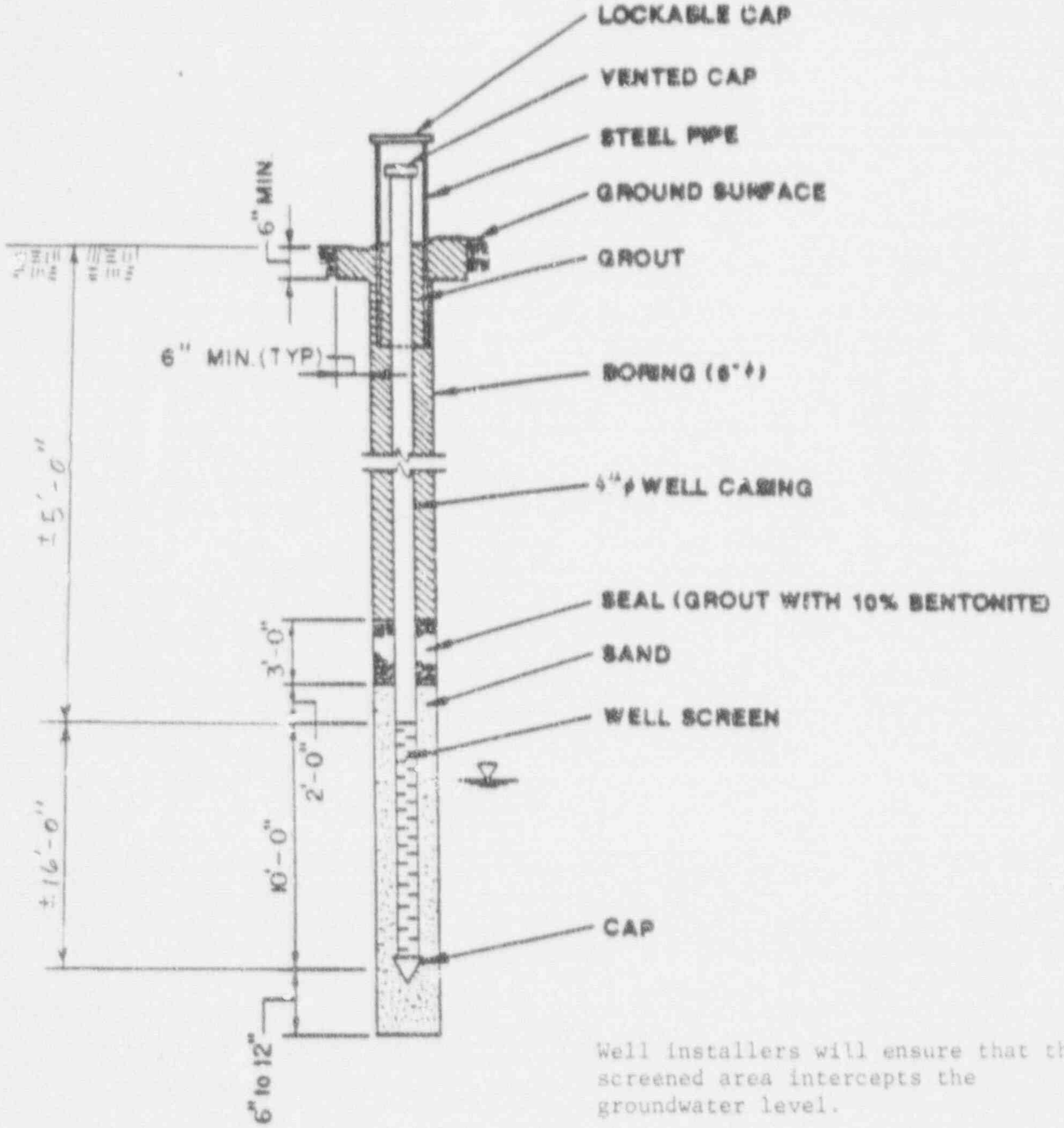
Location of Proposed Groundwater Monitoring Well



ATTACHMENT 2
Catawba Nuclear Station
Location of Proposed Groundwater Monitoring Well



ATTACHMENT 3
Catawba Nuclear Station
Groundwater Monitoring Well Detail



Well installers will ensure that the screened area intercepts the groundwater level.

DRAWING NOT TO SCALE

NOTES: 1.ALL DIMENSIONS ARE APPROXIMATE.
2.ALL CASING MATERIAL SHALL BE PVC.
3.WELL SCREEN MATERIAL SHALL BE TRILOC.

DUKE POWER CO.

GROUNDWATER MONITORING WELL DETAIL

1

DUKE POWER

June 6, 1991

S.C. Department of Health and
Environmental Control (DHEC)
Underground Storage Tank Section
Ground-Water Protection Division
2600 Bull Street
Columbia, SC 29201

ATTENTION: Stanley Swartzel

SUBJECT: Catawba Nuclear Station
Underground Storage Tanks
File No: CN-707.20

Dear Mr. Swartzel:

On April 15, 1991, SC DHEC was notified of a small amount of diesel fuel contaminated soil found while drilling a cathodic protection well at Catawba Nuclear Station. Subsequent action after this notification was the following.

First, a tank tightness test was performed on the four diesel fuel storage tanks near the contaminated soil. The tanks tested tight on 4/19/91. Attachment 1 contains the tank testing results. On 4/22/91, Mark Berenbrok of SC DHEC was informed about the tank testing results and about our future groundwater well monitoring plans. Mark's guidance was to submit this tank testing data along with the groundwater monitoring well data after the groundwater monitoring well data became available.

Second, a groundwater monitoring well was installed at this location and developed. This well and two other nearby monitoring wells were then sampled and the samples submitted for semivolatile organic analysis. The sample results recently became available and are Attachment 2. Well locations in the backfilled area are shown on Attachments 3, 4, and 5. The sample analysis showed that in the backfilled area containing the diesel fuel tanks, only newly installed Monitoring Well 14 (MW-14) has semivolatile organic contamination. The two other nearby monitoring wells did not contain any semivolatile organic contamination. The semivolatile organics in MW-14 correlate with aged diesel fuel.

