



DUKE POWER

November 19, 1996

Mr. Van Keisler
S.C. Department of Health and Environmental Control
Bureau of Solid and Hazardous Waste Management
Division of Hydrogeology- Solid Waste Section
2600 Bull Street
Columbia, South Carolina 29201

Subject: Catawba Nuclear Station - York County, S.C.
Industrial Landfill Permit # 463303-1601
File: CN-705.05
Certified: P 576 350 879

Dear Mr. Keisler:

Attached please find the semi-annual groundwater monitoring report for Catawba Nuclear Station's Landfill #463303-1601. All monitoring results from the October 7, 1996, sampling event met the South Carolina State groundwater standards. This data indicates that the groundwater quality has not been adversely impacted by the landfill operations.

The next scheduled groundwater sampling event for this landfill is April, 1997. Should you have questions or comments regarding this report please contact me at (704) 875-5965.

Sincerely,

A handwritten signature in cursive script that reads 'John Estridge'.

John Estridge, Engineer
Environmental Division, Water Protection

jte/559

Attachment

cc: Catawba District Hydrogeologist
CNS NRC Document Distribution List
Mr. Virgil Autry - SCDHEC Division of Radioactive Waste Management

9612020179 961031
PDR ADOCK 05000413
R PDR

IE251/1

DUKE POWER COMPANY
GROUND WATER MONITORING REPORT

November 4, 1996

Table 1

Facility: Catawba Nuclear Station Landfill						
Sample Date: October 7, 1996 (Radiological Data)						
Parameter	Units	Parameter Codes	Monitoring Well Identification			
			LMW-1A	LMW-2	LMW-3	LMW-4
Lab Certificate No.		00008	99005	99005	99005	99005
Field pH	Std. Units	00400	6.0	6.3	6.2	6.2
Field Spec. Conductance	umhos/cm	00095	106	108	98	103
Ba-La-140	pCi/l	GS*	<5.815	<4.471	<4.756	<5.783
BE-7	pCi/l	GS*	<37.29	<40.04	<35.09	<34.69
CO-58	pCi/l	29893	<3.910	<4.235	<3.568	<4.201
CO-60	pCi/l	29601	<3.757	<5.134	<4.623	<4.609
CS-134	pCi/l	28414	<4.006	<4.466	<3.907	<4.156
CS-137	pCi/l	28401	<3.540	<4.732	<4.192	<4.161
FE-59	pCi/l	07064	<6.813	<8.631	<6.746	<7.616
I-131	pCi/l	29916	<4.550	<5.516	<4.775	<4.867
K-40	pCi/l	75038	112	<63.74	161	147
MN-54	pCi/l	29501	<3.454	<5.278	<4.135	<4.339
NB-95	pCi/l	GS*	<4.880	<4.538	<4.594	<4.710
Tritium	pCi/l		<96.4	<26.0	444	<199
ZN-65	pCi/l	29301	<8.541	<9.969	<9.594	<9.509
ZR-95	pCi/l	GS*	<7.291	<7.011	<7.155	<7.231

*Gamma Spectroscopy (GS) - Parameter Codes not identified at this time.

Authorized Release By:

Frank O. Senter

Date:

11-05-96

DUKE POWER COMPANY
GROUND WATER MONITORING REPORT

November 4, 1996

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CS-137	pCi/l	28401	<3.540	<4.732	<4.192	<4.151
FE-59	pCi/l	07064	<6.813	<8.631	<6.746	<7.616
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Authorized Release By:

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Date:

11-05-96

DUKE POWER COMPANY
GROUND WATER MONITORING REPORT

November 4, 1996
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*Gamma Spectroscopy (GS) - Parameter Codes not identified at this time.

