

Loo, Wade

From: Brian Bonser *RB*
Sent: Tuesday, April 14, 2009 11:03 AM
To: Wade Loo
Subject: FW: Catawba Tritium Sampling Info from SC DHEC
Attachments: Document.pdf

fyi

-----Original Message-----

From: Andrew Sabisch
Sent: Tuesday, April 14, 2009 10:55 AM
To: Jonathan Bartley; Robert Carroll; Brian Bonser; George Kuzo
Subject: Catawba Tritium Sampling Info from SC DHEC

The attached Fact Sheet will be posted on the SC DHEC website today detailing the tritium sampling that will be ongoing in the Bethel area surrounding the plant. Also attached is a copy of a BLM letter that will be sent to all residents where samples are taken from their wells.

If you need any more information, let me know.

There may be media interest once the Fact Sheet is posted on the SC DHEC website (<http://www.scdhec.gov/index.htm>)

Andy

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Fact Sheet

SC Department of Health and Environmental Control • 2600 Bull Street • www.scdhec.gov • Promoting and protecting the health of the public and the environment

April 2009

Bethel Community Testing for Radioactive Materials

Overview

Staff with the S.C. Department of Health and Environmental Control (DHEC) recently sampled water from 24 locations around the Catawba Nuclear Station, operated by Duke Energy, in York County. Of the 24 water samples taken, 20 were private wells, one was a public well and three were surface water samples from Lake Wylie, immediately adjacent to the facility.

The testing was done, as a precaution, to determine if radioactive materials are present in the groundwater near the Catawba Nuclear Station.

All 21 wells were tested for Gross Alpha and Gross Beta radiation, and general bacterial health. Ten wells were tested for Gross Gamma radiation. Three surface water samples and two wells were tested for Tritium.

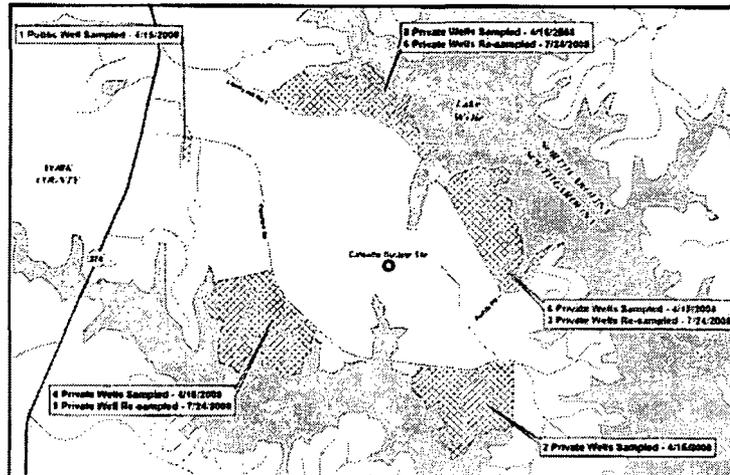
The wells tested were those closest to the Catawba Nuclear Station.

By starting with wells closest to a site it can be determined how far, and in which direction, potential contaminants could travel from a source. If these test results show no problems, it indicates the locations farther away should have the same result.

These samples were taken in April 2008 to determine groundwater quality in your area and to determine whether certain types of radioactive materials might be present in the groundwater. In July 2008, ten of the private wells were re-sampled to confirm results found in the initial sampling.

Summary of Results

Groundwater testing indicates that no radioactive materials from the Catawba Nuclear Station are present in the groundwater beyond the plant property. The testing showed that all 21 of the well water samples contained varying levels of Naturally Occurring Radioactive Materials (NORM). Well water can be treated to reduce the amount of radioactive materials present. Residents whose wells showed increased levels of NORM were given additional guidance on measures that can be taken to reduce the amount of those materials in their drinking water.



See Page 6 For Full Map

Regulatory Requirements:

If testing for radioactive materials shows levels continue to exceed EPA and DHEC safe drinking water levels, the Maximum Contamination Levels (MCLs), regulations state the water should be treated or ruled out as a source of safe drinking water.

