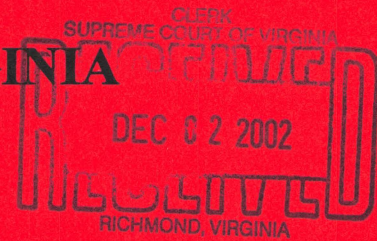


265 VA 416
IN THE

SUPREME COURT OF VIRGINIA

RECORD NO. 021507



**STATE WATER CONTROL BOARD,
DEPARTMENT OF ENVIRONMENTAL QUALITY
AND COUNTY OF HANOVER, VIRGINIA,**

Appellants,

v.

**FRANCES BROADDUS CRUTCHFIELD
AND HENRY RUFFIN BROADDUS,**

Appellees.

**JOINT APPENDIX
VOLUME II of III**

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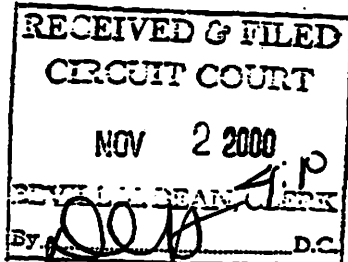
1 VIRGINIA:

2 IN THE CIRCUIT COURT OF THE COUNTY OF HANOVER

3
4
5 FRANCES BROADDUS CRUTCHFIELD
6 and
7 HENRY RUFFIN CRUTCHFIELD

8 vs.

9 STATE WATER CONTROL BOARD
10 and
11 DEPARTMENT OF ENVIRONMENTAL QUALITY



12 CHANCERY NO.
13 760CH99K01193-00

14 The deposition of FRANCES BAILEY BROADDUS
15 CRUTCHFIELD, a plaintiff herein, called on behalf of
16 the defendants, before Connie Alys Crane Pryor, a
17 Registered Court Reporter and a Notary Public in and
18 for the State of Virginia at Large, pursuant to
19 Notice, beginning at 9:05 a.m. on September 28, 2000,
20 at the offices of McSweeney, Burtch & Crump, 11 South
21 12th Street, Richmond, Virginia; said depositions
22 taken pursuant to the rules of the Supreme Court of
23 Virginia.

24 CRANE-SNEAD & ASSOCIATES, INC.
25 4914 Fitzhugh Avenue - Suite 203
Richmond, Virginia 23230
Tel. No. (804) 355-4335

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I N D E X

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1
2
3 FRANCES BAILEY BROADDUS CRUTCHFIELD, a
4 plaintiff herein, called on behalf of the defendants,
5 first being duly sworn, testifies as follows:

6 DIRECT EXAMINATION

7 BY MR. BUTCHER:

8 Q Ms. Crutchfield, would you please
9 state your full name and home address for the court
10 reporter?

11 A Yes. My name is Frances Bailey
12 Broaddus Crutchfield. That includes maiden and both
13 married names, since there is sometimes confusion.

14 Q Ms. Crutchfield, have you ever
15 testified in court or in a deposition before today?

16 A No, sir, I have not. Only in a
17 mock trial when I was in college.

18 Q Have you had a chance to talk
19 about the proceedings today with Mr. Marshall?

20 A Yes.

21 Q Do you understand that you're now
22 under oath in this proceeding?

23 A Yes.

24 Q Do you understand that the oath is
25 exactly the same oath and has exactly the same effect

Crutchfield - Direct

1 as in a trial?

2 A Yes, sir. If I had my hand on the
3 Bible. Yes, I do.

4 Q Do you understand that the
5 transcript that the reporter here will go into the
6 proceedings and become part of the trial of this case?

7 A Yes.

8 Q Are you taking any medication, or
9 are you subject to any condition that would interfere
10 with your ability to give truthful answers to my
11 questions today?

12 A No, sir.

13 Q I'm expecting that we'll take a
14 break in about an hour. But if you want to take a
15 breather before then, if you would, please, just
16 holler, we can take a break at any time.

17 A Henry might need to make a phone
18 call.

19 Q We can certainly take a break and
20 accommodate that.

21 One last little bit of preliminary
22 business. Because what we'll get out of this is the
23 transcript, all we'll see is what I said and then what
24 you said. And that makes it really important that you
25 listen carefully to my questions. And if you don't

Crutchfield - Direct

1 understand the question, that you ask me to clarify
2 it. Because if you answer a question with any
3 ambiguity in it, people are going to take that answer
4 straight off the transcript and think you understood
5 the question.

6 So would you please make sure that
7 if I start talking fast and ask confusing questions --

8 A I'll try.

9 Q All right. Ms. Crutchfield, where
10 do you live?

11 A I live in Powhatan County.

12 Q Where in Powhatan County?

13 A On Huguenot Trail. My address is
14 1196 Huguenot Trail, Midlothian, Virginia, although it
15 is over the Powhatan line. And the zip is 23113.

16 Q How long have you lived at that
17 address?

18 A My father bought that farm when I
19 was 11 years old. I lived there until I went to
20 college. I lived away from there until 1970, when my
21 brother was in the army, and my father was ill.

22 And in '72, I married Meade
23 Broadbuss and moved to Hanover County. Lived there
24 until '80, then back to Powhatan, because my father
25 had a broken hip, and my mother had a heart condition.

Crutchfield - Direct

1 And I'm still there.

2 Q You said you were away after
3 college until 1970. Where were you?

4 A I went to graduate school. I went
5 to Winston-Salem to undergraduate school, at Salem
6 College. Then I went to New York City to Columbia
7 University, got a master's degree, and lived there
8 until '70, working.

9 Q You said that in 1980 -- Excuse
10 me. In '72, you moved to Hanover. Where in Hanover?

11 A On a, in a trailer on the Pamunkey
12 River at Newcastle Farm with Meade Broadbuss. We lived
13 at Marlbourne, with his mother for a month before we
14 got the trailer.

15 Q Ms. Crutchfield, in Mr. Ellis'
16 letter, there's a statement that:

17 Newcastle Farm contains
18 significant documented historic resources
19 that would be adversely affected by
20 construction of the proposed discharge pipe,
21 reaeration structure and outfall.

22 MR. MARSHALL: Excuse me. Could
23 you let the witness know what letter you're
24 talking about?

25 MR. BUTCHER: I can do better than

Crutchfield - Direct

1 that.

2 MR. MARSHALL: Great. Just to
3 make sure we'll all on the same page.

4
5 BY MR. BUTCHER: (Continuing)

6 Q Let me show you, Ms. Crutchfield,
7 the Amended Bill of Complaint in the Petition for
8 Appeal that was filed in this matter on June 30, 2000,
9 and the attachment, which is a letter from Mr. Ellis.
10 Asks you to direct your attention to the third
11 paragraph from the bottom on Page 11.

12 A Okay.

13 Q The first one with the highlight
14 on it. Would you read that paragraph into the record,
15 please?

16 A Yes.

17 In the present case, Newcastle
18 Farm contains significant documented
19 historic resources that would indeed be
20 adversely effected by construction of the
21 proposed discharge pipe, reaeration
22 structure and outfall. These include the
23 colonial area town of Newcastle, a listed
24 Virginia historic landmark, and a portion of
25 Marlbourne, which is already listed on the

Crutchfield - Direct

1 National Register.

2 Q Mr. Ellis says that those include
3 the Newcastle Farm and a portion of Marlbourne. Are
4 there any other significant documented historic
5 resources on Newcastle Farm?

6 MR. MARSHALL: (To the witness)

7 To your knowledge.

8 A Unless you count the ruin of the
9 house that we were going to restore. But I believe
10 that might be outside the boundary. I'm not exactly
11 sure. But there's a chimney, a foundation.

12 There's been so much question as
13 to the exact boundary of Newcastle town site that I'd
14 just like to mention that.

15 Q Are there any others then, besides
16 the town site, the portion of Marlbourne and the,
17 perhaps the ruined house?

18 A You are speaking only of on the
19 land, am I correct?

20 Q Yes, ma'am.

21 A I believe that's it.

22 Q Mr. Ellis says that these
23 resources would be adversely affected by the
24 construction of the proposed discharge pipe,
25 reaeration structure and outfall.

Crutchfield - Direct

1 How, in your mind, would Newcastle
2 Farm be adversely affected by this construction?

3 A Okay. I'm take the -- I'll take
4 the pipe first, because that's perhaps the least
5 damaging. I personally am not completely convinced
6 that there aren't things under that ground, whether in
7 the town, out of the town, or on the property of
8 Marlbourne that putting that large a pipe through
9 might not destroy, or damage, or crush, or whatever.
10 I mean, you dig in the ground.

11 When we found the skeleton, the
12 first thing the archeologist told us was, stop, don't
13 use your shovel. And you're going to use a much
14 larger thing than my shovel to put this pipe in, I'm
15 sure.

16 Although it's supposed to be so
17 many feet underground, should we have livestock and
18 need to fence posts in, there's always a danger that
19 the farmer could pierce your pipe.

20 The structure is going to be
21 there. It's going to be aesthetically unpleasant to
22 see and possibly to smell, whether it's historic
23 resources or just people walking around the farm.

24 People will be coming in all the
25 time to check it. That will be invasive.

Crutchfield - Direct

1 Um, anything close to you as in a
2 neighbor situation. If your neighbor has an ugly
3 house, it might devalue your property. Certainly, it
4 would be aesthetically unpleasant to you to see. And
5 it's going to be not just a neighbor, but something
6 plopped in the middle of us there forever and ever.

7 And certainly, I don't believe
8 there's any dispute that the value of the property
9 will be lower because of having it there.

10 People coming to see the historic
11 resources will be unpleasantly affected by the fact
12 that there's sewage outfall right there next to this
13 town.

14 Q Can you think of any others at the
15 moment?

16 A I am very surprised that you can
17 put anything under the National Historic Landmark.

18 I would like to clarify this
19 National and Virginia. Newcastle town site is a
20 Virginia Historic Landmark. That's a state
21 designation. Marlbourne, Edmund Ruffin's home, and
22 his property surrounding it, those two things are a
23 National Historic Landmark. And those, I thought,
24 were to be federally protected. And I'm very
25 surprised that any sewer pipe would be allowed to be

Crutchfield - Direct

1 put through there.

2 And then both of them are --
3 Marlbourne is on the National Register of Historic
4 Places. Newcastle town site is eligible for the
5 national list. And that is a protection afforded to
6 both landmarks.

7 Q Mr. Ellis' letter talks about
8 construction of the pipe, the structure and the
9 outfall. And you're speaking of the existence of the
10 pipe under the ground as being a form of injury.

11 A Well, the construction will tear
12 up all kinds of things and will use our farm roads. I
13 doubt the big machinery will do them any good. And it
14 could possibly block access.

15 It's the proximity, I suppose, and
16 the aesthetic damage that seem to me to be the worst.
17 And they'll dig a foundation. They'll dig a huge
18 ditch for the pipe.

19 Q All right. How will the -- How
20 will the construction of the discharge pipe, the
21 aeration structure and the outfall personally harm you
22 by being under the ground?

23 A I will always know it's there. I
24 will smell it, and I will see it.

25 I will never eat fish from that

Crutchfield - Direct

1 river, again. I will never swim in that river. I
2 won't camp beside that river.

3 My only home site will be right
4 there in view. I'll have this lovely sewage outfall
5 structure in my front yard.

6 Q Let me ask you to focus your
7 answers, Ms. Crutchfield, on the historic sites --

8 A Okay.

9 Q -- for the time being. How will
10 the existence of the pipe under the ground reduce the
11 value of the historic sites as to you?

12 MR. MARSHALL: Exactly what pipe
13 are you talking about here when you say the
14 pipe?

15 MR. BUTCHER: The pipe that she
16 testified about.

17 A Well, do you -- You said the
18 land. I asked you if you were speaking of the land.
19 And you said the land.

20 Now, there is pipe that's going to
21 go into the river. There are pipes that will go
22 through the land and carry the sewage to the aeration
23 structure. Do you mean both, or do you mean one or
24 the other?

25 Q I mean anything that you can tell

Crutchfield - Direct

1 me that will harm the historic resource on this
2 property.

3 A Okay. The pipe going through the
4 land to the aeration structure will destroy whatever
5 is under there. And there will be valve vents. There
6 will be possibilities of it breaking. There will be
7 whatever is crushed and destroyed to put it in there.
8 It will be an unsightly, an un, perhaps, not an
9 unsightly neighborhood, but perhaps a neighbor that
10 you feel that you know is always there.

11 The pipes going from the structure
12 into the river will destroy possibly the river bottom,
13 which is another -- I mean, it's historical. It's
14 been there forever and ever. There is habitat. 30
15 million gallons of sewage will stir up the leafy
16 bottom. And Heaven knows what is there and what will
17 be flushed down somewhere.

18 Q What things are under the ground
19 that will be disturbed by this pipe?

20 A Every time it rains, we find
21 relics. Sometimes arrowheads, sometimes pieces of
22 pottery, sometimes shards, bits of china. There are
23 things under there that we don't know -- There are
24 human bones under there. As you know, we found a full
25 skeleton, and we have found other bones. But we

Crutchfield - Direct

1 stopped digging. So we don't know what's there. But
2 even though it might not be absolutely within the town
3 site boundary, there were farms, and homes, and
4 Indians and people who lived outside the town. There
5 could be things. Across the road, there is a 1690's
6 home site that someone discovered recently.

7 Q Specifically, is there any
8 historic resource that you can identify that will be
9 harmed by the digging of the ditch or the presence of
10 the pipe underground?

11 A I think the entire town of
12 Newcastle will be disturbed just because it's there.

13 Q Focusing on things that are under
14 the ground, what specific things are under the ground
15 now that will be harmed by the placement or the
16 existence of that pipe?

17 A Things unknown to you and me.

18 Q Have you performed any kind of
19 study to find what's under the ground there?

20 A You have. Darryl Blake did.

21 Q Do you know of any other studies?

22 A Official studies? You mean of
23 official archeological studies, no.

24 Q What do you mean by official?

25 A I mean archaeologists, people with

Crutchfield - Direct

1 a degree in archeology, not Sunday farmers looking for
2 arrowheads.

3 Q Could I have that back for a
4 moment? I think I left the notes that I want inside
5 the front cover.

6 Help me understand how you think
7 the site of the discharge pipe, reaeration structure
8 and outfall will be aesthetically unpleasant as to
9 either Marlbourne or Newcastle, Virginia, or the
10 ruined house.

11 A Are you really asking me whether
12 sewage outfall, aeration apparatus and pipes would not
13 be unsightly in your front yard? I think it would
14 smell bad, and I don't think it would be a pretty
15 sight.

16 Q What --

17 A I don't think that's the kind of
18 structure one would put in an historic district that
19 one was preserving and trying to maintain its
20 integrity.

21 Were we to uncover the field for a
22 dig and examine the foundations and the grave yards,
23 and whatever else is there, I can't imagine that a
24 sewage outfall structure of the 2001st (sic.) century
25 would enhance the enjoyment of anyone.

Crutchfield - Direct

1 Would you like that in the front
2 yard of the Governor's Palace at Williamsburg? I just
3 can't imagine that anything like that would do
4 anything but detract.

5 Q In what historic district will the
6 reaeration structure be located?

7 A It will be -- The reaeration
8 structure will be a close neighbor to the Newcastle
9 town site. The pipe will go through Marlbourne and
10 Newcastle Farm.

11 Q In what historic district will the
12 outfall be located?

13 A The outfall will also be a close
14 neighbor to the boundary of the Newcastle town site.

15 Q It's right on the boundary as the
16 boundary has most recently been delineated.

17 Q How will the property value be
18 affected in a fashion that is not, that will not be
19 compensated by the condemnation proceeding?

20 A I believe that a home site on the
21 Pamunkey River will go for more than \$12,000.00. And
22 that's that the County has offered us.

23 Were we to develop that property,
24 I don't believe anybody would disagree that an acre
25 lot would certainly go for more \$12,000.00, river

Crutchfield - Direct

1 front property.

2 Q Does the reduction in the value of
3 the property as development property affect the value
4 of the historic resources on the property?

5 A As far as I'm concerned, it's
6 really not applicable, because I would not develop it.
7 But certainly, it does. You put something like that
8 next to anything, that's going to devalue its new
9 neighbor.

10 Q Ms. Crutchfield, I'll show you a
11 document that the reporter is marking as Crutchfield
12 1.

13
14 NOTE: The above-referred to
15 document dated April 1, 1999 was marked and
16 filed as Crutchfield Exhibit No. 1.

17
18 Q Let me ask you, first, to look at
19 the cover, and ask you if you have seen this document
20 before?

21 A Yes, I have.

22 Q Have you had a chance to review
23 it?

24 A Let me just look at it first.
25 It's been a while. Okay.

Crutchfield - Direct

1 Q Let me ask you to turn to Figure
2 1, which is right behind Page 1.

3 Does that appear to be an accurate
4 depiction of the location of the project corridor with
5 respect to the Newcastle archeological site?

6 A With respect to the corrected map,
7 yes.

8 Q What do you mean by corrected map?

9 A The original map that I was given
10 by the Department of Historic Resources showed a
11 different boundary for Newcastle town site.

12 Q Is this one accurate?

13 A Gray & Pape says it is, and I
14 don't believe I have the credentials to dispute that.

15 Q Let me ask you to turn back to the
16 abstract, which is, I think, the other green tab
17 there. And look at the last sentence of the next to
18 the last paragraph. The statement here is that:

19 This project will not have an
20 affect on the location, setting or use to
21 contribute to Marlbourne's significance.

22 Do you agree with that statement?

23 A No, I do not. Um, one of the most
24 disturbed things by the sewage outfall will be the
25 river bottom.

Crutchfield - Direct

1 And the reason that Edmund Ruffin
2 is so revered in Virginia is not because of his civil
3 war activities but because of his farm activities. He
4 is called the Father of Soil Chemistry. Because he
5 discovered that by taking marl from the river bottom,
6 he was able to have the fertilizer for his field. So
7 that he could restore land that had been depleted by
8 having the same crop grown on it year, after year,
9 after year.

10 And this marl, in itself, is
11 significant. And I don't believe the sewage pipe is
12 going to do it any good. I read this sentence, but I
13 disagree.

14 Q Other than the marl, is there any
15 other basis that you have for disagreeing with that
16 statement?

17 A I'm not willing to say under oath
18 that the pipe under the field will absolutely have no
19 effect.

20 Q Would you describe for me the
21 effect that the pipe under the field will have on the
22 location, setting or use that contribute to
23 Marlbourne's significance?

24 A Marlbourne is a farm. There is a
25 possibility any time you put something under a field,

Crutchfield - Direct

1 farmers are forever cutting wires and piercing pipes.

2 I'm not convinced that it won't
3 smell at the point of the valve vents.

4 I can't say for sure that it would
5 not have an effect, because I believe it will.

6 Q Let's turn the document that the
7 reporter is marking as Crutchfield 2.

8
9 NOTE: The above-referred to tax
10 map was marked and filed as Crutchfield
11 Exhibit No. 2.

12
13 Q Do you recognize this figure?

14 A Yes.

15 Q Do you recognize it, indeed, as a
16 colored version of the tax map?

17 A Yes. It looks like someone else
18 shrunk them and put them together.

19 Q Again, do the locations of the
20 farm road and the proposed easement and railroad bed
21 look to be accurate, as far as you can tell?

22 A I think so.

23 Q The map here on Crutchfield 2
24 shows four colored parcels. The first yellow one up
25 at the top that I'd like to refer to as 78-1, which

Crutchfield - Direct

1 are the last numbers on there.

2 A Uh huh. (Indicating in the
3 affirmative.)

4 Q Who owns 78-1?

5 A My son and I.

6 Q Your son is Mr. Broaddus?

7 A Yes. Henry Broaddus.

8 Q Turning to the site 86-1A, who
9 owns that parcel?

10 A My son and I.

11 Q And again, the same son?

12 A Yes. I have only the one son,
13 Henry Ruffin Broaddus.

14 Q Then the blue 86-39, who owns that
15 parcel?

16 A 86-39. My son and I.

17 Q And then the pink one, which is
18 86-1. Who owns that one?

19 A I think we own all of it. I'm
20 wouldn't swear to the boundaries. I'm not a surveyor.
21 But it looks like Newcastle, what we call Newcastle
22 Farm.

23 Q Do you have any ownership in the
24 other properties that is to the west and south of
25 this, the Marlbourne properties?

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1 A There is a piece of Marlbourne
2 that falls within the boundaries of what we own. But
3 most of that is owned by my brother and sister-in-law,
4 Tilman and Margaret Broadbus.

5 Q I've got a map of that. We'll get
6 to it in a minute.

7 A And across the road, some of it is
8 Tilman and Margaret, some of it is Ruffin cousins. I
9 wouldn't begin to delineate all these pieces.

10 Q Do you on your son own any other
11 property that is near, or do you think will be
12 affected by this part of the project?

13 A I don't believe so.

14 Q Let me show you a document that
15 the reporter is marking as Crutchfield 3.

16
17 NOTE: The above-referred to
18 preliminary drawing of a map was marked and
19 filed as Crutchfield Exhibit No. 3.

20
21 Q Do you recognize this document,
22 Ms. Crutchfield?

23 A Yes.

24 Q Do you recognize it to be the
25 County's preliminary drawing for the discharge end of

Crutchfield - Direct

1 the project?

2 A I recognize it as one of them, I
3 think.

4 Q Now, when you spoke of underground
5 pipe before, were you referring to the pipe that
6 appears on this diagram and goes to what's marked as
7 the end here at the Pamunkey River?

8 A Yes.

9 Q Let me show you another one that
10 the reporter is marking as Crutchfield 4.

11
12 NOTE: The above-referred to Plan
13 and Profile Broadus Property map was marked
14 and filed as Crutchfield Exhibit No. 4.

15
16 Q With a badly exaggerated vertical
17 scale, do you also recognize that as part of their
18 preliminary drawings?

19 A Yes, I do.

20 Q Does this appear to show the
21 current state of the proposal for the discharge
22 structure and the aeration structure?

23 MR. MARSHALL: (To the witness)

24 To the best of your knowledge.

25 A It looks to me that it doesn't

Crutchfield - Direct

1 really show much of the structure. It's the pipe and
2 the -- I assume this is the -- Is this the river
3 bank, here?

4 Q I believe so.

5 A It shows the pipes coming down
6 into the river bank, but I'm not sure about the
7 structure.

8 The building, the housing
9 equipment and the actual -- What's on top of the
10 bank, I guess.

11 Q Let me ask you to go back to
12 Crutchfield 1, Ms. Crutchfield, and look at Figure 5.

13 A Yes.

14 Q It's right behind Page 30. All
15 right.

16 After my dawdling around here,
17 Ms. Crutchfield, we're at Crutchfield Exhibit 1 and
18 Figure 5, which is at Page 31. Do you recognize this
19 figure?

20 A Uh huh. (Indicating in the
21 affirmative.)

22 Q As far as you can tell, is this
23 figure accurate in terms of the Marlbourne Plantation
24 boundary and the location of Marlbourne House and
25 Upper Marlbourne House?

Crutchfield - Direct

1 A Well, is this yellow the National
2 Historic Landmark designation?

3 Q I believe so.

4 A That is the only part of the
5 Marlbourne boundaries that I recognize. That belongs
6 to my brother-in-law. And I would not pretend to know
7 all of its boundaries. I believe the yellow is what
8 the Department of Historic Resources designates as the
9 National Historic property that goes with Marlbourne
10 House.

11 Q And that does, indeed, overlap the
12 project corridor --

13 A Correct.

14 Q -- for the Hanover project, does
15 it not?

16 A Yes, it does.

17 Q As to the location of Marlbourne
18 House, Upper Marlbourne House, do those look to be
19 generally correct to you?

20 A I think so.

21 Q Just measuring with my thumb, it
22 looks like Marlbourne House is about two miles away
23 from the project right-of-way coming in from 360. And
24 the Upper Marlbourne House might be a little bit
25 farther. Is that a fair reading of the map?

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1 A Possibly, I think so.

2 Q With that done, let us, let me
3 show you the document that the reporter will mark as
4 Crutchfield 5.

5
6 NOTE: The above-referred to
7 document dated 10 December 1999 was marked
8 and filed as Crutchfield Exhibit No. 5.

9
10 Q Have you seen this one before,
11 Ms. Crutchfield?

12 A This one, I have not. I have seen
13 it before; I have not had it in my possession to look
14 at. I was --

15 Q All right. Have you had a chance
16 to read it before?

17 A No, sir.

18 Q Let me ask you to turn to the
19 abstract, which is marked Page i.

20 At the last sentence at the bottom
21 of the page, would you read that for the reporter?

22 A Uh huh. (Indicating in the
23 affirmative.)

24 However, it is recommended that
25 the portion of Site 44HN314 which is located

Crutchfield - Direct

1 within the proposed development area is not
2 eligible for the National Register of
3 Historic Places during, under Criterion D,
4 and the proposed construction activities
5 within the project area will not have an
6 effect on any significant archeological
7 resources.

8 Q Do you agree or disagree with that
9 statement?

10 A I disagree.

11 Q Would you tell me the basis for
12 disagreeing with it?

13 A I would need to see, No. 1, why it
14 is not eligible, because I personally have not --
15 I'm -- Wait. Before I go on, would you point to me
16 on a map Site 44HN314?

17 Q I think I have one here. If you
18 look at Page 2.

19 A It's this one. Which is,
20 according to this map, this is outside of the
21 boundary. This is the prehistoric site, I believe.

22 Q I believe that this is the
23 construction site --

24 A Right.

25 Q -- for the outfall structure.

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1 A Correct.

2 Q And the district.

3 A I would still disagree. I don't
4 know what's under there. And I've not been privy to
5 any of the things that were found in the Phase II. I
6 received the Phase II this morning.

7 Q If you look up a little higher,
8 ahead of that last paragraph, on Page i, it says that:

9 The plowzone in this area, in many
10 cases, extended as far as 0.6 meters below
11 the current surface.

12 A Where are you?

13 Q I'm at the first sentence of the
14 last paragraph of Page i.

15 A Okay.

16 Q Has the property here been plowed
17 while you owned it?

18 A Mostly, we do not, but I'm sure it
19 has been plowed every now and then.

20 Q Do you have any financial interest
21 in the historic sites on the farm?

22 A What do you mean by financial
23 interest?

24 Q Are they valuable to you in terms
25 of money? Do you expect to have any income from them

Crutchfield - Direct

1 or to see any increase in the value of the property if
2 you were to sell it because of those sites?

3 A Anything that has intrinsic value
4 has economic value, as well. I personally don't plan
5 to profit financially. But, yes, it has financial
6 value and more intrinsic value.

7 Q All right. You've mentioned --

8 A I do not plan to sell it. I've
9 said that over and over.

10 Q Excuse me for interrupting. You
11 mentioned the marl at the bottom of the river, the
12 site of the aeration structure, and the smell that you
13 expect, I believe from both the aeration structures
14 and perhaps from vents.

15 A Yes.

16 Q Is there anything else you can
17 think of that would affect the value of the historic
18 resource?

19 MR. MARSHALL: I'll note just an
20 objection for the record to the extent that
21 you're characterizing her testimony.
22 Obviously, what she said is in the record.
23 If you're asking if there are additional
24 things other than what she's already
25 testified to, she can answer that. But I do

Crutchfield - Direct

1 object to the characterization of her
2 previous testimony.

3 A Um, yes. I think there is an
4 immoral violation of what I consider to be human
5 stewardship of pieces of earth which have fallen to it
6 to be safeguarded.

7 Certainly, you can defeat me, but
8 if I allow it, I think that I'm being untrue to what I
9 believe to be my responsibility.

10 Q I'm not trying to belittle that
11 for a moment, Ms. Crutchfield, but I need to
12 understand exactly what you think that value is, and
13 how you think that this project will affect it, so
14 please excuse me while I probe.

15 A Okay.

16 Q You have mentioned the effect on
17 the marl, the site of the structure and the smell.

18 How is it that these will reduce
19 the value of either Newcastle, Marlbourne or the house
20 ruin in terms of their value as historic resources?

21 A Are you looking for a specific
22 transitory something I could say, such as if I take my
23 hand and smash this glass, that destroys it?

24 Q You're going to have to tell me
25 what the value is to you, the value that you perceive

Crutchfield - Direct

1 in these historic resources, and how you think the
2 County's project is going to harm them. That really
3 is the issue that we have to deal with. And you have
4 to tell me. I can't tell you.

5 A I think to take property which has
6 been safeguarded for perhaps as many as six
7 generations as a farm, as a historic site, and convert
8 any piece of it into a repository for human waste is
9 destructive.

10 Q And how does the project, as it's
11 permitted by the Water Control Board, reduce the value
12 of Marlbourne, Newcastle or the, perhaps the ruined
13 site in terms of their value as historic resources?

14 A You are giving them the close
15 neighbor of a sewage facility. If such were built
16 near your home next door to you, you would see a
17 financial decrease in value. You would, more
18 importantly, feel an aesthetic decrease in what you
19 see and what you smell.

20 Q Do you obtain any financial value
21 from the historic resources here?

22 A No.

23 Q In terms of the aesthetic value of
24 these resources, is the value of these resources going
25 to be reduced in terms of being able to show them to

Crutchfield - Direct

1 scholars?

2 A I think somewhat.

3 Q In what --

4 A Let me show you the relics in my
5 field, and let me show you the sewage outfall. I
6 think the scholar would assume that I certainly have
7 degraded the historic resources by allowing such to be
8 built next door to them.

9 Q Will the construction of this
10 project reduce the value of Marlbourne, Newcastle
11 Farm, or the ruin to you to perform historic research?

12 A Certainly. That property will
13 never be as enjoyable for any purpose.

14 Q Do you propose to conduct historic
15 research on this property?

16 A I have planned for a long time to
17 do that.

18 Q Have you ever conducted any
19 historic research on the property?

20 A Yes.

21 Q Has that been published?

22 A Actually, I think it's -- I'm not
23 certain what you mean by published. There certainly
24 are documents with the Department of Historic
25 Resources about Newcastle town site. Certainly, I

Crutchfield - Direct

1 have written things. I'm not sure what is in print
2 where, so I would hesitate to say. Simon & Schuster
3 didn't publish a best seller about it, no. But there
4 are documents.

5 Q Have you written letters about the
6 historic resources on the property?

7 A Oh, yes.

8 Q Have you written any before the
9 County announced its plans to put this structure in
10 place?

11 A Yes.

12 Q Do you have plans to write any in
13 the future?

14 A Yes.

15 Q What do you plan to study on the
16 property?

17 A What do I plan to study?

18 Q Yes, ma'am.

19 A The home sites. There is a fellow
20 named Richard Helm who has studied and researched who
21 lived there. And he's tracing each home site as to
22 who started out there, who sold to whom, and exactly,
23 um, what transpired, as far as land holdings in the
24 town after it was surveyed by Patrick Henry's father
25 and given by William Meriwether, I believe, to start

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1 with.

2 My son plans to write a book about
3 the town and the river. And we have--we, meaning my
4 first husband, I and other members of the family--have
5 always wanted to get together the data and write a
6 definitive history of Newcastle.

7 And when I was in England, I
8 discussed with particularly the farmer whose home I
9 had a room in and others the way that they open a
10 field and map out the foundations and study what's
11 there, and then close it up and farm again.

12 And we talked about building a
13 little museum for the artifacts that we have found.

14 We did send away a tooth from the
15 skeleton that we found to archaeologists in
16 Williamsburg who determined that she was a woman who
17 lived in the 1700s. And we had to find a certain
18 number of pipe stems, which my husband and I used to
19 search on Sunday afternoons with the baby on our back.
20 And we had to find, I believe it was 150 so that a
21 mean date could be established.

22 And we have always enjoyed just
23 picking up things on the surface and hoped that one
24 day, we would dig down and see what was really there.

25 Q How will the construction of the

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1 County's project interfere with your ability to study
2 the home sites?

3 A It will be an ever present cloud
4 of man's ruination of his environment sitting there,
5 smelling. A growth engine for Hanover County was not
6 in our dreams.

7 Q How will the construction of the
8 project interfere with your ability to build a museum
9 on the property?

10 A I don't think that's -- What do
11 you mean, how will it interfere? Obviously, I can't
12 build it on that spot, but -- I don't think, I don't
13 think a spot next door to a sewage outfall would be a
14 place for a historic museum.

15 MR. BUTCHER: Should we take a
16 break?

17
18 NOTE: At this time, recess is had
19 from 10:00 to 10:07 a.m.; whereupon the
20 deposition continues, viz:

21
22 BY MR. BUTCHER: (Continuing)

23 Q Ms. Crutchfield, you mentioned
24 living on the property in a trailer. Where was that
25 trailer located with respect to Newcastle Farm?

Crutchfield - Direct

1 A It was on it.

2 Q And you said it was on the river?

3 A It was right between the ruins of
4 the old house and the river, yes.

5 Q How did the sewage from that
6 trailer get disposed of?

7 A Septic tank.

8 Q Septic tank on the property?

9 A Yes.

10 Q Let me show you a document that
11 the reporter is marking as Crutchfield 6.

12

13 NOTE: The above-referred to
14 document dated April 28, 1999 was marked and
15 filed as Crutchfield Exhibit No. 6.

16

17 Q Do you recognize that document?

18 A I have seen so many documents
19 concerning this that I couldn't absolutely swear that
20 I've had this one as compared to others.

21 Q Okay. If you look down at the
22 bottom, you'll see some stamped on numbers. It's 1 on
23 the first page.

24 A Uh huh. (Indicating in the
25 affirmative.)

Crutchfield - Direct

1 Q 2 on the second. They call those
2 Bates numbers. They say they've been Bates stamped.
3 I guess somebody named Bates is the one who invented
4 the gadget that does that. If you go back to Bates
5 stamp 8, I think it's Page 8 of this set of documents.

6 A Okay.

7 Q It says that this is an:
8 Authorization to discharge under
9 the Virginia Pollutant Discharge Elimination
10 System and the Virginia State Water Control
11 Law.

12 It provides that:

13 In compliance with the provisions
14 of the Clean Water Act as amended and
15 pursuant to the State Water Control Law and
16 regulations adopted pursuant thereto, the
17 following owners authorized to discharge in
18 accordance to the effluent limitations, and
19 so on --

20 The owner is the County of
21 Hanover. Does that help you identify the document?

22 A Yes.

23 Q Have you, if indeed it is the
24 VPDES permit that the Water Control Board issued for
25 Hanover, and that is the subject of your appeal, have

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1 you reviewed this document before today?

2 A I think so.

3 Q Let me ask you to turn one more
4 page, to Page 9, turn it on your side so you can read
5 it. This is the page that sets forth the effluent
6 limitations that the Water Control Board as imposed on
7 the County for the discharge at Outfall 001, as they
8 quaintly call it, upon commencement of discharge from
9 the five million gallons per day facility.

10 Let me ask you to go down to the
11 table there. The entry after Flow is CBOD5. It says
12 that the discharge limitation is monthly average of 10
13 milligrams per liter or 189 kilograms per day.

14 A Would you review for me, please,
15 what CBOD5 stands for?

16 Q I'm glad to tell you what I think
17 it is. I'm just the lawyer here.

18 A I'm not a chemist, either.

19 Q I believe that that's carbinations
20 BOD5, which is a measure of the oxidizable waste in
21 the effluent. They put a limitation on it both in
22 terms of concentration--10 milligrams per liter--and
23 in terms of the amount that can go out in a day, 189
24 kilograms.

25 How does the Water Control Board's

Crutchfield - Direct

1 imposition of this effluent limit harm the value of
2 the historic resources on your property?

3 MR. MARSHALL: I'm going to object
4 to this line of questioning to the extent,
5 1, it calls for a legal conclusion.

6 2, no foundation has been laid as
7 to what any of these things mean or that
8 Ms. Crutchfield is qualified to respond to
9 the specifics of such question.

10 CBOD5. I mean, the purpose of
11 this deposition is to discuss her standing
12 and allegations of that standing. To the
13 extent that you're going to question her
14 about the merits of a particular limitation
15 selected, that is the purpose of the appeal
16 of the permit. I mean, that's what we're
17 going to litigate before Judge Hughes. So
18 I'm going to object to that for the reasons
19 I noted. But specifically as well, because
20 you're moving into the merits, almost.
21 You're asking her in answering these
22 questions to prove her case. That is what
23 we're going to do before Judge Hughes. So I
24 object to that line of questions.

25 If you want to discuss her

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1 allegations of standing, which we have been
2 doing before this line of questions,
3 continue. But this getting into specifics
4 of this is arguing the merits of the case,
5 and that's not the purpose of this
6 deposition.

7 MR. BUTCHER: I hate litigating
8 against a man named Marshall in this town.

9
10 BY MR. BUTCHER: (Continuing)

11 Q Did you understand my question,
12 Ms. Crutchfield?

13 A No, I did not.

14 Q Let me try, again.

15 A Would you, please?

16 Q Do you understand that as set out
17 here on Page Bates stamp 9 in the permit, the Water
18 Control Board has imposed a monthly average effluent
19 limitation on the County for CBOD5, whatever it is, of
20 10 milligrams per liter and 189 kilograms per day for
21 the five million gallons a day discharge?

22 A I will take your word for that,
23 yes.

24 Q In what respect does the Water
25 Control Board's imposition of that limit on the County

Crutchfield - Direct

1 harm the historic resources on your property?

2 MR. MARSHALL: I'll incorporate
3 the same objection.

4 A I don't -- I don't know.

5 Q If they were to cut that effluent
6 limitation to five milligrams per liter and half of
7 189--which is not going to be a round number--would
8 that, in your mind, reduce the harm to the historic
9 resources on your property?

10 MR. MARSHALL: I will note the
11 same objection.

12 A You're asking me how their
13 safeguard can hurt more. I suppose there are degrees
14 of damage, and more safeguards might somewhat lessen
15 the damage. Other than that, I don't know.

16 Q What specifically is the damage to
17 your historic, to the historic resources on your
18 property of this effluent limitation of 10 milligrams
19 per liter and 189 kilograms per day?

20 MR. MARSHALL: John, I'm going to
21 object, again. I mean, she's testified
22 earlier today about the fact the existence
23 of the project on this property, these
24 historic resources, damages aesthetic
25 values, the use and enjoyment of the

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1 historic resources. She's testified about
2 smells from historic property.

3 The specifics of this, again, goes
4 to the merits of this case and what will be
5 litigated. And as she's testified that
6 she's not a scientist. She can't give you
7 the specifics as to whether 10 or 5
8 milligrams per liter -- She doesn't know
9 what that means. There's no -- She can't
10 answer that question.

11

12 BY MR. BUTCHER: (Continuing)

13 Q Did you understand my question,
14 Ms. Crutchfield?

15 A Any milligrams, or whatever, will
16 be there. I will see them whether I'm on the corner
17 of Marlbourne, or Newcastle, or any other piece of my
18 property, I will see them, I will smell them, I will
19 know that they are there. My enjoyment of every
20 molecule of it, milligram, liter, whatever else, will
21 be lessened by this project.