Since the diesel fuel storage tanks tested tight and the analysis showed the contamination is aged diesel fuel localized in a small portion of the backfilled area, it appears that this soil contamination may have occurred during tank installation. We intend to analyze these three groundwater monitoring wells within the next 6 months to ensure that the groundwater contamination has not increased or spread.

If there are any questions about this letter, please contact me at (704) 373-2758.

Sincerely,

John Carter, Technical System Manager
Nuclear Environmental Compliance

Alan Nietering

Alan Nietering
Nuclear Production Engineer

\ARN:003

Attachments

bc w/Attachments: J. C. Adams
D. A. Bain
P. A. Clawson
J. T. Estridge
M. C. Griggs
R. A. Santini
D. E. M. Sullivan
A. F. Tinsley
R. R. Wylie
Route(Staff)

bc w/o Attachments: J. S. Forbes
W. A. Haller
C. L. Hartzell
R. M. Propst

✓ XC: CN-707.20
→ O: ARN

PRECISION TANK SERVICE INC.

RECEIVED
APR 24 1991
TECHNICAL SERVICES, G.O.

April 22, 1991
Duke Power Co.
P.O. Box 256
Clover, S.C. 29710
Attention: Robert Wiley

TEST#: 910419-01
DATE: 04/19/91
STATION: Catawba Nuclear Facility, Catawba, S.C.

Dear Mr. Wiley,

A tank integrity test was performed on the above storage tank(s) using the LEAK COMPUTER system. This test was performed in accordance with the precision test requirements of EPA-40-CFR part 240 subpart D, as well as the manufacturers recommended procedures.

The results of the test are given below and indicate whether the tank(s) with the associated piping (with the exception of pressurized piping) passed or failed the integrity criteria. Included is the computer printout of the test data, indicating the average leak rate and the confidence level as shown at the end of each strip chart. This information is stored in a permanent file, if future verification is needed to confirm the tank integrity at the time of the test.

TEST RESULTS

Grade	Tank Size (Gals)	Leak Rate (gph)	Test Level	Tank System
DIESEL	45000	0.044	@ 16 INCHES ABOVE TANK TOP	PASS
DIESEL	45000	0.024	@ 17 INCHES ABOVE TANK TOP	PASS
DIESEL	45000	0.012	@ 18 INCHES ABOVE TANK TOP	PASS
DIESEL	45000	-0.035	@ 20 INCHES ABOVE TANK TOP	PASS

If you have any questions, please feel free to call me at (704) 938-8265.

Sincerely,
Timothy Roy
Timothy Roy
Certification Number A/P 147
Precision Tank Service

PRECISION TANK SERVI[C]

TANK TEST DATA SHEET

TECHNICIAN NAME: T Roy CERTIFICATION # RP 147

TEST # 910419-01 DATE: 04-19-91

TEST LOCATION: CATAWBA NUCLEAR FACILITY
HWY 274

CONTACT NAME: PHONE:

SITE SKETCH

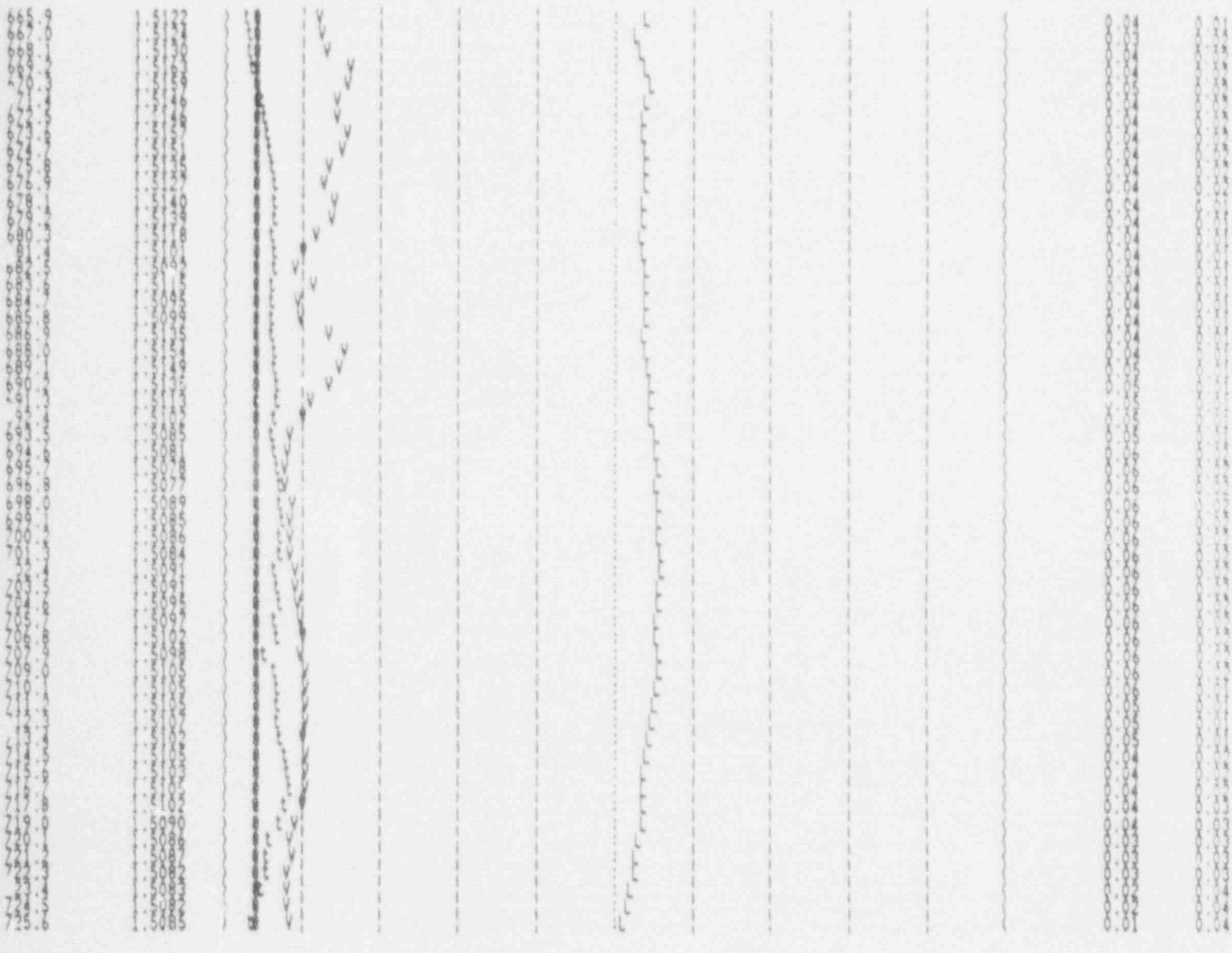
COMMENTS

STRIP CHART FOR DATA RECORD: 91041993.C18 OF 45000 (

Test Address: CATAWBA NUCLEAR FACILITY
Test Operator: PTS-TJ ROY

LEAK RATE AVG OF 20 CYCLES   TANK TEMP @ START: 65.4 F
COE: 0.000474   DEN: 0.826   LFD: 6.0   Manifolding: None

		(-------------------- @ = 10.0F ---------------)	AVG	THREE
		(--------------------t = 0.1 F ---------------)	LEAK	STD
T.ME	GAL	(-------------------- V = 0.1 gal -------------)	RATE	DEV



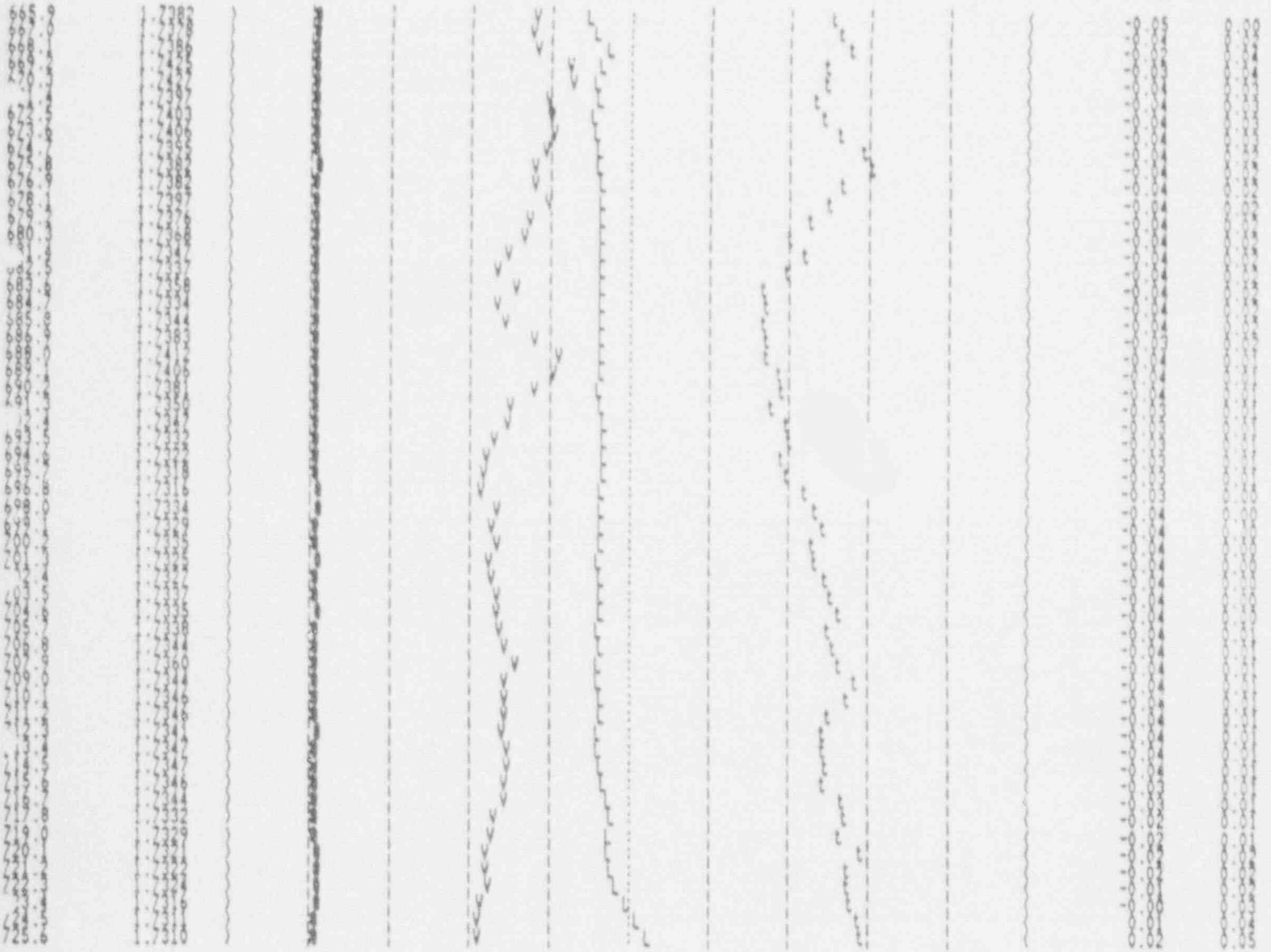
END OF STRIP CHART
DATA COLLECTED ON LEAK COMPUTER SN 88060102

STRIP CHART FOR DATA RECORD: 91041992.817 OF 45000 G

Test Address: CATAWBA NUCLEAR FACILITY
Test Operator: PTS-TJ ROY

LEAK RATE AVG OF 20 CYCLES TANK TEMP @ START: 66.1 F
COE: 0.000473 DEN: 0.817 LFD: 6.0 Manifolding: None