Authorized Release By: Frank O. Senter

Date: 11-05-96

DUKE POWER COMPANY
GROUND-WATER MONITORING REPORT

November 5, 1996

Table 1

Facility: Catawba Nuclear Station Industrial Waste Landfill - Permit No.463303-1601								
Sample Date: October 7, 1996 (GEOCHEMISTRY DATA)								
Parameter	Units	Storet Number	Monitoring Well Identification				FIELD	SC R.61-58
			LMW-1A	LMW-2	LMW-3	LMW-4	BLANK	MCL
Lab Certificate No.		00008	99005	99005	99005	99005	99005	
Top of Well Casing	msl-feet		628.33	625.35	630.34	630.36		
Depth to Water	feet		29.67	23.63	29.50	24.27		
Water Elevation (0.01')	msl-feet	82545	598.66	601.72	600.85	606.09		
Well Depth	feet		37.00	33.70	35.00	37.10		
Field Spec. Conductance	umho/cm	00095	106	108	98	103		
Field pH	Std. Units	00400	6.0	6.3	6.2	6.2		6.5-8.5*
Lab pH	Std. Units	00403	6.0	6.2	6.2	6.1	5.9	6.5-8.5*
Chloride	mg/l	00940	4.8	8.9	11	6.4	<1.0	250*
NO3	mg/l	00630	<0.05	0.55	<0.05	<0.05	<0.05	10.0
Sulfate	mg/l	00945	<1.0	<1.0	2.6	<1.0	<1.0	250*
TOC	mg/l	00680	0.43	0.56	0.50	0.48	<0.1	

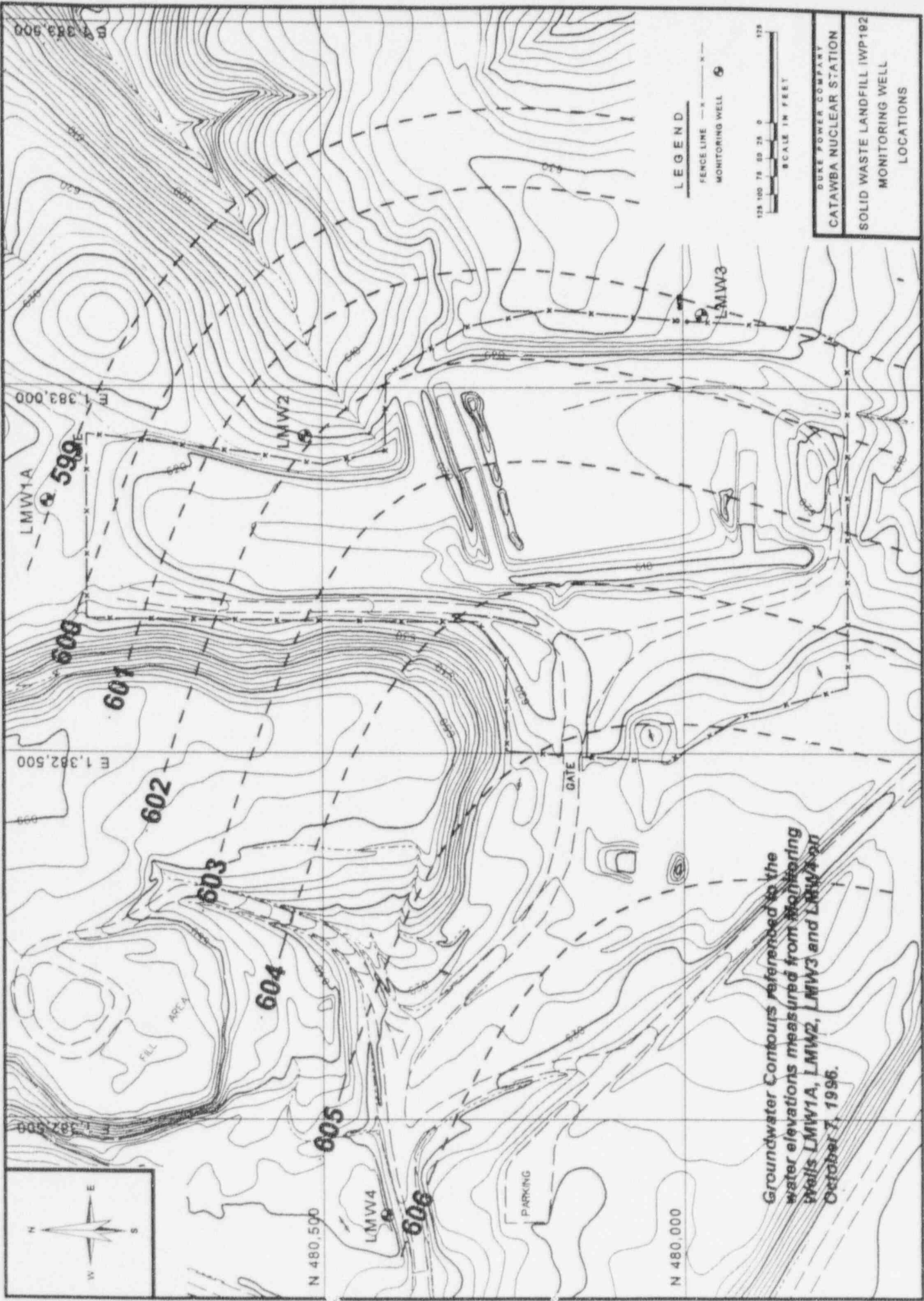
* SC R.61-58.5(O) Secondary Maximum Contaminant Level (MCL) for drinking water as reference only.