22 Q Is it your testimony then that no
23 matter what these limitations might be, the site and
24 the smell are harmful --

25 A Yes.

Crutchfield - Direct

1 Q -- to the historic resources?

2 A Yes, sir. And the enjoyment there
3 of me or anyone else.

4 Q So --

5 A Specifically mine.

6 Q So if they were to, if the County
7 were to clean this effluent up to the quality of
8 drinking water, it would still be harmful to the
9 historic resources, you believe?

10 A Yes, sir, I do believe.

11 Q You mentioned other uses of the
12 property. I think you particularly mentioned fish.
13 Are there -- Let me look on my list, here.

14 Well, let me first complete my
15 homework here. Where on this property is the ruin
16 that you mentioned that may, that you think might
17 conceivably be a historic resource?

18 A You mean the house?

19 Q Yes.

20 A Where on the property?

21 Q Yes.

22 A It's right beside the railroad cut
23 looking this way toward the spot where the County now
24 owns a piece of property.

25 Q Can you point it out on one of the

Crutchfield - Direct

1 maps in one of these two --

2 A Maybe.

3 Q -- studies that were Exhibits 1
4 and 5.

5 A Maybe.

6 Q Or even better on Crutchfield 2,
7 which is the tax map.

8 A I'm not sure if I can or not.
9 It's -- I think it's right in here. Maybe it's --

10 Q This is not a memory quiz. If you
11 don't remember, it's --

12 A I don't remember, exactly. It's
13 in the general vicinity.

14 Q Is it on either of the historic
15 sites?

16 A That's why I'm hesitating, because
17 I'm not a hundred percent sure. As close as these
18 lines are -- It's very near the railroad bed.

19 Q To your recollection then, it's
20 either on or near the Newcastle archeological site?

21 A Correct.

22 Q In your opinion, you also
23 mentioned -- As a matter of fact, in your testimony,
24 you also mentioned fishing and swimming.

25 A Yes.

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1 Q In your pleading, you mentioned
2 recreational use such as camping.

3 A Yes.

4 Q How will the construction of this
5 project impact fishing, swimming, recreational uses?

6 A I will never again eat fish from
7 that river. There are several varieties of fish that
8 I know of that I have enjoyed in the past. And I will
9 not eat them from effluent.

10 Q Why will you not eat fish after
11 the project is completed?

12 A Because as I told you, I'm not a
13 chemist, and I don't know what chemicals are there
14 which could harm them. Also, I may never be able to,
15 because the anagomous (sic.) fish may be impeded in
16 their migratory paths. So they may not be around for
17 me to even catch much less eat.

18 Q Somewhere, we also mentioned
19 recreational. Is there any recreational use?

20 A We swim. We go boating. We camp
21 along the river bank. We use water from the river for
22 cooking. Have been known even to drink it, although
23 it's not too smart without iodine tablets, maybe.

24 Q Why is it not too smart to drink
25 the river water?

Crutchfield - Direct

1 A It's not smart to drink water
2 anywhere.

3 Q Why is that?

4 A Because you just never know what's
5 in it.

6 Q Will the presence of this
7 discharge make it less smart to drink the water?

8 A Absolutely.

9 Q Why is that?

10 A As far as I'm concerned.

11 Q Why is that?

12 A I have drank the water in the past
13 with no ill effects. But I, to my knowledge, I have
14 not swallowed pure effluent.

15 I'm a Boy Scout leader. I bring
16 troops there very often. One of my scout troops wrote
17 a letter. And the last line of it was, we think
18 swimming in sewage would not be good for us, and we
19 don't want the mussels to be hurt.

20 There are four varieties of fresh
21 water muscles there, and they could possibly be
22 damaged. Even though they're not endangered now, they
23 might become so.

24 The aquatic life is, I think, very
25 much an open question, because no one has shown me

Crutchfield - Direct

1 data that says this will not hurt them.

2 Q Do you have any basis for thinking
3 that it will hurt them?

4 A Certainly. I have a very limited
5 knowledge of marine life, but I do know that there are
6 possibly seven varieties of anagomous (sic.) fish.
7 Two kinds of herring, alewife and blue back. American
8 and Hickory Shad. There's something that we call
9 Jumping Mullet, I don't know what its real name is.
10 Though, mullet, I think, is a legitimate name. And
11 White Perch. And they move from salt water to fresh
12 water to spawn, then the adults go back to salt water,
13 and then the new young come from fresh to salt. And
14 should there be oxygen sags in the river, they would
15 be as detrimental to the migratory fish as the dam
16 would be.

17 And that's from a very limited
18 encyclopedia-type reading. I am no scientist, and I
19 don't know. But I know just enough to feel, or I have
20 read enough to feel that there should be more
21 investigation.

22 Q Is it your testimony that the
23 Board's permit authorizes an oxygen sag that would be
24 harmful to anadromous fish?

25 A It's my testimony that it might

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1 possibly authorize such; and therefore, should be
2 studied further.

3 Q On what you do base your view that
4 it might possibly cause an oxygen sag?

5 A Simply my reading of histories of
6 fish and articles called Murky Waters. As I said, I
7 can't testify scientifically, because I don't know.
8 All I know is that I feel there should be careful
9 investigation. And when in doubt, don't is a good
10 motto for harming wild life.

11 Q Let me ask you to go back to the
12 permit, Crutchfield 6. And Page 9 of Crutchfield 6.

13 In what way are these effluent
14 limitations inadequate to protect anadromous fish?

15 MR. MARSHALL: Note the same
16 objection that I made earlier today. She's
17 testified multiple times to these questions
18 she's not a scientist. She's told you the
19 basis for her allegation and her averment
20 regarding harm to wild life, and that there
21 was a lack of study.

22 And again, you're getting into the
23 merits of the litigation. That's what we're
24 going to argue before Judge Hughes and what
25 we're briefing.

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1 A My chemistry course is more than
2 30 years old, and I would not begin to answer that
3 question with any sort of truthful knowledge.

4 Q Has anyone told you that these
5 effluent limits and other requirements of the permit
6 are insufficient to protect anadromous fish?

7 MR. MARSHALL: Objection to the
8 extent -- Well, objection. Attorney/client
9 privilege and work product doctrine.

10 A I'll follow the advice of my
11 attorney.

12 Q Has anyone other than your lawyers
13 told you this these effluent limitations are
14 insufficient to protect anadromous fish, swimming,
15 recreation, boating, camping, water for cooking and
16 the bringing of Boy Scout troops there?

17 MR. MARSHALL: Objection to the
18 extent it calls for trial preparation work
19 product, counsel.

20 Q I'll repeat the question.

21 A Many discussions have been held on
22 the subject. But I could not truthfully testify as to
23 what someone has told me, lawyers or otherwise.

24 Q Well, your lawyer has just
25 admitted that the basis for your opinion seems to be

Crutchfield - Direct

1 what he's told you.

2 MR. MARSHALL: Objection to the
3 characterization of anything that I just
4 said. If you have a question, please, ask
5 it. Don't characterize my objections or my
6 client's testimony, please.

7 MR. BUTCHER: Thank you for the
8 instruction, Mr. Marshall.

9 MR. MARSHALL: You're most
10 welcome.

11
12 BY MR. BUTCHER: (Continuing)

13 Q Do you have any basis beyond what
14 your lawyers have told you for thinking that the
15 effluent limitations in this permit are insufficient
16 to protect the fish, the swimming, the recreation,
17 camping, water for cooking, bringing of Boy Scouts and
18 the mussels?

19 A I have done some limited novice
20 category reading. And such limited investigation on
21 my part causes doubts in my mind as to what will harm
22 what.

23 Q When is the last time you
24 personally fished in the river?

25 A Last time I personally fished in

Crutchfield - Direct

1 the river was -- I'm a swimmer and a diver. I've
2 been SCUBA diving in the river within the year, and
3 swimming many times. I cannot tell you exactly the
4 last time that I personally caught a fish in the
5 river. I generally eat what the scouts catch.

6 Q Let me let you in on a secret.
7 It's a guy thing. Fishing doesn't necessarily require
8 that you catch anything, so long as you take a beer.

9 A I know. I read a book and drink
10 the beer and let the guys fish. And then I help eat.

11 Q I think that's fishing.

12 A Okay.

13 Q With that definition of fishing --

14 A Then I'd say within 12 months
15 would be as close as I could put it.

16 Q If this project is not built, do
17 you intend to continue to fish --

18 A Yes, I do.

19 Q -- within that definition?

20 A I do.

21 Q And to swim and SCUBA dive?

22 A Yes, I do.

23 Q How often do you boat in the
24 river?

25 A Often. I don't know.

Crutchfield - Direct

1 Q Do you keep a boat at the river?

2 A I keep it in the shed near the
3 river, because people might come up and down the
4 river. And also, the water rises and falls, and it
5 can float away. I keep a canoe in the shed within a
6 mile or so.

7 Q Or be carried away. Do you camp
8 with the Boy Scouts or otherwise?

9 A Yes, I do.

10 Q Yourself?

11 A I do. I've been a leader for 20
12 years. And we're camping this weekend.

13 Q Let me back up for a moment and
14 ask you how often you visit the historic resources at
15 the site?

16 A Often. I couldn't tell you
17 exactly any more than I could tell you how many times
18 I swim. Some years, more often than others. When I
19 lived on the property, every day. When I moved away,
20 not every day. But I don't know, exactly. You're
21 talking about many, many years. I'm an old woman.

22 Q If the County builds this project,
23 will it reduce your use of the historic resources on
24 the property?

25 A It will reduce the number of

Crutchfield - Direct

1 times, and it will reduce my enjoyment every time. I
2 will see it. I will smell it. It will always be
3 there. And my enjoyment will be tremendously
4 decreased.

5 Q Do you or your tenants, or whoever
6 is farming the place, use BMP's to protect the river
7 on this property?

8 A I don't know what BMP's are.
9 We have, have sent soil samples
10 away to be tested. And the reason we don't plow is
11 because we don't want to put any more stuff into the
12 river than we can possibly help.

13 I know farmer's run-off is a
14 danger to a river. But I couldn't tell you how many
15 BMPs. I try to put as little of anything that would
16 hurt it. And to make sure that my farm, that they do
17 send the soil samples away to be checked. And they do
18 try to plow as little as possible to lessen run-off.
19 But I couldn't tell you. You'd have to ask the farmer
20 or the company where they send the tests.

21 Q Do I understand you correctly that
22 you don't personally farm the property, but that other
23 people do?

24 A That is correct.

25 Q Do you direct the methods that

Crutchfield - Direct

1 they use to farm the place?

2 A Direct is probably not the proper
3 word. We discuss. We rent to Margaret Pointer, who
4 employs farmers. And methods are discussed. But I
5 wouldn't say -- I don't direct them in the sense
6 that, do this, do this, do this. If they ask to do
7 something that I thought was damaging, I would ask
8 that they use another method.

9 Q Let me show you a photograph that
10 the reporter is marking as Crutchfield 7.

11

12 NOTE: The above-referred to
13 photograph was marked and filed as
14 Crutchfield Exhibit No. 7.

15

16 Q Do you recognize this aerial view
17 of the property?

18 A I was just thinking it's a good
19 thing I'm not a pilot, because it all looks very
20 different.

21 Q You might want to start at the
22 boat house there on the upper right, and the
23 irrigation pump there.

24 A Is that --

25 Q You're going to have to tell me,

Crutchfield - Direct

1 but I think it is.

2 A I think I recognize it. I think
3 that's my boat landing.

4 Q If you don't recognize it, we can
5 move right along.

6 A Oh, I said yes.

7 Q Does this appear to be a
8 photograph of the, the area that includes your boat
9 landing along the river?

10 A I think so. Yes, it appears to
11 be.

12 Q Am I correct in thinking that the
13 County, the parcel of land that the County has
14 condemned is over to the left where that left-most
15 road has the bend in it right up against the river,
16 over the left side of the picture?

17 A Over here?

18 Q Yes. Where the power lines cross
19 the river? Do you see that white patch on the other
20 side of the river?

21 A I think you're correct.

22 Q And over at the right, does that
23 look like your boat house?

24 A I think so, yes.

25 Q And is that long white or yellow

Crutchfield - Direct

1 thing going out to something in the river an
2 irrigation pipe?

3 A Yes.

4 Q Does this photograph show the area
5 of the old ruin that you were mentioning?

6 A I'm sure it must, but I can't find
7 it.

8 Q Let me show you not as good a copy
9 of another photograph as Crutchfield 8.

10

11 NOTE: The above-referred to
12 photograph was marked and filed as
13 Crutchfield Exhibit No. 8.

14

15 Q Is that the boat house kind of
16 hidden beyond the sycamore there?

17 A Yes.

18 Q As I'm looking at this from the
19 river, is the boat ramp then off to the left end of
20 the photograph?

21 A Yes.

22 Q And there appears to be three
23 pipes going out this time. Are those your farmer's
24 irrigation facilities?

25 A Yes. Yes.

Crutchfield - Direct

1 Q Is this the swimming hole?

2 A Yes.

3 Q Basically off of those rocks be
4 side the boat house?

5 A No. I usually go off the landing
6 and then go over -- There's a sort of island where
7 the concrete structure allows build up of sand and --

8 Q So just a little bit down stream
9 of here at the boat landing?

10 A Right. The boat landing is where
11 we usually go in. And off to this somewhere around in
12 here, I think is where the, the island sort of comes
13 and goes with the weather.

14 Q Let me show you a letter from the
15 Fish & Wildlife Service that the reporter is marking
16 as Crutchfield 9.

17
18 NOTE: The above-referred to
19 letter dated September 8, 1999 was marked
20 and filed as Crutchfield Exhibit No. 9.

21
22 Q Have you seen this letter before?

23 A Yes, I have.

24 Q Do you disagree with their
25 conclusion that the project is not likely to adversely

Crutchfield - Direct

1 affect the dwarf wedge mussel?

2 A If the dwarf wedge mussel were
3 there, I feel he would be adversely affected; but we
4 were unable to find him.

5 Q Have you ever personally witnessed
6 sewage effluent that's been treated to the limits
7 required in the proposed, well, in the permit that's
8 at issue here?

9 A I don't know.

10 MR. MARSHALL: I'm sorry. Could
11 you repeat that question? I lost it there.

12 Q Have you ever personally looked at
13 the effluent from a sewage treatment plant?

14 A From any sewage treatment plant?

15 Q Yes.

16 A Yes.

17 Q Where was that?

18 A I don't remember. Somewhere in
19 Virginia. I was a child and punished for going there.

20 Q To your knowledge, have you ever
21 seen sewage effluent that was treated to the limits
22 that are imposed by this permit?

23 A I don't know what limits they are
24 treated. I have a friend who has a farm on a creek
25 where, effluent goes in. But I don't know what

Crutchfield - Direct

1 treatment. And I don't even remember what county his
2 farm was in.

3 Q Are there any requirements that
4 the Water Control Board could put into that permit
5 that you think would remedy the harm that it's causing
6 to you?

7 A I don't have the knowledge to
8 answer that question.

9 MR. BUTCHER: Your witness, ma'am.

10 MS. WELLFORD: Let's just take
11 five minutes before we go.

12 MR. MARSHALL: Great.

13
14 NOTE: At this time, recess is had
15 from 10:40 to 10:45 a.m.; whereupon the
16 deposition continues, viz:

17

18

19

20 CROSS-EXAMINATION

21 BY MS. WELLFORD:

22 Q Good morning, Ms. Crutchfield.

23 For the record, I'm Yvonne Wellford with the County
24 Attorney's Office, in Hanover. Needless to say, I'm
25 representing the County in this matter.

Crutchfield - Cross (Wellford)

1 I'm going to ask you some
2 follow-up questions to dovetail what Mr. Butcher has
3 already explored with you, somewhat.

4 And the first area that I want to
5 explore is going to be assisted by a review of the
6 document that's just been marked as Crutchfield No.
7 10.

8
9 NOTE: The above-referred to
10 letter dated June 30, 2000 was marked and
11 filed as Crutchfield Exhibit No. 10.

12
13 Q Have you seen that document
14 before?

15 A Probably.

16 Q I'll represent to you this is what
17 your counsel has filed with the Circuit Court of the
18 City of Richmond to, as an amendment to the initial
19 pleading that was filed with the Court to start the
20 case.

21 A (Nodding head indicating yes.)

22 Q Does it look familiar?

23 A Uh huh. (Indicating in the
24 affirmative.)

25 Q Would it be fair to say that you

Crutchfield - Cross (Wellford)

1 had a chance to review it before it was filed with the
2 Court?

3 A Yes.

4 Q I'd like to refer you to Paragraph
5 10, which appears on Page 3 of the document. The
6 First Amended Petition.

7 In Paragraph 10, you and your son
8 allege that:

9 The issuing of this permit for a
10 proposed discharge will contribute to and
11 exacerbate significant existing violations
12 of Virginia's applicable water quality
13 standards for dissolved oxygen downstream
14 from the proposed discharge.

15 What is the basis for your
16 conclusion that this will occur?

17 MR. MARSHALL: I object. It calls
18 for a legal conclusion, and it goes beyond
19 the scope of this deposition.

20 We're talking today about
21 standing, and standing, alone. You're not
22 only going to the merits of our appeal, but
23 in that asking for legal conclusions.

24

25

Crutchfield - Cross (Wellford)

1 BY MS. WELLFORD: (Continuing)

2 Q Go ahead, Ms. Crutchfield.

3 A Would you repeat it, please. The
4 question?

5 Q All right. What is your basis for
6 your conclusions stated in Paragraph 10 of the First
7 Amended Petition for Appeal that the regulations, that
8 by issuing the permit for the proposed discharge, the,
9 the Department of Environmental Quality or the State
10 Water Control Board has contributed to and will
11 exacerbate significant existing violations of
12 Virginia's applicable water quality standards for
13 dissolved oxygen downstream from the proposed
14 discharge?

15 MR. MARSHALL: I'm going to note
16 the same objection. Before, obviously --
17 You're going to force her to answer, that's
18 fine. But I would appreciate an explanation
19 as to how this goes to standing and the
20 issue that we're here discussing today.
21 That goes to clearly the merits. You're
22 asking her to argue the case. Yvonne, how
23 does that go to standing?

24 MS. WELLFORD: I don't think we
25 have to get into an argument on that or a

Crutchfield - Cross (Wellford)

1 discussion on that on the record today. If
2 you're instructing the witness not to
3 answer, I'll be more than happy to take that
4 up with the Court. But I think because this
5 is in the nature of a discovery
6 deposition --

7 MR. MARSHALL: Well, no, it's not
8 a discovery deposition, because --

9 MS. WELLFORD: Well, it is.

10 MR. MARSHALL: -- because those
11 are not allowed except by leave of Court.
12 And the Order that you drafted, or the State
13 Water Control Board said only to the issue
14 of standing.

15 Now, if you want to ask about her
16 allegations of harm, you can do that, as
17 Mr. Butcher did. But you are going beyond
18 what the purpose of this deposition is for.
19 And I will instruct her not to answer. If
20 you want to call the Judge, you can call the
21 Judge. I don't think that this goes to the
22 issue of my client's standing to bring this
23 lawsuit. You're asking for a legal
24 conclusion. You're asking her to argue the
25 merits of the case.

Crutchfield - Cross (Wellford)

1 MR. BUTCHER: The issue before the
2 house, Mr. Marshall, is how your clients are
3 harmed by this, and how the Court's order
4 would rectify that harm. And I think that
5 Ms. Wellford is simply following up on the
6 line of questions that I opened, that tries
7 to look at the second arm of that. And that
8 is what is it that the Water Control Board
9 could have done better to fix this.

10 MR. MARSHALL: No. No. No. No.
11 That's --

12 MR. BUTCHER: And also, I submit
13 that it measures the harm to them and their
14 understanding of that.

15 But if you want to instruct your
16 client to not answer the question, we'll
17 just deal with that.

18 MR. MARSHALL: You hit the nail on
19 the head when you said it asks what the
20 State Water Control Board could have done to
21 minimize or eliminate the damage to my
22 client. That's not what is at issue. We're
23 not talking about what could they have done
24 so that we wouldn't be here. That's a merit
25 issue. That's a substance of the appeal

Crutchfield - Cross (Wellford)

1 issue. It does not go to standing.

2 And again, the other two parts of
3 it, the causation and redressability have
4 been decided by the Court, as clearly relief
5 is granted, should the Court, I believe he
6 used the word, I don't know if he's said
7 validate and enjoin use of the discharge
8 site in that plan opinion.

9 Those two issues are not on the
10 table right now.

11 MR. BUTCHER: I think you're
12 suggesting that the Board has authorized the
13 construction of this pipe and that outfall
14 structure, and they haven't. All they
15 authorized is discharge.

16 MR. MARSHALL: No, I understand
17 that.

18 MR. BUTCHER: And the only thing
19 Judge Hughes can do is effect the permit as
20 to the quality of that discharge.

21 Now, of course, you're asking for
22 him to prohibit it. But we're allowed to
23 investigate the less draconian remedy of
24 requiring a more stringent permit.

25 MR. MARSHALL: With my client

Crutchfield - Cross (Wellford)

1 today? Absolutely not.

2 MR. BUTCHER: All right. Well --

3 MR. MARSHALL: If you want to
4 argue that before the Court -- That's a
5 merits issue, John. That is not a standing
6 issue.

7 MR. BUTCHER: I'm not going to
8 argue with you at five dollars a page. If
9 you want your client to not answer, then
10 Ms. Wellford will make a record of what it
11 is she wants to ask, and we'll go on.

12 MS. WELLFORD: And I think I've
13 done that. So we will move on.

14
15 BY MS. WELLFORD: (Continuing)

16 Q Ms. Crutchfield, I'd like to refer
17 to Paragraph 17 of the Complaint, the First Amended
18 Petition for Appeal. That appears on Page 4.

19 A Uh huh. (Indicating in the
20 affirmative.)

21 Q Your allegation here suggests that
22 Newcastle Farm, itself, is a piece of land that
23 consists of roughly 900 acres?

24 A (Nodding head indicating yes.)
25 That's correct.

Crutchfield - Cross (Wellford)

1 Q And that Newcastle Farm is the
2 location of the historic town of Newcastle. Are you
3 referring here to the archeological area, the
4 designation?

5 A Yes. I'm referring to that half a
6 moon on the maps.

7 Q Let's focus on how that relates to
8 the County's property, itself. Where is the County's
9 project in relationship to the archeological site? Is
10 it on the archeological site?

11 A It's just outside the boundary.

12 Q So it will not impact the
13 archeological site at all?

14 A I think it will impact it, because
15 close neighbors impact each other.

16 Q But it won't touch it?

17 A It will always be there, and it
18 will lessen my enjoyment by site and smell forever.

19 Q All right. But it will not touch
20 it?

21 A Well, it's not there yet, so I
22 don't think I could say.

23 Q Well, you know where the 1.1 acre
24 condemned property and easement lie.

25 A It is -- It's -- The County says

Crutchfield - Cross (Wellford)

1 it will not touch it. Its diagram is just outside the
2 boundary.

3 Q Do you have any reason to dispute
4 that?

5 A It's too close for comfort. No, I
6 do not. It's not there, yet. I can't say.

7 Q Now, with regard to the easement,
8 the construction easement and the permanent easement,
9 which basically follows the farm road, none of that
10 affects, in terms of touching the Newcastle
11 archeological site, does it?

12 A No.

13 Q And the Marlbourne House
14 properties, the actual --

15 A The land.

16 Q -- structures.

17 A The land that is designated with
18 Marlbourne is, will be impacted, touched, pierced
19 through.

20 Q And that is only where the piping,
21 the easement will run; isn't that correct?

22 A That's where the pipe will go,
23 yes.

24 Q And the piping that will be, run
25 along this easement will be in the same location that

Crutchfield - Cross (Wellford)

1 there is an existing farm road that your family has
2 put in at some point in the past?

3 A It will follow -- It will be
4 beside the farm road, I think, yes.

5 Q And it, to your knowledge, is
6 there agricultural piping that also runs through that
7 farm road area?

8 A There are -- There are irrigation
9 pipes. I hit one, myself, putting up a tent. So I
10 would not answer that, because I am simply not sure
11 where they all are.

12 Q But it's possible there is
13 agricultural piping that runs along the same farm
14 road, as well?

15 A I don't think so. I think the
16 only pipe is one just up from the river near the boat
17 landing.

18 Q Going to, to Paragraph -- Let me
19 jump back a second.

20 You mentioned Marlbourne. The
21 Marlbourne House site, that is Upper Marlbourne and
22 Marlbourne, itself, are not on property that is owned
23 by your family--that is you and your son--at all,
24 isn't that correct?

25 A Not Upper Marlbourne. The

Crutchfield - Cross (Wellford)

1 Marlbourne House site is on --

2 Q You're talking about the physical
3 structure?

4 A The physical house is on property
5 owned by my brother and sister-in-law.

6 Q So that would not be something
7 that you would have any grounds to challenge, because
8 you don't own that property?

9 MR. MARSHALL: Objection. That's
10 a statement and a legal conclusion, not a
11 question. She's not going to answer that.

12 I mean, if you want to put it in
13 the form of a question, please do. But
14 you're testifying.

15 Q And the only area of the
16 Marlbourne property, to the extent that we're talking
17 about, the boundaries of the property, that would be
18 affected by the County's proposed project is where the
19 piping will run along the easement; isn't that
20 correct?

21 A I think you'd have to ask my
22 relatives who live up the hill. They may feel the
23 same way about a neighbor that I do.

24 Q I'm moving on. I think you're
25 answering a different question.

Crutchfield - Cross (Wellford)

1 A Okay. I didn't understand the
2 question, I guess.

3 Q Yes. As far as the actual
4 Marlbourne site that you claim is part of your
5 property, there was a small portion of the Marlbourne
6 site that is part of your property, isn't that
7 correct?

8 A Correct. Correct.

9 Q And the only part of your property
10 that is also part of the Marlbourne site is the area
11 where the County proposes to put in the piping, to
12 come in from 360 to the discharge site. Isn't that
13 correct?

14 A Are you saying is that the only
15 part of Marlbourne that's --

16 Q Affected by the County's property,
17 the County's project.

18 A If you mean just the physical
19 effect of putting the pipe through, yes.

20 Q Yes. Let's go to Page 50, or
21 Paragraph 50, which is Page 10.

22 In this paragraph, you describe a
23 study that was performed in 1972 and 1973 of mussel
24 activity on the Pamunkey River.

25 Do you have any current evidence

Crutchfield - Cross (Wellford)

1 of the presence of rare, threatened or endangered
2 mussels in the area of the proposed location for the
3 facility?

4 MR. MARSHALL: Let me note an
5 objection. Again, and I'll make it a
6 continuing objection to the extent this
7 doesn't go to standing. You are arguing the
8 merits of this appeal. And that's not what
9 this deposition is for. That's what the
10 hearing that you unilaterally scheduled on
11 November 9th is for. That's when we do the
12 merits. This is limited to standing.
13 You're delving into the merits of the case.
14 I don't think it's proper.

15 MS. WELLFORD: Are you instructing
16 her not to answer? Because I think that
17 this is an issue of injury. It's an inquiry
18 about injury. If there is no endangered
19 rare, threatened species, then this is, this
20 goes to the issue of injury. And that is a
21 standing issue.

22 MR. MARSHALL: This does not go to
23 the merits of any of these claims.

24 MR. BUTCHER: Could we stop the
25 five dollar a page clock and discuss this

Crutchfield - Cross (Wellford)

1 for a minute?

2 MR. MARSHALL: Yes.

3

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A So the question is, do I know of
any current study that shows where threatened or
endangered mussels --

Q In the area of the river adjacent

Crutchfield - Cross (Wellford)

1 to where the proposed discharge site will be?

2 A No.

3 Q You described the use of the
4 property for, by the Boy Scouts. Other than your
5 troop, are there other activities?

6 A I'm on the Council of the
7 Executive Board Member and a Commissioner for the
8 Council, which means my troop was probably a
9 fallacious statement. I am no longer affiliated with
10 just one troop. Any troop -- Any troop in the world
11 could get permission to camp there. And it's -- Many
12 troops have camped there with my permission.

13 Q How does one obtain permission to
14 use the area to camp if one's Boy Scout troop desires
15 to do that?

16 A A phone call to me or to my son.

17 Q Would you have any kind of
18 documentation of those kinds of calls?

19 A I wouldn't. Um, often, troop
20 permits are filed, tour permits are filed with
21 Council. So there possibly could be some of those. I
22 personally don't keep a list of everybody who's ever
23 camped.

24 Q Okay. And which Council are you
25 referring to?

Crutchfield - Cross (Wellford)

1 A The Robert E. Lee Council, on
2 Fitzhugh Avenue.

3 Q That would be in Richmond?

4 A Yes.

5 Q In Paragraph 72 of the First
6 Amended Complaint, you describe through your counsel
7 that you have personally witnessed such usage--and I
8 think that probably refers to the previous paragraph
9 that describes the Boy Scouts usage of your property.
10 Would that be fair to say?

11 A It would not be limited to Boy
12 Scouts, to the Boy Scouts.

13 Q What other usage were you
14 referring to in Paragraph 72?

15 A Friends, family, ourselves.

16 Q When you say that you personally
17 have witnessed that kind of usage of the property,
18 would you, would you say that that personal witnessing
19 has been fairly sporadic in light of the fact that you
20 don't live there?

21 A No. I would say that I have
22 personally not only witnessed, but also taken part in
23 it. And that it's -- Well, certainly, it's been
24 sporadic. It's not a regular schedule every third
25 Wednesday of every month, but could be very often when

Crutchfield - Cross (Wellford)

1 the weather is nice, then that's often. When the
2 weather is poor. Very often when I'm in town. The
3 summer I worked in Europe, I probably wasn't there
4 probably more than once or twice.

5 Q And you have not lived in, on the
6 property since 1980, is that correct?

7 A That, I believe, is correct.
8 Might have been '81.

9 Q I think I understood your prior
10 testimony --

11 A Now I -- My son camps there.

12 Q I'm talking about you. He'll
13 speak for himself.

14 A Okay.

15 Q You, as I understood your prior
16 testimony, are not personally involved in the farming
17 activities of the land in question?

18 A That is correct.

19 Q So it would be fair to say that
20 you do not have any kind of oversight that would draw
21 you down to the farm on a regular basis to become
22 involved in what's going on with the farming?

23 A Depends on what you mean by
24 regular basis. If there is a need for something to be
25 done, such as repair of the dam of the pond, or

Crutchfield - Cross (Wellford)

1 something that's gone on at the farm that needs to
2 involve the land owners, then I would be called to the
3 site. But there again, there's no regular meeting on
4 the third Wednesday of every month.

5 Q So would it be fair to say that
6 you are not down at the property on a weekly basis?

7 A Not every week. But I don't think
8 you could really characterize my attendance on the
9 property. I mean, many times, I go to the property
10 but not, not because I need to do anything about the
11 farming. I might just go jump in the river because I
12 happened to drive by, or I might be picnicking, or I
13 might camp for four or five days.

14 Q How often would you say you are
15 there once a month? Once a week?

16 A I have no idea. I have no idea.
17 It's been a tremendous variety.

18 Q You can't quantify it?

19 A No, I can't.

20 Q You mentioned that you have used
21 the river for swimming and apparently at least within
22 the past year, I think, according to your prior
23 testimony?

24 A Absolutely. Yes.

25 Q In the letter that is attached as

Crutchfield - Cross (Wellford)

1 Exhibit A to the Petition for Appeal, First Amended
2 Petition for Appeal, which is a letter that was
3 written by your attorney, Mr. Ellis, there is
4 reference, I believe, on Page 6 to the documentation
5 of fecal coliform in the river. Has that caused you
6 to limit your use of the water for swimming purposes,
7 Ms. Crutchfield?

8 A There, again, I am not a
9 scientist, and I don't really pretend to speak to
10 levels of what is in that river now. I just know that
11 there shouldn't be any more put in there until it is
12 certain that nothing will be damaged by addition to
13 what's there.

14 Q So you don't know whether or not
15 there is a level of fecal coliform that would be
16 unhealthy for you if you were swimming in it?

17 A I don't have scientific knowledge
18 as to any level of anything in there.

19 Q But suffice it to say, it hasn't
20 caused you to limit your usage of the river for
21 swimming, if it exists?

22 A I think that's fair.

23 Q And you, yourself, haven't
24 bothered to explore further about the levels of fecal
25 coliform in the water other than what's reported in

Crutchfield - Cross (Wellford)

1 this letter?

2 A I have commissioned knowledgeable
3 people to explore lots of things. I, myself, could
4 look at a lot of that and have absolutely no
5 understanding of what was meant.

6 Q And have you commissioned someone
7 to look into the fecal coliform presence in the water?

8 A We've commissioned so many people
9 that I'm not sure who's looking into exactly what and
10 testing. You'd have to refer that one to
11 Mr. Marshall.

12 Q So you simply don't know?

13 A I simply don't know.

14 Q The sentence that appears just
15 before the sentence that concerns the levels of fecal
16 coliform recorded by the DEQ researcher --

17 MR. MARSHALL: Where are you?

18 MS. WELLFORD: It's the third full
19 paragraph of Page 6 of Exhibit A.

20 MR. MARSHALL: What sentence?

21 MS. WELLFORD: It's the sentence
22 just before. It says:

23 However, the researcher who
24 collected the data in 1995 and 1996
25 suspected that it was due in part to

Crutchfield - Cross (Wellford)

1 non-point sources of pollution, including
2 agricultural runoff.

3 He's describing oxygen sag in the
4 river. Do you see that?

5 A Uh huh. (Indicating in the
6 affirmative.)

7 Q Now, agricultural runoff would be
8 fertilizer and that kind of thing going into the
9 river?

10 A (Nodding head indicating yes.)

11 Q And you have a total of roughly
12 900 acres under till?

13 A No.

14 Q How much?

15 A More like 600 and some under till.

16 Q That's all, you know, essentially
17 along the Pamunkey River?

18 A No, it's not. Some of it is along
19 the Pamunkey River. I couldn't tell you exactly how
20 many miles of river frontage there are. And over
21 toward the--I'm not sure if it's north, south, east or
22 west--but father back toward Marlbourne is where some
23 of the property is. It's not all on the river, is
24 what I'm saying. There are some back fields that are
25 quite far away from the river. No matter how much

Crutchfield - Cross (Wellford)

1 runoff, it probably will never reach the river.

2 Q Do you have any knowledge as to
3 what kind of fertilizer the folks that are farming
4 your property are using, Ms. Crutchfield?

5 A Off of the top of my head, no. We
6 are concerned about agricultural runoff. We do
7 studies. We submit -- We, meaning the farmers. But
8 I, personally, could not tell you what fertilizer they
9 use. I can tell you they use no till as much as
10 possible. They use fertilizer as sparingly and as
11 friendly to anything as possible, so as not to harm
12 any agricultural resources.

13 Q All right. And so it would be
14 fair to say, then, since you don't know what they're
15 using in terms of fertilizer, they could well be using
16 manure products as fertilizer on your farm?

17 MR. MARSHALL: I'm going to object
18 before she answers the question. This is
19 irrelevant to standing. It has nothing to
20 do with my client's ability to bring this
21 suit.

22 I don't know where you're going
23 with this or why you're going there, but I
24 make an objection. I think it's beyond the
25 scope of what the Judge ordered. It does

Crutchfield - Cross (Wellford)

1 not go to standing, and it is completely
2 irrelevant to, well, not only this
3 deposition, but the merits of the case.

4 Q Ms. Crutchfield?

5 A Would you repeat it?

6 Q It would be fair to say that you
7 have no knowledge as to whether the folks that are
8 farming your property are using manure products as
9 fertilizer for the farming activities they are engaged
10 in?

11 A I'm going to say, no, and let you
12 ask them. Because I don't want to be mistaken on the
13 record.

14 Q Okay. Ms. Crutchfield, you have
15 described the visual impact that you contend there
16 will be once this facility is constructed by the
17 County. And what I'd like to know is what information
18 you have concerning the visual impact that will exist
19 once this structure is completed. What do you know
20 about that?

21 A Any structural and agricultural
22 land which has been developed would be a visual blot,
23 as a billboard riding down the highway. I have -- I
24 don't really have, um, sufficient information from the
25 County as diagrams and drawings, I don't think, to

Crutchfield - Cross (Wellford)

1 answer that question.

2 Q So you don't know?

3 A A building for housing equipment,
4 monitoring equipment, a fence, landscaping, a parking
5 lot. Those are the words of the County as to what
6 it's going to put there.

7 Q But you've never seen a picture or
8 a drawing that will depict what it will look like?

9 A I don't think I have.

10 Q You've also described what you
11 anticipate the smell impact to be, for lack of a
12 better way to describe it.

13 A Uh huh. (Indicating in the
14 affirmative.)

15 Q And what is the basis for your
16 concern in that regard? What do you know about what
17 the County proposes that causes you concern, as far as
18 the smell impact?

19 A Sewage outfall connotes smell, in
20 my mind. I have read of, heard people who live near
21 sewage outfalls. And there are many, and, reports of
22 bad smells. And if you're going to ask me what
23 specific, I could not tell you.

24 Q All right. And do you know the
25 nature of the facilities that they, these folks

Crutchfield - Cross (Wellford)

1 resided next to? Is it the same kind of facility that
2 the County is proposing to construct?

3 A I would assume it was somewhere,
4 but I don't have scientific knowledge to know.

5 Q Ms. Crutchfield, there are a
6 number of options that one can pursue to provide some
7 kind of protection to property. One of those would be
8 a historic easement. Have you placed any part of your
9 property under a historic easement?

10 A When my husband died in 1975,
11 according to --

12 MR. MARSHALL: Before she answers,
13 I'm going to note an objection, again, for
14 the record.

15 A I was unable to.

16 MR. MARSHALL: I think it's
17 irrelevant and beyond the scope of this
18 definition.

19 (To the witness) Go ahead and
20 answer.

21 A When my husband died in 1975, the
22 laws of Virginia, as far as inheritance, were
23 different. He was killed on a Friday. We had an
24 appointment on Monday to make wills, because we now
25 had this five month old baby to the day. And he died

Crutchfield - Cross (Wellford)

1 before we ever made the wills; therefore, the property
2 went to the child with the mother's dower right.

3 I had to go to court to prove I
4 was the guardian of my own child. I had to go to
5 court to ask for the privilege of continuing to buy
6 the land from my mother-in-law. Because my husband
7 and his brother, having paid two sets of inheritance
8 taxes already on the property, didn't want to pay any
9 more, and had set up a system whereby they would buy
10 the land from their mother, giving her an income, and
11 then not having to pay an inheritance tax on the land.

12 There was no provision for what
13 would happen if one of them died, first. She's still
14 living.

15 My -- Therefore, I had to prove
16 that this was my child. I had to ask for the
17 privilege to, um, keep paying my mother-in-law. I had
18 to sell some land in order to pay the inheritance tax,
19 because there was no machinery for delay in cases such
20 as that.

21 We finished. So the land wasn't
22 mine to give an easement on. I investigated. I
23 talked to the Nature Conservancy, I talked to various
24 places. And the land belonged to a minor. The land
25 was heavily in debt. There was no way that I could

Crutchfield - Cross (Wellford)

1 put any kind of easement on it.

