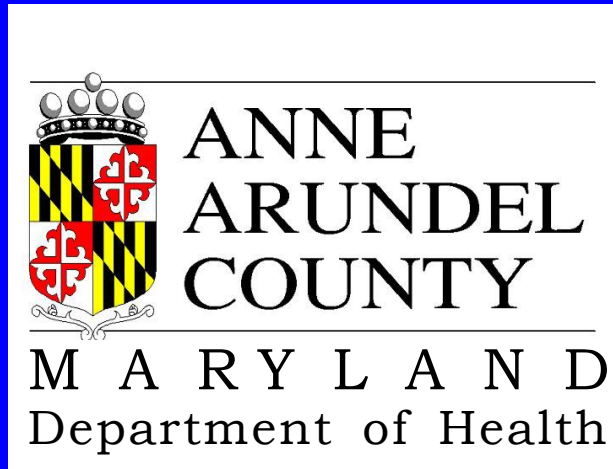


West County Groundwater Quality



April 19, 2007

“West County” Issues

1. Radium

2. Gambrills Investigation



What is Radium?

- Naturally occurring radioactive element found in rocks and soils
- Low pH levels dissolve the Radium attached to the soils and rock and release it into the groundwater
- Found in “shallow aquifers”



Health Effects of Ingesting Radium

- Any risk is from consumption only
- High levels and long-term exposure associated with bone cancer
- EPA estimates if 10,000 people drink 2 liters of water with a Radium level of 5 pCi/l a day for 50 years, 1 additional fatal cancer may occur



Recommendations for Radiological Testing

(in Area of Concern)

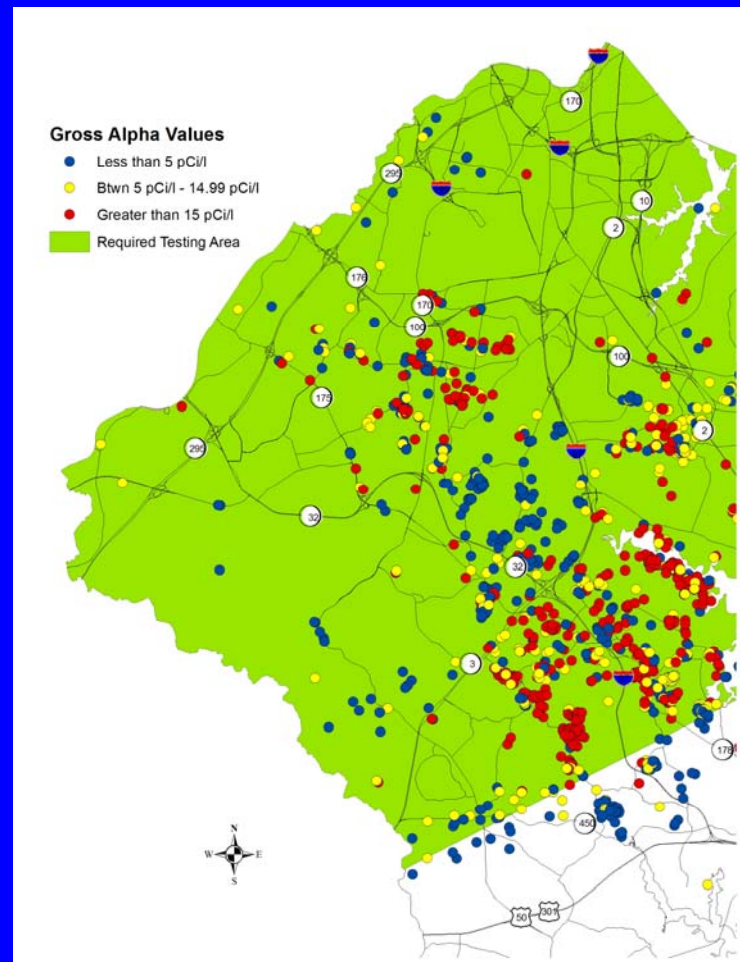
EXISTING WELLS

- Get water tested
- Currently on a fee paid basis
- Testing is not mandatory
- Assistance program for testing and water treatment under development