TIME	GAL	(-------- @ = 10.0F --------) (-------- t = 0.1 F --------) (-------- V = 0.1 gal --------)	AVG LEAK RATE	THREE STD DEV

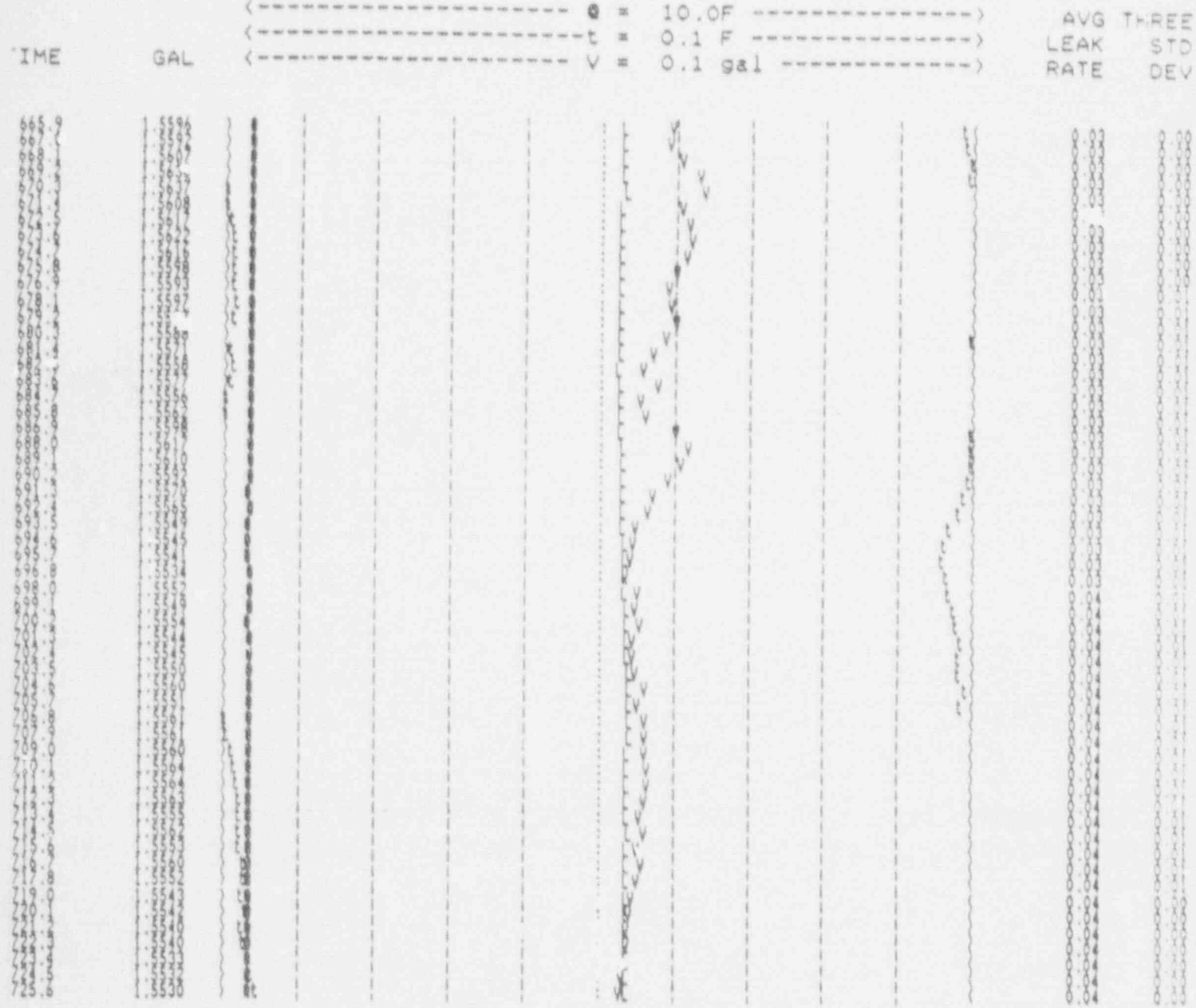


END OF STRIP CHART
DATA COLLECTED ON LEAK COMPUTER SN 88060102

STRIP CHART FOR DATA RECORD: 91041991.A16 OF 45000

Test Address: CATAWBA NUCLEAR FACILITY
Test Operator: PTS-TJ ROY

LEAK RATE AVG OF 20 CYCLES TANK TEMP @ START: 65.3 F
COE: 0.000473 DEN: 0.833 LFD: 6.0 Manifolding: None