2 We finished paying for it I
3 believe sometime after, say '93, '94, somewhere in
4 there, I believe. We finally finished. Um, it was my
5 feeling that he should put the easement on, because it
6 was really his. It was all he had left of his father.
7 And we were in the process of investigating. We had
8 not done anything. I am told the County project was
9 on the books before he reached the age of majority, so
10 that it wouldn't have mattered, anyway.

11 But, no. Once the County project
12 was on the books, DHR, Virginia Outdoors Foundation,
13 Nature Conservancy, and there are probably ten others,
14 will take property only subject to the County project;
15 therefore, were I to put it in easement at that point,
16 I would be saying, I agree with the County project,
17 which I did not.

18 Q And when did you and your son --
19 Your current ownership is fee simple with your son?

20 A What do you mean, fee simple?

21 Q I mean you are, you have clear
22 title to the property?

23 A Yes, we do.

24 Q And that's joint?

25 A Now. No. It's his, subject to my

Crutchfield - Cross (Wellford)

1 dower right.

2 Q And that has been the case since
3 what date?

4 A That's what I'm not exactly sure.
5 '90's.

6 Q So between sometime, what? Early
7 1990's?

8 A Probably. Not before mid, I don't
9 believe. The documents are somewhere. I just don't
10 remember, exactly. Say '93, '94, somewhere in there.

11 Q Who owned title to the property
12 prior to that? Was it subject to some kind of
13 mortgage?

14 A No. It wasn't subject to
15 mortgage. We owed on the land -- The way I
16 understand it from Carter Refo, the Commissioner of
17 Accounts to whom I had to pay \$350.00 a year until he
18 reached the age of majority to check my paperwork, to
19 make sure I wasn't cheating him -- The way I
20 understand it, there was no clear title to the
21 property. Although, there was no real mortgage on it,
22 except for our debt to my mother-in-law, there wasn't
23 a clear title until we had finished paying her, and
24 Henry was at the age, had reached the age of majority.

25 Q All right. When did your son --

Crutchfield - Cross (Wellford)

1 A That I had to ask permission from
2 Carter Refo to do anything.

3 Q When did your son reach the age of
4 majority?

5 A '93.

6 Q So between between '93 and the
7 present, no efforts have been made by you on your son
8 to place any of the property under historic easement?

9 A Between '93 and '97. We had some
10 dialog in the early '80's, but we had not, had not,
11 obviously had not put in an easement.

12 Q That would be the same for a
13 conservation easement?

14 A Yes. That would be the same for
15 anything. I think that's correct.

16 Q Mr. Butcher explored with you the
17 impact of this project, as far as you are concerned,
18 on the historic resources of the property. And one
19 question I wanted to follow up on was, in your mind,
20 is the County's completion of this project going to
21 render the historic resources of the property any less
22 historic than they already are?

23 A What do you mean by less historic?

24 Q I'll let you --

25 A Is it going to age prematurely

Crutchfield - Cross (Wellford)

1 or --

2 Q I don't know. But it's certainly
3 a contention that has been raised by you. That it's
4 going --

5 A I don't think you can make
6 something more or less historic. It either is or
7 isn't, I think.

8 Q So you agree this will not lessen
9 the historic value --

10 A Oh, no. I didn't say lessen the
11 historic value. I said make it more or less historic.
12 There's a big difference.

13 Q Okay. Tell me what you --

14 A I think it will lessen the value
15 very much.

16 Q How does it lessen the historic
17 value of the historic resources on this property?

18 A To put a 2001 sewage outfall next
19 to a 1700s town makes the atmosphere and environment
20 around it totally modern, progress-monster oriented
21 and non-historic.

22 Q How is that different from modern
23 farming activities that surrounds this --

24 A Farms is what the property has
25 always been.

Crutchfield - Cross (Wellford)

1 Q Yes. But not with irrigation
2 equipment, right?

3 A Irrigation equipment gives life;
4 sewage is a different story.

5 Q In your mind.

6 A In my mind.

7 MR. MARSHALL: That's all she can
8 testify to that's in her mind, not what's in
9 yours.

10 MS. WELLFORD: Indeed.

11

12 BY MS. WELLFORD: (Continuing)

13 Q Ms. Crutchfield, do you have in
14 your possession any documents which I would define as
15 including letters, photographs, that kind of thing,
16 that would support your contention that this property
17 has been regularly used for recreational activities by
18 you and your son?

19 A Yes.

20 Q I presume that you do not have
21 those with you today.

22 MR. MARSHALL: I would object.

23 You can ask questions about it. If we
24 decide to share such documents with you, we
25 will do so. This is not a fishing

Crutchfield - Cross (Wellford)

1 expedition. If you're getting ready to
2 request any and all documents, that's
3 totally inappropriate not a part of what
4 we're doing. Should we choose to rely on
5 those, though, you will see them.

6 Q Why don't you describe to me what
7 you have, Ms. Crutchfield?

8 THE WITNESS: (To Mr. Marshall)
9 Should I answer?

10 MR. MARSHALL: (To the witness.)
11 Answer. And describe everything.

12 THE WITNESS: Everything?

13 MR. MARSHALL: Everything.

14 A Well, when I dated Meade Broadbuss,
15 before I ever met his mother or saw his house, I saw
16 his river and his boat.

17 Q Let me stop you right here.
18 Rather than --

19 MR. MARSHALL: You asked the
20 question.

21 MS. WELLFORD: Jack, excuse me.
22 I'm taking the deposition.

23 MR. MARSHALL: Seriously.
24 You're --

25 MS. WELLFORD: I'm taking the

Crutchfield - Cross (Wellford)

1 deposition. All right?

2 MR. MARSHALL: You are, and I'm
3 defending it.

4
5 BY MS. WELLFORD: (Continuing)

6 Q Ms. Crutchfield, what I would
7 specifically like to focus on is usage within the past
8 five years, rather than going through the past 30 or
9 40 years of your history with this property.

10 A Okay. So you're going back to
11 '95. Um --

12 MR. MARSHALL: (To the witness)
13 And, again, from '95 on then, tell her
14 everything.

15 A I'm trying to remember where '95
16 starts.

17 Do you mean my family? Do you
18 mean my activities with friends and Scouts, or --

19 Q I'm talking about you and/or your
20 son.

21 A Well, there's a picture from '95
22 of him pulling a fish out of the river, a big bass.

23 Q Him, being --

24 A My son.

25 Um, I suspect there are Boy Scout

Crutchfield - Cross (Wellford)

1 troop pictures in four or five troops I can think of,
2 which show Boy Scouts camping on the property. But I
3 don't have them.

4 Q Would these include you?

5 A Some might. I don't know. I
6 don't -- Even back to '95, I don't remember every
7 time anybody took a picture of me. There are pictures
8 of me standing in the river. Um, Carol Prague took
9 some, as you know.

10 There are pictures of my
11 grandchild, my step-grandchild swimming in the river.

12 There are pictures of mussels we
13 pulled out of the river. There are pictures of people
14 in SCUBA gear going in the river. I was there. I
15 took the pictures; therefore, I'm not in the SCUBA
16 ones.

17 There are pictures of me swimming
18 in the river. I believe, um, Henry in the river.
19 Pictures of us in boats, water skiing.

20 Um, there are lots of family
21 picnic pictures. I would have to look back to see
22 exactly whether they fall in the '95 area. They tend
23 to be earlier, because when the kids are little, you
24 take more pictures.

25 Letters. There are some. I

Crutchfield - Cross (Wellford)

1 couldn't begin to tell you all of them. Usually,
2 Scouts and fishermen, make phone calls, asking.
3 Always send thank you notes. This are some letters
4 the Boy Scouts wrote about this particular project
5 asking that DEQ not to advise, um, the granting of the
6 permit. There are letters from two troops that I know
7 of, 876 and 879, I believe.

8 Q The troops are 876 and 879 that
9 have primarily used the property?

10 A There are two who have used the
11 property who wrote letters that are in exhibits
12 somewhere.

13 Q In the letter that was attached as
14 Exhibit A to the First Amended Petition for Appeal,
15 there is a discussion of the imposition by the
16 Virginia Resources Commission of a ban on fishing of
17 the, at least the shad. And I'm not sure if there
18 were other anadramous fish that were affected by the
19 ban. How did that impact your fishing of the river?

20 A Would you show me where that is,
21 please?

22 Q Page 10.

23 MR. MARSHALL: Where are you
24 drawing the statement from?

25 Q There is a quotation from the

Crutchfield - Cross (Wellford)

1 Richmond Times Dispatch. Do you see that? And then
2 just before that, a statement that in 1994, the VMRC
3 had imposed a total ban.

4 A Okay. Now, what was your
5 question?

6 Q How did that impact your fishing
7 of the river?

8 A My personal fishing? I've already
9 told you, I read books and eat fish that fishermen
10 catch. I would say it affected it in that I was
11 afraid that some day there would be no more shad for
12 me to eat.

13 Q All right. But did -- Between
14 1994 and at least 1999, it sounds like this ban was in
15 place. Were --

16 MR. MARSHALL: I object. That
17 assumes facts that are not in evidence, and
18 no foundation has been laid. If you want to
19 build that, go ahead. But --

20 Q Well, would you agree that this --
21 Your attorney's statements suggests that there was a
22 ban in place between 1994 and 1999.

23 MR. MARSHALL: I'll object. The
24 document speaks for itself. She's gotten to
25 the quote. If you want to ask her

Crutchfield - Cross (Wellford)

1 specific --

2 Q Tell me what you know about the
3 ban, Ms. Crutchfield.

4 A The only thing I know is that I've
5 read about it. And to me, it says that the shad are
6 endangered of becoming extinct, therefore --

7 Q So --

8 A Do you mean did I actually take a
9 shad out of the river during those years? I,
10 personally?

11 Q Well, let's go back to the first
12 question. Were you aware of the ban?

13 A Yes.

14 Q Okay. And what did you understand
15 the ban to be?

16 A An attempt to keep the fish from
17 becoming extinct.

18 Q Which fish?

19 A Shad.

20 Q Exclusively?

21 A American shad --

22 Q Exclusively limited to shad?

23 A American shad, hickory shad, I
24 don't know. This says shad fishing ban. It doesn't
25 put a ban on mullet, or perch, or bass. So I would

Crutchfield - Cross (Wellford)

1 assume that it, from reading, that it means shad.

2 Q And what is your understanding as
3 to how long this ban was in place?

4 A My understanding is I don't
5 remember. I get the Chesapeake Bay Journal, but
6 that's not totally scientific.

7 Q Were you aware of any fishing
8 activity off your property in the Pamunkey River at
9 any point between 1994 and 1999?

10 A I don't know what, what they
11 caught or kept. Some of my fishermen take pictures
12 and put the fish back. My son is that kind of
13 fishermen. I'm that kind of fishermen, if I ever
14 catch one. I'm not aware that anyone broke the ban,
15 if that's what you're getting at.

16 Q So it would be fair to say that as
17 far as, if this ban was in place, that it did not
18 impact your, that its impact on you was that you did
19 not eat any shad that was pulled out of the river
20 during this time frame?

21 A If I was aware of a ban, I did not
22 break it, if that's what you mean.

23 Q Okay. So do you recall eating any
24 fish between 1994 and 1999 that came out of the
25 Pamunkey that was fished off of your property?

Crutchfield - Cross (Wellford)

1 A Yes. Don't ask me what fish.

2 Usually perch.

3 Q And are you aware of any concerns
4 that have been raised with regard to the impact of the
5 proposed discharge on the perch population in the
6 river?

7 A Perch are anagamous (sic.), the
8 white ones. So there could possibly be.

9 Q So they're a migratory fish?

10 A Uh huh. (Indicating in the
11 affirmative.)

12 Q So you were eating a banned fish,
13 potentially?

14 MR. MARSHALL: Objection.

15 MS. WELLFORD: I'm just --

16 MR. MARSHALL: This is --

17 A I don't know. I'm not up on all
18 these regulations.

19 Q I'm trying to --

20 MR. MARSHALL: She gave you her
21 understanding of what this language means
22 four times.

23 A To mean, that says shad. I don't
24 know of a ban on perch when I ate a perch.

25 Q Okay. Just, one more follow-up

Crutchfield - Cross (Wellford)

1 question. On Paragraph 72 of the Complaint, which
2 appears at Page 14. Your allegation suggests that
3 this:

4 ...discharge site is heavily used
5 for all manner of primary contact
6 water-based recreation.

7 Let me take that sentence apart a
8 little bit. What is meant by the term primary contact
9 water-based recreation?

10 A I'm not sure. Um, I suppose it
11 means when the water actually touches you, or when
12 something from within the water goes inside of you.
13 That's actual physical contact, I guess.

14 Q So what --

15 A As compared to and the standing
16 the shore, looking, to actually jumping in the water
17 and swimming.

18 Q What do you understand then would
19 be the kinds of activities that would fall under this
20 category, primary contact water-based recreation?

21 A Eating the fish, swimming, diving,
22 just playing in the water. Um, canoeing, because one
23 usually winds up in the water. A lot of types of
24 boating. Because usually, go out in the river and
25 wind up jumping in.

Crutchfield - Cross (Wellford)

1 Q Okay. And what about the heavy
2 usage? What do you mean by that in this allegation?

3 A I would say, um, large groups of
4 people fairly frequently. For example, a scout troop
5 as compared to a husband and wife. Um, and the fact
6 that all types of usage. It could be a large group,
7 it could be a huge family party.

8 For example, on the 4th of July,
9 we used to invite almost everyone we knew. And until
10 he was old enough to have other summer time
11 activities, that was a huge, almost a county event.

12 Q And --

13 A And there are fishermen who have
14 permission, who I hesitate to use the word regularly,
15 because they don't call the same time every year. But
16 who call and ask for permission to fish.

17 Q Okay. But personally, witnessing
18 that, it is somewhat limited in light of the fact that
19 you live in Powhatan County, isn't that correct,
20 Ms. Crutchfield?

21 A I'm not there to watch it every
22 time, but I certainly drive out there and swim and
23 picnic and camp, myself, and -- With troops, with
24 whom I'm affiliated, and with family groups.

25 My husband and I have tented on

Crutchfield - Cross (Wellford)

1 the banks of the river many times.

2 Q What would you -- If you were to
3 quantify what fairly frequently means, when, in your
4 last answer, what would that mean? Weekly? Monthly?

5 A I'm not going to put a figure on
6 it, because I can't. I can't say I come six times in
7 the summer, three times in June, three times in July,
8 none in August, and -- I just -- I can't do that. I
9 do not remember. I don't have that kind of memory. I
10 never knew that I would need it.

11 That's asking me how many times I
12 eat fish. I don't know.

13 Q So it's certainly possible that
14 for an entire month, you would not be down at the
15 property to observe whether there are people there
16 using it for swimming or boating?

17 A People use it with permission.
18 People call and ask to use it.

19 Q But I'm talking about personally
20 witnessing. That's the allegation in Paragraph 72.

21 A Could there have been a month when
22 I did not witness one? Of course there could.

23 MS. WELLFORD: I think those are
24 all the questions I have.

25 Do you have any?

Crutchfield - Cross (Wellford)

1 MR. MARSHALL: I have a few, but
2 I'd like to just take a quick break, if we
3 could, please.

4
5 NOTE: At this time, recess is had
6 from 11:45 to 11:50 a.m.; whereupon the
7 deposition continues, viz:

8
9
10
11 CROSS-EXAMINATION

12 BY MR. MARSHALL:

13 Q For the record, my name is John
14 Marshall. I'm the attorney for the petitioners in the
15 matter, Frances Broaddus Crutchfield and Henry Ruffin
16 Broaddus. Good afternoon, Ms. Crutchfield.

17 A Good afternoon, sir.

18 MS. WELLFORD: Not yet.

19 MR. MARSHALL: It is somewhere.

20 A Good 5 before afternoon, sir.

21 Q Today, you've talked about your
22 ownership of a piece of property that has been called
23 Newcastle Farm. Would you please describe your
24 philosophy of the land management as it relates to
25 Newcastle Farm?

Crutchfield - Cross (Marshall)

1 A Yes. Um, I feel that Newcastle
2 Farm is, has been entrusted to me, rather than given
3 to me, and that it is a piece of open land along a
4 river, both of which I am the guardian during my life
5 time. And it is my obligation, duty, perhaps, to
6 safeguard and protect while the river and the land
7 that are in my care.

8 Q Do have you any plans to develop
9 the property for --

10 A No.

11 Q -- a subdivision?

12 A No.

13 Q Tell me about historic and
14 archeological resources, if any, that are at and
15 around Newcastle Farm.

16 A A portion of Newcastle Farm
17 consists of property that was designated a National
18 Historic Landmark, along with Edmund Ruffin's house,
19 Marlbourne.

20 Also, on Newcastle Farm is the
21 town site, the archeological site of a colonial town
22 which was a bustling seaport in the 1700s, and was, at
23 one time, considered for the capital of Virginia.
24 When Williamsburg burned, one of the replacement
25 cities suggested was Newcastle. And it lost by, I

Crutchfield - Cross (Marshall)

1 believe, two votes in the House of Burgesses. And
2 it's, it's all that's left of it is under the fields.

3 Q What ownership, if any, do you,
4 have of the town of Newcastle, or the land that was
5 the town of Newcastle and Marlbourne?

6 A The town of Newcastle on my
7 property, and a portion of it the Marlbourne property.

8 Q So you hold title --

9 A Yes.

10 Q -- to those two designated
11 historic landmarks?

12 A Correct.

13 Q What is your understanding of what
14 the County plans to do at Newcastle Farm?

15 A The County plans to build upon 1.1
16 acres which it has seized from us by quick take
17 condemnation process under eminent domain. On that
18 piece of land, the County plans to build aeration, um,
19 a stepaerator, a building to house monitoring
20 equipment, landscaping, a parking lot, a fence to
21 house its sewage outfall machinery.

22 Um, the County also has easements
23 to bury the pipe going to the structure. And there
24 will be a pipe going from the structure into the
25 river. And the pipe will be capable of carrying up to

Crutchfield - Cross (Marshall)

1 70 million gallons of effluent per day to be dumped
2 into the Pamunkey River.

3 In addition to the pipe
4 underground, there will be County vehicles coming in
5 to monitor, to check the equipment.

6 Q Describe your use and enjoyment of
7 the town of Newcastle and the portion of Marlbourne
8 that you own as historic and archeological resources?

9 A You mean just with respect to
10 finding pipe stems and china --

11 Q Correct.

12 A -- or with -- Well, we, we enjoy
13 just looking around out there and picking up
14 arrowheads, pipe stems, china shards.

15 We did find a human skeleton, and
16 we put up a tombstone for her grave. And we enjoy,
17 um, speculating about who she was and what she did,
18 who lived there with her.

19 And if you sit very quietly on
20 that land, you can almost hear the wooden oars hitting
21 the sides of the wooden boats and imagining what went
22 on hundreds of years ago.

23 Q As part of your use and enjoyment
24 of these historic and archeological resources, the
25 peace and sanctity of the Pamunkey River?

Crutchfield - Cross (Marshall)

1 A Yes. Rarely do you see other
2 people or -- It's far enough back that you don't hear
3 traffic. And it's, it's as if you were in the woods
4 in the 1700s if you close your eyes and imagine it.
5 It's peaceful. It's quiet. You hear geese.

6 Q Okay. Well, what impact does the
7 issuance of the VPDES permit being challenged in this
8 lawsuit have on the values that you've just described?

9 By that I mean, what are the
10 impacts that the issuance of this permit will have on
11 your use and enjoyment on the historic and
12 archeological resources on your property?

13 A It's a total negation, violation
14 of my philosophy of land use, if you will, for want of
15 a better word. It will always be there. I will see
16 it; I will smell it; I will know it's there if I close
17 my eyes.

18 Q Now, what will you see that will
19 be there?

20 A I will see the reminder of what we
21 humans have done to our world. And what, where once a
22 man discovered he could take something and rejuvenate
23 his fields now will be a spot where a huge monster of
24 sewage machinery will put residue of human waste.

25 Q As you stand at the historic town

Crutchfield - Cross (Marshall)

1 of Newcastle on your property, will you be able to see
2 the discharge and outfall structure?

3 A Yes.

4 Q What impact will that have on your
5 use and enjoyment of the historic and archeological
6 resources on your property?

7 A Once something has been violated,
8 it can never be put back exactly as it was before. I
9 will never have the enjoyment that I once had. It
10 will be almost as someone said putting a dog pen in
11 someone's front yard and coming whenever to walk and
12 feed the dog. It will, if -- If I were ever to
13 finish the house, as I always thought I would, or my
14 son would, or my decedents would, there will be this
15 sewage outfall in my front yard.

16 Q And so the property that you own
17 that has been documented as historic and archeological
18 resources will be less aesthetically pleasing, is that
19 correct?

20 A It will be very much less
21 aesthetically pleasing.

22 Q You are a riparian co-owner of
23 Newcastle Farm, is that correct?

24 A Yes.

25 Q What other impacts will result

Crutchfield - Cross (Marshall)

1 from the issuance of this VPDES permit as relates to
2 your use and enjoyment of historic and archeological
3 resources?

4 A Do you mean the land, or the
5 river, or both?

6 Q Both.

7 A I will never again walk across
8 that farm or go in that river without feeling that,
9 that I -- I will always feel a responsibility for
10 what has happened to it, as if I were a party to it.

11 And it will, it will forever be
12 violated. It will -- It will never be the same. I
13 will not enjoy it in the same way. I will -- I will
14 never swim in the river. I'm sure my friends and
15 scouts and family won't swim in it, either. We will
16 never again fish in the river or, and eat the fish.
17 It will be ruined. Spoiled. Damaged.

18 Q Do you remember the first time you
19 swam in the Pamunkey River at Newcastle Farm?

20 A Yes.

21 Q When was that?

22 A It was about 1970. And I was
23 dating Meade Broadbush.

24 Q And since that time, have you
25 continued to use the Pamunkey River at Newcastle Farm

Crutchfield - Cross (Marshall)

1 for recreational purposes?

2 A Yes.

3 Q If you could just describe what
4 some of those are.

5 A Family picnics, swimming, fishing,
6 water skiing, jet skiing. We've even been sailing in
7 it. It's not a great sailing body of water, because
8 it's narrow. And if the wind is not right, you could
9 sit still for a long time. Um, all kinds of boating,
10 though. Canoeing. Riding in johnboats, floating in
11 innertubes.

12 MR. MARSHALL: I'm going to hand
13 the court reporter a document that I'd like
14 to be marked as Crutchfield Exhibit 11.

15
16 NOTE: The above-referred to three
17 photographs were marked and filed as
18 Crutchfield Exhibit No. 11.

19
20 Q Can you identify this document?

21 A Yes. It's pictures of family
22 picnics, '75, '83, '79. I wouldn't swear to the
23 years, but somewhere in there.

24 Q Okay. And the picture in the
25 upper right corner --

Crutchfield - Cross (Marshall)

1 A Uh huh. (Indicating in the
2 affirmative.)

3 Q -- who is in that picture?

4 A Ray Clark is the person with the
5 hat on the raft. And I think the other two -- One is
6 Meade Anderson, one I don't know who it is. The
7 person in the water is yours truly.

8 We had a lot of very young
9 children in the family. And they couldn't swim
10 against the current of the tidal river, and they
11 couldn't make it that far to the island. So what I
12 would do is, do you see the stake in the front lower
13 right-hand corner? I would tie a rope to that stake
14 and swim the rope across. And then I would sit there
15 with a the rope so they could do hand-over-hand and
16 get to the island. I couldn't secure the rope on the
17 other side, because it's a navigable river, and you
18 can't block it. So I would swim over and hold the
19 rope so that they could get to the island. And we'd
20 take the rope and put it back again when they needed
21 to come home.

22 MR. MARSHALL: I'm going to hand
23 to the court reporter what I would like to
24 have marked as Crutchfield Exhibit 12.

25

Crutchfield - Cross (Marshall)

1 NOTE: The above-referred to two
2 photographs were marked and filed as
3 Crutchfield Exhibit No. 12.

4
5 Q Can you identify this document and
6 the pictures on it?

7 A Yes. One is the boathouse at high
8 water.

9 Q Okay.

10 A And it's when the water had
11 started to recede after a flood, but was still higher
12 than normal.

13 Q Is that your boat in the picture?

14 A That was our Boston Whaler, yes.

15 Q You use that to navigate?

16 A The Pamunkey River, yes.

17 Q And the bottom picture is a
18 picture of what?

19 A That is I (sic.) water skiing.
20 And I believe my brother Russell Bailey was driving
21 the boat. I'm not -- I think that's his head-you can
22 see. And I'm not sure. One was his girlfriend. I
23 don't know about the other two.

24 MR. MARSHALL: I'm going to hand
25 to the court reporter what I'd like to have

Crutchfield - Cross (Marshall)

1 marked as Crutchfield 13, please.

2

3

4

5

6

7

8

Q Ms. Crutchfield, can you identify
this document?

9

A Yes.

10

Q What is it?

11

A It's fishing pictures of my son.

12

13

Q Starting in the upper left,
describe for me what those pictures show.

14

A Henry's first fish.

15

Q Okay.

16

17

18

A And he's sitting there, holding
it. And then he's standing, holding it. And later,
he ate it.

19

Q What about the bottom picture?

20

21

22

A That's circa 1995. Actually, it
is '95. It's still on the picture. And that's Henry
with a bass, I believe. A big fish.

23

24

Q That was taken at the Pamunkey
River at Newcastle Farm, correct?

25

A Correct.

Crutchfield - Cross (Marshall)

1 MR. MARSHALL: I'm going to hand
2 the court reporter a document I'd like to
3 have marked as Crutchfield Exhibit 14,
4 please.

5
6 NOTE: The above-referred to
7 photograph was marked and filed as
8 Crutchfield Exhibit No. 14.

9
10 Q Can you identify this document,
11 Ms. Crutchfield?

12 A Yes. That's the grandchild.
13 That's Heleanor looking for mussels. And I think it's
14 around '97 or '98.

15 Q Is this -- Is this -- This is a
16 picture of the granddaughter --

17 A Yes.

18 Q -- at Newcastle Farm in the
19 Pamunkey River?

20 A Yes. She's right, um, right at
21 the boat landing. You can kind of see its outline.
22 It's right at the very tip of it.

23 Q Now, as a result of the issuance
24 of this VPDES permit, assuming that if it was to be
25 upheld on this appeal, and the County began to

Crutchfield - Cross (Marshall)

1 discharge treated sewage in the Pamunkey River will
2 you ever swim in the Pamunkey River again?

3 A No.

4 Q Will you fish in the Pamunkey
5 River at Newcastle Farm again?

6 A No.

7 Q Will you canoe in the Pamunkey
8 River at Newcastle Farm again?

9 A No.

10 Q And what impact will the issuance
11 of the VPDES permit at issue in this litigation have
12 on the camping activities at Newcastle Farm, both for
13 the Boy Scouts in general, and you, personally?

14 A It will certainly lessen the
15 camping. It will very dramatically lessen the
16 enjoyment of the camping. There is something very
17 pleasurable about camping near a body of water and
18 being able to jump in when it's hot or just, just
19 enjoy it and hear the water. It kind of sings you to
20 sleep. The Pamunkey River has a nice ripple to it.
21 At night when it's quiet, you hear it.

22 It will just -- It will never be
23 the same. There will be this, this, this element of
24 the monster progress that is destroying our
25 environment always present, always there. We will see

Crutchfield - Cross (Marshall)

1 it. We will smell it. We probably will hear it.

2 Q So the -- I'm sorry. Go ahead.

3 A We will close our eyes and ears
4 and pretend it's not there, but it always will be.

5 Q So the issuance of this VPDES
6 permit, that damages your aesthetic interest in the
7 property, is that correct?

8 A That is correct.

9 Q And the issuance of the VPDES
10 permit damages your recreational interest in the
11 property, is that correct?

12 A That is correct.

13 Q You've described earlier today
14 both for Mr. Butcher and Ms. Wellford the fishing that
15 you have enjoyed in the Pamunkey River at Newcastle
16 Farm over any number of years.

17 Other than the actual fishing, how
18 else did you use and enjoy the fish and other aquatic
19 species found in the river at Newcastle Farm?

20 A Well, I liked snorkeling. I liked
21 to dive and just look at them. And certain times of
22 year, there are minnows you can see right up on the
23 boat landing. It's -- To me, it's pleasant to sit on
24 the river bank and watch -- There are turtles about
25 so big, sometimes come up on logs.

Crutchfield - Cross (Marshall)

1 You used to hear lots and lots of
2 frogs. Don't hear them as much. But when we lived in
3 the trailer, we'd get, um, we would hear them. And
4 even had a tree frog live on the window for a number
5 of months.

6 Um, mostly just watching and
7 listening. And I mean, if I never caught a fish, I
8 would still like to -- I love to swim among them and
9 look at them. And if you have the right equipment and
10 the light, you can enjoy them a lot in the river.

11 Q So your snorkeling and diving in
12 the Pamunkey River at Newcastle Farm will cease as a
13 result of the issuance of this permit, is that
14 correct?

15 A It will cease to me. To me,
16 swimmable and drinkable are somewhat inevitable,
17 because I tend to inhale when I swim. And even diving
18 is less pleasurable in water that's been ruined.

19 And if you've ever done any diving
20 in the Pamunkey River, over the years, you can see
21 what man's done to the river. It's already started up
22 at the bridge site where there's a wagon wheel, tires
23 and all kinds of stuff. And it's just rather
24 horrifying to think what we have done to our rivers.

25 Q You mentioned earlier that we've

Crutchfield - Cross (Marshall)

1 discussed the historic and archeological value of the
2 land that you own, including the town of Newcastle and
3 a portion of Marlbourne.

4 What role, if any, does the
5 Pamunkey River play in adding value to the property as
6 a historic and archeological resource?

7 A Well, the Pamunkey River -- The
8 Pamunkey River dictated that the town be there in the
9 first place. It was a seaport. And ships, which were
10 smaller than ocean going vessels, more smaller than
11 they are now, and the river was larger than it is now,
12 came up to the port, bringing wine, silk, thread,
13 whatever from the East, and was, we still find the
14 bottle necks and vases which can be dated by
15 archaeologists.

16 Um, and then the river silted, and
17 the town sort of fell by the wayside and disappeared,
18 really.

19 And then the land was farmed. And
20 farmers planted the same old crop, year after year in
21 their fields and depleted the nutrients from their
22 fields.

23 One farmer discovered he can take
24 the marl from the river bottom and make fertilizer and
25 rejuvenate his fields. And now, well -- And then,

Crutchfield - Cross (Marshall)

1 um, the farm, the river became a source of enjoyment,
2 as it bordered the farm.

3 And now, people who see land and
4 water as money to be made have found it to be what
5 they consider a spot to dump their industrial waste
6 into.

7 So in a way, it's kind of dictated
8 all the things that have happened to it, and to the
9 land. And meanwhile, we have, I'm sure sagas of
10 survival of various creatures on the land and in the
11 river.

12 Q Did you attend any public hearings
13 focusing on the question of whether or not the State
14 Water Control Board should issue this permit?

15 A Yes. I attended, I think it was a
16 hearing held by the DEQ with a member of the Water,
17 State Water Control Board, an open hearing. And I did
18 attend.

19 Q And do you remember, or do you
20 know who Allen Brockenbrough is?

21 A Yes, I do. -

22 Q Who is Mr. Brockenbrough?

23 A He's -- Well, now, I don't know
24 what his exact title is. He works for DEQ, and he was
25 at the hearing. He did speak at the hearing.

Crutchfield - Cross (Marshall)

1 Q What did Mr. Brockenbrough say
2 about the drinkability and swimmability of this water
3 after issuance of this permit?

4 A He said that, um, that people had
5 said it was safe to drink, but he wouldn't drink it.
6 I believe the newspaper reporter said that was the
7 only moment of levity in the hearing.

8 Q Assume for just a moment -- This
9 follows up on a question that Mr. Butcher posed
10 earlier.

11 Premised on the assumption that,
12 you know, what if the water that was coming out of
13 this pipe was clean drinking water. Would that fact
14 in any way lessen the negative impact to your
15 aesthetic interests in the archeological and
16 historical sites at Newcastle Farm?

17 A No. The fact that any pipe is
18 there, that any industrial treated waste water,
19 effluent, sewage, whatever you want to call it, the
20 fact that, that anything is -- The kinds of
21 pollution. Some could be chemically proven to be
22 polluting, and there are other kinds of pollution that
23 bothers the mind and the spirit and can't be
24 quantified. But it's probably a greater source.

25 Q But from a historic and

Crutchfield - Cross (Marshall)

1 archeological resources point, you would still have to
2 look at the same structure?

3 A Correct.

4 Q And that would have the same
5 negative impact that you've described earlier as your
6 aesthetic interests, is that correct?

7 A Yes, that is correct.

8 Q Does your son live on the property
9 at Newcastle Farm?

10 A He does presently.

11 Q So he --

12 A Do you mean now, or do you mean in
13 the past?

14 Q Now.

15 A Now, yes, he does.

16 Q So he goes to sleep at Newcastle
17 Farm on the Pamunkey River every night?

18 A Yes.

19 Q And wakes up with the sun at
20 Newcastle Farm on the Pamunkey River every morning?
21 Correct?

22 A Correct. Unless he's home for
23 some reason, such as an early hearing.

24 MR. MARSHALL: I don't have
25 anything further.

Crutchfield - Cross (Marshall)

1 MS. WELLFORD: I think we have a
2 couple of quick follow up.

3 MR. MARSHALL: I thought you had
4 finished.

5 MS. WELLFORD: But you crossed.
6 We do have a chance to recross.

7 MR. MARSHALL: I'll just note an
8 objection to that. I don't know that you
9 do. Go ahead. Ask your questions. Subject
10 to that objection. You've ended your
11 deposition.

12

13

14

15 **REDIRECT EXAMINATION**

16 **BY MS. WELLFORD:**

17 Q Ms. Crutchfield, you suggested
18 that there had been a human skeleton found on the
19 property. What, what was going on at the time that
20 caused this skeleton to be unearthed?

21 A My husband was grading land for
22 boat landing. The current boat landing that exists.
23 And our Dalmation dog found a bone.

24 Q And you mentioned that there's a
25 grave stone that was erected.

Crutchfield - Redirect

1 A Uh huh. (Indicating in the
2 affirmative.)

3 Q By you?

4 A Yes.

5 Q When was that put in place?

6 A I think it was in '97.

7 Q The skeleton was found while your
8 husband was alive, so that --

9 A Correct.

10 Q -- was at least 20 years before?

11 A Uh huh. (Indicating in the
12 affirmative.) '75. In October of '75, I believe it
13 was when she was found.

14 Q The photographs that appear on
15 Crutchfield No. 12, can you tell me when those were
16 taken? I don't think you identified the date.

17 A The water skiing was in the '80's.
18 And the boat landing was -- I mean, the boat house,
19 it's right after -- Probably -- Oh, it's '74. It's
20 on the picture. It was soon after its construction.

21 MR. MARSHALL: Just so we're
22 clear, we're talking about Exhibit 12.

23 MS. WELLFORD: That's what I
24 asked.

25 A This was in the '80's, the water

1 skiing, after my husband was dead. This one was
2 shortly after the completion of the boat house. He
3 built the boat house, himself. That was in '74. The
4 picture was developed in October.

5 MR. BUTCHER: I have no further
6 questions.

7 MS. WELLFORD: That's it.

8 MR. BUTCHER: Thank you,
9 Ms. Crutchfield.

10
11
12
13 And further this deponent saith not.
14
15

16 DEPOSITION CONCLUDED AT 12:24 P.M.
17
18
19
20
21
22
23
24
25

1
2 COMMONWEALTH OF VIRGINIA,

3 CITY/COUNTY OF: _____, to wit:
4
5
6

7 I, FRANCES BAILEY BROADDUS CRUTCHFIELD, do
8 hereby certify that I have read the foregoing pages of
9 typewritten matter numbered 1 through 125, and that
10 the same contains a true and correct transcription of
11 the deposition given by me on the 28th day of
12 September, 2000, at Richmond, Virginia, to the best of
13 my knowledge and belief.
14
15

16 _____
17 Date Frances Bailey Broaddus Crutchfield

18 Subscribed and sworn to before me this

19 _____ day of, 2000.
20

21 My commission expires _____.
22
23 _____
24
25

1 COMMONWEALTH OF VIRGINIA,
2 COUNTY OF HENRICO, to-wit:
3
4

5 I, Connie Alys Crane Pryor, a Registered
6 Professional Reporter and Notary Public for the State
7 of Virginia at Large, do hereby certify that the
8 foregoing deposition of FRANCES BAILEY BROADDUS
9 CRUTCHFIELD was duly taken and sworn to before me at
10 the time and place set out in the caption hereto.

11 Further, that the transcript of the
12 deposition is true and correct to the best of my
13 ability, and that there were 14 exhibits filed with me
14 during the taking hereof.

15 Given under my hand this 11th day of
16 October, 2000.
17
18

19 Connie Alys Crane Pryor
20 Connie Alys Crane Pryor - RPR
21 Notary Public for the State of Virginia
at Large

22 My Commission expires:
23 August 31, 2002
24
25



GRAY & PAPE INC.

CULTURAL RESOURCES CONSULTANTS

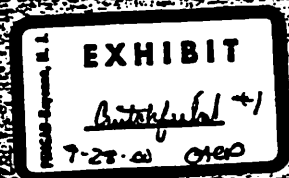
1705 EAST MAIN STREET RICHMOND, VIRGINIA 23223 TEL (804) 644-0866 FAX (804) 643-9118

PHASE I CULTURAL RESOURCES INVESTIGATIONS OF A PORTION OF THE PROPOSED TOTOPOTOMOY WASTEWATER TREATMENT PLANT EFFLUENT FORCE MAIN AND THE OUTFALL/CASCADE AERATOR STRUCTURE LOCATION HANOVER COUNTY, VIRGINIA

VDP# File Number: 97-0159

Prepared for:

Hazen and Sawyer, P.A.
4011 West Chase Blvd.
Raleigh, North Carolina 27607
(919) 873-2152



April 1, 1998

**PHASE I CULTURAL RESOURCES INVESTIGATIONS
OF A PORTION OF THE PROPOSED
TOTOPOTOMOY WASTEWATER TREATMENT PLANT
EFFLUENT FORCE MAIN AND THE
OUTFALL/CASCADE AERATOR STRUCTURE LOCATION,
HANOVER COUNTY, VIRGINIA**

VDHR File Number: 99-0159

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Project Manager**

ABSTRACT

Gray & Pape, Inc. (Gray & Pape), Richmond, Virginia, conducted a Phase I cultural resources survey of a portion of the proposed Totopotomoy Wastewater Treatment Plant effluent force main and outfall/cascade aerator structure location in Hanover County, Virginia. The project was conducted for Hazen and Sawyer, Raleigh, North Carolina, under contract to the Hanover County Department of Public Utilities.