Test Results:

Tritium

Of the 24 water samples taken five were tested for tritium, **none** showed any tritium above the U.S. Environmental Protection Agency (EPA) and DHEC safe drinking water standards. **(For all results, see table on page 4.)**

- The EPA and DHEC safe drinking water limit for tritium is **20,000 picocuries** per liter of water (abbreviated as pCi/L). (EPA Safe Drinking Water Act, 40 CFR 141)

Gross Alpha

Of the 24 well water samples taken, all 21 well water samples showed detectible levels of Gross Alpha radiation. The three surface water samples were not tested for Gross Alpha. **(For all results, see tables on pages 4 & 5.)**

- The U.S. EPA and DHEC safe drinking water limit, or Maximum Contaminant Level (MCL), for Gross Alpha is **15 pCi/L**. (EPA Safe Drinking Water Act, 40 CFR 141)

In the 21 well water samples, where Gross Alpha was detected, ten of the wells initially exceeded or nearly exceeded the Maximum Contamination Level of 15 pCi/L. Those ten wells were re-sampled on July 24th.

- In addition to the MCL for Gross Alpha, the U.S. EPA and DHEC limit the level of several specific radioactive Alpha materials:
 - Radium-226 MCL = **5 pCi/L**.
 - Radium-228 MCL = **5 pCi/L**.
 - Combined Radium-226 & Radium-228 MCL = **5 pCi/L**.
 - Uranium MCL = **30 micrograms** per liter of water ($\mu\text{g/L}$) which is approximately equal to 20 pCi/L.

In the ten wells re-sampled on July 24th, four contained higher levels of a specific set of Alpha materials, Radium-226, Radium-228, Combined Radium-226 and Radium-228, and Uranium.

Laboratory analysis showed the materials detected result from NORM often found in the ground or soil. These results are attributed to a high concentration of naturally occurring Uranium and Radium.

Gross Beta

Of the 24 water samples taken, 21 well water samples were tested for Gross Beta. Fifteen of the 21 well water samples showed detectible levels of Gross Beta radiation in either the initial testing or the re-sampling. The three surface water samples were not tested for Gross Beta. **(For all results, see table on page 4.)**

Laboratory analysis showed these elements are a result of NORM often found in the ground or soil.

Gross Gamma

If test results exceed the Gross Alpha or Gross Beta Maximum Contamination Levels, Gross Gamma tests are run to determine whether materials containing Gamma radiation exist in the water sources. No detectable levels of Gamma material were found. **(For all results, see table on page 4.)**

Understanding Radiation Exposure:

Radiation is everywhere. It is in our bodies and in the world around us. We have about 120,000 picocuries of radioactivity in our bodies. These naturally occurring radioactive substances expose our bodies to between 25 and 40 "millirem" per year, abbreviated as "mRem/yr". We are exposed to a constant stream of radiation from the earth, the sun and outer space. The average American receives 360 millirem from natural or other sources each year. A typical chest x-ray yields between 8 and 10 millirem. Working under fluorescent light bulbs or the use of a cell phones will result in several millirem per year for each.

The severity and type of radiation exposure we receive, the amount of radiation, the length of exposure to radiation and the means by which we are exposed all influence whether personal health would be affected.

- Under the EPA and DHEC safe drinking water standard, the Maximum Contaminant Level (MCL) for tritium is 20,000 pCi/L; for Gross Alpha the MCL is 15 pCi/L; for Gross Beta the MCL is 50 pCi/L.
- The EPA's safe drinking water standards are based upon lifetime drinking consumption calculations where the individual is drinking two liters of water – from the water source – per day, 365 days a year over a 70-year life span.
- Average U.S. background tritium levels, found in groundwater, are approximately 50 pCi/L.