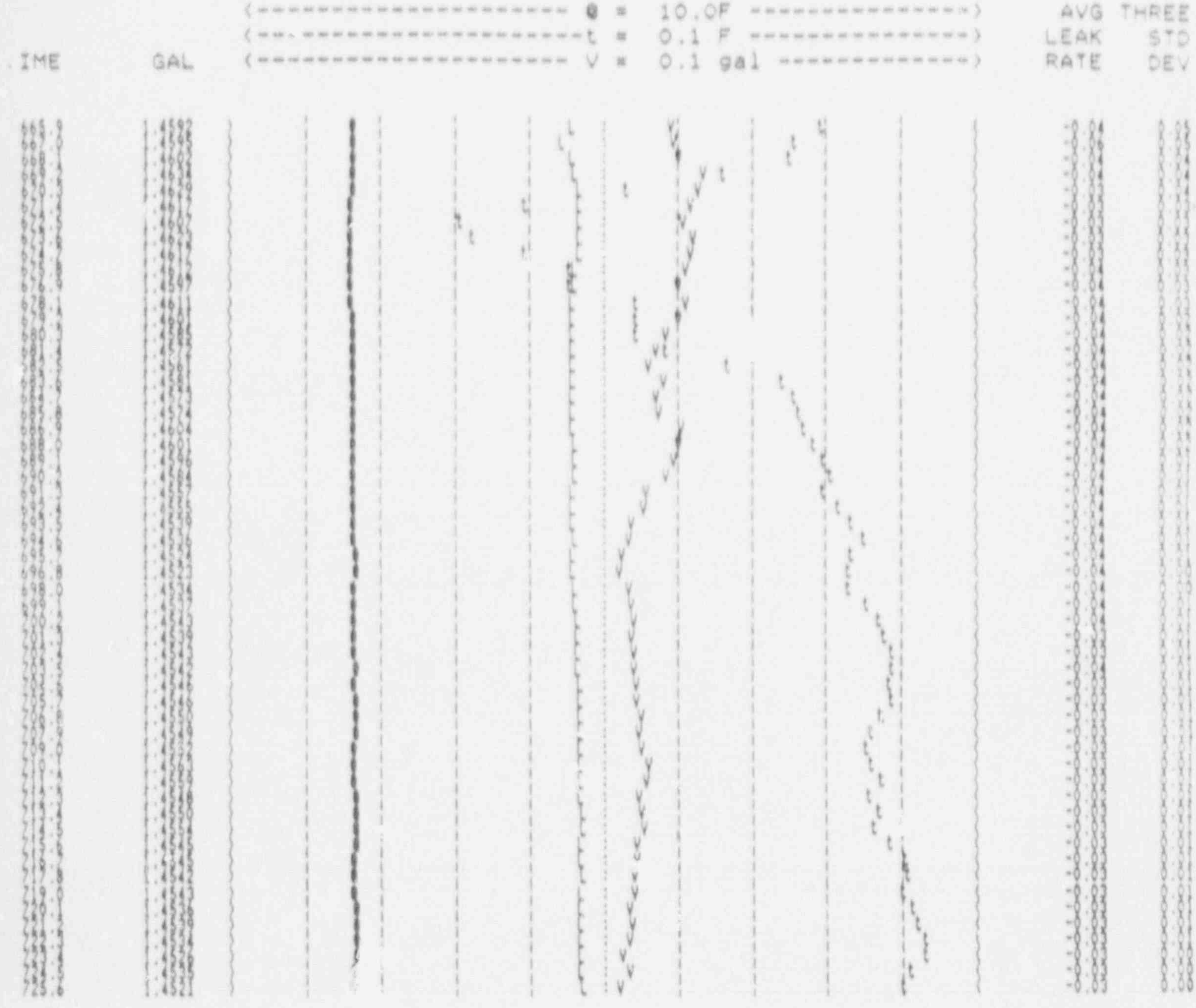
END OF STRIP CHART
DATA COLLECTED ON LEAK COMPUTER SN 88060102

Catawba Nuclear Station
Letter to DHEC
Attachmer 1
Tank Test _ Report
Page 6 of 6

STRIP CHART FOR DATA RECORD: 91041994.D20 OF 45000 (

Test Address: CAT'WBA NUCLEAR FACILITY
Test Operator: P\s-TJ ROY

LEAK RATE AVG OF 20 CYCLES   TANK TEMP @ START: 66.7 F
COE: 0.0004?J   DEN: 0.931   LFD: 6.0   Manifolding: None



END OF STRIP CHART
DATA COLLECTED ON LEAK COMPUTER SN 88060102

SemiVolatile Organics
per USEPA Method 8270

Sample Site: Catawba Nuclear Station — Report Date: 05/21/91
Field ID: CNS-043091-GLF-MW6 — Sampling Date: 04/30/91
Laboratory ID: 91-04-279-02A

	Parameter	Concentration	Quantitative Limit
C010	N-Nitrosodimethylamine	ND	10 µg/l
C020	Aniline	** ND **	10 µg/l
C015	Phenol	ND	10 µg/l
C025	Bis(2-chloroethyl)ether	ND	10 µg/l
C030	2-Chlorophenol	ND	10 µg/l
C035	1,3-Dichlorobenzene	ND	10 µg/l
C040	1,4-Dichlorobenzene	ND	10 µg/l
C045	Benzyl alcohol	ND	10 µg/l
C050	1,2-Dichlorobenzene	ND	10 µg/l
C055	2-Methylphenol	ND	10 µg/l
C060	Bis(2-chloroisopropyl)ether	ND	10 µg/l
C065	4-Methylphenol	ND	10 µg/l
C070	N-Nitrosodipropylamine	ND	10 µg/l
C075	Hexachloroethane	ND	10 µg/l
C410	Nitrobenzene	ND	10 µg/l
C415	Isophorone	ND	10 µg/l
C420	2-Nitrophenol	ND	10 µg/l
C425	2,4-Dimethylphenol	ND	10 µg/l
C430	Benzoic acid	** ND **	50 µg/l
C435	Bis(2-chloroethoxy)methane	ND	10 µg/l
C440	2,4-Dichlorophenol	ND	10 µg/l
C445	1,2,4-Trichlorobenzene	ND	10 µg/l
C450	Naphthalene	ND	10 µg/l
C455	4-Chloroaniline	ND	10 µg/l
C460	Hexachlorobutadiene	ND	10 µg/l
C465	4-Chloro-3-methylphenol	ND	20 µg/l
C470	2-Methylnaphthalene	ND	10 µg/l
C510	Hexachlorocyclopentadiene	ND	10 µg/l
C515	2,4,6-Trichlorophenol	ND	10 µg/l
C520	2,4,5-Trichlorophenol	ND	10 µg/l
C525	2-Chloronaphthalene	ND	10 µg/l
C530	2-Nitroaniline	ND	10 µg/l
C535	Dimethylphthalate	ND	10 µg/l
C540	Acenaphthylene	ND	10 µg/l
C543	2,6-Dinitrotoluene	ND	10 µg/l
C545	3-Nitroaniline	ND	10 µg/l
C550	Acenaphthene	ND	10 µg/l
C555	2,4-Dinitrophenol	ND	50 µg/l
C560	4-Nitrophenol	ND	50 µg/l
C565	Dibenzofuran	ND	10 µg/l
C570	2,4-Dinitrotoluene	ND	10 µg/l
C580	Diethylphthalate	ND	[illegible]
C585	4-Chlorophenyl phenyl ether	ND	10 µg/l
C590	Fluorene	ND	10 µg/l
C595	4-Nitroaniline	ND	50 µg/l