The project is located between Route 360 and the Pamunkey River in Hanover County. The project included survey of two discrete elements: (1) a proposed 1515-meter (4970-foot) long effluent force main segment; and (2) a 31- by 52-meter (100- by 170-foot) outfall/cascade aerator structure location. The effluent force main segment corridor measured 3 meters (10 feet) in width. The total area surveyed for this project measured 0.59 hectares (1.48 acres).

The first 1393 meters (4570 feet) of the proposed alignment identified three isolated artifact finds. Each of these isolated finds failed to meet the minimum qualifications for an archaeological site and therefore will not be considered for inclusion on the National Register of Historic Places (VDHR 1996). The project corridor crosses Marlbourne, a National Historic Landmark and National Register of Historic Places property, for a length of 762 meters (2500 feet) adjacent to an existing farm road. Part of the area has been disturbed by the construction of several agricultural buildings. None of the historic agricultural features associated with the significance of Marlbourne are located in the project. No artifacts were recovered or evidence of subsurface features were identified within the Marlbourne property. This project will not have an effect on the location, setting, or use that contribute to Marlbourne's significance.

In addition to the isolated finds, the Phase I survey identified one archaeological site. Site 44HN314 is a late eighteenth/early nineteenth century historic site located within the last 122 meters (400 feet) of the proposed corridor. Although artifactual materials were recovered from a 122 meter (400 foot) area within the corridor, the boundaries of Site 44HN314 could not be fully defined due to access restrictions. However, because of the number, variety, and age of cultural specimens recovered during the field investigations and the possible association of the site with the nearby Newcastle Town National Register property, any development within the boundaries of 44HN314 should be preceded by a Phase II archaeological evaluation.

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CHAPTER I. INTRODUCTION

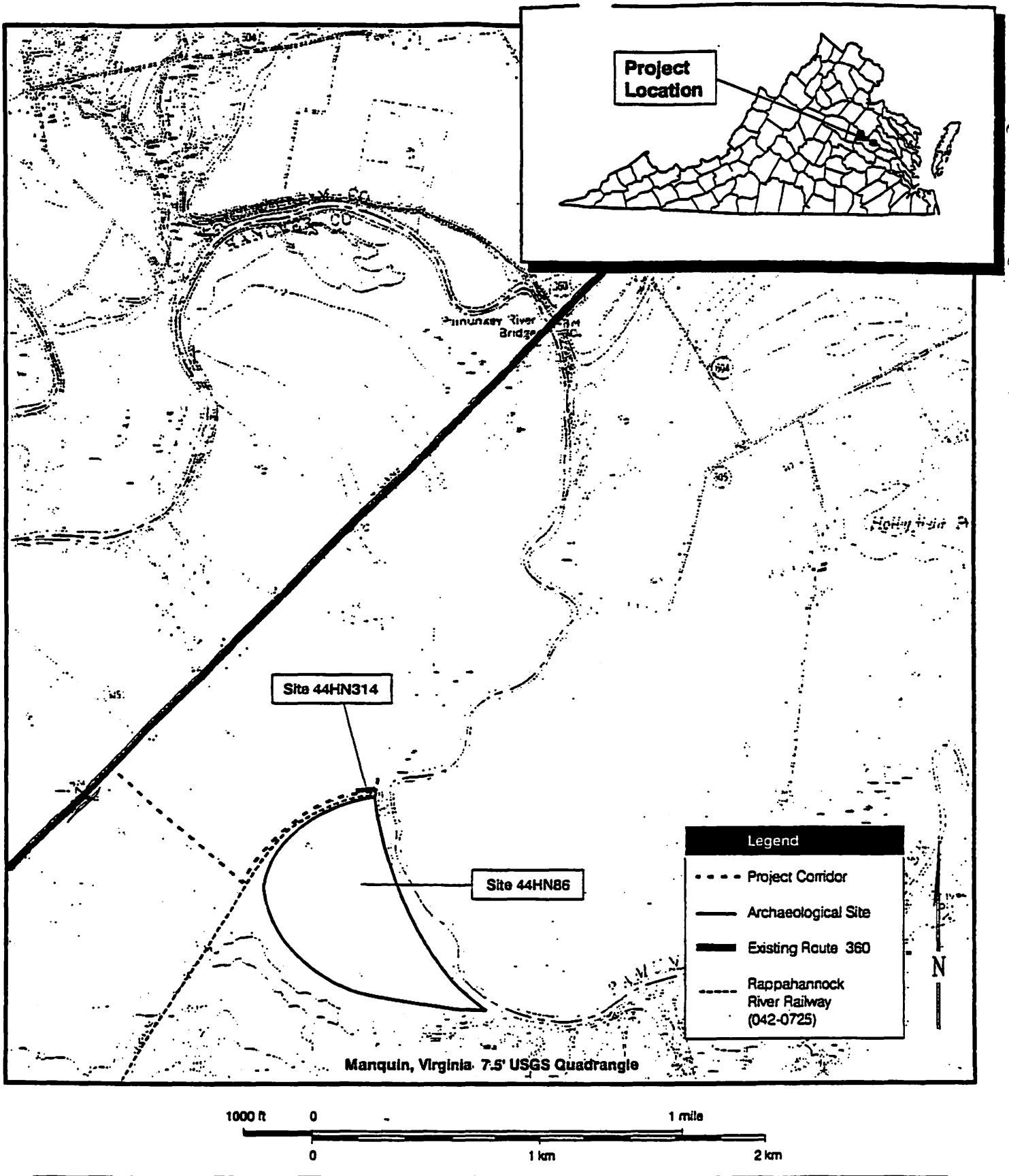
Gray & Pape, Inc. (Gray & Pape), Richmond, Virginia, conducted a Phase I cultural resources survey of the proposed Totopotomoy Wastewater Treatment Plant (WWTP) outfall/cascade aerator structure and that portion of the effluent force main from the aerator structure to Route 360 in Hanover County, Virginia (the Project). The survey was conducted for Hazen and Sawyer, P.C., Raleigh, North Carolina, under contract to the Hanover County Department of Public Utilities.

This Project was authorized by the Hanover County Department of Public Utilities in order to meet the terms of its Conditional Use Permit CUP-16-97 (CUP) and to comply with the requirements of Section 106 of the Historic Preservation Act of 1966, as amended. Stipulations 5 and 6 of the CUP state the following:

5. Specific alignment of outfall lines shall be designed to minimize the impact on identified historic resources. In addition, at least sixty (60) days prior to the initiation of construction, the applicants shall provide notice to the Historical Commission (and any other designated agencies) the intention to proceed. Agents authorized by the Historical Commission and the Department of Public Utilities shall be allowed to recover historic artifacts within the easement with ownership of artifacts to remain the respective property owner.
6. In the vicinity of the Newcastle Town Archaeological Site, before any ground disturbing action by the applicant, a professional archaeologist will determine the need for an archaeological inventory or testing evaluation. Any such studies will be carried out before or in conjunction with construction and would meet the requirements of the State Historic Preservation Office (SHPO).

This project only surveyed the portion of the effluent force main from the aerator structure to the point where it reaches Route 360 (Figure 1). The remainder of the effluent force main to the WWTP will be covered by a separate project undertaken by Hanover County.

Hanover County has not yet applied for Federal permits for the sewer outfall force main and outfall structure; thus, this project is not yet considered a Federal undertaking that would trigger compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. In the near future, the County will proceed with Federal permitting procedures and at that time this project will fall under the purview of Section 106. In light of the fact that the Project will be evaluated under Section 106 procedures, Gray & Pape completed its investigations pursuant to Section 106, as amended, and the procedures for the Protection of Historic Properties (36 CFR 800). The completed



Location of Project Area

work and this report conform to the guidelines contained in the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (Federal Register 48:190:44716-44742). The archaeologists who directed this work meet or exceed the qualifications set forth in the *Secretary of the Interior's Professional Qualifications and Standards* (48 FR 44738-9).

PROJECT DESCRIPTION

The proposed project is located between Route 360 and the Pamunkey River in Hanover County, Virginia (Figure 1). Adjacent to the pipeline corridor stand the ruins of an antebellum Gothic Revival-style dwelling and the remains of an early twentieth century railroad bed that end at the Pamunkey River. These features are located outside the project area limits and will not be impacted by the proposed construction. The project included survey of two discrete elements: (1) a proposed 4970-foot (1515-meter) long effluent force main segment; and (2) a 31- by 52-meter (100- by 170-foot) outfall/cascade aerator structure location. The effluent force main segment trench corridor measured 3 meters (10 feet) in width. The total area surveyed for this project measured 0.59 hectares (1.48 acres).

The archaeological fieldwork included systematic shovel testing of both survey elements. The shovel testing interval was 50 feet (15 meters) with a single line of shovel tests centered within the trench corridor and a grid of shovel tests laid across the structure location. This strict program of shovel testing was necessitated by the proximity of the Project to Site 44HN86, the archaeological remains of the eighteenth and nineteenth century Town of Newcastle (Botwick and Neville 1998).

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CHAPTER II. ENVIRONMENTAL CONTEXT

Environmental and cultural contexts provide the basis for assessing the sensitivity of the present project area for archaeological resources. Further, they assist in the interpretation of the cultural resources identified during this survey. The environmental context section below describes variables that influenced past human settlement and land use in the project region. This data is important for understanding what locations were occupied by prehistoric and historic populations in this area and why they were selected. The prehistoric context in Chapter III provides an outline of the known prehistoric periods for eastern Virginia. The historic context, presented in Chapter IV, contains an overview of the historic developments in the project region and information on the history of the Town of Newcastle. These contexts contain information necessary to relate the archaeological resources under consideration to broad patterns of regional prehistory and history.

PHYSIOGRAPHY

The project area lies in the western portion of the Coastal Plain geophysical province of Virginia. The Coastal Plain comprises an eastward sloping surface of generally low relief. Erosion, however, has created areas of hilly topography. Elevations in the Coastal Plain do not exceed 90 meters (300 feet) above mean sea level (amsl) (Dietrich 1971:102). The project area lies between 12 and 14 meters (40 and 45 feet) amsl.

The survey area lies on a table landform adjacent a sharp oxbow of the Pamunkey River. The project vicinity exhibits little relief to the north and west. East and south of the survey area, however, the terrain descends sharply to the Pamunkey River (to the east) and to an unnamed tributary (on the south). The walls of these two valleys are nearly vertical and offer access to the river only through deep erosional cuts in the escarpment. Along the Pamunkey River, a narrow terrace of alluvium and fan deposits is present at the foot of the slope. This discontinuous feature tapers and lenses out to the south. Along the unnamed tributary, a narrow valley exists through which the stream flows. The flanks of this stream are marshy and uninhabitable. A northern branch of this unnamed tributary flows along the northwest portion of the survey area. This part of the landform is poorly drained and uninhabitable as well.

The project area is in the York River drainage basin. As noted, it lies adjacent to the Pamunkey River, one of the major tributaries to the York. The Pamunkey is the principal watercourse in the project environs and would have constituted an important means of transportation for both prehistoric and historic human populations in this region as well as a source of subsistence resources. Other water courses in the immediate vicinity of the project area include the unnamed tributary at its southern margin as well as several intermittent and ephemeral drainages located along the south side of the Pamunkey River.

The bedrock of the Coastal Plain consists of partially consolidated sedimentary rocks of Cretaceous, Eocene, and Miocene marine sands, gravels, clays, and marls. Outcrops of siliceous lithic raw materials suitable for prehistoric chipped-stone tool manufacture do not occur in the Coastal Plain. However, such materials are present in secondary deposits along the region's stream valleys. Deposits of sand, gravel, and marl also represented economically important natural resources exploited during the nineteenth and twentieth centuries.

SOILS

The United States Department of Agriculture (USDA) has mapped one principal soil type in the project area: Pamunkey fine sandy loam. Pamunkey soils of this series are well drained on narrow to broad, slightly convex terraces along the larger streams of the region (Hodges et al. 1980:56). Soils of this series comprise old forest soils with well-developed subsoil horizons.

The soils in the project area are the product of weathering and have not been subject to extensive deposition or erosion. Therefore, any archaeological deposits in the survey area will most likely be located at, or immediately below, the ground surface. Also, the Pamunkey River has been eroding its right bank in the project vicinity throughout the Holocene period. Thus, the river bank would have formerly extended an unknown distance to the east. While the extant bluff contains evidence of historic and at least late prehistoric (Woodland period) occupations, any evidence of earlier occupations may have eroded away.

PALEOENVIRONMENT

Late Pleistocene and Early Holocene climates would have presented prehistoric populations with different environments than presently exist in the Chesapeake region. The following summary of paleoenvironments in the region rely on information in Carbone (1976), Custer (1984), Fesler (1992), and LeeDecker et al. (1991).

The Late Pleistocene period, characterized by the withdrawal of the Laurentide glaciers, presented a cooler and moister climate than presently exists in the region. Spruce dominated the forests of this era, although the vegetation may have existed in a mosaic pattern that encompassed grasslands, coniferous forests, and deciduous forests. The deposition of clays by streams and rivers supported freshwater marsh vegetation. This habitat supported several faunal species no longer present in this region, such as mammoth, mastodon, moose, elk, and caribou. This period spanned roughly from 10,000 to 8000 B.C. (Carbone 1976; Custer 1984; Fesler 1992; LeeDecker et al. 1991).

A warming climate beginning after circa 8000 B.C. contributed to the replacement of grasslands with hardwood beech-hemlock-birch forests. Marshes continued to develop along watercourses (Fesler 1992). Such habitats would have been attractive to certain game species such

as elk, moose, and white-tailed deer. Animal species adapted to cold climates migrated north or became extinct (LeeDecker et al. 1991).

At approximately 6500 B.C., environmental conditions that roughly resembled modern circumstances emerged. A relatively warm and humid climate initially typified the period after 6500 B.C., but conditions became drier towards 3100 B.C. Changes included the spread of forests dominated by hemlock, which were then succeeded by oak-hickory forests. Wetlands continued to expand, possibly as a result of the humid conditions noted above. The plant types presently found in these zones, such as gum, sweet gum, ash, red maple, walnut, elm, and cypress, became common. Faunal species that flourished and formed important resources for human populations included deer and turkey. The success of these species probably resulted from the prevalence of mast resources such as hickory; these species also became important food sources for human populations (Fesler 1992; LeeDecker et al. 1991; Stewart et al. 1987).

The period between 3100 and 800 B.C. was characterized by warm and dry conditions which gave way to a progressively cooler and moister climate. Grasslands may have spread as a result of the dry conditions, and the prevailing forest type would likely have consisted of an essentially modern oak-hickory-pine complex. In wetland areas this forest type would have declined while relative proportions of cypress-gum vegetation rose. The stabilization of sea level around the beginning of this period contributed to the development of the extensive estuarine habitats that ring the Chesapeake Bay. This habitat supported a diverse range of subsistence resources utilized by human populations in the region such as shellfish beds, anadromous fish runs, and migratory waterfowl (Carbone 1976; Custer 1984; Fesler 1992; LeeDecker et al. 1991). Temperatures after 800 B.C. grew cooler and moister. These conditions have remained relatively stable into the modern era (LeeDecker et al. 1991).

MODERN CLIMATE

At present, the region is characterized by a relatively mild continental climate. Summer temperatures average 74 degrees Fahrenheit and winter temperatures reach an average of 37 degrees. Rainfall is well distributed throughout the year (Hodges et al. 1980:1).

FLORA AND FAUNA

The biotic communities of the region have undergone considerable change in some areas as a consequence of human activities, such as urbanization, logging, land clearance, and mechanized agriculture. The project vicinity is characterized by wooded areas, pastures, and agricultural fields with some residential areas on the periphery of the area.

Floral associations once represented within the project vicinity included woodlands of mixed chestnut, oak, and hickory, with yellow poplar located in moister areas. Shortleaf and Virginia pine were distributed throughout the hardwood forests. In addition to providing resources sought by

prehistoric and historic populations, this original woodland would have included habitats for a variety of fauna that were important to both populations.

Human activities have greatly affected the number and the kind of arboreal, aquatic, and terrestrial taxa that can now be found in the region. Mammals formerly common to the region included opossum, black bear, raccoon, mink, weasels, river otter, skunks, foxes, bobcat, squirrels, beaver, muskrat, lagomorphs, mice, vole, shrew, and white-tailed deer. Extirpated taxa include fisher, red wolf, gray wolf, elk, and bison. Many of the defunct species may have been economically important to prehistoric Native Americans as food, materials for domestic uses (e.g.-sinew and fur), or raw materials for tools (e.g., antler and bone). Bird species which were available included owl, heron, mourning dove, duck, grouse, quail, vulture, hawks, and turkey. Reptiles and amphibians including snakes, lizards, several turtle species, and frogs were also exploited. Aquatic resources were abundant in the area's streams and include trout, pike, minnows, carp, suckers, bass, sunfish, and bluegill.

CHAPTER III. CULTURAL CONTEXTS

PREHISTORIC CONTEXT

The following overview of the prehistoric cultural history of the region provides a framework for the interpretation of any archaeological resources identified during this survey. In addition, it serves as a basis for making preliminary evaluations with regard to National Register eligibility. Human occupations in the region during prehistoric times can be divided into several cultural-temporal periods, characterized by differing adaptations to changing climatic and environmental conditions. The VDHR divides the prehistory of Virginia into three principal periods: (1) Paleoindian, (2) Archaic, and (3) Woodland. The latter two periods are subdivided into early, middle, and late subperiods (VDHR 1992). The later stages of the Late Woodland period are sometimes characterized as the Contact Period to denote the initial interaction between Native American and European populations. These periods and their defining characteristics are discussed below.

The Paleoindian period represents the earliest known human occupation of eastern North America. Paleoindians in the Middle Atlantic region appear to have relied on a strategy of hunting and gathering, possibly focusing on large game animals (Gardner 1989), although they also made use of fish, small game, and plant foods (Dent 1995; Kauffman and Dent 1982). Populations of this period probably lived in small, mobile groups or bands that occupied a succession of transient camps (Gardner 1989). Consequently, most sites of the period are small and diffuse, and exhibit little evidence of reuse. Toolkits exhibit a generalized quality, with few tools adapted to specialized uses. Those few sites that appear to have been occupied for longer duration, or occupied repeatedly, are associated with sources of high-quality lithic raw material sources (Dent 1995:104).

A series of well-made fluted bifaces that includes the Clovis, Hardaway-Dalton, Quad, and Cumberland point types represent the most commonly found diagnostic artifacts for this period. The Paleoindian tool kit also includes scrapers (especially distal- and lateral-edge unifaces), spokeshaves (concave unifaces), hammerstones, abraders, gravers, wedges, as well as multi-use flakes and bifaces (Gardner 1989).

Because of the climatic continuity from the Paleoindian period to the Early Archaic period, some archaeologists (Custer 1984, 1990; Gardner 1989) have argued that the Early Archaic represents a substage of the preceding era. However, while the environmental setting may have been similar, important changes in settlement strategies, such as increased use of upland zones and changes in lithic technology, distinguish the Early Archaic.

Changes in material culture include a shift from the fluted Paleoindian points to smaller bifaces that were side-notched or stemmed to facilitate hafting. The blades of these points often

exhibit serrated edges. The technological changes manifested by these implements reflect new subsistence procurement strategies oriented around the exploitation of smaller game animals and plants (McMillan and Klippel 1981). Diagnostic hafted bifaces of the Early Archaic in Virginia include Kirk Stemmed and Notched, Palmer Corner Notched, and several small bifurcated-base types (e.g. LeCroy). Ground stone tool technology also emerged during this period. Other tools present in the Early Archaic assemblage include drills, adzes, numerous scraper forms, gravers, and chipped-stone adzes (Gardner 1989; Lowery and Custer 1990). The addition of plant food-processing implements, such as mortars, pestles, and nutting stones to the Archaic tool kit imply an increased use of floral resources. A trend toward expedient tool technologies also began in the early Archaic (Blanton and Sassaman 1989).

Settlement patterns of this period suggest that Early Archaic groups occupied areas along major river drainages and utilized extractive sites in upland zones and/or specific, localized environmental settings, such as freshwater wetlands, springs, or bogs (Custer 1990:27). Sites that may represent long-term habitations are typically situated at the confluence of a major stream and tributary or on broad stretches of land protruding above a floodplain or marsh. Such settings offered the greatest assortment and quantity of subsistence resources within the smallest land area. In general, the variety of site types and activities represented during this period reflect an adaptation to a more diverse resource base caused by greater diversity of environmental settings and seasonal fluctuations in climate.

Many of the trends that characterized the preceding period persisted into the Middle Archaic. In general, this era is distinguished by a mobile lifeway in which (probably) egalitarian groups exploited a variable and unpredictable array of subsistence resources. The settlement system of Middle Archaic groups is exemplified by small, short-term camps and is represented by scatters of lithic artifacts, primarily waste flakes and generalized stone tools. Sites occur in diverse topographic settings within the region, including interdrainage areas as well as along major river valleys. Researchers have commented on the expedient quality of these assemblages. Archaeologists in Virginia (Blanton and Robinson 1990; Stevens 1991) and in other regions (e.g., Blanton and Sassaman 1989) have suggested that these sites indicate a highly mobile settlement strategy adapted to the patchy and unpredictable distributions of subsistence resources offered by the environment at this time. Middle Archaic populations would have relocated frequently and exploited resources where and when they were encountered, manufacturing suitable tools as needed. Base camps, if they existed, probably lay at the confluences of major streams and a tributary or on broad areas of land that dominated a floodplain or marsh.

The various bifurcated biface forms introduced during the previous cultural period demarcate the earliest portions of the Middle Archaic. These types were replaced by a series of stemmed forms that include, in order of appearance: Stanley; Morrow Mountain types; Guilford; and Halifax points. Gardner (1989) notes a shift toward quartz as a preferred raw material occurring in the Middle Atlantic. Other elements of Middle Archaic material culture reflect a continually evolving technology. For example, atlatl weights appeared during this period. The advent of atlatl weights indicates the landmark development of the spear thrower. In addition, ground stone mortars, pestles, manos, metates, nutting stones, grooved axes, and celts are frequently associated with Middle

Archaic components. In the Middle Atlantic region, this ground stone technology distinguishes the period from the preceding era (e.g., Stewart and Cavallo 1991), and it points to the importance of floral resources to Middle Archaic populations (Ford 1977).

Significant changes in settlement patterns and economic practices that occurred late in the Late Archaic period distinguish it from the preceding periods. Dent (1995) terms this latter part of the Late Archaic as one of intensification. It is sometimes referred to as the "transitional" or "terminal" Late Archaic, and is characterized, for example, by amplified food production and increased use of various resources. Prior to these cultural transformations, adaptations related to the Late Archaic reflected continuity with those of the Middle Archaic. In other words, the period was characterized by highly mobile groups making use of expedient technology to exploit variable and widely dispersed resources.

The "terminal" Late Archaic is marked by regional varieties of broad-bladed, parallel-stemmed, hafted bifaces (Coe 1964:123-124). During this period, steatite bowls became an integral part of the artifact assemblage. In addition, Late Archaic groups developed interregional trade that included such items as copper (Great Lakes), marine shells (Gulf Coast), and imported exotic lithic raw material (Winters 1969).

The subsistence economy of Late Archaic groups within the Mid-Atlantic region evidences a stronger orientation to riverine resources (Mouer 1991) and the cultivation of native plant taxa (Fritz and Smith 1988; Voigt and Pearsall 1989). These changes mark the difference between the earlier and later portions of the Late Archaic. In contrast to the adaptations described above, late Late Archaic populations oriented their subsistence and settlement strategies around a less diverse set of resources, but emphasized resources found in predictable locations and abundant quantities.

Settlement/subsistence strategies reflect this trend. Settlement focused on large river valleys and the utilization of resources available in them probably reflects an adjustment to conditions wrought by stabilized sea levels and other hydrologic changes. Products of these altered conditions included vast mudflats, salt marshes, freshwater swamps, and other aquatic and semi-aquatic habitats. The spawning grounds of anadromous fish grew and led to expansive fish runs which comprised a predictable and plentiful resource. Despite this focus the presence of interior sites appears to indicate a continued use of a range of plant and animal species.

The use of local lithic sources intensified beginning with the Late Archaic period. In the Coastal Plain, secondary sources of cobbles from along the rivers and their tributary streams were utilized. Quartz, quartzite, and basalt constituted the preferred materials for the manufacture of hafted bifaces and larger tools. However, nonlocal materials such as rhyolite and steatite were also obtained by populations that resided at least part of the time in the Coastal Plain.

Dent (1995) remarks that the process of intensification suggests greater social complexity and the possible introduction of social hierarchies. He points to the postulated fish run harvests as an example of an undertaking that required large labor units for the construction of weirs and processing of the quantities of fish generated by these undertakings. Such work would have required some authority to coordinate. At the same time, Dent suggests that people focused more time on

fewer aspects of subsistence, and began to lose their individual autonomy as they came to rely more heavily on the labor of others. This process had important implications for social organization because such social arrangements were more tightly bonded and interdependent than those of band-level societies. Dent (1995:211) suggests that as these new social conditions emerged, people lost control of the products of their work and experienced a decreased ability to escape from these circumstances. With these constraints on independence and mobility in place, new social constructs could materialize.

The Early Woodland, and its transition from the Late Archaic period, is the least understood of the Woodland phases. Early Woodland adaptations appear to reflect continuity with the preceding Late Archaic period. The Early Woodland, however, is distinguished principally by the introduction of ceramic technology. A second marker of the Early Woodland includes the replacement of Late Archaic large, stemmed hafted biface forms with small lanceolate, stemmed, and notched styles. These forms occur in a variety of raw material types, in contrast to the use of mainly coarse materials, such as quartzite, that characterized the Late Archaic period (McLearen 1991:113).

Early Woodland populations appear to have followed settlement/subsistence strategies similar to those of the Late Archaic period. Early Woodland groups coalesced into centralized settlements on a seasonal basis, and family or microband groups dispersed to smaller habitation sites during other portions of the year. Although rudimentary horticulture may have occurred during the period, the basis of Early Woodland subsistence economy consisted of hunting, fishing, and gathering wild foods.

The continuity of the Early Woodland period with the preceding Late Archaic period is underscored by certain early ceramic types, such as Marcey Creek Plain, made with steatite temper and often in the forms of steatite vessels (McLearen 1991:124). Sand-tempered Elk Island (or Accokeek) ceramics were introduced into the region after circa A.D. 900 along with small contracting stemmed- and lanceolate projectile point types, chipped and ground stone tools, and ornaments (McLearen 1991:115-119; Mouer 1991:57).

Many of the settlement and subsistence strategies that developed during the Late Archaic and Early Woodland persisted into the Middle Woodland period. Distinguishing traits of the Middle Woodland consist principally of changes in material culture. Characteristic artifact types include a series of new hafted biface forms such as Potts, Rossville, Fox Creek, and triangle points. In addition, new pottery types occur which are found throughout the Coastal Plain (Stewart 1992:2, 5).

The early part of the Middle Woodland is characterized by Popes Creek and related ceramics (McLearen 1991:41; Stewart 1992:2). These types include crushed rock temper, and frequently exhibit net impressed surface treatment (Stewart 1992:8). During the second half of the period, shell-tempered Mockley ceramics became prevalent in the region. Examples of this ware commonly display net- or cord-impressions, or no surface treatment. Vessels of this type most often possess jar shapes with rounded or semiconical bases. They typically have strait rims which sometimes evidence incised decorations (Potter 1993:62, 66).

Populations of the Middle Woodland emphasized the exploitation of wild food sources through gathering, hunting, and fishing. Although they may have possessed some cultigens, these formed an insignificant part of the total subsistence base (Stewart 1992:13). The trend toward focused and intensified adaptation persisted into the Middle Woodland. These trends imply a degree of social complexity that would include some form of leadership to coordinate the harvesting, processing, storage, and distribution of resources (Stewart 1992:13, 19).

Middle Woodland settlement patterns appear similar to those of the Early Woodland and continue the trend toward greater sedentism (Blanton 1992:68). Settlement of the period is distinguished by lengthy occupations of base camps or hamlets (Stewart 1992:14) and smaller sites occupied during forays from the larger camps to obtain specific resources.

The trend toward sedentism culminated during the Late Woodland period with the establishment of permanently or semipermanently occupied villages and hamlets. Populations in the region grew during the period, and increasingly complex social systems developed. In addition, horticultural production emerged as a significant element of the subsistence base (Turner 1992:97).

Aspects of material culture that signal the period include distinctive pottery types that derive from late Middle Woodland varieties and which mirror the widespread homogeneity that existed earlier. Initially, the dominant Late Woodland ceramic consisted of shell-tempered Townsend wares, which most frequently display fabric-impressed and incised surface treatments. By the later portion of the period, the spatial range of this pottery type had become constrained to the margins of the Chesapeake. Along upper portions of the James River and the Appomattox River Townsend ware was replaced by sand and crushed quartz-tempered Gaston ware. Other forms of material culture include triangular projectile hafted bifaces, other chipped-stone implements, and ground axes and pipes (Turner 1992:103-104).

An important difference between the Late Woodland and earlier periods involved a greater reliance on horticultural production. By the early Late Woodland, varieties of maize, beans, and squash had been introduced to the region, and local populations raised produce in fields prepared through slash and burn techniques (Potter 1993:101; Turner 1992). Due to the meagerness of regional data relating to these cultigens, the proportion of the Late Woodland diet that they composed can not be evaluated. Wild foods, however, appear to have continued to make up a significant percentage of the overall diet (Turner 1992).

Potter (1993:100-101) notes that Late Woodland settlement patterns varied over time. Potter's data from the Potomac Valley suggest that by the late Middle Woodland period, populations occupied large residential villages. During the early Late Woodland, however, the population scattered into dispersed small settlements, possibly as a result of environmental changes. The introduction of horticulture also permitted the region's population to expand into new environments. Small resource-procurement camps continued to occur in association with these settlements. By the second half of the Late Woodland period, populations began to coalesce into denser settlements, often encircled by palisades. These latter features, in combination with less dispersed settlement,

could indicate increasing intergroup conflict (Potter 1993; Turner 1992:113). In addition, survey data from the James River valley suggest greatly reduced utilization of interior areas and secondary drainages than occurred during earlier periods. This shift probably reflects the introduction of cultivation, which was more suited to floodplain and terrace locations along major drainages (Turner 1992:114).

By the Late Woodland, the Virginia Coastal Plain was populated by Algonquian-speaking groups organized into a complex chiefdom level society. Information regarding the attributes of these societies comes primarily from ethnohistorical data; archaeological data do not clearly point to complex social organizations during this period (Turner 1986). Characteristics of the Powhatan chiefdom, encompassing most of the Chesapeake Bay shoreline, appear to have included social ranking, hierarchical settlement patterns, unequal access to resource surpluses and exotic goods (including European trade items after contact), and differential burial practices according to rank (Potter 1989; Rountree 1990; Turner 1992).

HISTORIC CONTEXT

This section presents an overview of regional history as well as a more specific history of the project area's immediate vicinity. The following overview of Hanover County history describes more general cultural and historical developments and provides a framework for interpreting the historic archaeological resources identified during this Phase I survey.

HANOVER COUNTY OVERVIEW

Hanover County was originally part of Charles River Shire, one of the eight shires created at the founding of the Virginia colony in 1634. By 1654, part of that shire had been designated the county of New Kent. In 1720, residents of the upper, or western, part of New Kent, concerned about their distance from the county seat, petitioned the General Assembly for a division of the county. As a result, Hanover County was created in 1720 but it had no western border. In 1742, Louisa County was created from Hanover's western lands. The county seat was established at Hanover Courthouse and a handsome brick courthouse was constructed between 1737 and 1742 (Peters and Peters 1995:10). Prior to the construction of the court building, the county justices met in a tavern.

Colonizing efforts in Hanover, as elsewhere in Virginia, concentrated first along navigable waterways, and initial settlement in the County occurred along the Pamunkey River and its major tributaries. The first land patents were issued in the 1660s for land along the river with major settlement activity in the 1680s and 1690s. Hanover developed in a dispersed, rural pattern of farms and small communities. Its fertile soils and proximity to river and land transportation routes were the primary factors that influenced land development. The lands along the Pamunkey River were well suited to growing tobacco, which became the first major profitable agricultural crop in the

county. The port towns of Newcastle and Hanover town were established, in part, to accommodate the shipment of tobacco to London and Glasgow.

The first settlers in the county were English men and women which became the dominant culture in Virginia and Hanover County. Other Euroamerican groups that came to Hanover included Scots, Scotch-Irish, and Huguenots with cultures that closely paralleled that of the English. Most Euroamerican immigration to Hanover occurred in the seventeenth, eighteenth, and early nineteenth centuries (Land and Community Associates [LCA] 1992:109). African-Americans soon followed the first English settlers. Initially as indentured servants and later as slaves, they became an integral part of the early tobacco-based society of the county. Tobacco was grown in Hanover with slave labor on both large and small plantations. Population expansion was directly related to the tobacco-dominated economy of the Virginia colony and its demand for new agricultural land. By 1790, Hanover's population stood at 14,754, over half, 8,223, were slaves (Anonymous 1990:9).

Until the mid-to-late twentieth century, agriculture was the major land use pattern in the county. Tobacco production in Hanover peaked in the years before the Revolutionary War and gradually declined in the early nineteenth century. This was due to a number of factors including decreased fertility of the land in Hanover coupled with competition from newly opened and more fertile lands further west, declines in the price of tobacco, and changes in the channels of trade (LCA 1992:9). Although tobacco continued to be grown in Hanover well into the twentieth century, mostly in the western end of the county, grains, particularly wheat and corn, became the preferred crop. Throughout the nineteenth and twentieth centuries, the majority of Hanover County farms were general purpose family farms that grew a variety of subsistence crops for home consumption.

The history of Hanover County during the American Revolution is highlighted by the activities of the county's most famous patriot, Patrick Henry. Born in Hanover in 1736, Henry's debut in political circles occurred in 1763 when he argued the penalty phase of what came to be known as the Parson's Cause at Hanover Courthouse. His oratorical skills, first displayed in this case and later in his Stamp Act speech in 1765 and his "Liberty or Death" speech in 1775, provided some of the most inspirational rhetoric of the Revolution. Henry was elected the first governor of the new state of Virginia and returned two times to the statehouse.

Although no battles were fought in Hanover County during the American Revolution, both armies passed through the county. In 1781, British troops burned several homes and warehouses at Hanover town and Newcastle and Cornwallis's army camped in Hanover. Cornwallis reportedly stayed at Hanover Tavern. The following year Count Rochambeau's troops camped at Hanover town en route from Yorktown to New England where they would sail home.

Hanover County's location north and east of Richmond, the capitol of the Confederacy, placed the county in harm's way during the Civil War. Two major campaigns were fought on Hanover soil: the 1862 Peninsular Campaign and the final struggle of 1864-1865. During the Peninsular Campaign of 1862, General George McClellan and the Army of the Potomac clashed several times in Hanover with the Army of Northern Virginia under General Robert E. Lee. The fiercest fighting in Hanover occurred at Mechanicsville and Gaines' Mill. Just prior to this, General J.E.B. Stuart and his cavalry made the famous ride around McClellan to investigate his strength and position.

The year of 1864 was particularly significant for Hanover County. Beginning in May, a series of engagements and battles occurred in Hanover including North Anna, Totopotomoy Creek, and Haw's Shop. They culminated in the Battle of Cold Harbor which was the scene of a horrific loss of life, particularly on the Union side. Within the first hours of battle, some 5,000 Union soldiers were killed or wounded. The sheer quantity of the dead struck even the most seasoned campaigners (Jaynes 1986:165). As a result of these battles, a number of battlefields are found in Hanover and the county contains the largest surviving concentration of earthworks in the Richmond metropolitan area (LCA 1992:56).

Many Hanover men served in the Confederate Army. A particularly noteworthy Hanoverian in the Civil War was Edmund Ruffin, a famous agriculturist and secessionist. Ruffin participated in the firing upon Fort Sumter, the first engagement of the war. In 1865, Ruffin killed himself when the South was defeated. Ruffin lived and was buried at his plantation, Marlbourne, in eastern Hanover which is still owned by his descendants.

Like most of the south, the late nineteenth century was a period of recovery from the Civil War for Hanover County. Transportation routes, notably the railroads, that had been damaged during the war were repaired and were a source of growth for several of Hanover's small villages. Ashland prospered; Randolph Macon College moved there after the war and in the 1880s the Richmond, Fredericksburg & Potomac Railroad (RF&P) promoted Ashland as a Richmond suburb.

The countryside continued to be dominated by agricultural pursuits although the harvest of timber played an increasing role. In the early twentieth century, farmers in the county's western section continued to grow tobacco as a cash crop. In the eastern half of the county with its sandy soils, diverse truck farming became the county's most profitable industry. Hanover County farms successfully produced two agricultural products - tomatoes and melons. Hanover tomatoes are still considered a delicacy. Dairy farming also increased during this period.

By the mid-twentieth century farming had suffered a significant decline in Hanover with a decrease of over 50 percent, from 2461 farms in 1910 to 1074 in 1960. By 1979, there were only 630 working farms in the county, a nearly 40 percent decrease in only 20 years (LCA 1992:11). Today, Hanover is increasingly suburban with numerous residential developments covering the former farm land.

PROJECT VICINITY HISTORY

The project corridor lies just north of the boundaries of the historic Newcastle Town Archaeological Site as defined by the boundaries shown on the National Register nomination form of 1974. Because of the proximity of the project corridor to the site of the now-vanished town as well as its importance in Hanover County history, a history of Newcastle is presented here. This history has been drawn from a variety of sources and focuses mainly on its eighteenth century past. Less is known about the nineteenth and twentieth century history of the town, its demise, and the reintegration of the land into the surrounding agricultural fields. Also presented here is the history of Newcastle Farm which lay just to the north of the town. A brief history of Marlbourne is also given because the project corridor traverses Marlbourne for a length of 762 meters (2500 feet).

Town Of Newcastle History

In 1693, William Meriwether inherited from his grandfather, David Crafford, a 400-acre plantation on the Pamunkey River known as Assaquin. By 1738, Meriwether had laid out a village of half-acre lots on 40 acres of a section of the plantation known as Poindexter's Neck (Colvin 1983:6). The lots were sold and a village formed that was named for the Duke of Newcastle. By the time he laid out Newcastle, William Meriwether was influential locally and had been a member of the House of Burgesses for a few years. In 1744, when the legality of these town lots was upheld by an act of the Virginia General Assembly, Newcastle was described as "much encreased (sic) and improved" (Henning 1969:(5) 257).

About six miles up river from Newcastle, Mann Page II of Rosewell inherited a tract of land known as Mahixen where he constructed a warehouse in 1730. It became known as Page's Warehouse and planters stored their tobacco there prior to shipment abroad. Several years after the founding of Newcastle a group of Scottish merchants built a store at the warehouse. In 1762, Page petitioned the colonial legislature for permission to set aside 100 acres of Mahixen as a town named Hanovertown. Much like Newcastle, it functioned as a river port.