For more information about NORM or information on how to treat water that may have elevated levels of NORM, visit the following DHEC websites:

Naturally Occurring Radium in Drinking Water:

<http://www.scdhec.gov/environment/water/radium.htm>

Uranium:

<http://www.scdhec.gov/environment/water/uranium.htm>

Or contact:

DHEC Bureau of Water

Chuck Gorman

(803) 898-3112

Pete Stone

(803) 898-4151

For more information on Nuclear Power Plants in South Carolina visit our website at:

http://www.scdhec.net/environment/lwm/html/nuclear_power.htm

For more information on EPA and DHEC safe drinking water limits visit the following websites at:

DHEC Understanding Your Drinking Water:

<http://www.scdhec.gov/environment/water/dwoutreach.htm>

EPA Radionuclides in Drinking Water:

<http://www.epa.gov/safewater/radionuclides/index.html>

Basic Information about Radionuclides in Drinking Water:

<http://www.epa.gov/safewater/radionuclides/basicinformation.html>

Radiation and Radioactivity:

<http://www.epa.gov/radiation/understand/>

Commonly encountered Radionuclides:

<http://www.epa.gov/radiation/radionuclides/index.html>

If you have additional questions about your well sampling, well testing results or information contained in this document please call 1-800-476-9677; during normal business hours, Monday through Friday, from 8:30 a.m. to 4:30 p.m.

Bethel Community Well Water Testing Results

Date	Team # – Sample #	Tritium*	Gross Alpha*	Gross Beta*	Gross Gamma*	Notes
04/15/2008	CNS1-01	---	4.59 pCi/L	6.92 pCi/L	N/A	Private Well
04/15/2008	CNS1-02–Duplicate**	---	7.65 pCi/L	7.41 pCi/L	N/A	Private Well
04/15/2008	CNS1-03	---	3.16 pCi/L	4.97 pCi/L	N/A	Private Well
04/15/2008	CNS1-04	---	20.5 pCi/L	11.5 pCi/L	---	Private Well
07/24/2008	CNS8-04	---	23.1 pCi/L	7.72 pCi/L	< LLD	Private Well
04/15/2008	CNS1-05	---	22.1 pCi/L	10.8 pCi/L	---	Private Well
07/24/2008	CNS8-05	---	2.74 pCi/L	8.42 pCi/L	< LLD	Private Well
04/15/2008	CNS1-06	---	14.6 pCi/L***	< LLD	---	Private Well
07/24/2008	CNS9-06	---	8.37 pCi/L	4.82 pCi/L	< LLD	Private Well
04/15/2008	CNS2-11	---	6.74 pCi/L	< LLD	---	Public Well
04/15/2008	CNS2-13	---	6.7 pCi/L	6.01 pCi/L	---	Private Well
04/15/2008	CNS2-14	---	14.6 pCi/L***	13.7 pCi/L	---	Private Well
07/24/2008	CNS7-14	---	33.3 pCi/L	11.1 pCi/L	< LLD	Private Well
04/15/2008	CNS2-15	---	19.0 pCi/L	< LLD	---	Private Well
07/24/2008	CNS8-15	---	16.9 pCi/L	12.8 pCi/L	< LLD	Private Well
04/15/2008	CNS3-21	---	16.4 pCi/L	< LLD	---	Private Well
07/24/2008	CNS7-21	---	21.3 pCi/L	5.1 pCi/L	< LLD	Private Well
04/15/2008	CNS3-22	---	15.5 pCi/L	4.47 pCi/L	---	Private Well
07/24/2008	CNS7-22	---	17.4 pCi/L	7.29 pCi/L	< LLD	Private Well
04/15/2008	CNS3-23	---	31.6 pCi/L	17.9 pCi/L	---	Private Well
07/24/2008	CNS7-23	---	27.9 pCi/L	14.2 pCi/L	< LLD	Private Well
04/15/2008	CNS3-25	---	28.4 pCi/L	15.6 pCi/L	---	Private Well
07/24/2008	CNS7-25	---	22.4 pCi/L	13.6 pCi/L	< LLD	Private Well
04/15/2008	CNS3-26	---	7.38 pCi/L	5.85 pCi/L	N/A	Private Well
04/15/2008	CNS4-31	---	0.0527 pCi/L	< LLD	N/A	Private Well
04/15/2008	CNS4-32	---	2.16 pCi/L	4.83 pCi/L	N/A	Private Well
04/15/2008	CNS4-32–Duplicate	---	1.63 pCi/L	< LLD	N/A	Private Well
04/15/2008	CNS4-34	---	17.8 pCi/L	6.54 pCi/L	---	Private Well
07/24/2008	CNS9-34	---	17.5 pCi/L	7.67 pCi/L	< LLD	Private Well
07/24/2008	CNS9-34–Duplicate	---	6.18 pCi/L	8.8 pCi/L	---	Private Well
04/15/2008	CNS4-37	---	5.59 pCi/L	< LLD	N/A	Private Well
04/15/2008	CNS4-38	---	1.42 pCi/L	< LLD	N/A	Private Well
04/15/2008	CNS5-01-GW	388 pCi/L	9.23 pCi/L	< LLD	N/A	Private Well
04/15/2008	CNS5-01-GWD (Duplicate)	514 pCi/L	12.3 pCi/L	< LLD	N/A	Private Well
04/15/2008	CNS5-02-GW	< LLD	6.45 pCi/L	< LLD	N/A	Private Well
04/15/2008	10-804	1,320 pCi/L	---	---	N/A	Surface Water
04/15/2008	CW-198	692 pCi/L	---	---	N/A	Surface Water
04/15/2008	CW-230	994 pCi/L	---	---	N/A	Surface Water