SemiVolatile Organics per USEPA Method 8270

Sample Site: Catawba Nuclear Station Report Date: 05/21/91
Field ID: CNS-043091-GLF-MW7 Sampling Date: 04/30/91
Laboratory ID: 91-04-279-03A

	Parameter	Concentration	Quantitative Limit
C310	N-Nitrosodimethylamine	ND	10 µg/l
C320	Aniline	** ND **	10 µg/l
C315	Phenol	ND	10 µg/l
C325	Bis(2-chloroethyl)ether	ND	10 µg/l
C330	2-Chlorophenol	ND	10 µg/l
C335	1,3-Dichlorobenzene	ND	10 µg/l
C340	1,4-Dichlorobenzene	ND	10 µg/l
C345	Benzyl alcohol	ND	10 µg/l
C350	1,2-Dichlorobenzene	ND	10 µg/l
C355	2-Methylphenol	ND	10 µg/l
C360	Bis(2-chloroisopropyl)ether	ND	10 µg/l
C365	4-Methylphenol	ND	10 µg/l
C370	N-Nitrosodipropylamine	ND	10 µg/l
C375	Hexachloroethane	ND	10 µg/l
C410	Nitrobenzene	ND	10 µg/l
C415	Isophorone	ND	10 µg/l
C420	2-Nitrophenol	ND	10 µg/l
C425	2,4-Dimethylphenol	ND	10 µg/l
C430	Benzoic acid	** ND **	50 µg/l
C435	Bis(2-chloroethoxy)methane	ND	10 µg/l
C440	2,4-Dichlorophenol	ND	10 µg/l
C445	1,2,4-Trichlorobenzene	ND	10 µg/l
C450	Naphthalene	ND	10 µg/l
C455	4-Chloroaniline	ND	10 µg/l
C460	Hexachlorobutadiene	ND	10 µg/l
C465	4-Chloro-3-methylphenol	ND	20 µg/l
C470	2-Methylnaphthalene	ND	10 µg/l
[illegible]	Hexachlorocyclopentadiene	ND	10 µg/l
C515	2,4,6-Trichlorophenol	ND	10 µg/l
C520	2,4,5-Trichlorophenol	ND	10 µg/l
C525	2-Chloronaphthalene	ND	10 µg/l
C530	2-Nitroaniline	ND	10 µg/l
C535	Dimethylphthalate	ND	10 µg/l
C540	Acenaphthylene	ND	10 µg/l
C547	2,6-Dinitrotoluene	ND	10 µg/l
C545	3-Nitroaniline	ND	10 µg/l
C550	Acenaphthene	ND	10 µg/l
C555	2,4-Dinitrophenol	ND	50 µg/l
C560	4-Nitrophenol	ND	50 µg/l
C565	Dibenzofuran	ND	10 µg/l
C570	2,4-Dinitrotoluene	ND	10 µg/l
C580	Diethylphthalate	ND	10 µg/l
C585	4-Chlorophenyl phenyl ether	ND	10 µg/l
C590	Fluorene	ND	10 µg/l
[illegible]	4-Nitroaniline	ND	10 µg/l

SemiVolatile Organics per USEPA Method 8270
(Continued)

Sample Site: Catawba Nuclear Station   Report Date: 05/21/91
Field ID: CNS-043091-GLF-MW7   Sampling Date: 04/30/91
Laboratory ID: 91-04-279-03A

	Parameter	Concentration	Quantitative Limit
C610	4,6-Dinitro-2-methylphenol	ND	50 µg/l
C615	N-Nitrosodiphenlyamine	ND	10 µg/l
C625	4-Bromophenyl phenyl ether	ND	10 µg/l
C630	Hexachlorobenzene	ND	10 µg/l
C635	Pentachlorophenol	ND	50 µg/l
C640	Phenanthrene	ND	10 µg/l
C645	Anthracene	ND	10 µg/l
C650	Di-n-butylphthalate	ND	10 µg/l
C655	Fluoranthene	ND	10 µg/l
C710	Benzidine	** ND **	10 µg/l
C715	Pyrene	ND	10 µg/l
C720	Butyl benzyl phthalate	ND	10 µg/l
C725	3,3'-Dichlorobenzidine	ND	10 µg/l
C730	Benzo(a)anthracene	ND	10 µg/l
C740	Chrysene	ND	10 µg/l
C745	Bis(2-ethylhexyl)phthalate	ND	10 µg/l
C760	Di-n-octylphthalate	ND	10 µg/l
C765	Benzo(b)fluoranthene	ND	10 µg/l
C770	Benzo(k)fluoranthene	ND	10 µg/l
C775	Benzo(a)pyrene	ND	10 µg/l
C780	Indeno(1,2,3-cd)pyrene	ND	10 µg/l
C785	Dibenz(a,h)anthracene	ND	10 µg/l
C790	Benzo(g,h,i)perylene	ND	10 µg/l

Tentatively Identified Compounds

Scan #	Compound	Estimated Concentration µg/l

No Reportable TIC's

ND = < Detection Limit
(B) = Compound also Identified in Laboratory Blank
(J) = Estimated Concentration
** = Accurate quantitation of these compounds is not possible using EPA Method 8270. The EPA has recognized this problem, and deleted these compounds from CLP protocal. Any concentrations reported for these compounds should be regarded as approximations.