Newcastle was laid out in a grid plan and a 1751 map shows 52 numbered half-acre lots and six lots used for warehouses. John Henry, father of Patrick Henry, was the surveyor. There were three north-south streets, named, from east to west, Water, Second, and Main. It is unclear if Water Street was immediately adjacent to the river or was located up on the bluff. There were two east-west streets with the northern street known as the "Road to Bridge" while the southern street was the "Road to River." They probably descended to the river down the gullies that now exist on the edge of the bluff (Virginia Historic Landmarks Commission [VHLC] 1975:Sec.7). A 1781 map prepared for the French General Rochambeau shows the town laid out in a grid adjacent to the Pamunkey River (Loth 1986:193) (Figure 2). No scale is shown, but the southern margin of the town lies north of the unnamed tributary.

Several roads converged at Newcastle; one from Williamsburg, one to Hanover Courthouse and points west, and one north to the Rappahannock River and Philadelphia. In 1740, the county justices were authorized to build a bridge across the Pamunkey River here and by 1781, there was a ferry across the river at Newcastle (Colvin 1983:7).

Newcastle developed into a center of community activity. Dwellings and their outbuildings, taverns, warehouses, and granaries were constructed in the town. A 1745 Act of the General Assembly forbade the construction of wooden chimneys and ordered that all existing wooden chimneys be removed by the following year (VHLC 1975:Sec. 7). This law appears to have been followed by at least one resident, Walter Douglass. In 1769, he described his Newcastle holdings thusly,

The house that I live in has three rooms below, two of them with fireplaces, and two rooms above, with one fireplace, and brick chimnies (sic), a large kitchen, with a brick chimney, and one room above, a dairy joining it, and two other houses; a garden and another lot joining it, both well paled in; another house, and a shed the length of the house, a large stable, with two, eight feet sheds the length of the house, for holding

grain, sale &c. almost new. They would suit a merchant or a doctor (Virginia Gazette 1769:4:1).

This description also suggests an array of buildings and facilities associated with town lots in eighteenth-century Newcastle. Another type of holding is represented by the description of resident Samuel Pearson who owned a storehouse measuring 36 feet by 26 feet; a granary, 50 feet by 32 feet, a stable, and a chair house all of which were in "good order" and located on the main street (Virginia Gazette 1773:2:3).

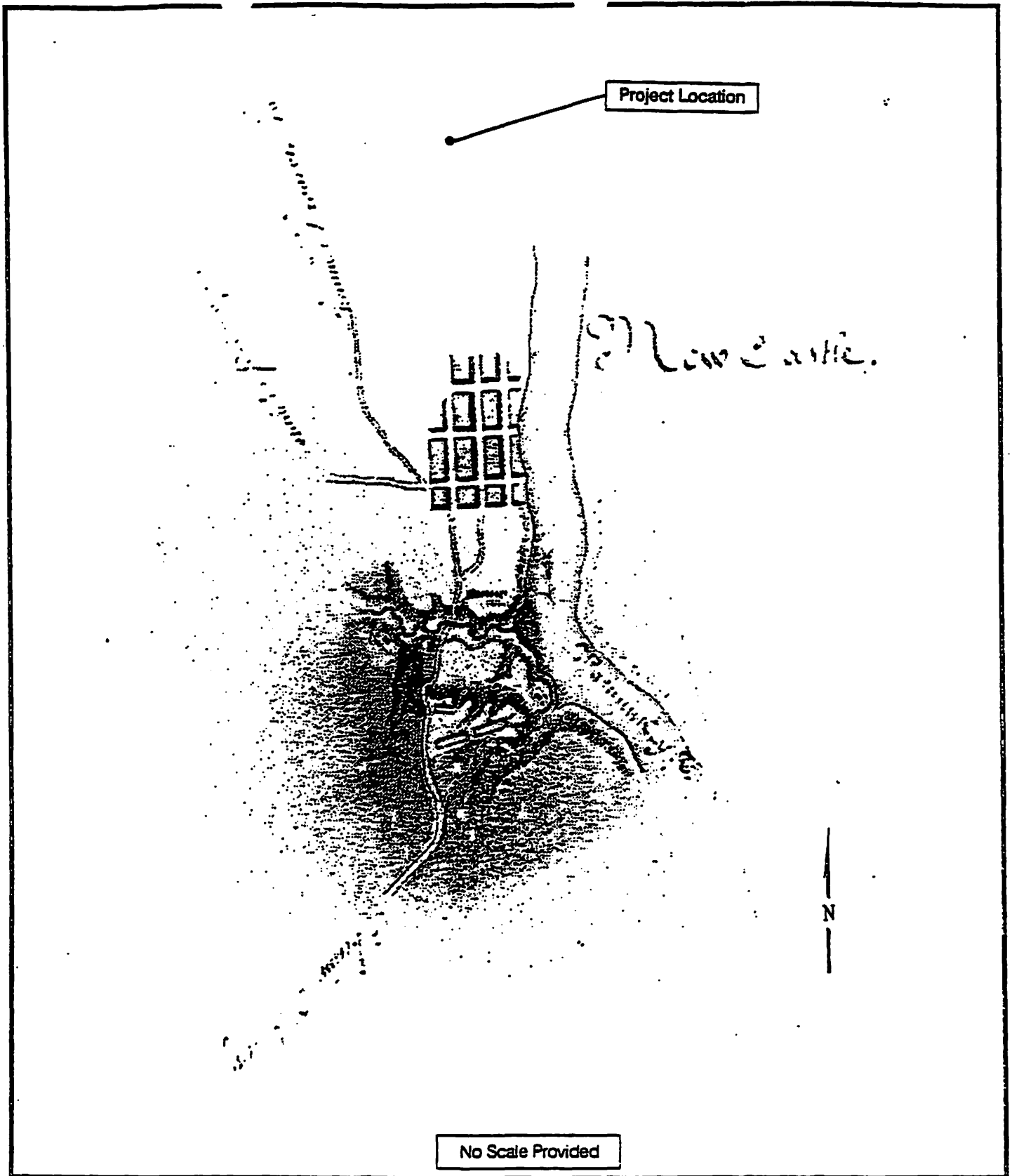
In addition to domestic occupations, planters and merchants had warehouses at Newcastle and several factors for Scottish and London merchants were located in the town. Ocean-going vessels visited its wharves. Tobacco and other agricultural products were shipped out of Newcastle and the breadth of the goods that found their way to the town is illustrated in a 1773 advertisement which listed European and East Indian goods valued at 500 pounds sterling. A flour inspector was appointed for the convenience of millers and shippers in 1780 (Henning 1969:(10)497).

Newcastle also acted as the nucleus for local social events and activities. For example, in August, 1746, the Newcastle house of Nicholas Water was the scene of celebrating for the defeat of Bonnie Prince Charlie's forces at the Battle of Culloden in Scotland. It was reported that

a long Arbor was set up, in which fifty Gentlemen and ladies dined, and several other Tables were full, in the House . . . A large Quantity of Punch was given to the Populace and at each health there was a Volley of small Arms Discharged, and three cheerful Huzzas at each Volley. A large bonfire was made in the evening, and the windows of the Loyalists in the Town were illuminated (VHLC 1975:Sec. 8).

When the removal of the colonial capitol from Williamsburg was contemplated in 1751, Newcastle was of sufficient size and substance that it, along with neighboring Hanover town, was put forth as an appropriate site. John Robinson, speaker of the House of Burgesses, apparently orchestrated this move because he had property in nearby King & Queen County (Tyler 1903-04:8(1)3). Robinson's efforts failed and Newcastle lost by two votes.

Another important event occurred at Newcastle on May 2, 1775. In a precursor to the American Revolution, Patrick Henry rallied Hanover volunteers at Newcastle to march to Williamsburg to protest Governor Dunmore's seizure of the colony's gunpowder. The colonial Governor relented and paid for the powder. In 1781, the troops of Anthony Wayne camped near Newcastle for a week in August. One of the officers described the country as having good water (Bruce 1968:8). French General Rochambeau also left a description of the town: "As you approach Newcastle, the country becomes more gay. This little capital of a small district contains 25 or 30 houses, some of which are pretty enough." Rochambeau's aide described it as located, "on a charming plain . . . and situated rather pleasantly on the banks of the Pamunkey, which is only 192



Rochambeau's 1782 Map of Newcastle
(Loth 1986)

feet wide there. We lunched at the home of a very wealthy person, Colonel Syme" (Colvin 1983:8; VHLC 1975:Sec 8). Not all was well at Newcastle that year, however, with the British setting fire to portions of Newcastle and nearby Hanover town during their march to Yorktown.

By 1800, intensive agriculture in the Piedmont caused the Pamunkey to begin to silt up making it difficult seagoing ships to come up as far as Hanover town and Newcastle. In 1823, Newcastle was described as a post town on the north bank of the Pamunkey River (Colvin 1983:8). Many of the residents moved to a healthier site on the ridge above Newcastle and formed the community known as Old Church. Although no one knows when Newcastle finally disappeared, taxes were still being paid on town lots there as late as 1850 (Colvin 1983:8).

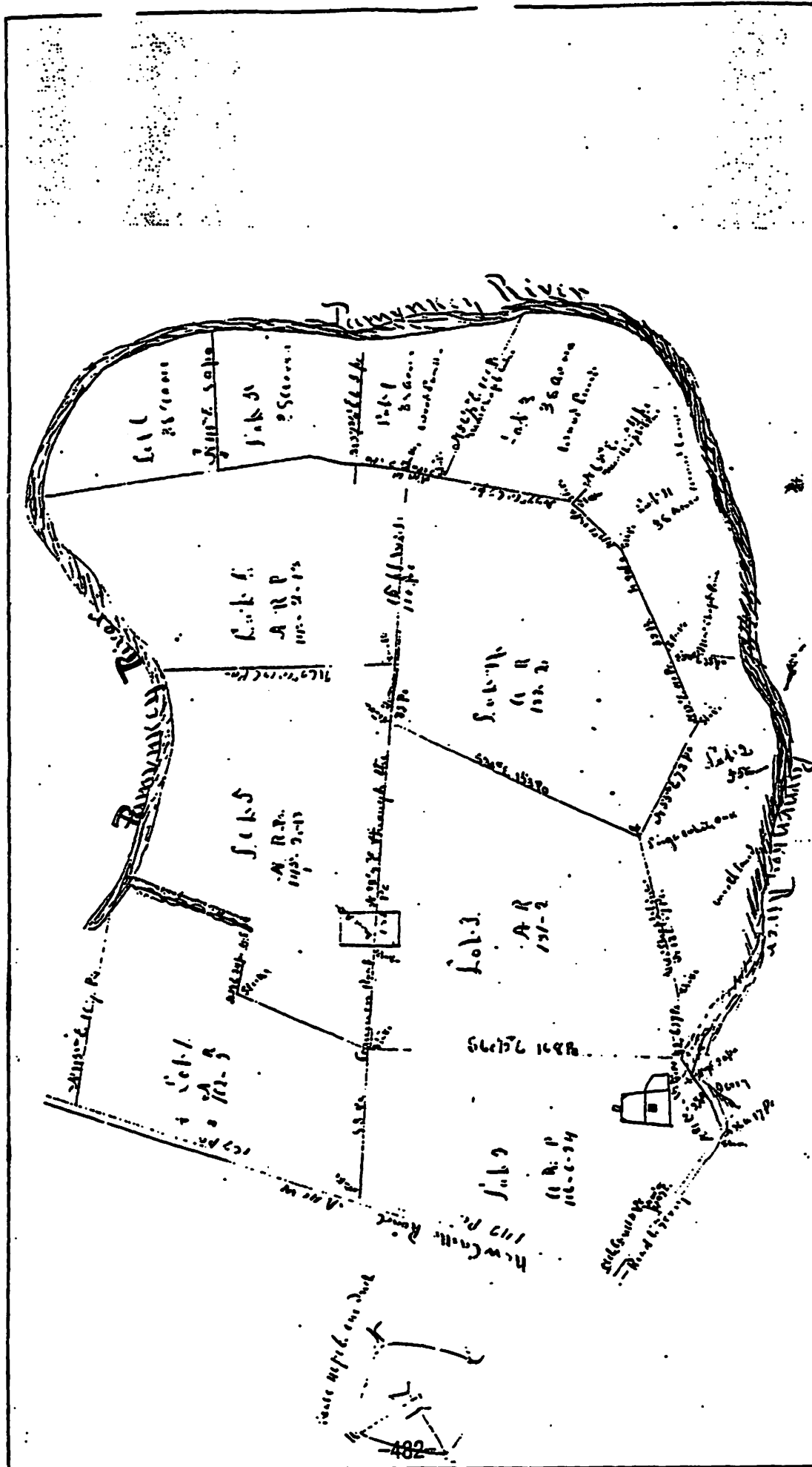
The name Newcastle appears on Civil War era maps of the area. The various maps show as many as three roads converging at Newcastle and locate the ferry either at the sharp bend in the Pamunkey River or just north of the bend. On one map the ferry is labeled Bassett's Ferry. A major road trended to the northwest from the ferry before recrossing the Pamunkey. Of the two smaller roads, one reached the present-day Route 606 opposite Ingleside while the other met the main road (Route 606) further to the east (Cowles 1983:Plate C, XCII, CXXXVII).

The Civil War first came to the Newcastle-Old Church area during General George McClellan's 1862 Peninsular Campaign and for much of that period Old Church was within the Federal lines. On May 26, 1862, a Union detachment marched to the Newcastle ferry where they burned the ferry-boat and captured four rowboats before proceeding downriver (Colvin 1983:69). Federal troops also camped in the Newcastle area (Colvin 1983:71). The Old Church area was once more occupied by Union forces in late May and early June of 1864 before the battle at Cold Harbor.

During most of the twentieth century, the town of Newcastle lay dormant and the land was gradually subsumed into the surrounding agricultural fields. One flurry of activity in the area was the construction of the Richmond and Rappahannock River Railway. It was established in 1912 to connect the counties east of the Pamunkey River with Richmond and to bring farm produce from the fertile Northern Neck area to Richmond. The initial phase extended from the streetcar line at Fair Oaks (Sandston) to the site of Newcastle on the Pamunkey River. Regular service on the sixteen mile line began in 1914 but it never reached the Northern Neck. World War I brought an end to the line but remnants are still visible in the project vicinity (McKenney 1986:93).

Newcastle Farm History

The history presented here for Newcastle Farm refers to the land owned by Spencer Ronae, his daughter, Eliza Roane Ruffin, and Carter Braxton in the nineteenth century. Figure 3 is a plat of Newcastle Farm that dates to 1888 when the farm was divided among the Braxton heirs and this history refers to that land only (Figure 3). Newcastle Farm was later purchased by Bessie C. and Roland Broadbush and incorporated into their other holdings including Marlbourne. Also called the Neck Plantation, present-day Route 360 bisects the property historically known as Newcastle Farm. Newcastle Farm historically did not include the site of Newcastle Town but lay to the north of it.



1888 Plat of Newcastle Farm
(source: Hanover County Plat Book 2:64)

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CARTOGRAPHIC CONSULTANTS

Newcastle Farm bordered the town of Newcastle on the north and descended from the previously mentioned Meriwether family through Mildred Meriwether who married Nicholas Syme. At Syme's death in 1812, the Newcastle plantation and adjacent ferry encompassed 1000 acres (Colvin 1983:9). Spencer Roane, a judge on the Virginia Supreme Court of Appeals later owned Newcastle Farm. In 1823, his estate is charged with 1029½ acres which is labeled "Neck Plantation" in the tax records. It was called the Neck Plantation because the Pamunkey River curves around the farm creating a neck or peninsular. The tax records also show buildings valued at \$400 on the property but give no indication as to the location or function of the building(s) (Hanover County Land Taxes [HCLT] 1823). The following year, his daughter, Miss Eliza Roane, was taxed for this same property, now labeled Newcastle Farm, and the tax rolls indicated it was transferred from the estate of Spencer Roane (HCLT 1824). Eliza Roane married a Ruffin. In 1827, Newcastle Farm was listed under the ownership of Albert G. Ruffin and the building value increased by \$175.01 which was noted as a new building. In 1830, this property was again listed under Eliza's name, this time Eliza Ruffin, and the tax records indicate a substantial building had been erected the previous year. The building value that year increased by almost \$600 for a total building value of \$1172.11 (HCLT 1830). Eliza Ruffin continued to pay taxes on Newcastle Farm through 1838 (HCLT 1838). On January 1, 1838, Eliza Ruffin of the city of Richmond "late of Hanover" conveyed to Carter Braxton "late of the County of Middlesex" 1037 acres

known by the name of The New Castle Tract and also by the name of the Neck lying between the Pamunkey River and the middle of the road leading from Hanover Town to the Ferry at New Castle bounded by the Pamunkey River aforesaid by a reserve of two acres and a fourth or thereabouts (attached to the Ferry aforesaid) which has been carved out of said tract by the upper line of the town of New Castle and by lands adjoining belonging to the estate of one George Blakey decd. (Hanover County Deed Book [HCDB] 1:318).

The following year it was transferred to the ownership of Carter Braxton in the tax records although the acreage increased from 1029½ acres to 1037 acres. That same year Braxton was charged with taxes for the 2-1/4 acre Newcastle Ferry lot which had been transferred from Jane G. Syme (HCLT 1839). For some unexplained reason, the building assessment of the 1037-acre tract dropped from \$1172.11 in 1839 to \$803.70 in 1840 although a note indicated \$109.27 was added for a new building on the property (HCLT 1840). In 1841, the 2-1/4 acre ferry lot with no buildings had an assessed value of \$200 per acre while the adjacent land was valued at \$17.10 per acre (HCLT 1840). Obviously, the ferry was a valuable property.

Carter Braxton was the grandson of one of the signers of the Declaration of Independence, Carter Braxton of King William County. Carter Braxton (the grandson) was born in Frederick County in 1789 and attended Washington College. He married Mary Grymes Sayre who had inherited a considerable estate in Middlesex County (Colvin 1983:25). The Braxtons sold her holdings in Middlesex County and moved to Hanover County with the purchase of the Newcastle Farm and ferry in 1838. These appear to be Braxton's earliest land holdings in Hanover County and he and his family lived on the Newcastle Farm (Colvin 1983:26). By 1843, Braxton had purchased two other tracts of land including a mill and a 71.5 acre parcel on which he constructed his house, Ingleside. In 1843, the buildings at Ingleside were valued at \$3003 as compared with the \$803.70 he was assessed for his Newcastle buildings. There were no buildings on the 2.25 acre ferry tract

(HCLT 1843). Carter Braxton died at Ingleside in 1855 with an estate that included Newcastle Farm and ferry (Colvin 1983:28).

For many years after the Civil War, Newcastle Farm was managed by Carter Braxton's son-in-law, Dr. William H. Macon. The Macons had moved in with her widowed mother during the Civil War and continued to live at Ingleside until his death in 1891 (Colvin 1983:109). About 1870, the heirs of Carter Braxton partitioned Newcastle Farm among themselves. A plat recorded in 1888 shows the division of this property as well as other landmarks in the area (Hanover County Plat Book [HCPB] 2:24)(Figure 3).

Beginning in 1893, the Newcastle Farm was acquired in a series of purchases by Bessie C. and Roland Broaddus from the six daughters of Carter Braxton with the final acquisition occurring in 1912 (Colvin 1983:162, note 15). Bessie C. Broaddus purchased the tract on which the project is located in 1903 (James River Title Agency, Inc. 1999). Bessie C. and Roland Broaddus were the daughter and the son-in-law of Charlotte Ruffin. The upper fringes of Newcastle adjoined the Ruffin farm, Marlbourne, and the Broadduses purchased Marlbourne in 1912 from Charlotte Ruffin (Colvin 1983:115, 118). Roland Broaddus died in 1914 and his son, Alexander Woodford Broaddus assumed responsibility for managing the land. In 1925, he established a dairy on the Newcastle Farm (Colvin 1983:118).

Marlbourne

Marlbourne (042-0020) is adjacent to Newcastle Farm. Before its purchase in 1843 by Edmund Ruffin, Marlbourne was the property of Bartholomew "Bar" Tomlin. The plantation had begun as 196 acres which Mary Blakey, Bar's wife, had received from the estate of her father George Blakey of Richmond (Colvin 1983:18). Tomlin purchased adjoining parcels and in 1840, the Tomlins built a large house on the crest of the bluff overlooking the Pamunkey River bottom lands. Unfortunately, Tomlin was unable to meet his financial obligations and all but a ninety-six acre parcel was sold at public auction on March 13, 1843 (Colvin 1983:18). At a resale of the property in October 1843, the house and 977-1/4 acres were purchased by Edmund Ruffin of Prince George County.

Edmund Ruffin was an accomplished agricultural analyst and is significant in American agricultural history. His experiments with the use of marl as a fertilizer for soils deficient in lime were responsible to making its use popular in Virginia. Ruffin named the property he purchased in Hanover County Marlbourne for the substance. Unfortunately, his land was devoid of marl but the adjacent Newcastle Farm, had an abundant supply of marl and its owner, Carter Braxton, offered Ruffin access to it (Mitchell 1981:52). Ruffin produced a number of publications on agriculture and in 1838 created and edited the *Farmer's Register*, which became one of the most widely read American farm magazines of its day (LCA 1992:10). It was at the end of Ruffin's ten-year stint as editor and publisher of the *Farmer's Register* that he purchased the land in Hanover and moved there. It is, however, Edmund Ruffin's role at the bombardment of Fort Sumter in Charleston harbor at the onset of the Civil War for which Ruffin is most remembered today.

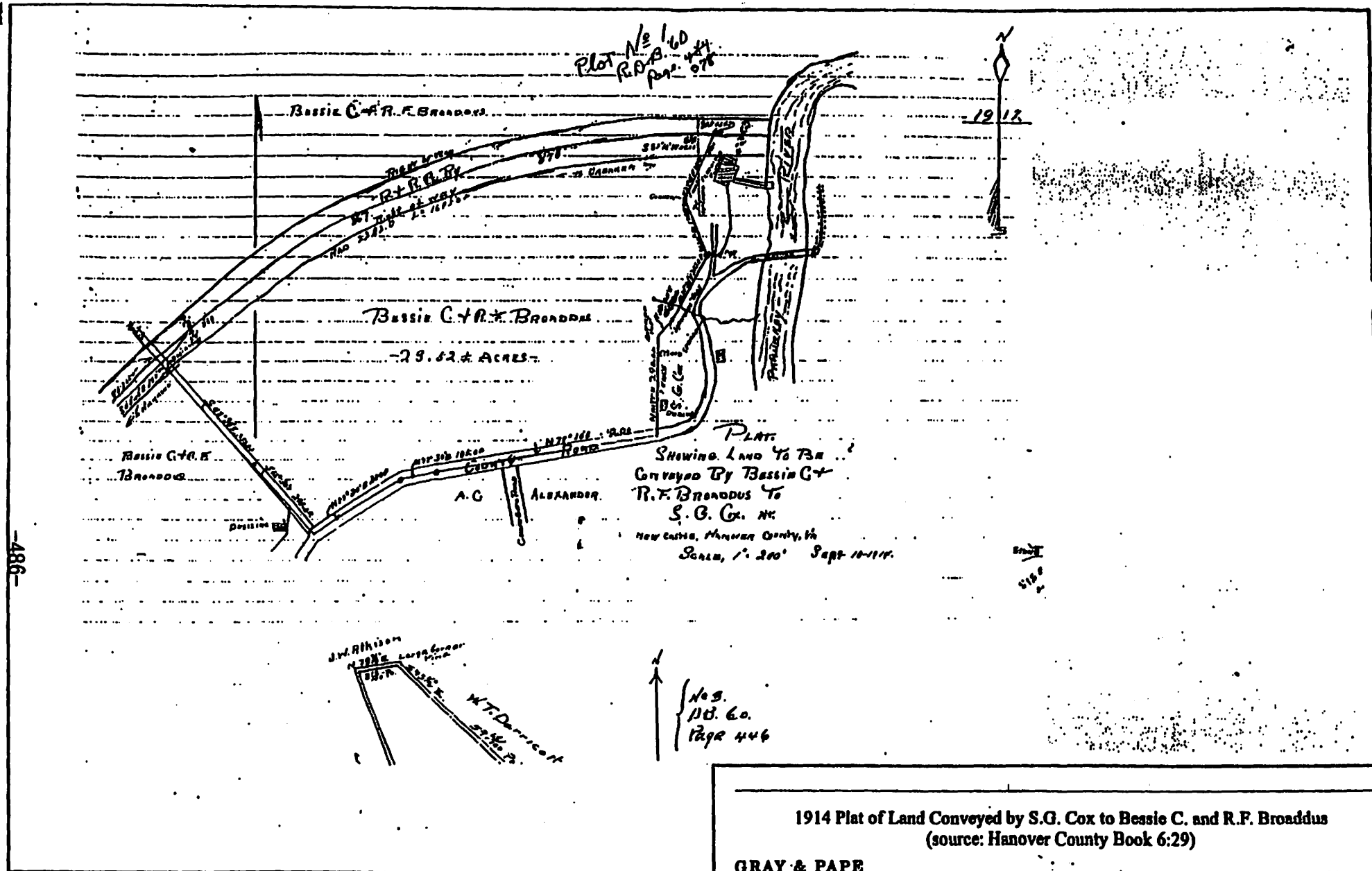
Edmund, his wife Susan, and their six youngest children moved to Marlbourne on January 1, 1844. Their two oldest sons, Edmund, Jr. and Julian Calax, remained in Prince George where they

had already established themselves. Edmund, Jr., the oldest child, purchased his father's land at Coggins' Point in Prince George County where he built his house Beechwood. He also owned land in Charles City County.

Julian Calax Ruffin was the fifth child and second son of Edmund and Susan Ruffin. Julian helped his father in the publication of the *Farmer's Register* and 1843 the elder Ruffin had given Julian a tract of land in Prince George County as well as slaves to work the land. Julian married Charlotte Meade of Cedar Level near Petersburg in 1852. During the chaos created by the Civil War, both Edmund, Jr. and Julian were forced to move their families from Prince George County and by 1863 had purchased Marlbourne from their father and other family members (Colvin 1983:76). In July 1863, Julian rejoined a militia unit and was killed during the Battle of Drewry's Bluff. Julian's wife and children had moved to Petersburg to escape Union forces in Prince George County and during the siege of Petersburg moved to Marlbourne.

After the war, Marlbourne was partitioned between Julian's family and Edmund, Jr. Edmund received the portion that became known as Upper Marlbourne and Charlotte received the existing house and 606 acres of land. Charlotte Ruffin and her family continued to live at Marlbourne and became fixtures in the Old Church community. Charlotte's oldest son, Julian, managed his mother's property after he returned from school in 1896. In 1905, he purchased Upper Marlbourne which had been sold out of the Ruffin family in 1902 (Colvin 1983:102, 115). As noted above, Mrs. Ruffin's daughter, Bessie, and her husband, Roland C. Broadus, a lumberman and farmer, purchased Marlbourne in 1912 (Colvin 1983:115).

The Richmond and Rappahannock River Railway was constructed through the combined Broadus property in the early twentieth century and a series of plats dated 1913 to 1915 show the its right-of-way in the project vicinity. Other landmarks in the area are also shown on these plats. One plat shows the rail line as well as a proposed siding running southeast of the main line and just to the northwest of a fertilizer factory on the Pamunkey River (HCPB 6:15). Another shows the railroad right-of-way just down river from the sharp bend in the river, the fertilizer factory and its pier on the river, the bridge crossing the river and to the road leading to it which trends to the river from the south and west (HCPB 6:29)(Figure 4). Also shown is a dwelling marked S.G. Cox, a shed, and fence line west of the road and an unmarked building between the road and river. All of these features appear to be within the boundaries of Newcastle Town Archaeological Site.



1914 Plat of Land Conveyed by S.G. Cox to Bessie C. and R.F. Broadbuss
(source: Hanover County Book 6:29)

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CHAPTER IV. RESEARCH DESIGN

To evaluate the project area's potential to contain archaeological resources, Gray & Pape reviewed archaeological site inventory data at the Virginia Department of Historic Resources (VDHR) as well as articles and survey reports that discuss prehistoric and historic settlement, land use practices in the project region, and historic map data. Phase I survey expectations, based on the results of this review, are presented below.

PREHISTORIC ARCHAEOLOGICAL RESOURCES

A review of the archaeological site inventory at the VDHR indicates that only two sites (44HN2 and 44HN126) with prehistoric components have been recorded within 1.6 kilometers (1.0 mile) of the project area (Figure 1). A number of additional sites with prehistoric components have been recorded in the project vicinity.

Site 44HN2 consists of a prehistoric and historic site. Surface collection at this site produced prehistoric artifacts classified on the site inventory form as "points" and "sherds," which indicate a Woodland component. It lies alongside an intermittent drainage north of the survey area. This site's location is inside a broad meander of the Pamunkey River and local topographic data suggests that several abandoned stream channels are located within the meander. The stream adjacent to Site 44HN2 flows through one such abandoned channel. In combination, this topographic information suggests that the site may have been located closer to the Pamunkey River in the past. Interpretations about site function are difficult to put forth due to insufficient site file data and a lack of paleoenvironmental data. The site form indicates that this site measured 2.0 hectares (5.0 acres) and lay in surface deposits.

Site 44HN126 is situated north of the survey area and straddles an ephemeral tributary of the Pamunkey River. This site also represents prehistoric and historic occupations, although the site file data does not indicate site type or chronology.

A concentration of five sites (44HN35, 44HN36, 44HN37, 44HN38, and 44HN127) with prehistoric components lie east of the survey area. These sites all lie along bluffs on the south bank of the Pamunkey river, in situations similar to the present project area. The largest of these sites is 44HN127, estimated at 11,668 square meters (125,600 square feet). The other four sites are comparatively small, measuring between 200 and 750 square meters (2153 and 8073 square feet). The site file data suggest that none of these sites have been systematically investigated beyond identification surveys. Nevertheless, Site 44HN127 has yielded high numbers of prehistoric materials from several episodes of surface collecting. Diagnostic articles from this site include 180 projectile points indicative of the Early Archaic through Late Woodland periods. A low number of pottery sherds was also recovered from the site along with assorted flaked and ground stone implements and cobble tools. The site is described as a "multicomponent camp complex," and the collected

assemblage certainly suggests that a range of activities took place at the site during different time periods. Without further data, however, it is difficult to assign this site to a functional category.

The other sites are also hard to classify in terms of function. Each site appears to have been identified through small surface scatters of artifacts, reported as sand- and shell-tempered sherds and "chips." The only exception to this is Site 44HN36, which produced a sample of 608 pottery sherds recovered over a period of several years of surface collecting. An attachment to the site file indicates that 306 of these sherds could be identified as to type, and this total is dominated by 206 Gaston Simple Stamped sherds, indicative of a Late Woodland/early historic component at the site. Other types recovered in much lower numbers include Accokeek, Pope's Creek, Prince George, and Roanoke Simple Stamped wares, indicative of Early through Late Woodland occupations. In addition, three Colonoware sherds suggest a Contact period or early Historic period occupation.

These data suggest the types of prehistoric archaeological resources that could be encountered within the two survey areas. Survey reports and articles (Mouer 1986; Stinson and Wheaton 1982; Voigt et al. 1990) further suggest the possible site types likely to occur. Two principal site types are most often encountered in the Fall Zone region: base camps and limited-activity camps. Base camps represent locations where micro- or macroband groups congregated for relatively long periods. Such sites are relatively large and show evidence of intensive occupation, such as high numbers of artifacts and features. Features may represent dwellings or other structures, storage pits, hearths, middens, and burials. Late Woodland sites may also include evidence of palisaded settlements. In addition, such sites include a high degree of intrasite artifact variability, indicating that a number of different activities took place at them. In the coastal plain, this site type most often occurs in association with riverine settings, not in upland environments such as the project area. Such sites might be expected to occur on river terraces or in locations that exhibit more facil access to the river than the present survey area.

In contrast to base camps, limited-activity camps reflect locations occupied briefly by single individuals or small groups during forays from base camps. Such sites were occupied to perform specific tasks, such as resource procurement and/or processing. They are characterized by low to moderate density scatters of artifacts and assemblages display little artifact variability, indicating that few different activities took place. Features may be present but not in high numbers, and they should exhibit little functional variability. This site type occurs in upland locations in the region, most often in settings like bluff edges overlooking swamps and major watercourses, knolls, dry areas near springs or other water sources, and near surface outcrops of lithic raw materials (Stinson and Wheaton 1982:11).

This review indicates the project area's sensitivity for prehistoric archaeological resources, as well as for the types of resources most likely to occur. The eastern portion of the survey area lies on a table terrace adjacent to the Pamunkey River, which would have afforded easy access to this important waterway and its riverine resources. An erosional gully just south of the project area could have been used to travel to the river, although it is also precipitous and may have required some modification. There is, however, no evidence that this feature existed during the prehistoric period. The poor access to the river suggests that the project area would have been less suitable for a residential site. Also, more accessible locations are present further upstream from the project area. Thus, prehistoric archaeological sites likely to occur in the project area are limited-activity camps.

Based on diagnostic artifacts found in the immediate vicinity, Archaic through Woodland period resources may be encountered. As noted previously, though, the Pamunkey River has been eroding this location, and it is possible that evidence for the earlier chronological periods is no longer present.

HISTORIC ARCHAEOLOGICAL RESOURCES

The archaeological site inventory files indicate that the project area lies approximately 46 meters (150 feet) north of the boundaries of Site 44HN86 (Figure 1). This site represents the historic Town of Newcastle, listed on the Virginia Landmarks Register as "Newcastle Town Archaeological Site." As discussed in Chapter IV, Newcastle was founded in the 1730s on the west bank of the Pamunkey River and remained occupied until the first part of the nineteenth century, serving primarily as a river port and market center during this period. A 1781 map prepared for the French General Rochambeau shows the town laid out in a grid adjacent to the Pamunkey River (Loth 1986:193)(Figure 2). No scale is shown, but the southern margin of the town lies north of an unnamed tributary of the river. The archaeological significance of the site lay in its early abandonment and the low levels of disturbance to the area since then. Owing to these factors, the site may contain significant archaeological information about a pre-Revolutionary War American port town (English 1975). The Newcastle Town Archaeological Site was listed in the Virginia Landmarks Register in 1975. Although a National Register of Historic Places (NRHP) nomination form was prepared for this archaeological site in 1975, it was never listed in the National Register.

Information available from the VDHR files for Newcastle (archaeological file 44HN86 and architectural file 42-101) provides information on previous archaeological investigations at the town site. The archaeological site file, dated January 1978, indicates that an archaeological investigation had been undertaken by Alistair MacDonald and the property owners. The site form states that a section of the field at the site of the town proper had been opened to reveal several brick walls of what appeared to be cellars. Other brick features had been exposed by field cultivation practices. North, or upriver, from the town site, it was noted that grading operations had exposed one human grave adjacent to a brick foundation (Site Form 44HN86). The human remains were reinterred on the site and are now marked with a modern marble gravestone (Frances Broadus Crutchfield personal communication, 2 November 1998; *Herald Progress*, 14 September 1998). Artifacts noted at the time of the site visit by David K. Hazzard of the Virginia Historic Landmarks Commission (VHLC) Archaeology Office (predecessor of the VDHR) included creamware and pearlware. Further, a letter from Alastair Macdonald (1975) to Virginia Shaw English in the files of the VDHR suggests that archaeological testing at this site consisted of surface collection and the excavation of a single 10-foot square. The surface collection resulted in the delineation of an artifact scatter measuring 457 meters (1500 feet) north to south (parallel to the river) and extending 182 meters (600 feet) west from the river. Artifacts included fragments of eighteenth and nineteenth century ceramics, glass bottles, and tobacco pipes. The test unit excavation exposed portions of a brick foundation (Macdonald 1975;). No further information on archaeological excavations of Newcastle was found in the VDHR files.

A map attached to the NRHP nomination form indicates the boundary of Newcastle extended between the abandoned railroad grade on the north and an unnamed Pamunkey River tributary to the south (Figure 1). Moreover, the map attached to the NRHP nomination depicts areas where artifacts

were recovered, and these do not include the wider area encompassed by the site boundary in this map. The northern of these two areas is labeled "slight evidence of 18th-and early-19th century occupation." The southern area of the two, which is represented by a rectangle, is labeled "Archaeological evidence of extensive 18th century occupation." When the NRHP form was completed in 1975 a justification of the boundaries selected for the site was not required and the Verbal Boundary Description section on the form was not completed. Thus, it is unclear how this boundary was established or what evidence supported it. The present project area lies just north of the recorded site boundary as well as the two areas of artifact concentrations.

Nevertheless, the proximity of this the documented town site to the project area suggested at least a moderate potential for historic archaeological resources in the survey area. Rochambeau's map depicts two roads extending from the south margin of the town. These roads flow together, then continue southward across the unnamed stream before heading into the uplands on the stream's south side. The distance that this road lay from the survey area cannot be determined from the historic map. However, its presence suggests the possibility that outlying settlement associated with the town could have been located in the immediate vicinity of the survey areas.

Thus, based on the presence of the Town of Newcastle, the survey area was characterized as having a moderate to high potential for historic archaeological resources. The types of resources likely to occur consisted of eighteenth- to early nineteenth-century occupations. The function of any such occupations could not be evaluated.

OTHER HISTORIC RESOURCES

Other historic resources in the area include an early twentieth century railroad bed, bridge abutments across the Pamunkey, house ruin and the Marlbourne Historic District (042-0020) which is also a National Historic Landmark. As noted in the historic context section, a quasi-train/streetcar line was constructed through eastern Hanover. Its bed is still visible in sections through eastern Hanover including the Cold Harbor and Old Church areas. In some areas it is noted on USGS topographic maps as "old railroad grade." Parts of the line that are still visible were surveyed as part of the survey of historic resources undertaken by Hanover County between 1989 and 1992 (LCA 1992). The railroad bed is a noticeable landscape feature where it crosses the Broadus property. In some areas it is an elevated bed while in others it is a depression and the easternmost surviving segment is filled with water. A farm road also utilizes part of the railroad bed.

The abutment for a bridge across the Pamunkey River in this vicinity is most noticeable on the King William County side of the river. Constructed of concrete, it was built when the Richmond and Rappahannock River Railway was just beginning in the early twentieth century. It appears to have been a bridge for automobile and other vehicles (Colvin 1983:118).

The ruin of a dwelling stands just south of the pipeline corridor. Photographs of this house taken between 1972 and 1975 while it was still standing show that it was a two-story, three-bay, frame dwelling with board and batten siding and stood on a low brick foundation (Plates 1-4). Standing-seam metal covered the gable roof and there was a center chimney, which today is the most noticeable feature of the ruin. Features such as the board and batten siding, center chimney, the



Plate 1. House (1972-1975 photograph)
(Historic photograph courtesy Frances Broadus Crutchfield)



Plate 2. House (12/1998 photograph), view to the east.