* = Measured in pCi/L or picocuries per liter of water.

** = Sample well CNS1-02 was a double blind duplicate sample taken from well CNS1-01. This means the two samples were pulled from the same well but given separate sample numbers to ensure lab and analysis testing procedures.

*** While Gross Alpha levels were within the EPA safe drinking water limit, results for specific screening for Combined Radium-226 and Radium-228 exceeded additional MCLs.

(Gross Alpha breakdown on following page)

Date	Team # - Sample #	Gross Alpha Contributors				Notes
		Radium-226	Radium-228	Radium 226 & 228	Uranium	
07/24/2008	CNS8-04	< LLD	< LLD	< LLD	35.2 µg/L or 23.6 pCi/L	Private Well
07/24/2008	CNS8-05	< LLD	< LLD	< LLD	34.9 µg/L or 23.4 pCi/L	Private Well
07/24/2008	CNS9-06	< LLD	< LLD	< LLD	---	Private Well
07/24/2008	CNS7-14	0.405 pCi/L	3.88 pCi/L	4.285 pCi/L	19.25 µg/L or 12.9 pCi/L	Private Well
07/24/2008	CNS8-15	< LLD	< LLD	< LLD	23.58 µg/L or 15.8 pCi/L	Private Well
07/24/2008	CNS7-21	< LLD	0.758 pCi/L	< LLD	28.21 µg/L or 18.9 pCi/L	Private Well
07/24/2008	CNS7-22	0.729 pCi/L	1.45 pCi/L	< LLD	16.86 µg/L or 11.3 pCi/L	Private Well
07/24/2008	CNS7-23	1.71 pCi/L	5.27 pCi/L	6.98 pCi/L	30.45 µg/L or 20.4 pCi/L	Private Well
07/24/2008	CNS7-25	1.02 pCi/L	5.53 pCi/L	6.55 pCi/L	29.70 µg/L or 19.9 pCi/L	Private Well
07/24/2008	CNS9-34	< LLD	1.31 pCi/L	1.31 pCi/L	27.16 µg/L or 18.2 pCi/L	Private Well

- * = Measured in pCi/L or picocuries per liter of water.
- ** = Sample well CNS1-02 was a double blind duplicate sample taken from well CNS1-01. This means the two samples were pulled from the same well but given separate sample numbers to ensure lab and analysis testing procedures.
- *** While Gross Alpha levels were within the EPA safe drinking water limit, results for specific screening for Combined Radium-226 and Radium-228 exceeded additional MCLs.
- <LLD = Lower Level of Detection (means any radioactive material present was lower than what is scientifically measurable). This can also be expressed as Minimum Detectable Activity (MDA).
- N/A = Initial screening of sample showed no indicators that would require secondary Gross Gamma screening/testing. (Gross Gamma test are run only if Gross Alpha or Gross Beta is exceeded.)
- pCi/L = Picocuries per liter of water.
- µg/L = Micrograms per liter of water.
- = Not Tested/Not Analyzed.