SemiVolatile Organics
per USEPA Method 8270

Sample Site: Catawba Nuclear Station
Field ID: CNS-043091-GLF-MW14
Laboratory ID: 91-04-279-04D

Report Date: 05/21/91
Sampling Date: 04/30/91

	Parameter	Concentration	Quantitative Limit
C310	N-Nitrosodimethylamine	ND	10 µg/l
C320	Aniline	** ND **	10 µg/l
C315	Phenol	ND	10 µg/l
C325	Bis(2-chloroethyl)ether	ND	10 µg/l
C330	2-Chlorophenol	ND	10 µg/l
C335	1,3-Dichlorobenzene	ND	10 µg/l
C340	1,4-Dichlorobenzene	ND	10 µg/l
C345	Benzyl alcohol	ND	10 µg/l
C350	1,2-Dichlorobenzene	ND	10 µg/l
C355	2-Methylphenol	ND	10 µg/l
C360	Bis(2-chloroisoproply)ether	ND	10 µg/l
C365	4-Methylphenol	ND	10 µg/l
C370	N-Nitrosodipropylamine	ND	10 µg/l
C375	Hexachloroethane	ND	10 µg/l
C410	Nitrobenzene	ND	10 µg/l
C415	Isophorone	ND	10 µg/l
C420	2-Nitrophenol	ND	10 µg/l
C425	2,4-Dimethylphenol	ND	10 µg/l
C430	Benzoic acid	** ND **	50 µg/l
C435	Bis(2-chloroethoxy)methane	ND	10 µg/l
C440	2,4-Dichlorophenol	ND	10 µg/l
C445	1,2,4-Trichlorobenzene	ND	10 µg/l
C450	Napthalene	ND	10 µg/l
C455	4-Chloroaniline	ND	10 µg/l
C460	Hexachlorobutadiene	ND	10 µg/l
C465	4-Chloro-3-methylphenol	ND	20 µg/l
C470	2-Methylnaphthalene	> 257 µg/l	10 µg/l
C510	Hexachlorocyclopentadiene	ND	10 µg/l
C515	2,4,6-Trichlorophenol	ND	10 µg/l
C520	2,4,5-Trichlorophenol	ND	10 µg/l
C525	2-Chloronaphthalene	ND	10 µg/l
C530	2-Nitroaniline	ND	10 µg/l
C535	Dimethylphthalate	ND	10 µg/l
C540	Acenaphthylene	ND	10 µg/l
C543	2,6-Dinitrotoluene	ND	10 µg/l
C545	3-Nitroaniline	ND	10 µg/l
C550	Acenaphthene	ND	10 µg/l
C555	2,4-Dinitrophenol	ND	50 µg/l
C560	4-Nitrophenol	ND	50 µg/l
C565	Dibenzofuran	ND	10 µg/l
C570	2,4-Dinitrotoluene	ND	10 µg/l
C580	Diethylphthalate	ND	10 µg/l
C585	4-Chlorophenyl phenyl ether	ND	10 µg/l
C590	Fluorene	ND	10 µg/l
C595	4-Nitroaniline	ND	20 µg/l

SemiVolatile Organics
per USEPA Method 8270
(Continued)

Sample Site: Catawba Nuclear Station
Field ID: CNS-043091-GLF-MW14
Laboratory ID: 91-04-279-04D

Report Date: 05/21/91
Sampling Date: 04/30/91

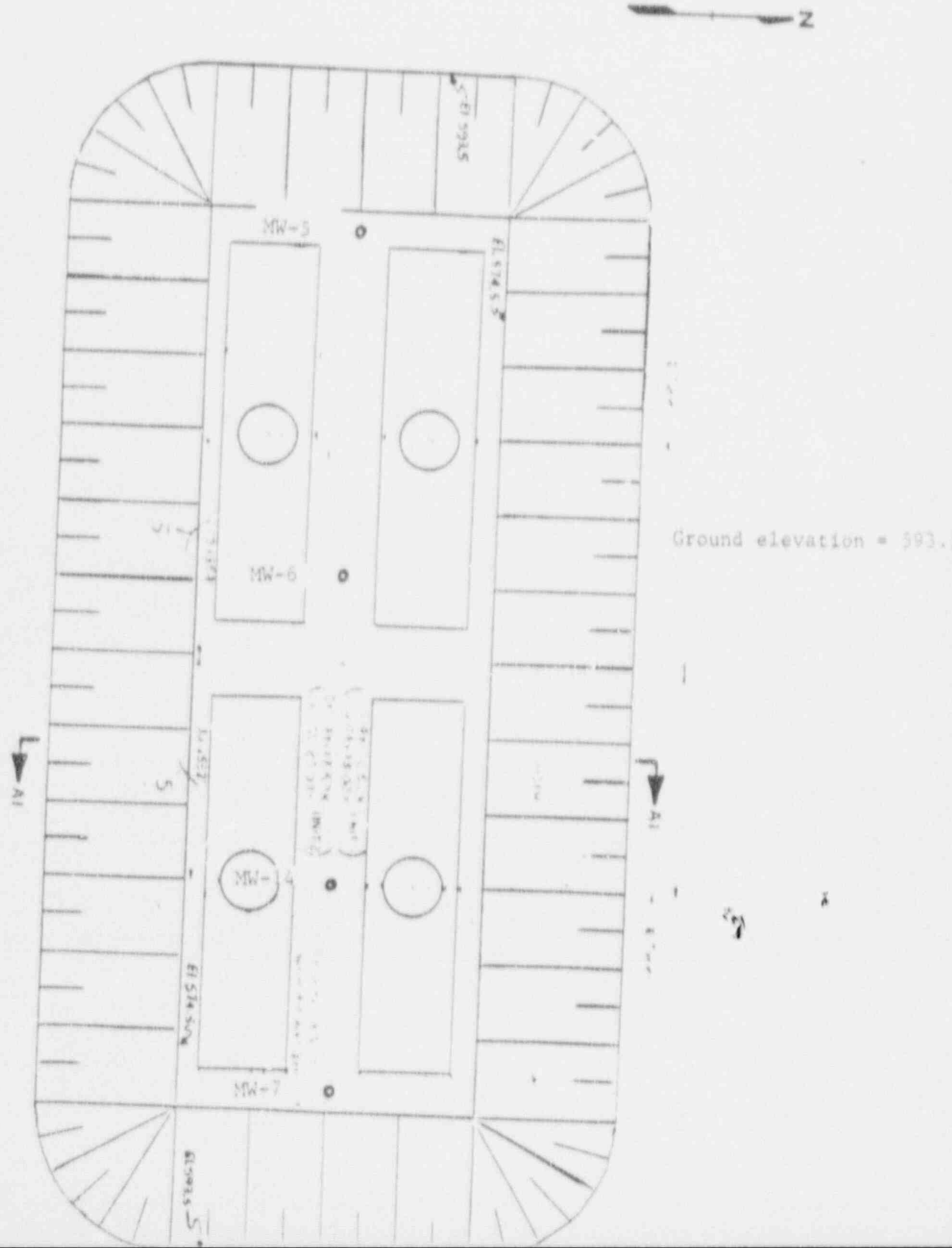
	Parameter	Concentration	Quantitative Limit
C610	4,6-Dinitro-2-methylphenol	ND	50 µg/1
C615	N-Nitrosodiphenlyamine	ND	10 µg/1
C625	4-Bromophenyl phenyl ether	ND	10 µg/1
C630	Hexachlorobenzene	ND	10 µg/1
C635	Pentachlorophenol	ND	50 µg/1
C640	Phenanthrene	58 µg/1	10 µg/1
C645	Anthracene	ND	10 µg/1
C650	Di-n-butylphthalate	ND	10 µg/1
C655	Fluoranthene	ND	10 µg/1
C710	Benzidine	** ND **	10 µg/1
C715	Pyrene	ND	10 µg/1
C720	Butyl benzyl phthalate	ND	10 µg/1
C725	3,3'-Dichlorobenzidine	ND	10 µg/1
C730	Benzo(a)anthracene	ND	10 µg/1
C740	Chrysene	ND	10 µg/1
C745	Bis(2-ethylhexyl)phthalate	ND	10 µg/1
C760	Di-n-octylphthalate	ND	10 µg/1
C765	Benzo(b)fluoranthene	ND	10 µg/1
C770	Benzo(k)fluoranthene	ND	10 µg/1
C775	Benzo(a)pyrene	ND	10 µg/1
C780	Indeno(1,2,3-cd)pyrene	ND	10 µg/1
C785	Dibenz(a,h)anthracene	ND	10 µg/1
C790	Benzo(g,h,i)perylene	ND	10 µg/1