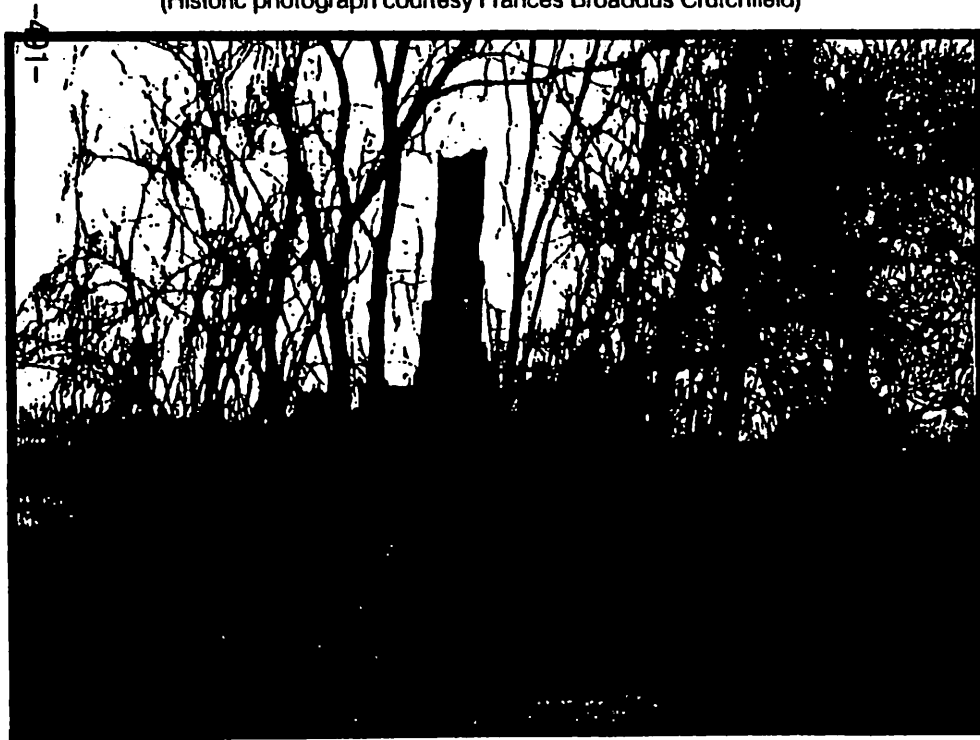


Plate 3. House (12/1998 photograph), view to the southeast.

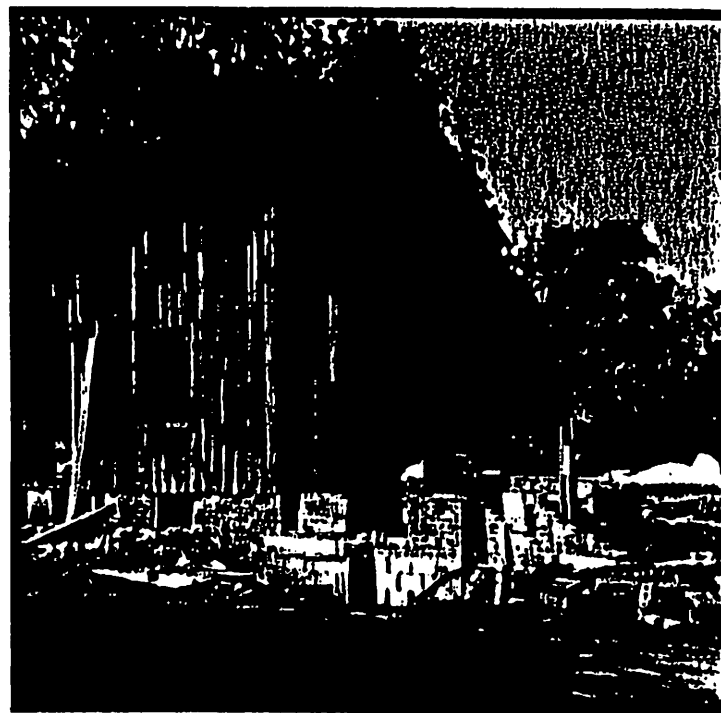
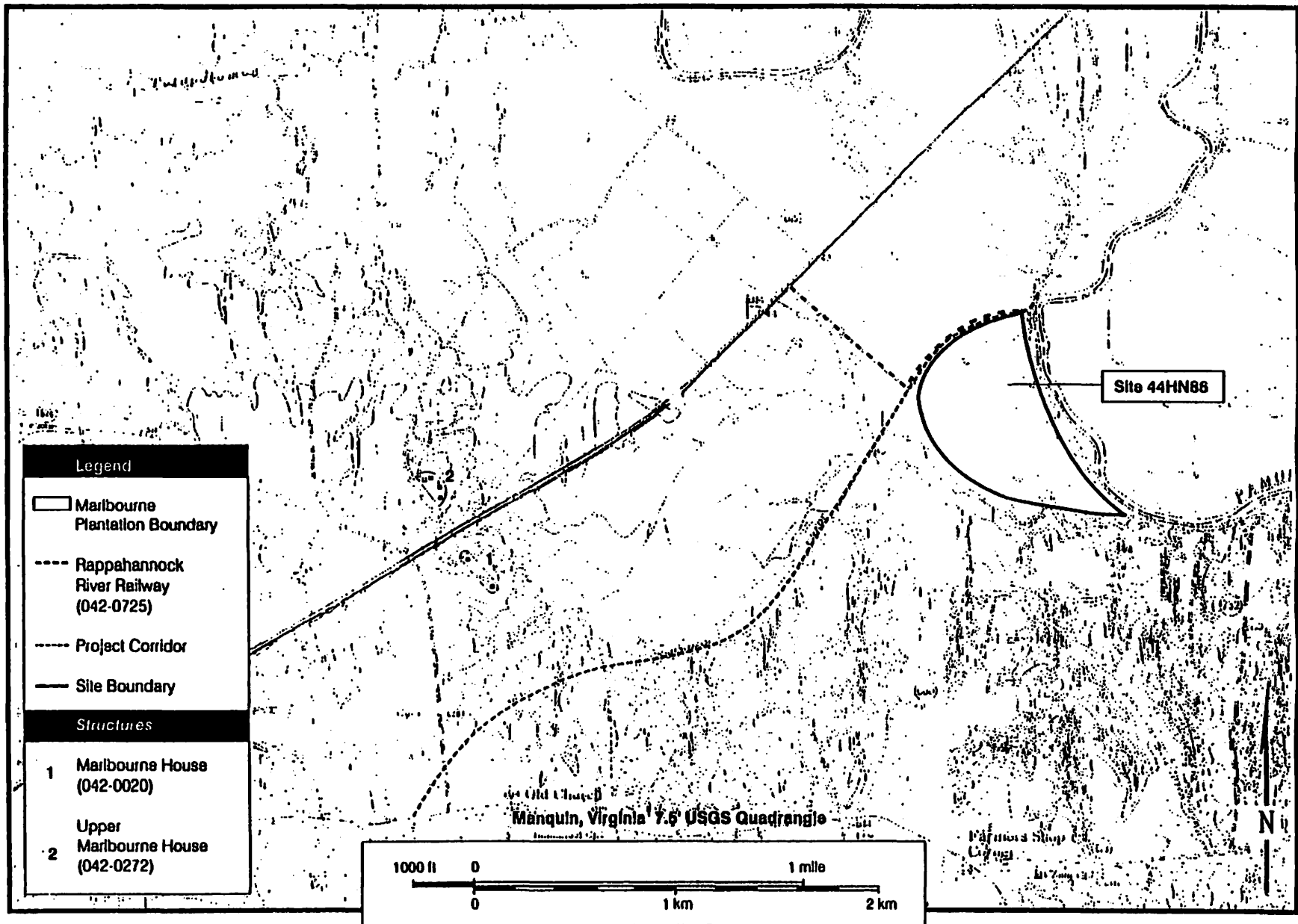


Plate 4. House (1972-1975 photograph)
(Historic photograph courtesy Frances Broadus Crutchfield)

scalloped bargeboard in the gable ends, and the square-headed hoodmold over the door indicate that this house was Gothic Revival in style and was probably built in the 1840s or 1850s. There were only a few examples of this style built in Hanover county and two of the best examples of this style of architecture are found in the Old Church area (LCA 1992:36). They are Immanuel Church and the Immanuel Church Rectory. The Library at Hickory Hill was also built in the Gothic Revival style. Today, all that remains of this house is the brick foundation, with some 1970s additions, and the center chimney. The photographs of the house taken between 1972 and 1975 were supplied by Frances Broadus Crutchfield.

Marlbourne (Edmund Ruffin Plantation) (042-0020) was listed as a National Historic Landmark (NHL) in 1964 and placed on the Virginia Landmark Register in 1969. The NHRP nomination form prepared in 1974 lists its Areas of Significance as Agriculture and Political. Marlbourne was the home of noted agriculturist Edmund Ruffin from 1843 until his death in 1865 and the site of many of his pioneering agricultural experiments. The fields of Marlbourne still contain traces of the marl pits and irrigation sites created by Ruffin as part of his agricultural experiments at this farm. Ruffin, who was also an ardent secessionist, is credited as giving the signal to fire the first shot against Fort Sumter in Charleston harbor. With the collapse of the Confederacy in 1865, Ruffin committed suicide. He is buried in the family graveyard near the house at Marlbourne. The NHL and NRHP boundaries for Marlbourne are those owned by Edmund Ruffin 1843-1855 and includes approximately 1200 acres. This project pipeline corridor traverses the Marlbourne NHL for a length of 762 meters (2500 feet) immediately adjacent to an existing farm road (Figure 5).



Boundaries of Marlbourne (042-0020) (Edmund Ruffin Plantation)
(Source: Marlbourne National Register Nomination Form)

CHAPTER V. PROJECT METHODS

ARCHIVAL RESEARCH METHODS

Archival research entailed the examination of many types of documents including real estate deeds and plats, real estate tax records (land tax books), historic real estate advertisements, National Register of Historic Places nomination forms, county architectural surveys, census records, maps, local histories, and published histories of the region. Repositories visited to conduct research included the Library of Virginia, the Virginia Department of Historic Resources, the Pamunkey Regional Library, and the Hanover County Clerk's Office.

FIELD METHODS

The goal of the Phase I archaeological survey was the identification of all archaeological resources within the 0.59-hectare (1.48-acre) survey area. The fieldwork included a systematic investigation of surface and subsurface contexts. Pedestrian reconnaissance, restricted to the proposed corridor and outfall/cascade aerator site, served to refine preliminary characterizations of the project area and its archaeological resource potential. Additionally, the reconnaissance included inspection of exposed areas of ground surface, and other clear areas to identify archaeological deposits or features.

Subsurface investigation included the excavation of systematic shovel testing and soil probes across the Project. Shovel tests lay at grid points established within the two survey areas. The grid was established on north and south axes. Points along the north-south axis of each survey area were indicated by numeric designations, and points on the east-west axis were indicated with letters. Specific grid points, which lay at 15-meter (50-foot) intervals, were identified by alphanumeric designations.

Shovel tests were placed at 7.62- or 15-meter (25- or 50-foot) intervals. Excavation proceeded according to natural stratigraphy and all soil was screened through 1/4-inch mesh hardware cloth to facilitate artifact recovery. Soil texture was described with reference to standard definitions, and descriptions of soil color followed the Munsell soil color charts. All pertinent information on each shovel test excavation was maintained on standard forms. Color photographs were taken of each survey area to document disturbance, slope, and other relevant characteristics. Finally, maps of each survey area were prepared that depicted shovel test locations and other pertinent data.

LABORATORY ANALYSIS

Initial processing of recovered artifacts included washing and sorting according to raw material category and provenience. A computerized field specimen log was generated during this

process which was then used to compile an inventory of the materials recovered during the field work (Appendix B). Artifacts were then examined and described using the following methods.

PREHISTORIC ARTIFACT ANALYSIS

For the purpose of this study, technological and morphological attributes of artifacts formed the basis of the analytical process. Since only two prehistoric artifacts were found, artifact analysis was limited to identification of flake type and raw material.

A description of the artifact types identified during this Phase I survey follows. This discussion is organized by material group. The taxonomy employed for this analysis follows Kozarek (1987) and Taylor and Koldehoff (1991).

Lithics

Debitage

Debitage consists of all lithic refuse generated during the process of manufacturing, reworking, or maintaining chipped-stone tools. Debitage does not include debris that has been subsequently modified or utilized.

Secondary flakes: Flakes produced during the intermediate tool and/or core shaping process. Secondary flakes are typically longer than they are wide and exhibit a lenticular platform. These flakes do not exhibit a prominent Hertzian cone, are considerably thinner than the primary flakes described above, and display many scars from previously detached flakes. General reduction/thinning flakes and bifacial thinning flakes fall into this category. They may be produced during the middle and late stages of tool manufacture or during tool maintenance and reworking. Only two secondary quartz flakes were found during this survey (Appendix B).

HISTORIC ARTIFACT ANALYSIS

The initial step in historic artifact analysis involves cataloging the assemblage. Data recorded on each artifact include information on form, material, functional classification, manufacturing technology, and attributes that are chronologically diagnostic. Material classifications are subdivided to afford greater flexibility and detail of inclusive data. The attributes category in the inventory provides additional information on individual size, condition, or completeness.

Identification and classification of historic artifacts for this survey are generally limited to descriptive categories. Examination of the inventory focuses on functional and chronological data. The classification of ceramic artifacts is emphasized for the purposes of this study because of their utility in chronological reconstruction. Other artifacts such as nails and certain types of glass also provide chronological information. The following sections include discussions of the descriptive categories utilized to inventory the artifact assemblages.

Typology and Chronology of Manufacture

The application of standard typological methods served to characterize the historic artifact assemblages. The following sections begin with a review of information used to describe the artifact assemblages and delineate their chronological positions. Information in Jones and Sullivan (1985), Miller (1980, 1988), Munsey (1970), Noel Hume (1970), and Worthy (1982) provided the basis for this categorization.

Ceramics

After identifying specific items (e.g., vessels, chamber pots, etc.), ceramic artifacts were placed into one of three groups based on paste and manufacturing technique: (1) earthenwares, (2) stonewares, and (3) porcelain. Specific artifacts were then categorized by ware type. Date ranges for artifacts were assigned on the basis of ware type and in some instances by the techniques employed for manufacture and decoration. If present, maker's marks also provided information on the date of the artifact.

Glass

For the purposes of this analysis, glass was examined principally for chronological and functional attributes. Glass was first sorted according to the type of object it reflects (e.g., bottle, jar, tableware). Individual artifacts were then assigned to a functional category based on presumed use. Additional information recorded on each glass artifact included color and manufacturing technique.

Chronological analysis of the glass sample was based primarily on manufacturing technique and color. Attributes of manufacture that indicate dates for glass artifacts may include finish treatment, mold markings, embossment, maker's marks, and stylistic elements. Colors may also indicate the period during which the glass was produced. In general, dark green glass represents a type popular until the 1860s. Glass that displays a violet tint represents solarized material to which manganese has been added. This type of glass dates between 1880 and 1914.

Other artifacts

Changes in nail manufacturing technology provide the basis for determining dates for construction on a site. In general, handmade nails date to the period prior to the 1820s. Machine-cut nails became common between the 1820s and 1870s. Wire nails, invented in the 1850s, came into popular use in the 1870s.

Other artifact types can also provide dates. Such information is typically derived from attributes such as material, manufacturing technology, form/function, or maker's marks. This information is recorded when appropriate.

Chronological Analysis

The artifacts recovered from each site indicate the general range of dates during which the site was occupied. In some instances, the same information can be obtained for discrete depositional units at sites.

In general, the artifacts that possessed the earliest dates were assumed to suggest the initial occupation of the site. Furthermore, the artifacts with the latest date of manufacture provided a terminus post quem (TPQ) that refers to the date after which a deposit was generated. For the purposes of these Phase I investigations, TPQs were tentatively utilized to suggest the latest date through which the site had been occupied.

Functional Analysis

All historic artifacts were classified according to functional category. Sorting the materials in this manner provides a convenient organizational scheme for description of all the historic artifacts and provides the basis for suggesting what activities occurred at historic components. The initial step in this analysis involved determining the relative frequencies of functional groups represented within a discrete assemblage. In general, it was assumed that high frequencies of domestic artifacts and architectural-related artifacts indicated a domestic occupation. High incidences of artifacts that represent other functional groups could indicate other, specialized, activities. For example, a high percentage of horse tack and low frequencies of domestic artifacts might indicate the location of a stable. The functional classes utilized for this study are based on South (1977) and are described below.

Domestic group materials are those items that are directly associated with household activities. Elements of this group include food service and storage vessels; furniture items such as vases, mirrors, building enhancements, etc; and food remains such as bones, cobs, nuts, seeds, and shells (e.g., oyster shells).

Architecture group artifacts are identified as those elements associated with the building environment. Artifacts included in this group are brick, mortar, nails, window glass, building hardware, cementing agents, shingles, etc. Not included in this group are those elements used to enhance the building environment.

The *arms* group encompasses all forms of weaponry and accessories. This includes gun and pistol parts, ammunition, knives, swords, bayonets, and so forth.

The *clothing* group designates artifacts associated with clothing such as cloth, leather, fasteners, etc.; accessory items such as belt buckles, shoe hooks, and shoes; and those items used in the construction and repair of clothing such as needles, pins, scissors, and thimbles.

Personal group artifacts include objects that are associated with an individual or with individual use. Coins, keys, tobacco-related artifacts, items for cosmetics and personal hygiene, combs, brushes, and all writing materials are included in this group.

The *activities* group contains objects that have more than one possible function, or those which do not fit into any of the previous functional group classifications. These artifacts include tools, toys, table items, and miscellaneous hardware elements.

CURATION

Following the completion of this project, artifacts will be prepared for curation following guidelines outlined by the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation*. All recovered artifacts will be delivered to the current property owners or to a facility specified by them for permanent storage.

CHAPTER VI. PROJECT RESULTS AND RESOURCE DESCRIPTIONS

The Phase I survey involved systematic shovel testing throughout the entire length of the proposed force main corridor. The field investigations resulted in the identification of one historic archaeological site in the easternmost portion of the study area. In addition, three isolated historic artifacts were also recovered. The fieldwork was conducted on 13-14 January 1999 under the field direction of Jerrell Blake.

SURVEY RESULTS

Subsurface investigations consisted of a program of shovel tests within the proposed 1515 meter (4970 foot) long by 3-meter (10-foot) wide force main corridor and a 31 by 52 meter (100 by 170-foot) area which will serve as the location for the proposed outfall/cascade aerator structure. The proposed force main corridor runs along a dirt/gravel farm road, which begins at Route 360 and trends southeast for approximately 762 meters (2500 feet). The corridor then turns northeast for 698 meters (2290 feet) until it reaches the western bank of the Pamunkey River (Figure 6). A total of 102 shovel tests was excavated throughout the entirety of the project area. Of this total, 21 tests yielded cultural material. As a result, one historic archaeological site, 44HN314, and three isolated historic artifact locations were identified within the project area (Appendix A).

The field investigations began at the proposed outfall/cascade aerator structure location which is situated at the eastern terminus of the project area. The outfall/aerator location measures 30 meters (100 feet) northeast-southwest and 52 meters (170 feet) northwest to southeast (Figure 6). Two shovel test transects (Transects A and B) were excavated within the proposed facility location. Six of seven shovel tests excavated at the outfall/aerator location produced cultural materials. A third line, Transect C, was employed to survey the remaining force main corridor. Along this line, beginning with Shovel Test C1, an artifact scatter was encountered which extended for a distance of 91 meters (300 feet) west of the proposed outfall/aerator location. Taken together, all of these cultural materials relate to Site 44HN314. The specific characteristics of Site 44HN314 will be discussed in the following section.

West of Site 44HN314, three isolated artifact locations were recorded within the project corridor. Each of these locations is described below:

ISO-1

A Bristol glazed stoneware sherd with an Albany slip was recovered in the plowzone of Shovel Test C13 (Figure 6; Appendix B). This isolated artifact represents secondary deposition due to casual discard, road maintenance, and/or agricultural cultivation. Since it represents only one artifact and was recovered in a disturbed context, ISO-1 does not meet the criteria to be considered a site as specified by the Virginia Department of Historic Resources' *Guidelines for Archaeological Investigations in Virginia* (1996). Therefore, it was recorded as an historic archaeological location.

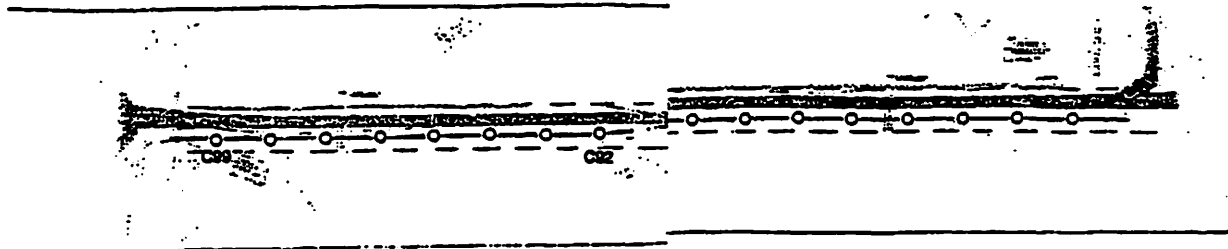
ISO-2

Shovel test C16 yielded two undecorated creamware sherds within the first 20 centimeters (8 inches) of the 10YR4/3, brown sandy loam plowzone (Figure 4; Appendix B). Two additional shovel tests were excavated 7.62 meters (25 feet) to the east and west of the original positive test. No additional cultural materials were recovered from the radials. ISO-2 consists of only 2 artifacts that were found in the disturbed plowzone, so it does not meet the criteria to be considered a site as specified by the Virginia Department of Historic Resources' *Guidelines for Archaeological Investigations in Virginia* (1996). As a result, ISO-2 was recorded as an historic archaeological location.

ISO-3

One shard of patinated, non-machine made green bottle glass was recovered from the plowzone of Shovel Test C30 (Figure 6; Appendix B). Like the other previously mentioned historic locations, this artifact was, most likely, redeposited due to casual discard, road maintenance, and/or agricultural cultivation. ISO-3 does not meet the criteria to be considered a site as specified by the Virginia Department of Historic Resources' *Guidelines for Archaeological Investigations in Virginia* (1996); therefore, this was recorded as an historic archaeological location.

From Shovel Test C30 to the project area's northern terminus at Route 360, a total of 1036 meters (3400 feet), no artifacts were recovered. The typical soil profile in this portion of the project area consisted of 20-centimeter thick 10YR4/3, brown sandy clay loam plowzone and a 10YR6/6, brownish yellow clay. Between Shovel Tests C80 and C92, approximately 152 meters (500 feet), the landform has been graded and graveled to create a parking area for farm equipment and tractor trailers. Subsurface testing, therefore, was not possible along this portion of the corridor, which is also the location of several metal outbuildings and silos (Plate 6). To define the boundaries of the disturbance, soil probes were performed with a split-spoon auger at 15-meter (50-foot) intervals. The soils proved to be a mixture of very compact 2.5Y6/4, light yellowish brown clay loam, 7.5YR5/8, strong brown clay, and 2.5Y5/4, light olive brown sandy loam containing 50-75 percent industrial grade road gravel.

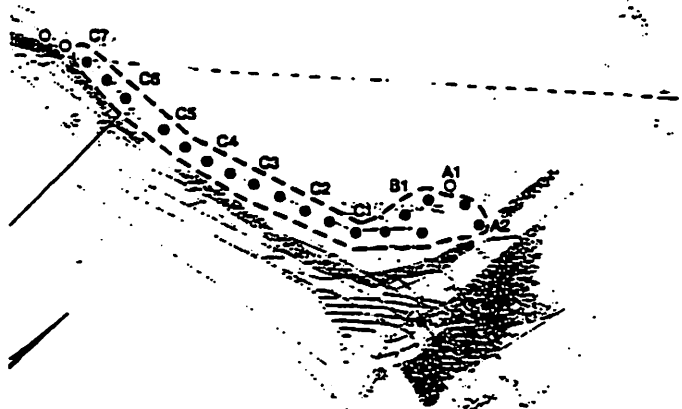
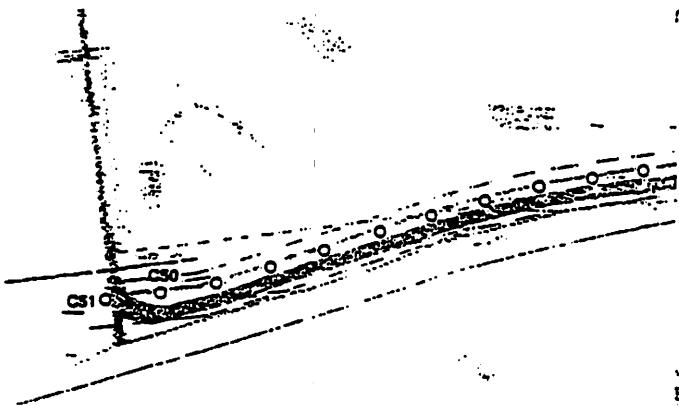
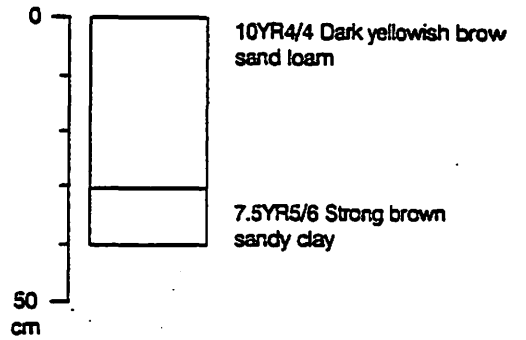


: yellowish brown mottled with
t yellowish brown

: brown mottled with
yellowish brown

ng brown

**Site 44HN314
Shovel Test B1**



Showing Survey Coverage

Figure 6

SITE DESCRIPTION

As noted above, a single archaeological site, 44HN314, was identified at the extreme eastern end of the study area. This cultural resource is described below.

Site 44HN314

Located on a table terrace 30 meters (100 feet) west of a sharp oxbow in the Pamunkey River, historic archaeological Site 44HN314 extends approximately 91 meters (300 feet) to the west along the north side of the dirt/gravel farm road (Figure 6, Plate 5). The site, as defined within the project area boundaries, measures 122 meters (400 feet) east-west, 7.62 meters (25 feet) wide north-south along the force main corridor, and 15 meters (50 feet) wide where the location of the outfall structure was tested. No archaeological testing was conducted outside of the proposed corridor.

Along Transect A, only the first two shovel tests were excavated. Shovel Test A2 was positive, as was its radial, excavated 7.62 meters (25 feet) to the west. These tests contained one sherd of white salt-glazed stoneware and one molded Whieldon/Clouded ware sherd, respectively (Appendix B). The remaining shovel test locations along Transect A fell on the 30-40 percent river bank slope and were not excavated. Along Transect B, only Shovel Test B1 and its radials, B-1+7.5E and B+7.5N, were excavated; all were positive. Shovel Test B1 contained one undecorated creamware sherd and one non-machine made shard of green bottle glass, and B-1 + 7.5E contained one nail of unspecified manufacture, two undecorated creamware sherds, and one flat aqua glass fragment (Appendix B). The typical soil profile on this portion of the landform consisted of a 30-centimeter (12-inch) thick layer of 10YR4/4, dark yellowish brown sandy loam plowzone. The substratum is a 7.5YR5/6, strong brown sandy clay.

On Transect C, the primary path of the force main corridor, artifacts were recovered in shovel tests C1 through C7 and six radials. Creamware, pearlware, whiteware, non-machine made green bottle glass, cut and wrought nails, and kaolin pipe fragments were recovered within this portion of the site (Appendix B). With the exception of Shovel Test C2, the soil strata encountered in these positive shovel tests were very similar to those in Transects A and B, a 30-centimeter (12-inch) thick layer of 10YR4/4, dark yellowish brown sandy loam plowzone followed by a 7.5YR5/6, strong brown sandy clay substratum.

Shovel Test C2 was the only shovel test within Site 44HN314 that exhibited a different soil profile. This profile consisted of a 40-centimeter (16-inch) thick, mottled 10YR4/4 dark yellowish brown and 10YR6/4, light yellowish brown sandy loam plowzone. Along with a small amount of brick and shell fragments in Level I, the shovel test yielded a kaolin pipe bowl fragment, one pearlware sherd, one Whieldon/Cloudedware sherd, one nail, and one glass shard (Appendix B). Level II, 40-65 centimeters (16-26 inches) below surface, was a mottled layer of 7.5YR3/2 dark brown and 10YR6/4 light yellowish brown sandy loam. An unidentified faunal bone fragment, one 5/64"-bore kaolin pipe stem, one burned unidentified earthenware sherd, one nail, two patinated green bottle glass shards, and one undecorated whiteware sherd were recovered in the first 10-15

centimeters (4-6inches) of this level mixed with charcoal and brick fragments. The third sterile subsoil layer consisted of a 7.5YR5/6, strong brown sandy clay.

The discovery of mottled soils and mixture of brick fragments, charcoal, and oyster shell in Level II of Shovel Test C2 suggests the presence a subsurface cultural feature. Two shovel tests were excavated at reduced intervals to the west and east of Shovel Test C2 and although each test yielded artifactual material, no further evidence of the soil anomaly was observed. Without further archaeological investigation, however, it is impossible to determine if the deposits encountered in Shovel Test C2 represent an isolated fill episode or if they are associated with the archaeological remains of a domestic occupation.

Artifact Discussion

The Phase I testing resulted in the identification of a previously unrecorded historic site, 44HN314 and three isolated historic locations. Artifact classes represented in the historic artifact assemblage include architecture, domestic, personal, and miscellaneous groups. The architectural group, represented by 25 items, comprises 23 percent of the assemblage. These items consisted of 7 shards of aqua window glass and 18 nails. The nails include 5 wrought examples, including a Rose-head and a T-head. These specific nail types were commonly used in floor and finishing construction during the seventeenth and eighteenth century (Noel Hume 1970: 252, 253). Four cut nails (first manufactured in America circa 1790 and in common use between 1820 and the 1870s) were also recovered. Six of the remaining nine nail fragments could only be identified as non-machine made, which conceivably places them within the eighteenth century. The absence of steel-wire nails in this assemblage is very telling. The first wire nail-making machines were imported to New York in the early 1850's; however, regular size wire nails were not produced in sufficient numbers to displace cut nails until the last quarter of the nineteenth century (Noel Hume, 1970: 254). Therefore, the structure associated with this assemblage was probably built in the last half of the eighteenth century and any additions constructed well before the 1870s. It is also quite feasible that the structure in question may have been abandoned and/or destroyed by the end of the nineteenth century, but certainly before the turn of the twentieth century.

Only 7 pieces of window glass were identified, but they were such small shards that their manufacturing technique could not be ascertained. Insofar as they could be identified, the brick fragments observed in the field were largely handmade and, thus, consistent with an eighteenth- or nineteenth-century date.

The domestic artifact class includes 48 items, which is 45 percent of the assemblage. This category of artifacts is made up entirely of ceramic vessel and glass bottle fragments. The ceramic assemblage, which totaled 37 sherds, includes 13 creamware sherds, 7 pearlware fragments, 5 pieces of ironstone, 2 Whieldon ware sherds, 2 redware sherds, 2 red paste slip ware fragments, 1 white, salt-glazed stoneware fragment, and one piece of hard paste, undercoated porcelain. The glass sample contains 11 pieces of green bottle glass, very common artifacts on seventeenth and eighteenth century sites. The ceramics recovered provide the best dating evidence for this assemblage: white, salt-glazed stoneware posses a general date range of 1720-1770; Whieldon ware (1750-1775); color glazed, red paste earthenwares (1750-1900); creamwares (1762 and 1770); pearlware (1780-1830); Ironstone (1813-1900); and one sherd of porcelain, which was not well represented in inventories until the



Plate 5. Location of Site 44HN314, looking west.

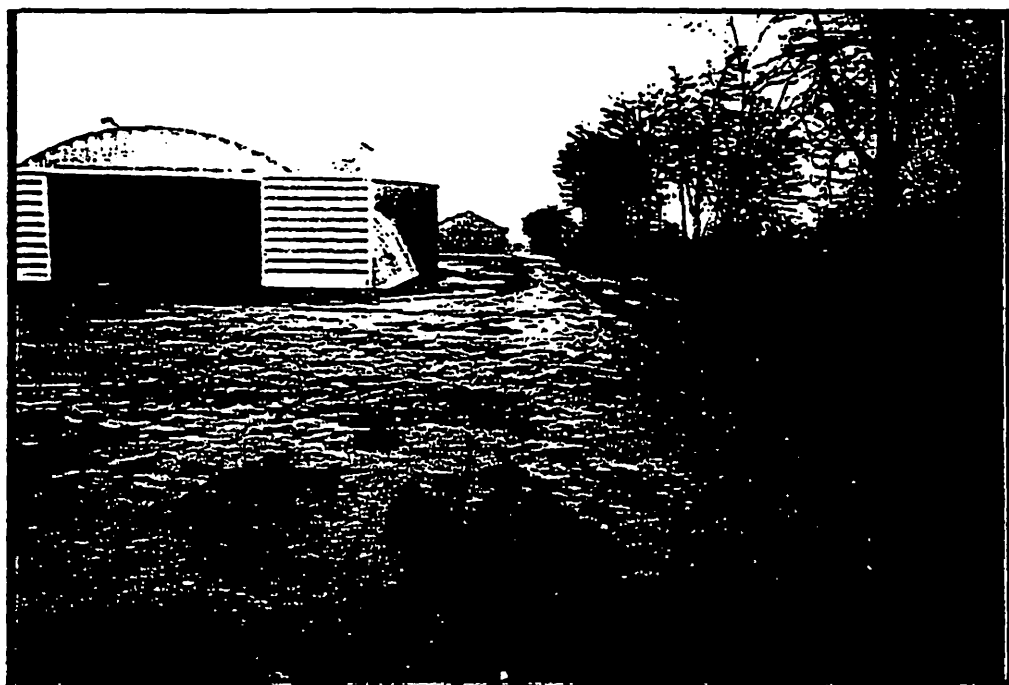


Plate 6. Disturbed area between C-80 & C-92.

second quarter of the eighteenth century (Noel Hume, 1970: 257). While these items suggest a broad date range, they are consistent with a mid-eighteenth to mid-nineteenth century occupation.

Three kaolin pipe bowl fragments and a 5/64" bore pipe stem were recovered at 44HN314. These three artifacts from the personal functional group are commonly found in prodigious numbers on most seventeenth to nineteenth century sites. Even though Binford's straight-line regression formula requires a large assemblage to produce a reliable date, 5/64" bore pipe stems were commonly used throughout the eighteenth century. Thereafter, their use declined as they were replaced by 4/64" bore pipes.

The miscellaneous artifacts include unclassified faunal materials such as bone and shell fragments. The bones are, most likely, remnants of domestic consumption of animal resources, both free range and domesticated species. Bivalves, especially oyster, were a highly utilized resource prehistorically (used very intensively by Woodland groups along the coastal plain and Chesapeake) and historically. Oyster shell is also dumped and disced into agricultural fields to revitalize depleted soils. The final miscellaneous artifacts include glass that could not be identified as to function.

While this assemblage is too small to indicate a specific function for the site, the assemblage appears to represent a mid-eighteenth to mid-nineteenth century domestic occupation. This span is encompassed by the Settlement to Society through Antebellum Period historic contexts. The time range roughly corresponds to the documented period during which the Town of Newcastle was occupied. Given the temporal information provided by the recovered artifacts and the site's proximity to the Newcastle Town National Register property, Site 44HN314 was most likely associated with that town's sphere of influence.

CHAPTER VIII. CONCLUSIONS AND RECOMMENDATIONS

This report describes the Phase I archaeological survey undertaken for a portion of the Hanover County Waste Water Treatment Plant effluent force main and the outfall/cascade aerator structure location. The areas surveyed from Route 360 to the western bank of the Pamunkey River were the corridor proposed for the force main and the proposed location of a wastewater outfall station. The Phase I survey included the preparation of historic contexts, an evaluation of the archaeological resource potential of the survey area, archaeological field work, and laboratory analysis.

The project is located between Route 360 and the Pamunkey River in Hanover County. The project included survey of two discrete elements: (1) a proposed 1515-meter (4970-foot) long effluent force main segment; and (2) a 31- by 52-meter (100- by 170-foot) outfall/cascade aerator structure location. The effluent force main segment corridor measured 3 meters (10 feet) in width. The total area surveyed for this project measured 0.59 hectares (1.48 acres).

The first 1393 meters (4570 feet) of the proposed alignment identified three isolated artifact finds. Each of these isolated finds failed to meet the minimum qualifications for an archaeological site and therefore will not be considered for inclusion on the National Register of Historic Places (VDHR 1996).

The project corridor crosses Marlbourne, a National Historic Landmark and National Register of Historic Places property, for a length of 762 meters (2500 feet) adjacent to an existing farm road. Part of the area has been disturbed by the construction of several agricultural buildings. None of the historic agricultural features associated with the significance of Marlbourne are located in the project. No artifacts were recovered or evidence of subsurface features were identified within the Marlbourne property.

In addition to the isolated finds, the Phase I survey identified one archaeological site. Site 44HN314 is a mid eighteenth to mid nineteenth century historic site located within the last 122 meters (400 feet) of the proposed corridor. Although artifacts were recovered from a 122 meter (400 foot) area within the corridor, the boundaries of Site 44HN314 could not be fully defined due to access restrictions. A total of 105 artifacts were recovered from 17 consecutive shovel tests within the boundaries of the site. These materials consisted of architectural debris and domestic refuse diagnostic of a mid eighteenth century to mid-nineteenth century range of occupation. In addition to the artifactual material, shovel testing at the site also documented the presence of a probable sub-plowzone cultural deposit. This potential feature consisted of a 25 centimeter (9.84 inch) thick layer of dark brown sandy loam which contained moderate to heavy inclusions of brick and shell fragments and other artifactual materials. These cultural materials included a tobacco pipe stem fragment, sherd

from a burned ceramic vessel, and dark green bottle glass fragments. The exact nature of this feature is undetermined although it is very likely that the deposit relates to the historic occupation of the site.

Because archaeological testing was conducted only within the narrow area of the proposed corridor, the boundaries of Site 44HN314 could not be fully delineated. However, because of the number, variety, and age of cultural specimens recovered during the field investigations and the possible association with the nearby Newcastle Town National Register property, any development within the boundaries of 44HN314 should be preceded by further archaeological investigations. As such, Gray & Pape recommends that Phase II archaeological investigations should be conducted to determine whether Site 44HN314 is eligible to the National Register of Historic Places.

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APPENDIX A:
ARCHAEOLOGICAL SITE INVENTORY FORM

Archeological Report

City/Country: Hanover

VDHR Site Number: 44HN314

Other VDHR Number:

Site Name: twp#1

Temporary Designation: 98-30501-1

CULTURAL/TEMPORAL AFFILIATION

Cultural Designation	Temporal Designation
Euro-American	18th Century: 2nd half
Native American	Prehistoric/Unknown

Site Class: Terrestrial, open air

THEMATIC CONTEXTS/SITE FUNCTIONS

Sequence Number: 1.0

Category for thematic context:

Domestic

Example: Dwelling, single

Comments/Remarks:

This is an historic scatter in a plowed field north of the
Newcastle Town Site.