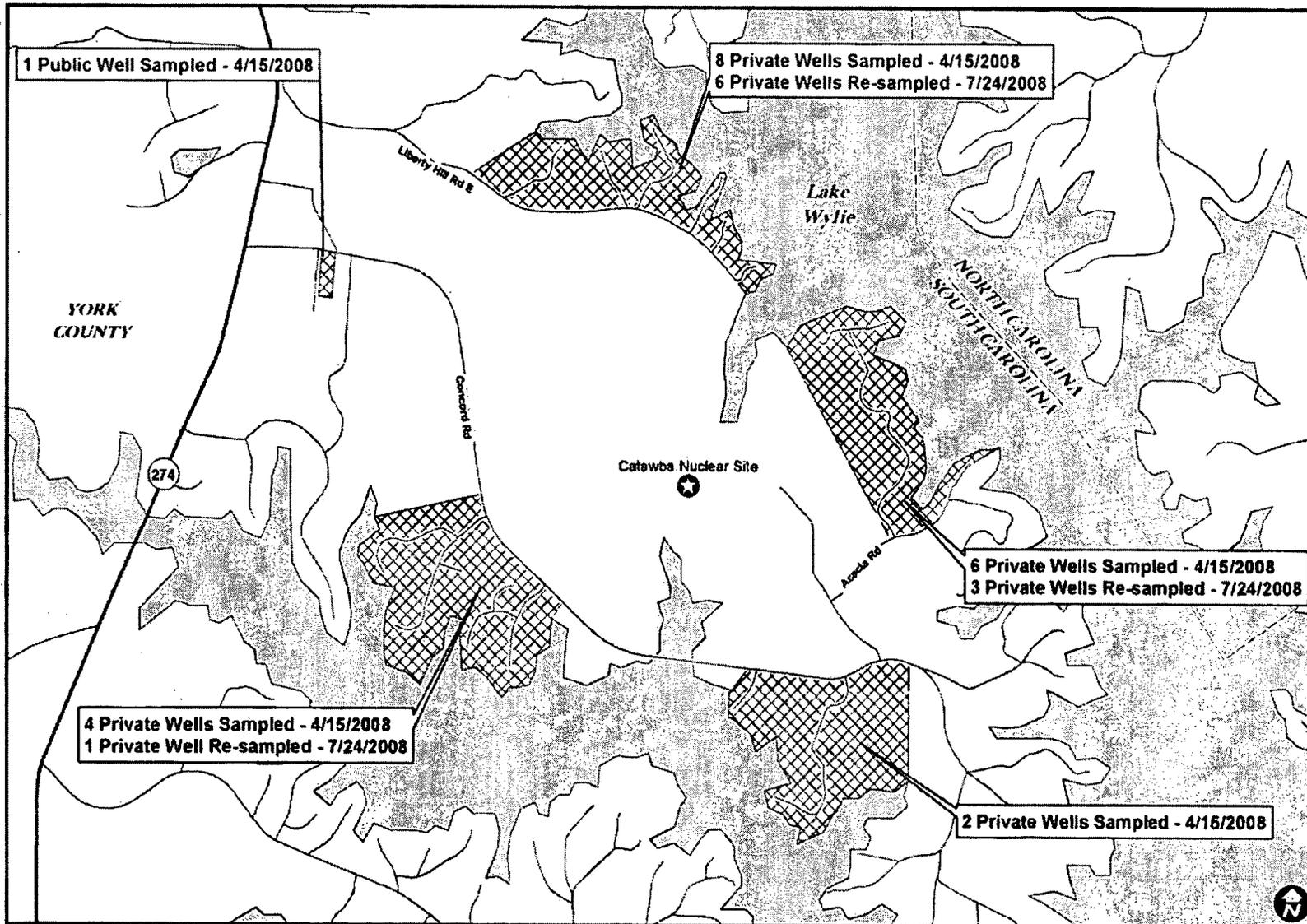
EPA Safe Drinking Water – Maximum Contamination Levels