NEW OR REPLACEMENT WELLS

- Radiological testing is MANDATORY
- Deeper wells are required

Radium Test Results



EPA Standards

- Screening Test (Gross alpha) = 15 pCi/l
- Radium 226/228 = 5 pCi/l

How to Reduce Exposure to Radium

- Install a water treatment system (Water Softener or Reverse Osmosis) to remove/reduce the Radium levels and retest the water
- Use bottled water for drinking and cooking
- Hook up to public water system if available
- Radium Pilot Grant Program

Water Softener



Reverse Osmosis



Gambrills/Odenton Well Water Investigation

- Investigation began in October 2006 after notification from MDE and Constellation
- Monitoring wells at a sand and gravel pit and a nearby residential well showed elevated levels of metals during monitoring as required by MDE.
- Sand and gravel pit used fly ash to “refill” the excavated pits.
- Anne Arundel County Department of Health responded to MDE and Constellation findings by conducting several rounds of water sampling for metals to determine the water quality in this area.

Results and Current Status of Investigation

- Tested 81 properties during the four rounds of sampling
- As of 4/1/07, 69 results have been received and the following metals have been found in some wells.

Round 1

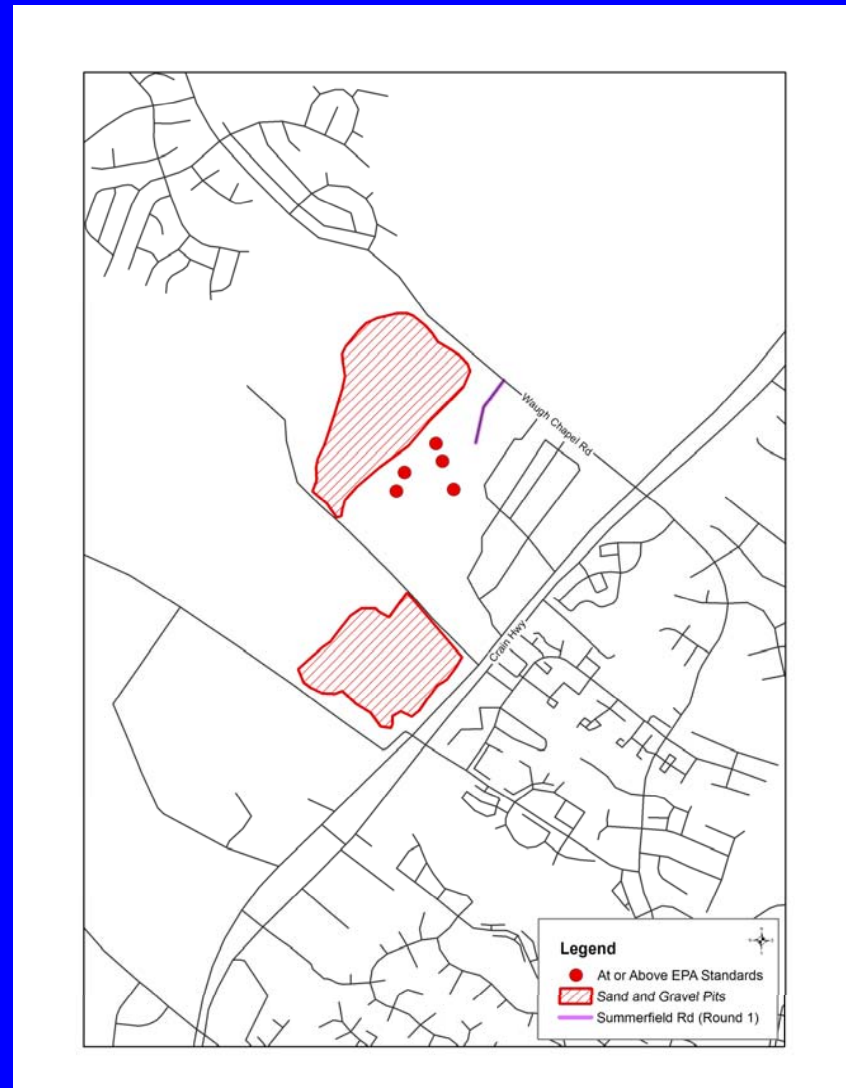
5 Wells Sampled

- 4 exceed Cadmium MCL
- 1 exceeds Beryllium MCL
- 3 exceed Thallium MCL
- 5 exceed Aluminum SMCL
- 5 exceed Manganese SMCL
- 4 exceed Sulfates SMCL

•Results are pretreatment

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level



Round 2

12 Wells Sampled

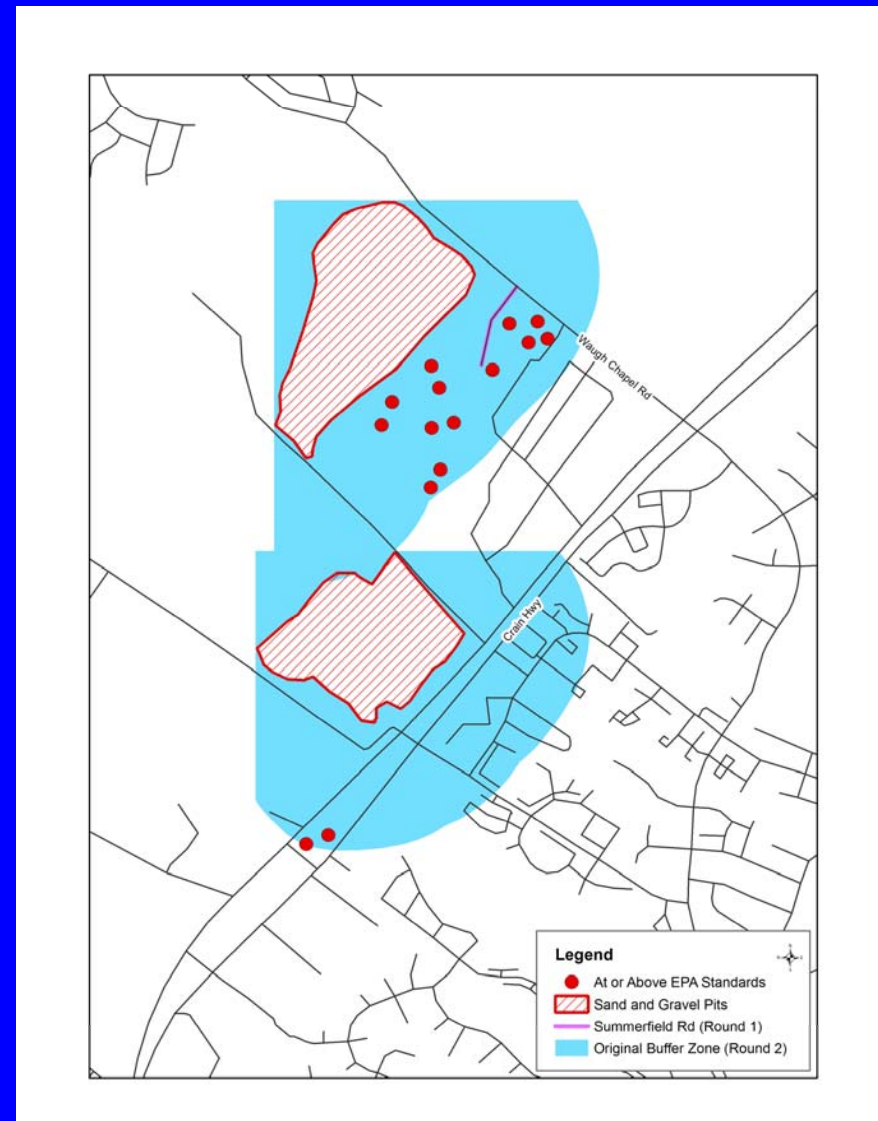
- 4 exceed Lead MCL
- 1 exceeds Thallium MCL
- 6 exceed Aluminum SMCL
- 3 exceed Manganese SMCL
- 1 exceeds Sulfates SMCL