Sequence Number: 1.1

Category for thematic context:

Indeterminate

Example:

Comments/Remarks:

This is two quartz flakes recovered in the plowzone.

Specialized Contexts:

USGS Quadrangle(s): MANQUIN

Loran:

Restrict UTM Data?

Center UTM (for less than 10 acres): Zone/East/North: 18/306600/4170920

Boundary UTMs (for 10 acres or more):

Physiographic Province: Coastal Plain

Drainage: York River

Landform: Second Terrace

Aspect: Flat Elevation: 42' Slope: 0-2%

Site Soils: Pamunkey fine sandy loam with a sandy clay substratum

Adjacent Soils:

Nearest Water Source: Pamunkey River

Distance: 100'

INDIVIDUAL/ORGANIZATION/AGENCY INFORMATION

Individual category codes:

Honorif:

First : Henry

Last : Broaddus

Suffix :

Title :

Company/Agency:

Address:

City:

State: VA Zip:

Phone/Ext:

Individual Category Code

OWNER Owner of property

Notes:

Ownership status: Private

Government ownership modifier:

Site Dimensions: 400 feet by 25 feet

Survey Strategy: Subsurface Testing

Survey Description:

Shovel tests were laid in with a compass and tape using the bench mark spike 42.52' in power pole JP 20 as a reference point. Shovel tests were excavated at 50' intervals, and radials at 25' intervals. See attached site map. No radial were excavated north or south of the

proposed right-of-way due to easement restrictions.

Site Condition: Unknown Portion of Site Destroyed

CURRENT LAND USE

Sequence Number: 1.0

Land Use: Subsistence/Agriculture

Example: Agricultural field

Comments/Remarks:

Land is currently planted in winter wheat.

Specimens obtained? yes Depository: Temporarily with Gray & Pape

Assemblage description:

See attached artifact inventory.

Specimens Reported?

Assemblage description--reported:

Field Notes: yes Depository: Temporarily with Gray & Pape

CULTURAL RESOURCE MANAGEMENT EVENTS

Date: 1/13/1999

Cultural Resource Management Event: Phase I Survey

Organization or Person: Gray & Pape, Inc.

ID # Associated with Event: 98-30501

CRM Event Notes or Comments:

All artifacts were recovered in the plowzone. No intact archaeological or architectural features were identified within the narrow right-of-way tested.

PHOTOGRAPHIC DOCUMENTATION AND DEPOSITORY

Sequence Number: 1.0

Photographic Documentation? yes

Depository: Temporarily with Gray & Pape

Type of photos: Color 35mm Photos

REPORTS, DEPOSITORY AND REFERENCES

Sequence #: 1.0

Report(s)? yes

Depository: Temporarily with Gray & Pape, Inc.

Reference for reports and publications

Phase I Cultural Resources Investigation of the Proposed
Totopotomy Wastewater Treatment Plant Effluent Force Main Segment
and the Outfall/Cascade Aerator Structure Location, Hanover
County, Virginia. Jerrell Blake, Ashley Neville, and Carol S.
Weed, 1

Additional Comments:

Due to the right-of-way restrictions, the site's complete limits could
not be delineated during Phase I survey.

VDHR LIBRARY REFERENCE NUMBER:

1 RECORD IN THIS REPORT

APPENDIX B:
ARTIFACT INVENTORY

**Phase I Cultural Resources Investigation of the
Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

PROVENIENCE			Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description		Date Attribute Range	Count	
Site: 44HN314												
Shovel Test	A 02			Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Salt-glazed	Date	1720-1770	1
Shovel Test	A 02	7.5W		Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware/Clay dedware	Molded	Fragment		1
Shovel Test	B 01			Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	1
Shovel Test	D 01			Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
Controlled Surface	D 01	1mSW		Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	1
Shovel Test	D 01	7.5B		Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment		1
Shovel Test	D 01	7.5B		Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment		1
Shovel Test	B 01	7.5B		Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	2
Shovel Test	D 01	7.5N		Vessel	DOMESTIC	CERAMIC	Earthenware	Unidentified type	Undecorated	Burned		1
Shovel Test	D 01	7.5N		Vessel	DOMESTIC	CERAMIC	Earthenware	Red Paste (coarse)	Color glaze, opaque	Fragment	1750-1900	1
Shovel Test	B 01	7.5N		Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
Shovel Test	C 01			Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment		1
Shovel Test	C 01			Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
Shovel Test	C 01			Iron	MISCELLANEOUS	IRON/STEEL	Panel	Iron	unidentified	Fragment		1
Shovel Test	C 01	7.5R		Nail	ARCHITECTURE	METAL	Iron/steel	Flat		Fragment	1815-1870S	1
Shovel Test	G 01	7.5R		Vessel	DOMESTIC	CERAMIC	Earthenware	Slipware	Slip decorated	Fragment		1
Shovel Test	C 01	7.5B		Vessel	DOMESTIC	CERAMIC	Powcelain	Hard paste	Undecorated	Fragment		1
Shovel Test	C 01	7.5B		Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
Shovel Test	C 02		1	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made (not wire)		Fragment		1
Shovel Test	C 02		1	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware/Clay dedware		Fragment		1
Shovel Test	C 02		1	Vessel	DOMESTIC	CERAMIC	Earthenware	Pewterware	Undecorated	Fragment	1780-1830	2

**Phase 1 Cultural Resources Investigation of the
Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

PROVENIENCE		Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description		Date Attribute Range	Count
Shovel Test	C 01	I	Unspecified form	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	1
Shovel Test	C 01	I	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay		Bowl	1
Shovel Test	C 02	II	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment	1
Shovel Test	C 02	II	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+
Shovel Test	C 02	II	Vessel	DOMESTIC	CERAMIC	Earthenware	Unidentified type	Undecorated	Fragment	1
Shovel Test	C 02	II	Bottle	DOMESTIC	GLASS	Palliated	Non-machine made	Green	Fragment	2
Shovel Test	C 02	II	Pipe, tobacco	MISCELLANEOUS	BIOLOGICAL	Faunal	None	unidentified	Fragment	1
Shovel Test	C 02	II	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay	Undecorated	Stem, 5/64"	1
Shovel Test	C 02	7.5B	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2
Shovel Test	C 02	7.5B	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made (not wire)		Fragment	1
Shovel Test	C 03		Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made (not wire)		Fragment	4
Shovel Test	C 03		Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770
Shovel Test	C 03		Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830
Shovel Test	C 03		Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Painted, under glazed monochrome	Rim	1780-1830
Shovel Test	C 03		Vessel	DOMESTIC	CERAMIC	Earthenware	Red Paste (coarse)	Slip decorated	Fragment	1
Shovel Test	C 03	7.5B	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment	1
Shovel Test	C 03	7.5B	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made (not wire)		Fragment	1
Shovel Test	C 03	7.5B	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770
Shovel Test	C 03	7.5B	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay	Undecorated	Bowl	1
Shovel Test	C 04		Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770
Shovel Test	C 04		Bottle	MISCELLANEOUS	GLASS	Palliated	Unspecified manufacture	Colorless	Fragment	1
Shovel Test	C 04	7.5B	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment	1
Shovel Test	C 04	7.5B	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2

**Phase I Cultural Resources Investigation of the
Proposed Tolopomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

PROVENIENCE			Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description		Attribute Range	Count	
Shovel Test	C 04	7.5B		Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	1	
Shovel Test	C 04	7.5B		Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Base	1	
Shovel Test	C 04	7.5W		Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made (not wire)		Fragment	1	
Shovel Test	C 04	7.5W		Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830	1
Shovel Test	C 04	7.5W		Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	3
Shovel Test	C 04	7.5W		Vessel	DOMESTIC	CERAMIC	Earthenware	Tin-enamelled earthenware	Undecorated	Fragment		1
Shovel Test	C 04	7.5W		Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
Shovel Test	C 04	7.5W		Shell	MISCELLANEOUS	BIOLOGICAL	Partial	Shell	unidentified	Fragment		2
Shovel Test	C 04	7.5W		Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment		2
Shovel Test	C 04	7.5W		Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment		1
Shovel Test	C 05			Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S	1
Shovel Test	C 05			Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought	T-head, flat point	Partial		1
Shovel Test	C 06			Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment		1
Shovel Test	C 06			Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment		1
Shovel Test	C 06			Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made (not wire)		Fragment		1
Shovel Test	C 06			Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830	1
Shovel Test	C 06			Vessel	DOMESTIC	CERAMIC	Earthenware	Unidentified type	Undecorated	Burned		2
Shovel Test	C 07			Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment		1
Shovel Test	C 07			Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought	Rose head, flat point	Partial		2
Shovel Test	C 07			Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Burned	1815-1870S	1
Shovel Test	C 07			Vessel	DOMESTIC	CERAMIC	Earthenware	Ironstone	Undecorated	Rim	1813-1900	1
Shovel Test	C 07			Vessel	DOMESTIC	CERAMIC	Earthenware	Ironstone	Undecorated	Fragment	1813-1900	1
Shovel Test	C 07			Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1

**Phase I Cultural Resources Investigation of the
Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

PROVENIENCE		Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description		Date Attribute Range	Count
Shovel Test	C 07		Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment	1
Shovel Test	C 07		Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Aqua, light	Fragment	1
Shovel Test	C 07		Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Aqua	Fragment	1
Shovel Test	C 07	7.5B	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua	Fragment	2
Shovel Test	C 07	7.5B	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
Shovel Test	C 07	7.5B	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S
Shovel Test	C 07	7.5B	Vessel	DOMESTIC	CERAMIC	Earthenware	Ironstone	Undecorated	Fragment	1813-1900
Shovel Test	C 07	7.5B	Vessel	DOMESTIC	CERAMIC	Powcelain	Hard paste	Undecorated	Fragment	1
Shovel Test	C 07	7.5B	Lid liner	DOMESTIC	GLASS	Opaque	Machine-made	White, opaque	Fragment	post 1893
Shovel Test	C 07	7.5B	Bottle	MISCELLANEOUS	GLASS	Solarized	Unspecified manufacture	Amethyst	Fragment	2
Shovel Test	C 07	7.5B	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Green, emerald	Fragment	1
Shovel Test	C 07	7.5B	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Green, light	Fragment	1
Shovel Test	C 07	7.5B	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	4

Site: 44HIN314 Total: 103

**Phase 1 Cultural Resources Investigation of the
Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

PROVENIENCE	Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description	Date Attribute Range	Count
Site: ISO #1								
Shovel Test	C 13	Vessel	DOMESTIC	CERAMIC	Stoneware	Domestic buff stoneware	1810-1840 glazed & Albany slip	1
Site: ISO #1	Total:	1						

**Phase I Cultural Resources Investigation of the
Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

PROVENIENCE	Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description	Date Attribute Range	Count
Site: ISO #2								
Shovel Test	C 16	Vessel	DOMESTIC	CERAMIC	Earthenware	Crownware Undecorated	Fragment 1762-1770	2
Site: ISO #2	Total:	2						

-527-

**Phase I Cultural Resources Investigation of the
Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Historic Artifact Inventory

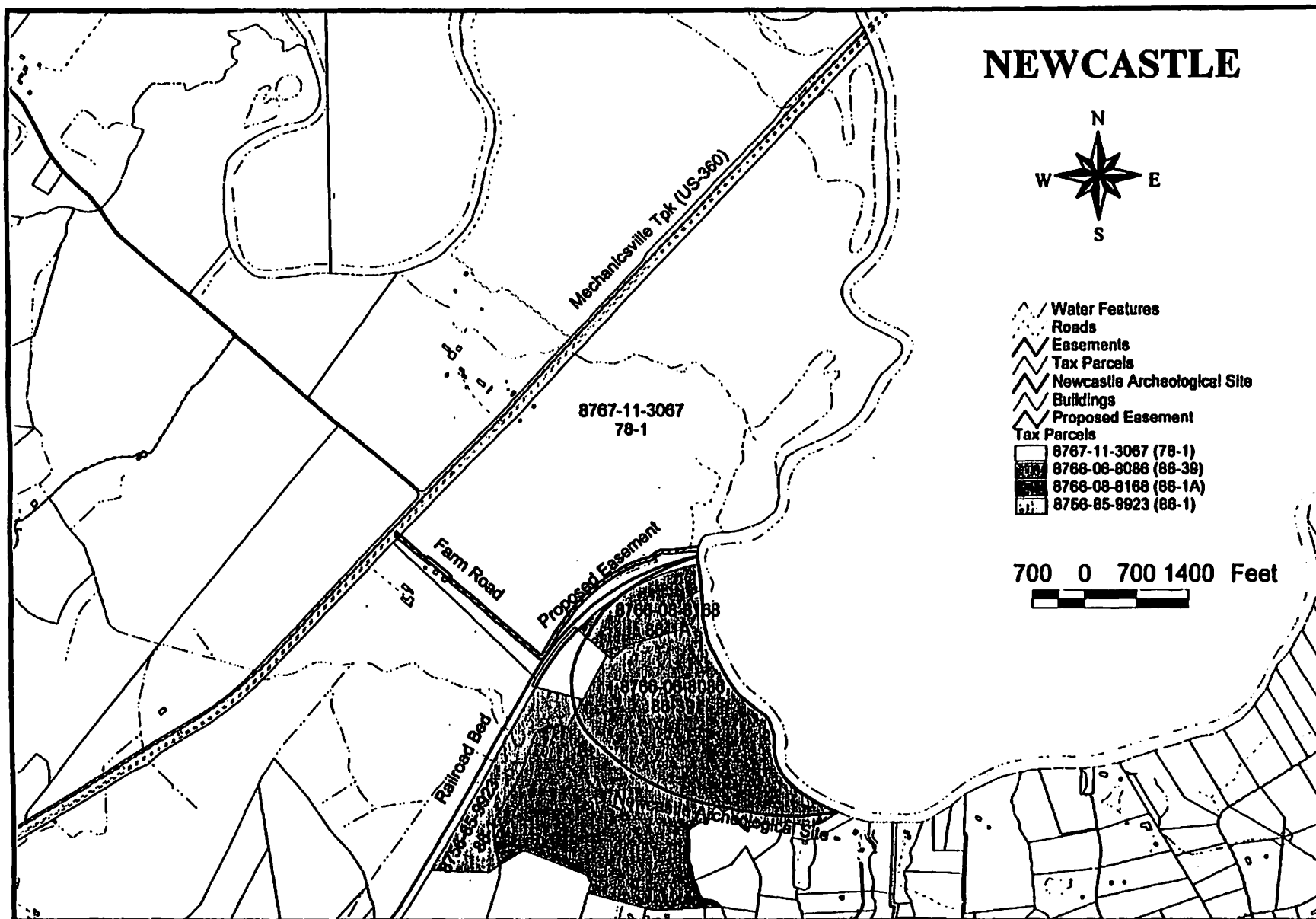
PROVENIENCE	Level	Name	Functional Group	Material Class	Artifact Type	Artifact Description	Date Attribute Range	Count
Site: ISO #3								
Shovel Test	C 30	Bottle	DOMESTIC	GLASS	Patented	Non-machine made	Green Fragment	1
Site: ISO #3	Total:	1						

**Phase I Cultural Resources Investigations of the
Proposed Wastewater Treatment Plant
Effluent Force Main Segment and
the Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

Prehistoric Artifact Inventory

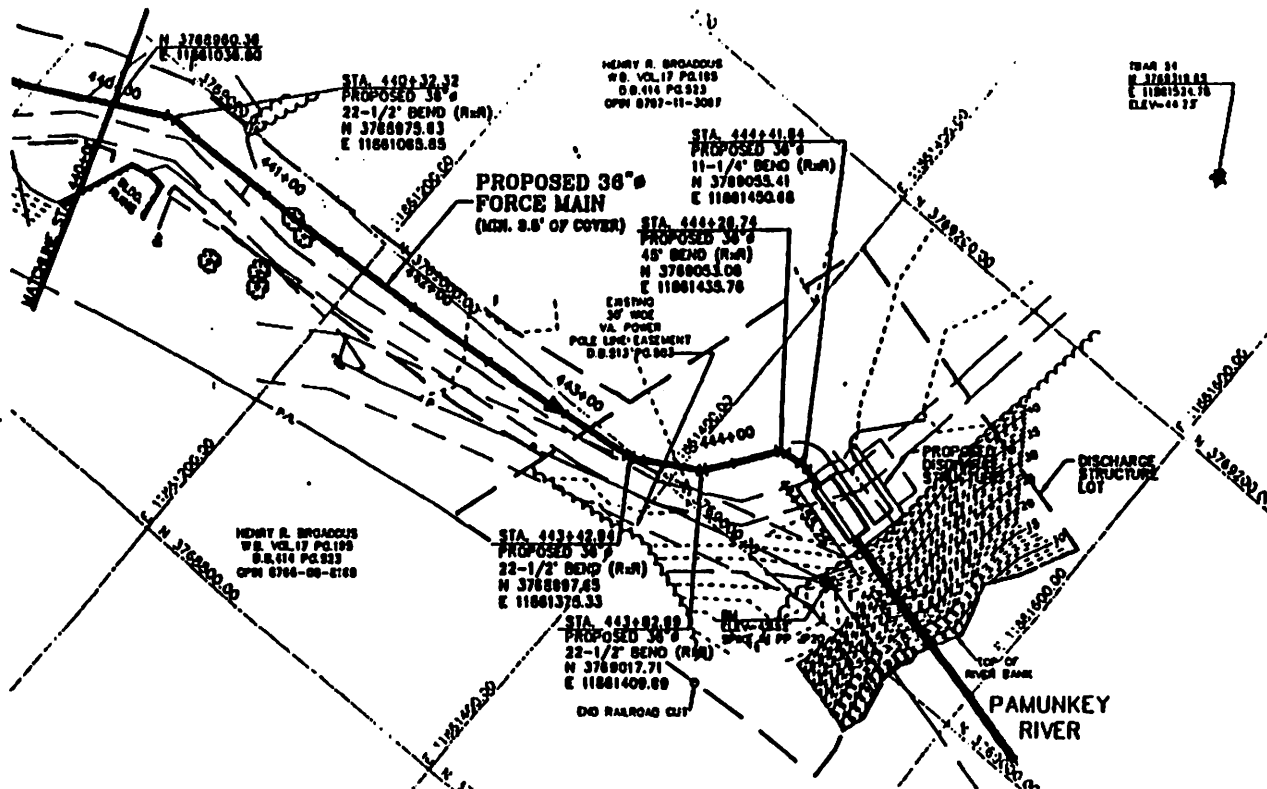
<u>Provenience</u>	<u>Level</u>	<u>Material Group</u>	<u>Artifact Class</u>	<u>Artifact Type</u>	<u>Description</u>	<u>Material</u>	<u>Unit</u>	<u>Retouch</u>	<u>Ct</u>	<u>Weight (grams)</u>
Site: 44HN314										
Shovel Test	A 02	7.5W	Lithics	Debitage	Secondary Flake	Whole	MA	0.5-1.0in		1
Shovel Test	A 02	7.5W	Lithics	Debitage	Thinning	Whole	MA	0.5-1.0in		1

Site: 44HN314 Total: 2



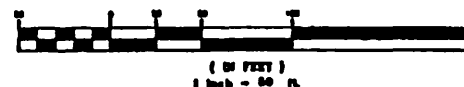
-531-

EXHIBIT
Butterfield #2



THE LOCATION OF EXISTING UTILITIES IS TAKEN FROM EXISTING PLANS AND FIELD SURFACE OBSERVATION. THE EXACT LOCATION IS UNKNOWN AND SHALL BE CONFIRMED PRIOR TO EXCAVATION FOR PROPOSED LINE WORK. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT LEAST 48 HOURS PRIOR TO COMMENCING EXCAVATION.

PLAN VIEW
GRAPHIC SCALE



EXHIBIT

Caulfield #3
7-28-02 *Cter*

NO.	ISSUED FOR	DATE	BY	APPROVED
1	CONSTRUCTION			
2	REGULATORY APPROVAL			

DESIGNER **B.F.B.**
DRAWN **C.M.J.**
CHECKED **J.C.E.**
PROJ. ENGR. **B.F.B.**



TIMMONS
ENGINEERS * ARCHITECTS * SURVEYORS
LANDSCAPE ARCHITECTS * ENVIRONMENTAL SCIENTISTS
GEOGRAPHIC INFORMATION SYSTEMS CONSULTANTS
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HAZEN AND
Environmental Engineers
RALEIGH, NORTH C

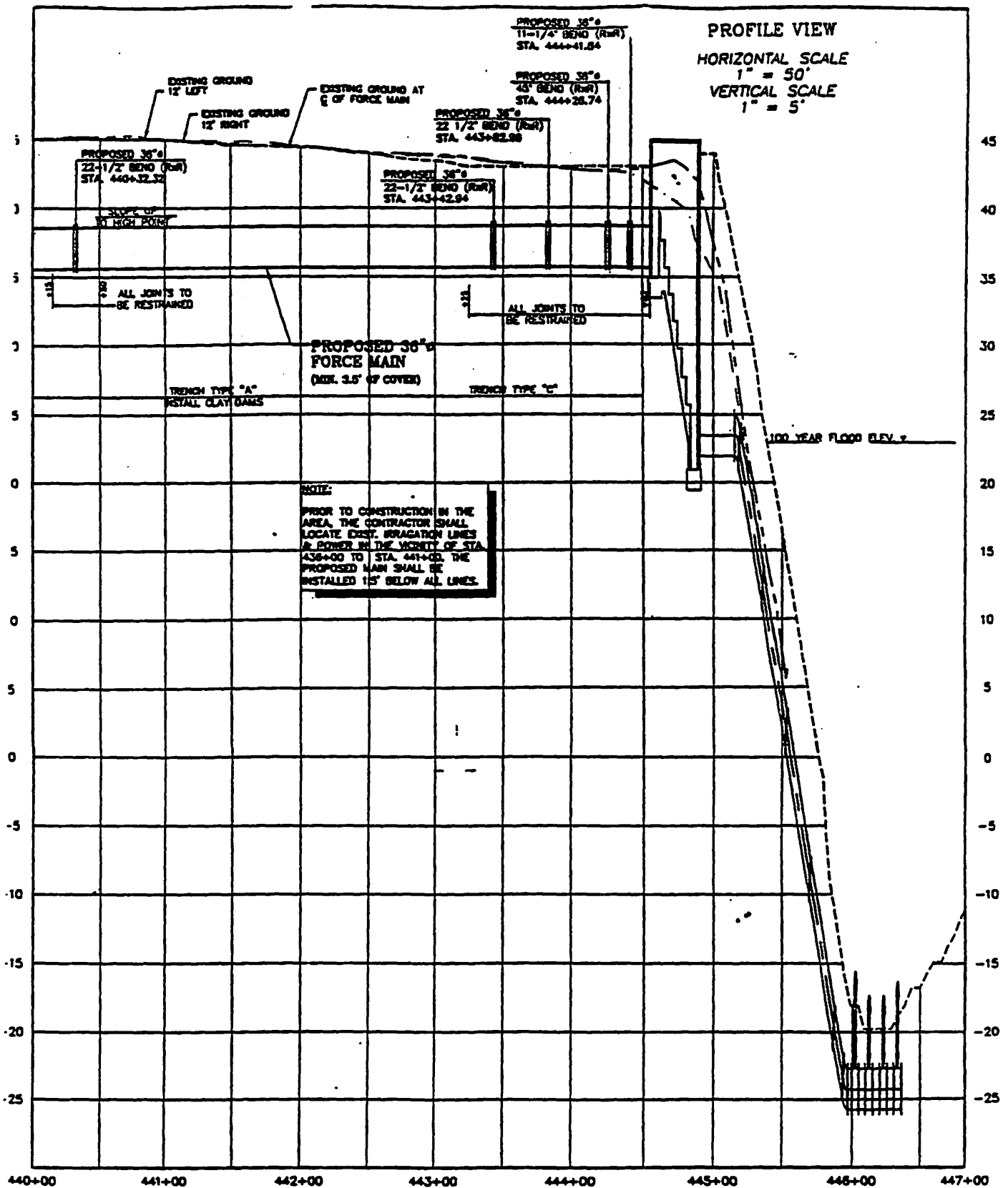


EXHIBIT
Contestfield #4
9-28-00
onep

Final Report:

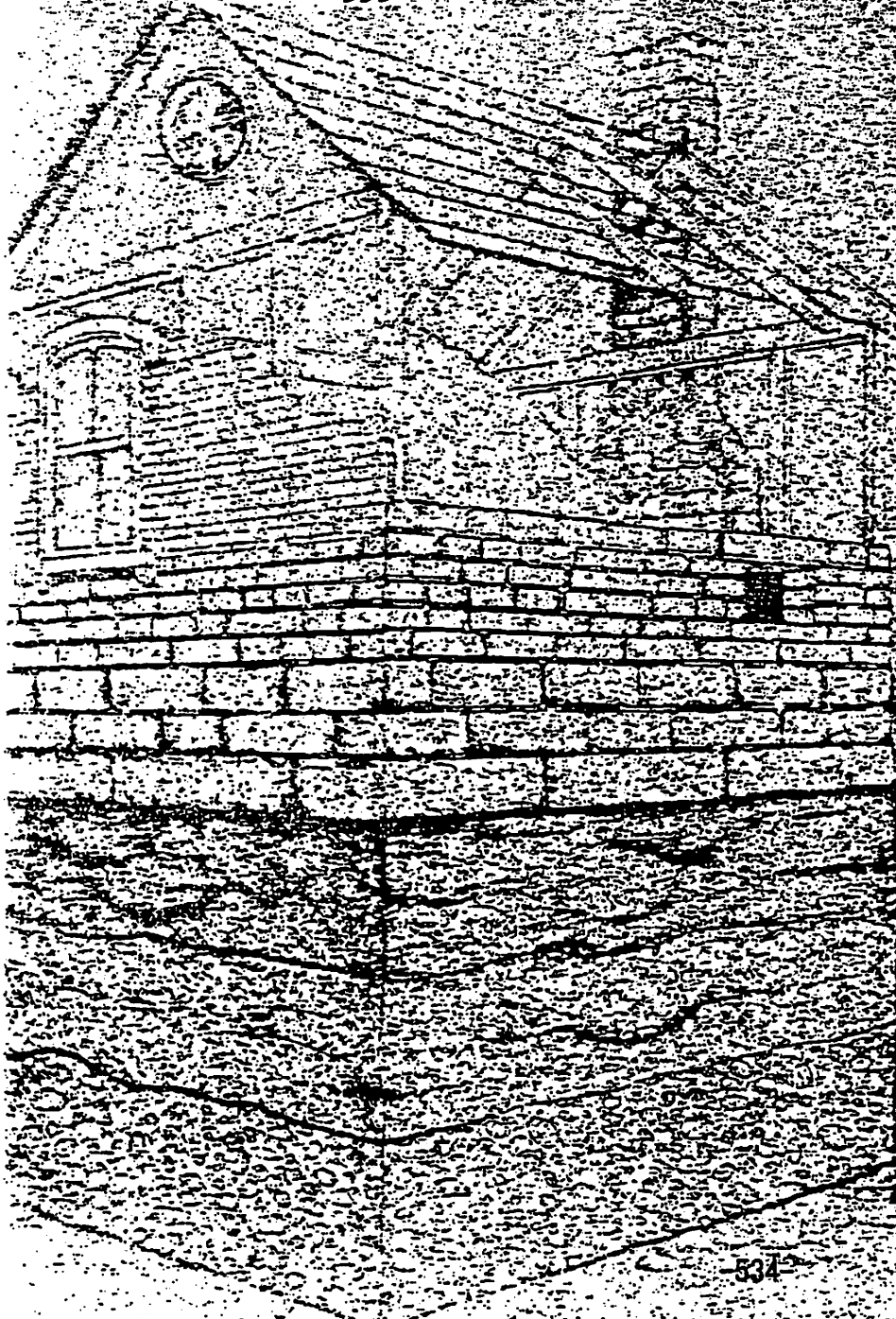
**A Limited Phase II Archaeological Evaluation of a
Portion of Site 44HN314 Located Within the
Proposed Totopotomoy Wastewater Treatment
Plant Effluent Force Main and the Outfall/Cascade
Aerator Structure Location, Hanover County, Virginia**

VDHR File Number 99-0159

10 December 1999

EXHIBIT

Centerville 75
1-28-01 CHOP



Prepared for:
Hazen and Sawyer, P.C.
4011 West Chase Blvd.
Raleigh, North Carolina 27607

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804-644-0656

**A LIMITED PHASE II ARCHAEOLOGICAL EVALUATION OF A PORTION
OF SITE 44HN314 WITHIN THE PROPOSED
TOTOPOTOMOY WASTEWATER TREATMENT PLANT
EFFLUENT FORCE MAIN AND THE
OUTFALL/CASCADE AERATOR STRUCTURE LOCATION,
HANOVER COUNTY, VIRGINIA**

VDHR File Number: 99-0159

FINAL REPORT

Prepared for:

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**Len Winter
Project Manager**

ABSTRACT

Between August 30 and September 5, 1999, Gray & Pape, Inc., conducted a limited Phase II archaeological evaluation of a portion of Site 44HN314 in advance of the proposed construction of the Totopotomoy Wastewater Treatment Plant effluent force main and outfall/cascade aerator structure location in Hanover County, Virginia. The project was conducted for Hazen and Sawyer, of Raleigh, North Carolina, under contract to the Hanover County Department of Public Utilities.

Site 44HN314 is located south of Route 360 in an agricultural field approximately 30 meters (98.4 feet) to the west of the Pamunkey River. Archaeological fieldwork was focused on those portions of the site contained within the proposed development area: Area 1, the proposed discharge structure lot, measures approximately 0.44 hectares (1.1 acres); Area 2, the proposed permanent access and utility easement measures approximately 15.24 meters (50 feet) north-south by 48.8 meters (160 feet) north to south. In total, the portion of the site under investigation measures approximately 0.52 hectares (1.28 acres).

The Phase II archaeological field investigations at Site 44HN314 included 68 shovel tests, the hand excavation of 2, 1-meter (3.3-foot) by 1-meter (3.3-foot) test units, and 8 machine-excavated test trenches. A total of 952 artifacts were recovered during the field investigations. Architectural debris such as brick fragments, nails, and window glass dominated the assemblage. Ceramic vessel fragments, bottle glass, and tobacco pipe fragments were also well represented. The investigation also recorded evidence of a prehistoric occupation at the site: diagnostic materials from the Late Archaic and Woodland periods were recovered. As a result of the field investigations, Site 44HN314 has been defined as a multi-component site that contains sparse evidence of prehistoric occupation during the Archaic and Woodland periods. The site was occupied again during the fourth quarter of the eighteenth century through the second quarter of the nineteenth century at which time it functioned as a domestic site.

Subsurface testing indicated that deep plowing has severely impacted the integrity of the cultural deposits at Site 44HN314. In many cases, the plowzone extended as far as 0.6 meters (2 feet) below the current surface. Despite the high density of artifactual material, no intact subsurface cultural deposits were observed during the investigation. As such, those portions of Site 44HN314 that are contained within the proposed development area do not contain sufficient integrity to yield any further significant information about the past. Because the site was not evaluated in its entirety, a final determination of the overall site's eligibility for the National Register of Historic Places is not possible. However, it is recommended that the portion of Site 44HN314 which is located within the proposed development area is not eligible for the National Register of Historic Places under Criterion D, and the proposed construction activities within the project area will not have an effect on any significant archaeological resources.

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CHAPTER I. INTRODUCTION

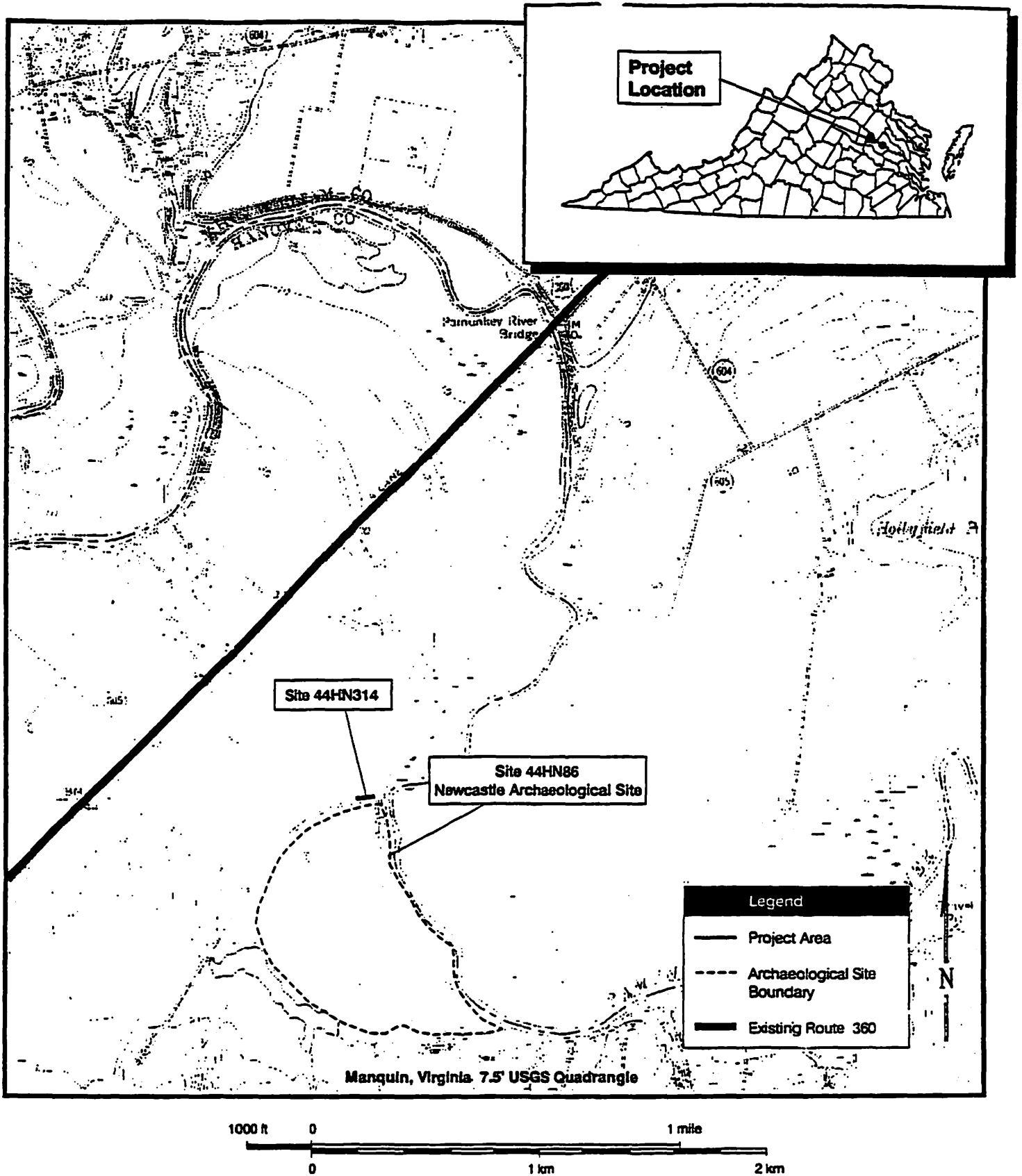
Gray & Pape, Inc. (Gray & Pape), Richmond, Virginia, conducted a limited Phase II archaeological evaluation of Site 44HN314 in advance of the proposed construction of the Totopotomoy Wastewater Treatment Plant (WWTP) effluent force main and outfall/cascade aerator structure in Hanover County, Virginia. The survey was conducted for Hazen and Sawyer, P.C., Raleigh, North Carolina, under contract to the Hanover County Department of Public Utilities. This project was authorized by the Hanover County Department of Public Utilities in order to meet the terms of its Conditional Use Permit CUP-16-97 (CUP) and to comply with the requirements of Section 106 of the Historic Preservation Act of 1966, as amended.

The intent of a Phase II evaluation is to gather sufficient data to make possible a determination of the site's eligibility for nomination to the National Register of Historic Places. Eligibility for nomination is dependent on the site's ability to satisfy very specific criteria established by the federal government (36CFR 60.4 [a-d]). Although the entirety of the site was not evaluated, the field investigations at Site 44HN314 were designed to provide the necessary data for an assessment of the site's integrity and level of potential significance within the proposed development area.

The Phase II evaluation at Site 44HN314 was conducted with regard to the Advisory Council on Historic Preservation's 36 CFR Part 800: Protection of Historic Properties; the Department of Interior's 36 CFR 60: National Register of Historic Places; the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation; National Register *Bulletin 15*, How to Apply the National Register Criteria for Evaluation; Section 4(f) of the Departments of Transportation Act (Advisory Council on Historic Preservation 1986; United States Department of the Interior 1981, 1983, 1991). All archaeological investigations followed the Secretary of the Interior's (1983) "Standards and Guidelines for Archaeology and Historic Preservation" and the Virginia Department of Historic Resources' (VDHR's) "Guidelines for Archaeological Investigations in Virginia" (1996). Laboratory curation of cultural materials collected during the survey was made with regard to Federal (36 CFR 79) and State (VDHR 1993) guidelines. Appendix A presents the artifact inventory for this project.

PROJECT DESCRIPTION

Site 44HN314 is located between Route 360 and the Pamunkey River in Hanover County, Virginia (Figure 1). Site 44HN314 was initially identified by Gray & Pape during a 1998 Phase I survey of the proposed Totopotomoy Wastewater Treatment Plant effluent force main (Blake et al. 1999). The site itself is located on a terrace approximately 30 meters (98.4 feet) to the west of the Pamunkey River. Due to property access restrictions during the initial



Detail of Manquin, VA USGS Quadrangle
Depicting Site 44HN314

investigation, the boundaries of the site could not be fully delineated and only those portions of the site that fell within the proposed project area could be investigated. According to the 1999 report, the site measures approximately 122 meters (400 feet) east to west and 7.62 meters (25 feet) north to south (Blake et al. 1999: 39).

Shovel testing at the site yielded a light scatter of non-diagnostic prehistoric lithic material and a variety of historic domestic refuse and architectural debris that range in date from the mid-eighteenth century to the second quarter of the nineteenth century. Phase I survey also indicated the survival of a potential sub-plowzone historic cultural deposit. Based upon the site's proximity to the Newcastle Town Virginia Landmarks Register property and the likelihood for the survival of intact sub-plowzone cultural deposits, the historic component of Site 44HN314 was recommended for further investigation in order to conclusively determine its eligibility in terms of the criteria established by the National Register of Historic Places.