- Tritium** = 20,000 picocuries per liter of water (pCi/L)***
- Gross Alpha** = 15 picocuries per liter of water (pCi/L)***
- Gross Beta** = 50 picocuries per liter of water (pCi/L)***

EPA Safe Drinking Water Levels for Gross Alpha Contributors – Maximum Contamination Levels

- Radium-226** = 5 picocuries per liter of water (pCi/L)***
- Radium-228** = 5 picocuries per liter of water (pCi/L)***
- Combined Radium-226 +228 (if both are present)** = 5 picocuries per liter of water (pCi/L)***
- Uranium** = 30 micrograms per liter of water (µg/L)***
(30 µg/L is approximately equal to 20 pCi/L)

*** All limits are based upon consumption of two liters of water per day, 365 days per year over a 70-year lifespan.



D H E C

CNS

Sampling Areas

**Residential Well Sampling Adjacent
to Catawba Nuclear Site (CNS)
April 15, 2008 and July 24, 2008**

0 0.25 0.5 1 Miles

Date: 01/03/2009
Source Data: NCEM/C
Cartographer: David Reed, DLWNI

BUREAU OF LAND AND WASTE MANAGEMENT

April 14,2009

((Resident Name))
((Resident Address))
((City/Town)), South Carolina ((ZIP CODE))

RE: Your Sample ID: ((NPP CODE))-((Sample number))

Dear ((Resident Name)):

As you are aware, staff from the S.C. Department of Health and Environmental Control (DHEC) was in your community on April 15, 2008 to sample some private wells near the Catawba Nuclear Station. We sampled 21 wells and three surface water systems. The samples were analyzed to determine if radiation was in the groundwater.

Groundwater testing indicates that **no radioactive materials** from the Catawba Nuclear Station are present in the groundwater beyond the plant property. The testing showed all 21 of the well water samples contained varying levels of Naturally Occurring Radioactive Materials (NORM).

Well water can be treated to reduce the amount of radioactive materials present. Residents whose wells showed increased levels of NORM are being given additional guidance on measures that can be taken to reduce the amount of those materials in their drinking water.

Your results of this testing initially indicated a small amount of Gross Alpha particles above the Maximum Contamination Levels (MCLs) allowed by the U.S. Environmental Protection Agency (EPA) and the S.C. Department of Health and Environmental Control (DHEC). After re-sampling your well on July 24, 2008, results showed the levels detected were within the allowable range considered safe for drinking water under DHEC and EPA guidelines

Maximum Contamination Levels are conservative estimates based upon the assumption an individual consumes two liters of the water source per day, 365 days per year, over a 70-year lifespan.

While your results show levels above the standard, there is no immediate health risk to your or your family. However, based on the test results, you may want to consider routine testing of your water to determine whether these levels change significantly over time.

The results for all the testing from your community are contained in the enclosed **Bethel Community Testing for Radioactive Materials Fact Sheet**. Additional information on radioactive materials in groundwater is also enclosed.

As a precautionary measure, the Environmental Protection Agency (EPA) and DHEC would like to encourage you, and all citizens, to test their homes for radon. Radon is a naturally occurring, colorless, odorless radioactive gas that can be found in varying levels in different homes.

Acquiring a radon test kit will allow you to measure the average concentration in your home by placing a kit in the area to be measured and then sending the device to the manufacturer for analysis. For more information on radon and how you may obtain a *free* kit, please refer to the radon brochure enclosed. To request a free Radon test kit you can call 1-800-768-0362 or email radon@dhec.sc.gov.

For more information on Nuclear Power Plants in South Carolina visit our website at:

http://www.scdhec.net/environment/lwm/html/nuclear_power.htm

If you have additional questions about your well testing results or information contained in this document, please call 1-800-476-9677 during normal business hours (Monday thru Friday 8:30 a.m. to 5:00 p.m.).

Thank you for allowing us to test your well.

Sincerely,

Chris Staton, Director
Division of Waste Assessment and Emergency Response

Enclosures