- 2 wells meet EPA Standards

• Results are pretreatment

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level



Round 3

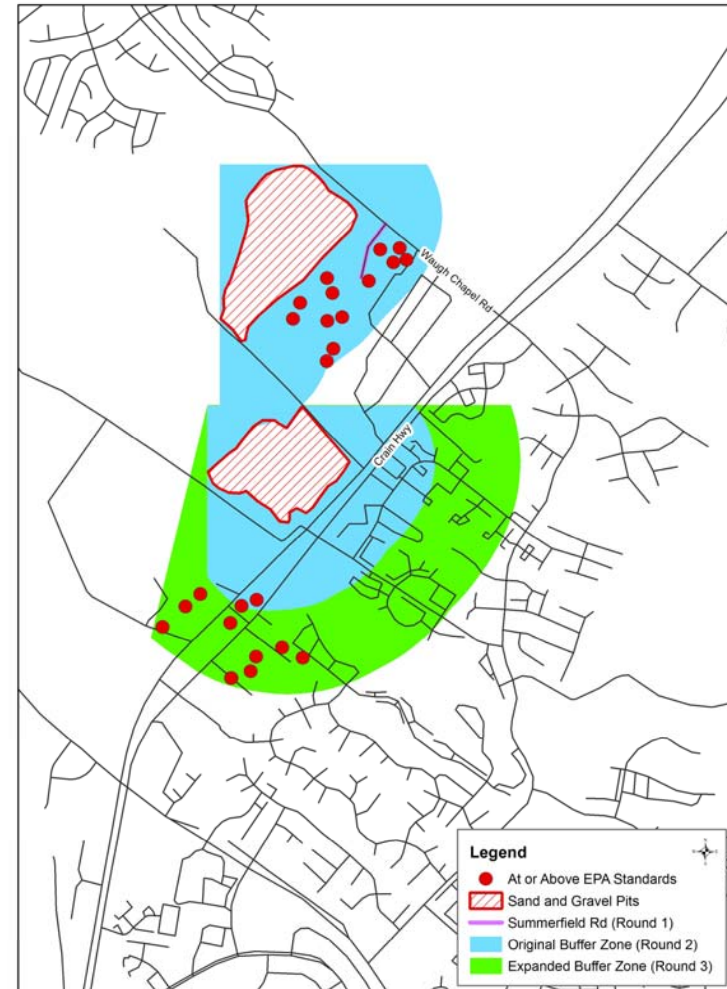
11 Wells Sampled

- 2 exceed Cadmium MCL
- 2 exceed Thallium MCL
- 3 exceed Lead MCL
- 1 exceeds Arsenic MCL
- 11 exceed Aluminum SMCL
- 5 exceed Manganese SMCL