Authorized Release By:

Gerald A. Santini

Date:

11.5.96



DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
SOLID WASTE LANDFILL IWP192
MONITORING WELL
LOCATIONS



LEGEND
FENCE LINE
MONITORING WELL
SCALE IN FEET

Groundwater Contours referenced to the
water elevations measured from Monitoring
Wells LMW1A, LMW2, LMW3 and LMW4 on
October 7, 1996.

FIELD SAMPLING CALIBRATION DATA FORM

Study CNS LANDFILLDate 10-7-96Weather Conditions cloudy, coolCollectors GLE, RAS

Surface Unit Reader _____

Equipment: Surface Unit # 23469

Transmitter # _____

Cable# _____

Battery # _____

Other Equipment _____

Procedure Number <u>3210</u>				Water Quality Analyzer <u>H2O #23473</u>			
Calibration Time		Time <u>0840</u>		Time <u>1315</u>		Time _____	
Variable	Calib.	Initial Value	Adjust To	Initial Value	Adjust To	Initial Value	Adjust To
Temp (°C)		<u>15.35</u> / >	<u>15.4</u>	<u>14.48</u> / >	<u>15.2</u>	_____	_____
Therm # <u>ELCHM313a</u>		_____	_____	_____	_____	_____	_____
DO (mg/l)	W	_____	_____	_____	_____	_____	_____
	W	_____	_____	_____	_____	_____	_____
	W	_____	_____	_____	_____	_____	_____
	AW	_____	_____	_____	_____	_____	_____
	B	_____	_____	_____	_____	_____	_____
pH (units)	B	<u>7.03</u> -- >	<u>7.00</u>	<u>7.05</u> / >	<u>7.00</u>	_____	_____
	B	<u>3.97</u> -- >	<u>4.00</u>	<u>4.02</u> / >	<u>4.00</u>	_____	_____
	B	_____	<u>10.00</u>	_____	<u>10.00</u>	_____	_____
SP Cond (umho/cm)	SS	<u>75.1</u> -- >	<u>75.0</u>	<u>75.4</u> / >	<u>75.0</u>	_____	_____
	SS	_____	_____	_____	_____	_____	_____
	SS	_____	_____	_____	_____	_____	_____
Orp (mv)	SS	_____	_____	_____	_____	_____	_____
	SS	_____	_____	_____	_____	_____	_____

KEY:

B = Buffer

SS = Standard Solution

-- > = Adjusted To

W = Winkler

AW = Average Winkler

- / - > = Not Adjusted To

NA = Not Applicable

LOCATION:	CNS LANDFILL #1		
PROCEDURE NUMBER:	3500		
SAMPLING DATE:	10-7-96	FIELD CREW	GUF RAS

WATER LEVEL METER #:	QED
TIME SAMPLE COLLECTED:	0915

WELL DIAMETER (INCHES)	WELL DEPTH (FEET)	-	WATER LEVEL (FEET)	=	WATER COLUMN (FEET)	X	$3.14 \times r^2$	=	VOLUME (FT ³)
2"	37.00	-	29.67	=	7.33	X	0.0218	=	0.1598
4"		-		=		X	0.0873	=	

WELL VOLUME	LITERS TO REMOVE:	
	(FT^3 x 28.32 LFT^3)	
	2" WELL	4" WELL
1	4.5	
5		
10		
20		

ODORS DETECTED:		FREE PRODUCT MEASUREMENT:	
TYPE:		METHOD:	
STRONG:		THICKNESS:	
MINOR:		OTHER:	
NONE:			