Tentatively Identified Compounds

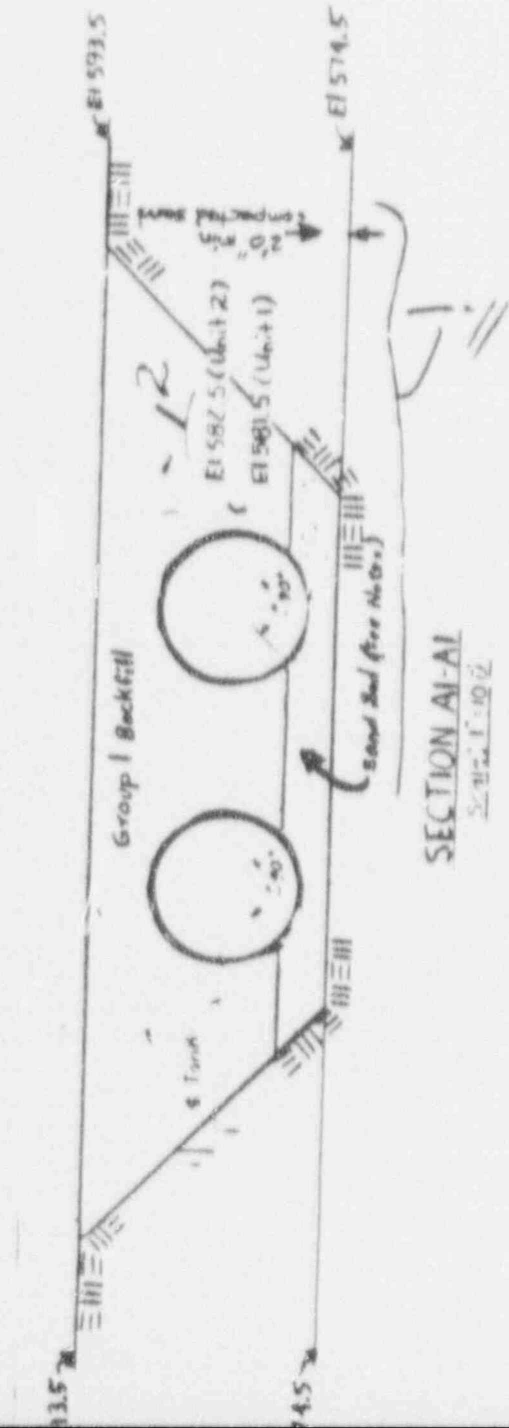
# of Compounds	Compound	Estimated Concentration (µg/1)
4	Alkyl Substituted Napthalene Compounds	562 µg
8	Alkyl Substituted Decane Compounds	2504 µg
3	Unidentified Compounds	157 µg

ND = < Detection Limit
(B) = Compound also Identified in Laboratory Blank
(J) = Estimated Concentration
** = Accurate quantitation of these compounds is not possible using EPA Method 8270. The EPA has recognized this problem, and deleted these compounds from CLP protocal. Any concentrations reported for these compounds should be regarded as approximations.

Catawba Nuclear Station
Letter to DHEC
Attachment 3
Plan View of Diesel Tank
Installation



Catawba Nuclear Station
Letter to DHEC
Attachment 4
Cross Section of Attachment 3



Catawba Nuclear Station
Letter to DHEC
Attachment 5
General Arrangement of
Unit 1 Diesel Tank Area