•Results are pretreatment

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level



Round 4

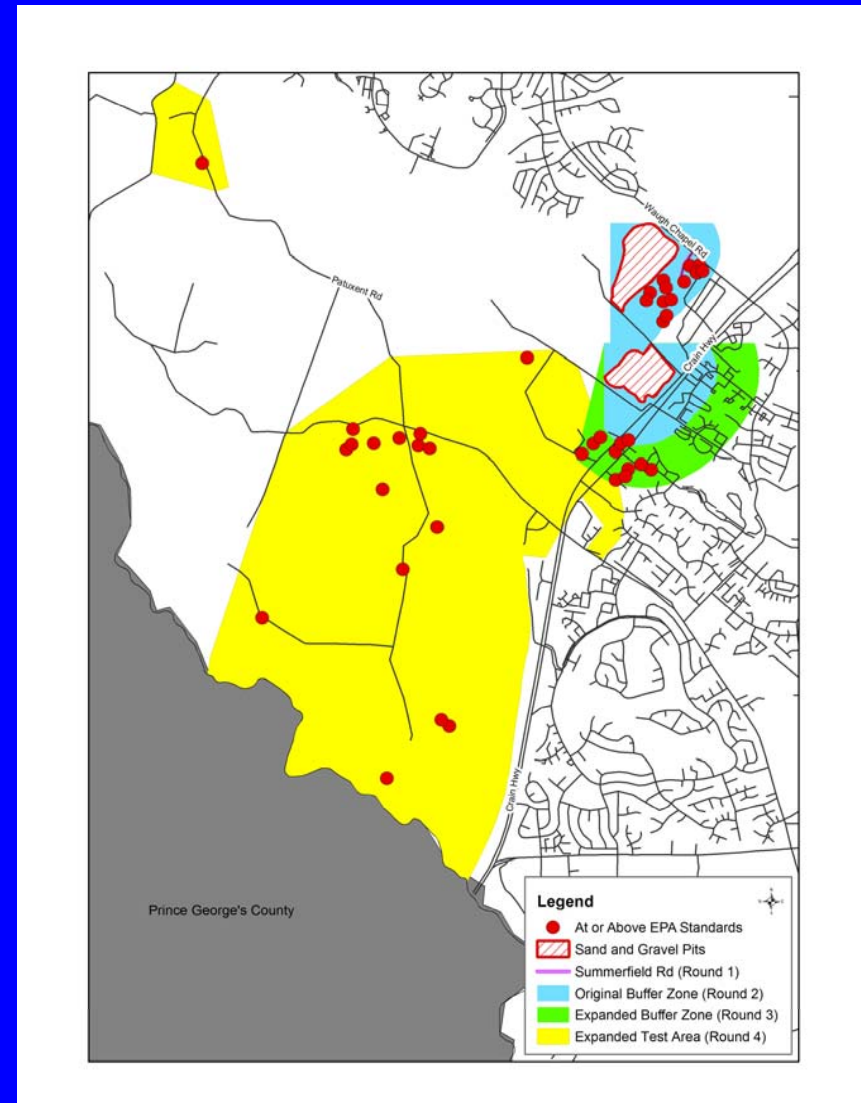
41 Wells Sampled

- 10 exceed Lead MCL
- 10 exceed Aluminum SMCL
- 1 exceeds Manganese SMCL
- 23 wells meet EPA Standards

• Results are pretreatment

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level



Results Table

Substance	Detected in Number of Wells	Amount Detected (Range)	Number of Wells At or Exceeding MCL	Number of Wells At or Exceeding SMCL	EPA MCL	EPA SMCL
Arsenic	3	4-25 ppb	1	N/A	10 ppb	N/A
Beryllium	3	1-5 ppb	1	N/A	4 ppb	N/A
Cadmium	7	4.4-16 ppb	6	N/A	5 ppb	N/A
Lead <small>(often related to household plumbing)</small>	31	5-160 ppb	17	N/A	15 ppb	N/A
Thallium	8	1-6 ppb	6	N/A	2 ppb	N/A
Aluminum	36	100-55,800 ppb	N/A	32	No MCL	50-200ppb
Manganese	14	60-2,370 ppb	N/A	14	No MCL	50ppb
Sulfates	34	10,000-1,189,800 ppb	N/A	5	N/A	250,000ppb

Next Steps

- Situation continues to be monitored.
- Possible solutions for those with elevated metals in their drinking water include water treatment systems, drilling new deeper wells or hooking to the public water supply if available.
- Long-term remedies will be handled on a case by case basis.

References

- Anne Arundel County Department of Health
- Maryland Department of the Environment
- Environmental Protection Agency