[illegible]

REFERENCE TAPE LEVEL: _____ QED SUBMERGENCE DEPTH READING: 2.63

REFERENCE DIGITAL LEVEL: _____

REFERENCE PROBE DEPTH: 32.30

- 2.63

29.67

LOCATION:	CNS LANDFILL #1		
PROCEDURE NUMBER:	3500		
SAMPLING DATE:	10-7-96	FIELD CREW	GLF, RAS

WATER LEVEL METER #:	QED
TIME SAMPLE COLLECTED:	1045

WELL DIAMETER (INCHES)	WELL DEPTH (FEET)	-	WATER LEVEL (FEET)	=	WATER COLUMN (FEET)	X	$3.14 \times r^2$	=	VOLUME (FT ³)
2"		-		=		X	0.0218	=	
4"	33.70	-	23.63	=	10.07	X	0.0873	=	0.8791

WELL VOLUME	LITERS TO REMOVE:	
	(FT ³ x 28.32 LFT ³)	
	2" WELL	4" WELL
1	25	25
5	↓	
10		
20		

ODORS DETECTED:		FREE PRODUCT MEASUREMENT:	
TYPE:		METHOD:	
STRONG:		THICKNESS:	
MINOR:		OTHER:	
NONE:			

[illegible]

REFERENCE PROBE DEPTH 28.50

REPLACED WATER LEVEL PROBE CONNECTION
AND FERREL ON AIR PROBE CONNECTION

23.63

LOCATION:	CNS LANDFILL #1		
PROCEDURE NUMBER:	3500		
SAMPLING DATE:	10-7-96	FIELD CREW	GLF BAS

1140

WELL DIAMETER (INCHES)	WELL DEPTH (FEET)	-	WATER LEVEL (FEET)	=	WATER COLUMN (FEET)	X	$3.14 \times r^2$	=	VOLUME (FT ³)
2"		-		=		X	0.0218	=	
4"	35.00	-	29.495	=	5.505	X	0.0873	=	0.4806

WELL VOLUME	LITERS TO REMOVE:	
	(FT ³ x 28.32 L/FT ³)	
	2" WELL	4" WELL
1		13.6
5		
10		
20		

[illegible]

29.475

LOCATION:	CNS LANDFILL #1		
PROCEDURE NUMBER:	3500		
SAMPLING DATE:	10-7-96	FIELD CREW	GLERAS

WATER LEVEL METER #:	QED
TIME SAMPLE COLLECTED:	1312

WELL DIAMETER (INCHES)	WELL DEPTH (FEET)	-	WATER LEVEL (FEET)	=	WATER COLUMN (FEET)	X	$3.14 \times r^2$	=	VOLUME (FT ³)
2"		-		=		X	0.0218	=	
4"	37.10	-	24.27	=	12.93	X	0.0873	=	1.1201

WELL VOLUME	LITERS TO REMOVE: (FT ³ x 28.32 L/FT ³)	
	2" WELL	4" WELL
1		32
5		
10		
20		

ODORS DETECTED:		FREE PRODUCT MEASUREMENT:	
TYPE:		METHOD:	
STRONG:		THICKNESS:	
MINOR:		OTHER:	
NONE:			

[illegible]

REFERENCE TAPE LEVEL:	QED SUBMERGENCE DEPTH READING: 8.03
REFERENCE DIGITAL LEVEL:	REFERENCE PROBE DEPTH' 32.30
	- 8.03
	24.27

SAM No. 9609258

Form 35226 (R10-93)

ANALYSES REQUESTED by bottle type—MUST NOTE PRESERVATIVE¹²
(may note special DL or Method)¹³

[illegible]Comments¹⁷: *

* See instructions on back of form.

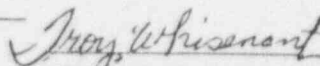
¹⁸ White, canary — LS Files Pink — Client Copy

Received: 10/07/96

10/28/96 14:41:01

REPORT CHEMICAL SCIENCES

PREPARED _____

TO RON SANTINIBY LABORATORY SERVICESENVIRONMENTAL CHEMISTRY

CERTIFIED BY

ATTEN RON SANTINIATTEN LABORATORY SUPPORTPHONE 875-5209CONTACT TLWCLIENT N GW CNSSAMPLES 5COMPANY DUKE POWER COMPANYFACILITY ENVIRONMENTAL CHEMISTRYPH DETERMINED PAST HOLDING TIME.WORK ID CNS LANDFILL #1TAKEN 10/7/96

TRANS _____

TYPE CATAWBA GROUNDWATERP.O. # 7330LANDFILLINVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this workorder

01 LMW-1A700 TC TOTAL ORGANIC CARBON02 LMW-2AA CL CHLORIDE03 LMW-3AA NO3 NITRATE (ONLY)04 LMW-4S PH PH VALUE05 LMW-FIELD BLANKUV SO4 SULFATE UV-VIS

Received: 10/07/96

Results by Sample

SAMPLE ID <u>IMW-1A</u>		SAMPLE # <u>01</u> FRACTIONS: <u>A</u>							
		Date & Time Collected <u>10/07/96 09:15:00</u> Category _____							
700_TC	0.43	AA_CL	4.8	AA_NO3	<0.05	S_PH	6.00	UV_SO4	<1.0
	MG/L		MG/L		MG-N/L		UNITS		MG/L

SAMPLE ID <u>IMW-2</u>		SAMPLE # <u>02</u> FRACTIONS: <u>A</u>							
		Date & Time Collected <u>10/07/96 10:45:00</u> Category _____							
700_TC	0.56	AA_CL	8.9	AA_NO3	0.55	S_PH	6.21	UV_SO4	<1.0
	MG/L		MG/L		MG-N/L		UNITS		MG/L

SAMPLE ID <u>IMW-3</u>		SAMPLE # <u>03</u> FRACTIONS: <u>A</u>							
		Date & Time Collected <u>10/07/96 11:40:00</u> Category _____							
700_TC	0.50	AA_CL	11.1	AA_NO3	<0.05	S_PH	6.18	UV_SO4	2.62
	MG/L		MG/L		MG-N/L		UNITS		MG/L

SAMPLE ID <u>IMW-4</u>		SAMPLE # <u>04</u> FRACTIONS: <u>A</u>							
		Date & Time Collected <u>10/07/96 13:12:00</u> Category _____							
700_TC	0.48	AA_CL	6.4	AA_NO3	<0.05	S_PH	6.07	UV_SO4	<1.0
	MG/L		MG/L		MG-N/L		UNITS		MG/L

SAMPLE ID <u>IMW-FIELD BLANK</u>		SAMPLE # <u>05</u> FRACTIONS: <u>A</u>							
		Date & Time Collected <u>10/07/96 13:20:00</u> Category _____							
700_TC	<0.1	AA_CL	<1.0	AA_NO3	<0.05	S_PH	5.86	UV_SO4	<1.0
	MG/L		MG/L		MG-N/L		UNITS		MG/L

Duke Power Company
Radiological and Environmental Services

Phone: 704-875-5371 Fax: 704-875-5974 Report Generated 10/23/96 06:58:10

Type of Sample : LANDFILL

Location : LMW-1A

Collection Begin : 10/07/96 09:15:00

Collection End : 10/07/96 09:15:00

GROUND WATER DATA

Sample ID # : 96005586

Station Name: CATAWBA

Sample Volume: 3.5

	<u>Activity</u>	<u>Error</u>	<u>Fraction</u>
MN54	< 3.454E+00	0.000E+00	PCI / LITERS
CO58	< 3.910E+00	0.000E+00	PCI / LITERS
FE59	< 6.813E+00	0.000E+00	PCI / LITERS
CO60	< 3.757E+00	0.000E+00	PCI / LITERS
ZN65	< 8.541E+00	0.000E+00	PCI / LITERS
NB95	< 4.880E+00	0.000E+00	PCI / LITERS
ZR95	< 7.291E+00	0.000E+00	PCI / LITERS
I131	< 4.550E+00	0.000E+00	PCI / LITERS
CS134	< 4.006E+00	0.000E+00	PCI / LITERS
CS137	< 3.540E+00	0.000E+00	PCI / LITERS
BALA140	< 5.815E+00	0.000E+00	PCI / LITERS
BE7	< 3.729E+01	0.000E+00	PCI / LITERS
K40	1.115E+02	2.465E+01	PCI / LITERS
H3	< 9.64E+01		PCI / LITERS

Type of Sample : LANDFILL

Location : LMW-2

Collection Begin : 10/07/96 10:45:00

Collection End : 10/07/96 10:45:00

GROUND WATER DATA

Sample ID # : 96005587

Station Name: CATAWBA

Sample Volume: 3.5

	<u>Activity</u>	<u>Error</u>	<u>Fraction</u>
MN54	< 5.278E+00	0.000E+00	PCI / LITERS
CO58	< 4.235E+00	0.000E+00	PCI / LITERS
FE59	< 8.631E+00	0.000E+00	PCI / LITERS
CO60	< 5.134E+00	0.000E+00	PCI / LITERS
ZN65	< 9.969E+00	0.000E+00	PCI / LITERS
NB95	< 4.538E+00	0.000E+00	PCI / LITERS
ZR95	< 7.011E+00	0.000E+00	PCI / LITERS
I131	< 5.516E+00	0.000E+00	PCI / LITERS
CS134	< 4.466E+00	0.000E+00	PCI / LITERS
CS137	< 4.732E+00	0.000E+00	PCI / LITERS
BALA140	< 4.471E+00	0.000E+00	PCI / LITERS
BE7	< 4.004E+01	0.000E+00	PCI / LITERS
K40	< 6.374E+01	0.000E+00	PCI / LITERS
H3	< -2.60E+02		PCI / LITERS

Duke Power Company
Radiological and Environmental Services

Phone: 704-875-5371 Fax: 704-875-5974 Report Generated 10/23/96 06:58:10

Type of Sample : LANDFILL
Location : LMW-3
Collection Begin : 10/07/96 11:40:00
Collection End : 10/07/96 11:40:00

GROUND WATER DATA

Sample ID # : 96005588
Station Name: CATAWBA
Sample Volume: 3.5

	<u>Activity</u>	<u>Error</u>		<u>Fraction</u>
MN54	< 4.135E+00	0.000E+00	PCI / LITERS	
CO58	< 3.568E+00	0.000E+00	PCI / LITERS	
FE59	< 6.746E+00	0.000E+00	PCI / LITERS	
CO60	< 4.623E+00	0.000E+00	PCI / LITERS	
ZN65	< 9.594E+00	0.000E+00	PCI / LITERS	
NB95	< 4.594E+00	0.000E+00	PCI / LITERS	
ZR95	< 7.155E+00	0.000E+00	PCI / LITERS	
I131	< 4.775E+00	0.000E+00	PCI / LITERS	
CS134	< 3.907E+00	0.000E+00	PCI / LITERS	
CS137	< 4.192E+00	0.000E+00	PCI / LITERS	
BALA140	< 4.756E+00	0.000E+00	PCI / LITERS	
BE7	< 3.509E+01	0.000E+00	PCI / LITERS	
K40	1.612E+02	2.837E+01	PCI / LITERS	
H3	4.440E+02	2.674E+01	PCI / LITERS	2.220E-02

Type of Sample : LANDFILL
Location : LMW-4
Collection Begin : 10/07/96 13:12:00
Collection End : 10/07/96 13:12:00

GROUND WATER DATA

Sample ID # : 96005589
Station Name: CATAWBA
Sample Volume: 3.5

	<u>Activity</u>	<u>Error</u>		<u>Fraction</u>
MN54	< 4.339E+00	0.000E+00	PCI / LITERS	
CO58	< 4.201E+00	0.000E+00	PCI / LITERS	
FE59	< 7.616E+00	0.000E+00	PCI / LITERS	
CO60	< 4.609E+00	0.000E+00	PCI / LITERS	
ZN65	< 9.509E+00	0.000E+00	PCI / LITERS	
NB95	< 4.710E+00	0.000E+00	PCI / LITERS	
ZR95	< 7.231E+00	0.000E+00	PCI / LITERS	
I131	< 4.867E+00	0.000E+00	PCI / LITERS	
CS134	< 4.156E+00	0.000E+00	PCI / LITERS	
CS137	< 4.161E+00	0.000E+00	PCI / LITERS	
BALA140	< 5.783E+00	0.000E+00	PCI / LITERS	
BE7	< 3.469E+01	0.000E+00	PCI / LITERS	
K40	1.472E+02	2.477E+01	PCI / LITERS	
H3	< 1.99E+02		PCI / LITERS	