Due to continued access restrictions, Phase II investigations at Site 44HN314 were limited to an approximately 0.4 hectare (1 acre) outfall area and a 15.24-meter (50-foot) wide access and utility easement. In total, the area under investigation measured approximately 0.52 hectares (1.28 acres). No fieldwork was conducted outside of the established project corridor. Within the project corridor, a series of systematic shovel tests was excavated at 6-meter (20-foot) intervals in order to identify any intra-site artifact concentrations and to document the nature of the site's stratigraphy. At the completion of the shovel testing, a combination of hand-excavated test units and machine-excavated test trenches were completed in order to document the existence of intact sub-plowzone cultural deposits.

ACKNOWLEDGMENTS

The Phase II archaeological investigations were conducted by Field Director Jerrell Blake between August 30 and September 5, 1999. The field crew consisted of Daryl Stahl, Frank Force, and Landon Plaster. Len Winter served as Project Manager, and Bradley McDonald was the Principal Investigator. Laboratory Director Elizabeth Cassebeer undertook artifact analysis. Ashley M. Neville conducted the Phase II-level background historical research, and graphics were prepared by Graphic Arts Director Casey Fagin and Graphic Artist Carly Meyer. Bradley McDonald, Jerrell Blake, and Ashley Neville were responsible for writing this report and Madonna Ledford Baltz served as editor. Gray & Pape also wishes to thank Frances Crutchfield for sharing her knowledge of the project area vicinity. The authors would like to thank the above mentioned staff of Gray & Pape for their contributions toward the completion of this report.

CHAPTER II. ENVIRONMENTAL CONTEXT

Environmental and cultural contexts provide the basis for assessing the sensitivity of the present project area for archaeological resources. Further, they assist in the interpretation of the cultural resources identified during this survey. The environmental context section below describes variables that influenced past human settlement and land use in the project region. This data is important for understanding what locations were occupied by prehistoric and historic populations in this area and why they were selected. Chapter III provides an overview of the property history and relevant historic themes as they relate to Site 44HN314. These contexts contain information necessary to relate the archaeological resource under consideration to broad patterns of regional history.

PHYSIOGRAPHY

The project area lies in the western portion of the Coastal Plain physiographic province of Virginia. The Coastal Plain comprises an eastward sloping surface of generally low relief. Erosion, however, has created areas of hilly topography. Elevations in the Coastal Plain do not exceed 90 meters (300 feet) above mean sea level (amsl) (Dietrich 1971:102). The project area lies between 12 and 14 meters (40 and 45 feet) amsl.

Site 44HN314 lies on a table landform adjacent a sharp oxbow of the Pamunkey River. The project area vicinity exhibits little relief to the north and west. East and south of the study area, however, the terrain descends sharply to the Pamunkey River (to the east) and to an unnamed tributary (on the south). The walls of these two valleys are nearly vertical and offer access to the river only through deep erosional cuts in the escarpment. Along the Pamunkey River, a narrow terrace of alluvium and fan deposits is present at the foot of the slope. This discontinuous feature tapers and lenses out to the south. Along the unnamed tributary, a narrow valley exists through which the stream flows. The flanks of this stream are marshy and uninhabitable. A northern branch of this unnamed tributary flows along the northwest portion of the survey area. This part of the landform is poorly drained and uninhabitable as well.

The project area is in the York River drainage basin. As noted, it lies adjacent to the Pamunkey River, one of the major tributaries to the York. The Pamunkey is the principal watercourse in the project environs and would have constituted an important means of transportation as well as a source of subsistence resources. Other watercourses in the immediate vicinity of the project area include the unnamed tributary at its southern margin as well as several intermittent and ephemeral drainages located along the south side of the Pamunkey River.

The bedrock of the Coastal Plain consists of partially consolidated sedimentary rocks of Cretaceous, Eocene, and Miocene marine sands, gravels, clays, and marls. Outcrops of siliceous

lithic raw materials suitable for prehistoric chipped-stone tool manufacture do not occur in the Coastal Plain. However, such materials are present in secondary deposits along the region's stream valleys. Deposits of sand, gravel, and marl also represented economically important natural resources exploited during the nineteenth and twentieth centuries.

SOILS

The United States Department of Agriculture (USDA) has mapped one principal soil type in the project area: Pamunkey fine sandy loam. Pamunkey soils of this series are well drained on narrow to broad, slightly convex terraces along the larger streams of the region (Hodges et al. 1980:56). Soils of this series comprise old forest soils with well-developed subsoil horizons.

The soils in the project area are the product of weathering and have not been subject to extensive deposition or erosion. Therefore, any archaeological deposits in the survey area will most likely be located at, or immediately below, the ground surface. Also, the Pamunkey River has been eroding its right bank in the project vicinity throughout the Holocene period. Thus, the riverbank would have formerly extended an unknown distance to the east.

PALEOENVIRONMENT

Late Pleistocene and Early Holocene climates would have presented prehistoric populations with different environments than presently exist in the Chesapeake region. The following summary of paleoenvironments in the region rely on information in Carbone (1976), Custer (1984), Fesler (1992), and LeeDecker et al. (1991).

The Late Pleistocene period, characterized by the withdrawal of the Laurentide glaciers, presented a cooler and moister climate than presently exists in the region. Spruce dominated the forests of this era, although the vegetation may have existed in a mosaic pattern that encompassed grasslands, coniferous forests, and deciduous forests. The deposition of clays by streams and rivers supported freshwater marsh vegetation. This habitat supported several faunal species no longer present in this region, such as mammoth, mastodon, moose, elk, and caribou. This period spanned roughly from 10,000 to 8000 B.C. (Carbone 1976; Custer 1984; Fesler 1992; LeeDecker et al. 1991).

A warming climate beginning after circa 8000 B.C. contributed to the replacement of grasslands with hardwood beech-hemlock-birch forests. Marshes continued to develop along watercourses (Fesler 1992). Such habitats would have been attractive to certain game species such as elk, moose, and white-tailed deer. Animal species adapted to cold climates migrated north or became extinct (LeeDecker et al. 1991).

At approximately 6500 B.C., environmental conditions that roughly resembled modern circumstances emerged. A relatively warm and humid climate initially typified the period after 6500 B.C., but conditions became drier towards 3100 B.C. Changes included the spread of

forests dominated by hemlock, which then were succeeded by oak-hickory forests. Wetlands continued to expand possibly as a result of the humid conditions noted above. The plant types presently found in these zones, such as gum, sweet gum, ash, red maple, walnut, elm, and cypress, became common. Faunal species that flourished and formed important resources for human populations included deer and turkey. The success of these species probably resulted from the prevalence of mast resources such as hickory; these species also became important food sources for human populations (Fesler 1992; LeeDecker et al. 1991; Stewart et al. 1987).

The period between 3100 and 800 B.C. was characterized by warm and dry conditions that gave way to a progressively cooler and moister climate. Grasslands may have spread as a result of the dry conditions, and the prevailing forest type would likely have consisted of an essentially modern oak-hickory-pine complex. In wetland areas this forest-type would have declined while relative proportions of cypress-gum vegetation rose. The stabilization of sea level around the beginning of this period contributed to the development of the extensive estuarine habitats that ring the Chesapeake Bay. This habitat supported a diverse range of subsistence resources utilized by human populations in the region such as shellfish beds, anadromous fish runs, and migratory waterfowl (Carbone 1976; Custer 1984; Fesler 1992; LeeDecker et al. 1991). Temperatures after 800 B.C. grew cooler and moister. These conditions have remained relatively stable into the modern era (LeeDecker et al. 1991).

MODERN CLIMATE

At present, the region is characterized by a relatively mild continental climate. Summer temperatures average 74 degrees Fahrenheit and winter temperatures reach an average of 37 degrees. Rainfall is well distributed throughout the year (Hodges et al. 1980:1).

FLORA AND FAUNA

The biotic communities of the region have undergone considerable change in some areas as a consequence of human activities, such as urbanization, logging, land clearance, and mechanized agriculture. Wooded areas, pastures, and agricultural fields characterize the project vicinity with some residential areas on the periphery of the area.

Floral associations once represented within the project vicinity included woodlands of mixed chestnut, oak, and hickory, with yellow poplar located in moister areas. Shortleaf and Virginia pines were distributed throughout the hardwood forests. In addition to providing resources sought by prehistoric and historic populations, this original woodland would have included habitats for a variety of fauna that were important to both populations.

Human activities have greatly affected the number and the kind of arboreal, aquatic, and terrestrial taxa that can now be found in the region. Mammals formerly common to the region included opossum, black bear, raccoon, mink, weasels, river otter, skunks, foxes, bobcat, squirrels, beaver, muskrat, lagomorphs, mice, vole, shrew, and white-tailed deer. Extirpated taxa

include fisher, red wolf, gray wolf, elk, and bison. Many of the defunct species may have been economically important to prehistoric Native Americans as food, materials for domestic uses (e.g. sinew and fur), or raw materials for tools (e.g., antler and bone). Bird species that were available included owl, heron, mourning dove, duck, grouse, quail, vulture, hawks, and turkey. Reptiles and amphibians including snakes, lizards, several turtle species, and frogs were also exploited. Aquatic resources were abundant in the area's streams and include trout, pike, minnows, carp, suckers, bass, sunfish, and bluegill.

CHAPTER III. HISTORIC CONTEXT

Following federal guidelines for preservation planning (USDI 1983), the VDHR (1992a) recommends that an historic context be developed for any archaeological resources identified within the project area. The historic context for any cultural resource must minimally include (1) identifying the region in which the resource is located, (2) the time period within which the site may be significant, and the (3) relevant cultural theme(s) with which the resource is associated. For archaeological sites such as those identified during the survey, relevant themes may include cultural change, economics, settlement, subsistence, technology, and additional themes. The development of the historic context allows for the association of the site with current regional, temporal, and thematic research domains. This allows the researcher to evaluate a resource's research potential in reference to important questions that have been developed for the region, time period, and theme with which the resource is associated.

Site 44HN314 is best associated with three distinct historic time periods as they are defined by the VDHR (1992a). These time periods are Colony to Nation (1750-1789), Early National Period (1789-1830), and possibly the initial part of the Antebellum Period (1830-1860). The overall function of the site best relates to the Domestic theme. Although the site contains a prehistoric component, only its historic component was evaluated under Criterion D for its National Register eligibility.

HANOVER COUNTY OVERVIEW

Hanover County was originally part of Charles River Shire, one of the eight shires created at the founding of the Virginia colony in 1634. By 1654, part of that shire had been designated the county of New Kent. In 1720, residents of the upper, or western, part of New Kent, concerned about their distance from the county seat, petitioned the General Assembly for a division of the county. As a result, Hanover County was created in 1720 but it had no western border. In 1742, Louisa County was created from Hanover's western lands. The county seat was established at Hanover Courthouse and a handsome brick courthouse was constructed between 1737 and 1742 (Peters and Peters 1995:10). Prior to the construction of the court building, the county justices met in a tavern.

Colonizing efforts in Hanover, as elsewhere in Virginia, concentrated first along navigable waterways, and initial settlement in the county occurred along the Pamunkey River and its major tributaries. The first land patents were issued in the 1660s for land along the river with major settlement activity in the 1680s and 1690s. Hanover developed in a dispersed, rural pattern of farms and small communities. Its fertile soils and proximity to river and land transportation routes were the primary factors that influenced land development. The lands along the Pamunkey River were well suited to growing tobacco, which became the first major

profitable agricultural crop in the county. The port towns of Newcastle and Hanover town were established, in part, to accommodate the shipment of tobacco to London and Glasgow.

The first settlers in the county were English men and women who became the dominant culture in Virginia and Hanover County. Other Euroamerican groups that came to Hanover included Scots, Scotch-Irish, and Huguenots with cultures that closely paralleled that of the English. Most Euroamerican immigration to Hanover occurred in the seventeenth, eighteenth, and early nineteenth centuries (Land and Community Associates [LCA] 1992:109). African-Americans soon followed the first English settlers. Initially as indentured servants and later as slaves, they became an integral part of the early tobacco-based society of the county. Tobacco was grown in Hanover with slave labor on both large and small plantations. Population expansion was directly related to the tobacco-dominated economy of the Virginia colony and its demand for new agricultural land. By 1790, Hanover's population stood at 14,754, over half, 8223, were slaves (Anonymous 1990:9).

Until the mid-to-late twentieth century, agriculture was the major land use pattern in the county. Tobacco production in Hanover peaked in the years before the Revolutionary War and gradually declined in the early nineteenth century. This was due to a number of factors including decreased fertility of the land in Hanover coupled with competition from newly opened and more fertile lands further west, declines in the price of tobacco, and changes in the channels of trade (LCA 1992:9). Although tobacco continued to be grown in Hanover well into the twentieth century, mostly in the western end of the county, grains, particularly wheat and corn, became the preferred crop. Throughout the nineteenth and twentieth centuries, the majority of Hanover County farms were general-purpose family farms that grew a variety of subsistence crops for home consumption.

The history of Hanover County during the American Revolution is highlighted by the activities of the county's most famous patriot, Patrick Henry. Born in Hanover in 1736, Henry's debut in political circles occurred in 1763 when he argued the penalty phase of what came to be known as the Parson's Cause at Hanover Courthouse. His oratorical skills, first displayed in this case and later in his Stamp Act speech in 1765 and his "Liberty or Death" speech in 1775, provided some of the most inspirational rhetoric of the Revolution. Henry was elected the first governor of the new state of Virginia and returned two times to the statehouse.

Although no battles were fought in Hanover County during the American Revolution, both armies passed through the county. In 1781, British troops burned several homes and warehouses at Hanover town and Newcastle, and Cornwallis' army camped in Hanover. Cornwallis reportedly stayed at Hanover Tavern. The following year Count Rochambeau's troops camped at Hanover town en route from Yorktown to New England where they would sail home.

Hanover County's location north and east of Richmond, the capitol of the Confederacy, placed the county in harm's way during the Civil War. Two major campaigns were fought on Hanover soil: the 1862 Peninsular Campaign and the final struggle of 1864-1865. During the Peninsular Campaign of 1862, General George McClellan and the Army of the Potomac clashed several times in Hanover with the Army of Northern Virginia under General Robert E. Lee. The

fiercest fighting in Hanover occurred at Mechanicsville and Gaines' Mill. Just prior to this, General J.E.B. Stuart and his cavalry made the famous ride around McClellan to investigate his strength and position.

The year of 1864 was particularly significant for Hanover County. Beginning in May, a series of engagements and battles occurred in Hanover including North Anna, Totopotomoy Creek, and Haw's Shop. They culminated in the Battle of Cold Harbor, which was the scene of a horrific loss of life, particularly on the Union side. Within the first hours of battle, some 5,000 Union soldiers were killed or wounded. The sheer quantity of the dead struck even the most seasoned campaigners (Jaynes 1986:165). As a result of these battles, a number of battlefields are found in Hanover and the county contains the largest surviving concentration of earthworks in the Richmond metropolitan area (LCA 1992:56).

Many Hanover men served in the Confederate Army. A particularly noteworthy Hanoverian in the Civil War was Edmund Ruffin, a famous agriculturist and secessionist. Ruffin participated in the firing upon Fort Sumter, the first engagement of the war. In 1865, Ruffin killed himself when the South was defeated. Ruffin lived and was buried at his plantation, Marlbourne, in eastern Hanover, which is still owned by his descendants.

Like most of the south, the late nineteenth century was a period of recovery from the Civil War for Hanover County. Transportation routes, notably the railroads, that had been damaged during the war were repaired and were a source of growth for several of Hanover's small villages. Ashland prospered; Randolph Macon College moved there after the war and in the 1880s the Richmond, Fredericksburg & Potomac Railroad (RF&P) promoted Ashland as a Richmond suburb.

The countryside continued to be dominated by agricultural pursuits although the harvest of timber played an increasing role. In the early twentieth century, farmers in the county's western section continued to grow tobacco as a cash crop. In the eastern half of the county with its sandy soils, diverse truck farming became the county's most profitable industry. Hanover County farms successfully produced two agricultural products - tomatoes and melons. Hanover tomatoes are still considered a delicacy. Dairy farming also increased during this period.

By the mid-twentieth century farming had suffered a significant decline in Hanover with a decrease of over 50 percent, from 2461 farms in 1910 to 1074 in 1960. By 1979, there were only 630 working farms in the county, a nearly 40 percent decrease in only 20 years (LCA 1992:11). Today, Hanover is increasingly suburban with numerous residential developments covering the former farmland.

PROJECT AREA HISTORY

Site 44HN314 lies just north of the boundaries of the historic Newcastle Town Archaeological Site as defined by the boundaries shown on the National Register nomination form of 1974. Because of the proximity of 44HN314 to the site of the now-vanished town as well as its importance in Hanover County history, a history of Newcastle is presented here. This

history has been drawn from a variety of sources and focuses mainly on its eighteenth century past. Less is known about the nineteenth and twentieth century history of the town, its demise, and the reintegration of the land into the surrounding agricultural fields. Also presented here is the history of Newcastle Farm which lays just to the north of the town.

Town of Newcastle History

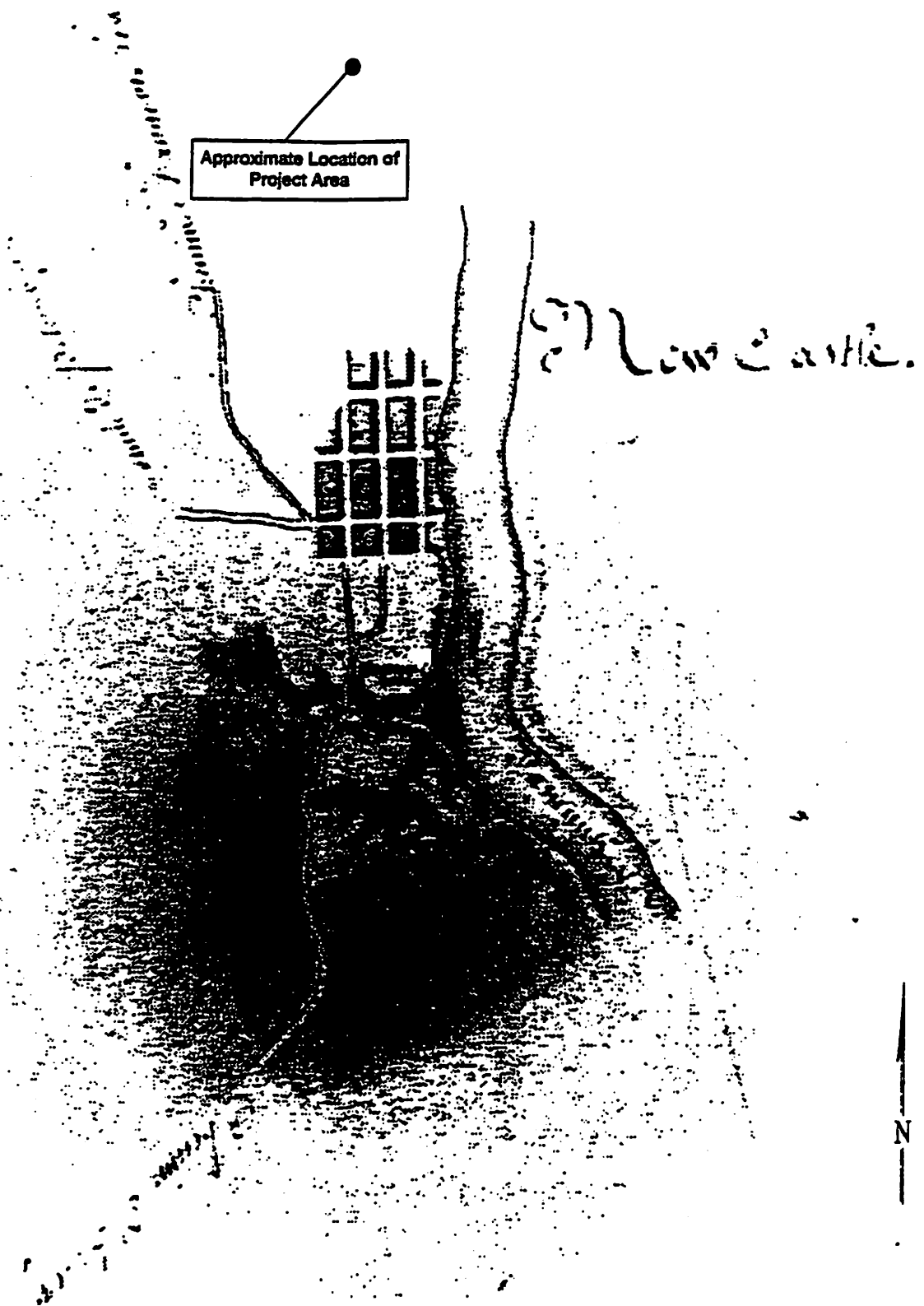
In 1693, William Meriwether inherited from his grandfather, David Crafford, a 400-acre plantation on the Pamunkey River known as Assaquin. By 1738, Meriwether had laid out a village of half-acre lots on 40 acres of a section of the plantation known as Poindexter's Neck (Colvin 1983:6). The lots were sold and a village formed that was named for the Duke of Newcastle. By the time he laid out Newcastle, William Meriwether was influential locally and had been a member of the House of Burgesses for a few years. In 1744, when the legality of these town lots was upheld by an act of the Virginia General Assembly, Newcastle was described as "much encreased (sic) and improved" (Henning 1969: (5) 257).

About six miles up river from Newcastle, Mann Page II of Rosewell inherited a tract of land known as Mahixen where he constructed a warehouse in 1730. It became known as Page's Warehouse and planters stored their tobacco there prior to shipment abroad. Several years after the founding of Newcastle a group of Scottish merchants built a store at the warehouse. In 1762, Page petitioned the colonial legislature for permission to set aside 100 acres of Mahixen as a town named Hanovertown. Much like Newcastle, it functioned as a river port.

Newcastle was laid out in a grid plan. A 1751 map shows 52 numbered half-acre lots and six lots used for warehouses. John Henry, father of Patrick Henry, was the surveyor. There were three north-south streets, named, from east to west, Water, Second, and Main. It is unclear if Water Street was immediately adjacent to the river or was located up on the bluff. There were two east-west streets with the northern street known as the "Road to Bridge" while the southern street was the "Road to River." They probably descended to the river down the gullies that now exist on the edge of the bluff (Virginia Historic Landmarks Commission [VHLC] 1975:Sec.7). A 1781 map prepared for the French General Rochambeau shows the town laid out in a grid adjacent to the Pamunkey River (Loth 1986:193) (Figure 2). No scale is shown, but the southern margin of the town lies north of the unnamed tributary.

Several roads converged at Newcastle; one from Williamsburg, one to Hanover Courthouse and points west, and one north to the Rappahannock River and Philadelphia. In 1740, the county justices were authorized to build a bridge across the Pamunkey River and by 1781, there was a ferry across the river at Newcastle (Colvin 1983:7).

Newcastle developed into a center of community activity. Dwellings and their outbuildings, taverns, warehouses, and granaries were constructed in the town. A 1745 Act of the General Assembly forbade the construction of wooden chimneys and ordered that all existing wooden chimneys be removed by the following year (VHLC 1975:Sec. 7). This law appears to have been followed by at least one resident, Walter Douglass. In 1769, he described his Newcastle holdings thusly,



Rochambeau's 1782 Map of Newcastle
(Loth 1986)

The house that I live in has three rooms below, two of them with fireplaces, and two rooms above, with one fireplace, and brick chimnies (sic), a large kitchen, with a brick chimney, and one room above, a dairy joining it, and two other houses; a garden and another lot joining it, both well paled in; another house, and a shed the length of the house, a large stable, with two, eight feet sheds the length of the house, for holding grain, sale &c. almost new. They would suit a merchant or a doctor (Virginia Gazette 1769:4:1).

This description also suggests an array of buildings and facilities associated with town lots in eighteenth-century Newcastle. Another type of holding is represented by the description of resident Samuel Pearson who owned a storehouse measuring 36 feet by 26 feet; a granary, 50 feet by 32 feet, a stable, and a chair house all of which were in "good order" and located on the main street (Virginia Gazette 1773:2:3).

In addition to domestic occupations, planters and merchants had warehouses at Newcastle and several factors for Scottish and London merchants were located in the town. Ocean-going vessels visited its wharves. Tobacco and other agricultural products were shipped out of Newcastle and the breadth of the goods that found their way to the town is illustrated in a 1773 advertisement which listed European and East Indian goods valued at 500 pounds sterling. A flour inspector was appointed for the convenience of millers and shippers in 1780 (Henning 1969: (10) 497).

Newcastle also acted as the nucleus for local social events and activities. In August 1746, the Newcastle house of Nicholas Water was the scene of celebrating for the defeat of Bonnie Prince Charlie's forces at the Battle of Culloden in Scotland. It was reported that "a long Arbor was set up, in which fifty Gentlemen and ladies dined, and several other Tables were full, in the House . . . A large Quantity of Punch was given to the Populace and at each health there was a Volley of small Arms Discharged, and three cheerful Huzzas at each Volley. A large bonfire was made in the evening, and the windows of the Loyalists in the Town were illuminated" (VHLC 1975:Sec. 8).

When the removal of the colonial capitol from Williamsburg was contemplated in 1751, Newcastle was of sufficient size and substance that it, along with neighboring Hanover town, was put forth as an appropriate site. John Robinson, speaker of the House of Burgesses, apparently orchestrated this move because he had property in nearby King & Queen County (Tyler 1977:8(1) 3). Robinson's efforts failed and Newcastle lost by two votes.

Another important event occurred at Newcastle on May 2, 1775. In a precursor to the American Revolution, Patrick Henry rallied Hanover volunteers at Newcastle to march to Williamsburg to protest Governor Dunmore's seizure of the colony's gunpowder. The colonial Governor relented and paid for the powder. In 1781, the troops of Anthony Wayne camped near Newcastle for a week in August. One of the officers described the country as having good water (Bruce 1968:8). French General Rochambeau also left a description of the town: "As you approach Newcastle, the country becomes more gay. This little capital of a small district contains 25 or 30 houses, some of which are pretty enough." Rochambeau's aide described it as located, "on a charming plain . . . and situated rather pleasantly on the banks of the Pamunkey, which is

only 192 feet wide there. We lunched at the home of a very wealthy person, Colonel Syme" (Colvin 1983:8; VHLC 1975:Sec 8). Not all was well at Newcastle that year, however, with the British setting fire to portions of Newcastle and nearby Hanover town during their march to Yorktown.

By 1800, intensive agriculture in the Piedmont caused the Pamunkey to begin to silt up making it difficult for seagoing ships to come up as far as Hanover town and Newcastle. In 1823, Newcastle was described as a post town on the north bank of the Pamunkey River (Colvin 1983:8). Many of the residents moved to a healthier site on the ridge above Newcastle and formed the community known as Old Church. Although no one knows when Newcastle finally disappeared, taxes were still being paid on town lots there as late as 1850 (Colvin 1983:8).

The name Newcastle appears on Civil War era maps of the area. The various maps show as many as three roads converging at Newcastle and locate the ferry either at the sharp bend in the Pamunkey River or just north of the bend. On one map the ferry is labeled Bassett's Ferry. A major road trended to the northwest from the ferry before recrossing the Pamunkey. Of the two smaller roads, one reached the present-day Route 606 opposite Ingleside while the other met the main road (Route 606) further to the east (Cowles 1983:Plate C, XCII, CXXXVII).

The Civil War first came to the Newcastle-Old Church area during General George McClellan's 1862 Peninsular Campaign and for much of that period Old Church was within the Federal lines. On May 26, 1862, a Union detachment marched to the Newcastle ferry where they burned the ferryboat and captured four rowboats before proceeding downriver (Colvin 1983:69). Federal troops also camped in the Newcastle area (Colvin 1983:71). The Old Church area was once more occupied by Union forces in late May and early June of 1864 before the battle at Cold Harbor.

During most of the twentieth century, the town of Newcastle lay dormant and the land was gradually subsumed into the surrounding agricultural fields. One flurry of activity in the area was the construction of the Richmond and Rappahannock River Railway. It was established in 1912 to connect the counties east of the Pamunkey River with Richmond and to bring farm produce from the fertile Northern Neck area to Richmond. The initial phase extended from the streetcar line at Fair Oaks (Sandston) to the site of Newcastle on the Pamunkey River. Regular service on the 16-mile line began in 1914 but it never reached the Northern Neck. World War I brought an end to the line but remnants are still visible in the project vicinity (McKenney 1986:93). The Richmond and Rappahannock River Railway was constructed through the combined Broadus property in the early twentieth century and a series of plats dated 1913 to 1915 show the its right-of-way in the project vicinity. Other landmarks in the area are also shown on these plats. One plat shows the rail line as well as a proposed siding running southeast of the main line and just to the northwest of a fertilizer factory on the Pamunkey River (HCPB 6:15). Another shows the railroad right-of-way just down river from the sharp bend in the river, the fertilizer factory and its pier on the river (near the location of the present boathouse), the bridge crossing the river and to the road leading to it which trends to the river from the south and west (HCPB 6:29)(Figure 4). Also shown is a dwelling marked S.G. Cox, a shed, and fence line west of the road and an unmarked building between the road and river. All of these features appear to be within the boundaries of Newcastle Town Archaeological Site.

Newcastle Farm History

The history presented here for Newcastle Farm refers to the land owned by Spencer Roane, his daughter, Eliza Roane Ruffin, and Carter Braxton in the nineteenth century. Newcastle Farm was later purchased by Bessie C. and Roland Broadus and incorporated into their other holdings including Marlbourne. Also called the Neck Plantation, present-day Route 360 bisects the property historically known as Newcastle Farm. Newcastle Farm historically did not include the site of Newcastle Town but lay to the north of it.

Newcastle Farm bordered the town of Newcastle on the north and descended from the previously mentioned Meriwether family through Mildred Meriwether who married Nicholas Syme. At Syme's death in 1812, the Newcastle plantation and adjacent ferry encompassed 1000 acres (Colvin 1983:9). Spencer Roane, a judge on the Virginia Supreme Court of Appeals later owned Newcastle Farm. In 1823, his estate is charged with 1029½ acres, which is labeled "Neck Plantation" in the tax records. It was called the Neck Plantation because the Pamunkey River curves around the farm creating a neck or peninsular. The tax records also show buildings valued at \$400 on the property but give no indication as to the location or function of the building(s) (Hanover County Land Taxes [HCLT] 1823). The following year, his daughter, Miss Eliza Roane, was taxed for this same property, now labeled Newcastle Farm, and the tax rolls indicated it was transferred from the estate of Spencer Roane (HCLT 1824). Eliza Roane married a Ruffin. In 1827, Newcastle Farm was listed under the ownership of Albert G. Ruffin and the building value increased by \$175.01, which was noted as a new building. In 1830, this property was again listed under Eliza's name, this time Eliza Ruffin and the tax records indicate a substantial building had been erected the previous year. The building value that year increased by almost \$600 for a total building value of \$1172.11 (HCLT 1830). Eliza Ruffin continued to pay taxes on Newcastle Farm through 1838 (HCLT 1838). On January 1, 1838, Eliza Ruffin of the city of Richmond "late of Hanover" conveyed to Carter Braxton "late of the County of Middlesex" 1037 acres "known by the name of The New Castle Tract and also by the name of the Neck lying between the Pamunkey River and the middle of the road leading from Hanover Town to the Ferry at New Castle bounded by the Pamunkey River aforesaid by a reserve of two acres and a fourth or thereabouts (attached to the Ferry aforesaid) which has been carved out of said tract by the upper line of the town of New Castle and by lands adjoining belonging to the estate of one George Blakey decd." (Hanover County Deed Book [HCDB] 1:318).

The following year it was transferred to the ownership of Carter Braxton in the tax records although the acreage increased from 1029½ acres to 1037 acres. That same year Braxton was charged with taxes for the 2-1/4 acre Newcastle Ferry lot that had been transferred from Jane G. Syme (HCLT 1839). For some unexplained reason, the building assessment of the 1037-acre tract dropped from \$1172.11 in 1839 to \$803.70 in 1840 although a note indicated \$109.27 was added for a new building on the property (HCLT 1840). In 1841, the 2-1/4 acre ferry lot with no buildings had an assessed value of \$200 per acre while the adjacent land was valued at \$17.10 per acre (HCLT 1840). Obviously, the ferry was a valuable property. The historic ferry is thought to have been located in the vicinity of the sharp bend in the river where the modern boathouse now is located.

Carter Braxton was the grandson of one of the signers of the Declaration of Independence, Carter Braxton of King William County. Carter Braxton (the grandson) was born in Frederick County in 1789 and attended Washington College. He married Mary Grymes Sayre who had inherited a considerable estate in Middlesex County (Colvin 1983:25). The Braxtons sold her holdings in Middlesex County and moved to Hanover County with the purchase of the Newcastle Farm and ferry in 1838. These appear to be Braxton's earliest land holdings in Hanover County and he and his family lived on the Newcastle Farm (Colvin 1983:26). By 1843, Braxton had purchased two other tracts of land including a mill and a 71.5-acre parcel on which he constructed his house, Ingleside. In 1843, the buildings at Ingleside were valued at \$3003 as compared with the \$803.70 he was assessed for his Newcastle Farm buildings. There were no buildings on the 2.25-acre ferry tract (HCLT 1843). Carter Braxton died at Ingleside in 1855 with an estate that included Newcastle Farm and ferry (Colvin 1983:28).

For many years after the Civil War, Newcastle Farm was managed by Carter Braxton's son-in-law, Dr. William H. Macon. The Macons had moved in with her widowed mother during the Civil War and continued to live at Ingleside until his death in 1891 (Colvin 1983:109). About 1870, the heirs of Carter Braxton partitioned Newcastle Farm among themselves. A plat recorded in 1888 shows the division of this property as well as other landmarks in the area (Hanover County Plat Book [HCPB] 2:24).

Beginning in 1893, the Newcastle Farm was acquired in a series of purchases by Bessie C. and Roland Broadbudds from the six daughters of Carter Braxton with the final acquisition occurring in 1912 (Colvin 1983:162, note 15). Bessie C. Broadbudds purchased the tract on which the project is located in 1903 (James River Title Agency, Inc. 1999). Bessie C. and Roland Broadbudds were the daughter and the son-in-law of Charlotte Ruffin. The upper fringes of Newcastle adjoined the Ruffin farm, Marlbourne, and the Broadbudds purchased Marlbourne in 1912 from Charlotte Ruffin (Colvin 1983:115, 118). Roland Broadbudds died in 1914 and his son, Alexander Woodford Broadbudds assumed responsibility for managing the land. In 1925, he established a dairy on the Newcastle Farm (Colvin 1983:118).

As late as 1975, a Gothic Revival-style dwelling stood just south of the project ROW and north of the railroad bed. In the 1880s, it was occupied by an African American man who operated the ferry for Mrs. Braxton (Steven Colvin, personal communication, October 1999). During the early part of the twentieth century, the house was the home to African American farm workers who were employed by the Broadbudds. The house eventually became known as Oliver's House for one of the Broadbudds workers, Oliver Jackson (Thiglmann Broadbudds, personal communication, October 1999). Today, only the foundation and chimney of this house survive.

During the last half of the twentieth century many of the historic roads, fence and tree lines, and other landscape features have been removed from the landscape as the Broadbudds family consolidated their land holdings and then redivided the land among various family members. Route 605, for example, which continued across Route 360 and joined Route 606 near Clifton now ends at Route 360 (Thiglmann Broadbudds, personal communication, October 1999). Other features, such as the railroad line have been added to the landscape.

CHAPTER IV. RESEARCH DESIGN AND METHODS

INTRODUCTION

Archaeology is based on the assumption that the behavior of an individual human is generally systematic in nature, following adaptation strategies and other patterns of behavior and value shared between members of the same cultural group. Therefore, the material remains resulting from accumulated episodes of individual behavior by members of that group will reflect patterns resulting from the cultural systems they hold in common. The remains left by an individual or group will also represent specific events, broad historical trends, and thematic associations.

It further is assumed that cultural remains are deposited upon and become part of a natural landscape subject to ongoing natural and cultural taphonomic processes. Processes including soil formation, erosion, colluvial and alluvial deposition, and human land use affect the context and preservation of archaeological remains.

The objective of the investigations at Site 44HN314 was to evaluate the National Register of Historic Places (NRHP) eligibility of the site. The Phase II historical research, archaeological field work, and laboratory analysis were designed to place the site into an appropriate environmental and cultural context; to ascertain the size, chronology, and function; and to evaluate its overall integrity and NRHP significance.

EVALUATION CRITERIA

Phase II investigations at 44HN314 were undertaken to evaluate its archaeological resources for inclusion on the NRHP. At the end of the Phase I investigation, the site was identified as the remains of a late eighteenth to early nineteenth century domestic occupation that was recommended as potentially eligible for nomination to the NRHP under Criterion D due to its potential to contain intact sub-plowzone cultural deposits and its possible association with the Newcastle archaeological site. Assessments of site eligibility were made with reference to the four NRHP criteria, which are summarized below.

Briefly, the four criteria set forth the characteristics that archaeological sites must embody to achieve NRHP status. Criterion A requires sites to possess associations with events that have made a significant contribution to American history. Criterion B involves the sites' associations with the lives of persons significant in the past. To qualify for the NRHP under Criterion C, sites must represent distinct types, periods, or methods of construction, or reflect the work of a master, or possess high artistic value. Criterion D applies to sites that may contribute important information to the study of the past. Archaeological sites most often display qualities of significance under this last criterion. In addition to meeting one or more of these standards,

sites must possess integrity of location, design, setting, materials, workmanship, feeling, and association (Townsend et al. 1993:16).

LITERATURE REVIEW AND BACKGROUND RESEARCH

Archival research entailed the examination of many types of documents including real estate deeds and plats, real estate tax records (land tax books), historic real estate advertisements, National Register of Historic Places nomination forms, county architectural surveys, census records, maps, local histories, and published histories of the region. Repositories visited to conduct research included the Library of Virginia, the Virginia Department of Historic Resources, the Pamunkey Regional Library, and the Hanover County Clerk's Office.

FIELD METHODS

The objectives of the archaeological field investigations for this project involved the assessment of site stratigraphy and content and determinations of site integrity within the proposed development area. Due to restrictions on property access, the site's boundaries were not fully delineated during this investigation. The field work for this project took place between August 30 and September 5, 1999.

The following procedures were employed during the evaluation of Site 44HN314. Preceding the shovel test excavations, a datum point was established near the extreme southeastern corner of the project area and assigned the coordinates N500 E500. Following Virginia Department of Historic Resources standards, shovel tests were excavated at intervals not exceeding 6.09 meters (20 feet). Horizontal control was maintained by assigning unique coordinates to each shovel test, thus establishing a shovel test grid where each individual shovel test was assigned a unique coordinate with respect to the site datum. Grid points that fell on obstacles that prohibited excavation, such as areas that are disturbed or waterlogged, would be excavated in an offset location, if possible, or, if unexcavated, the conditions at that location would be noted in the shovel test log.

Shovel tests measured 0.4 meters (1.3 feet) in diameter and excavation followed natural stratigraphy until culturally sterile subsoils were encountered and sampled. All soils were sifted through 1/4-inch mesh hardware cloth and recovered artifacts were bagged separately according to the natural stratum that produced them. Soil color was described according to the Munsell (1994) soil color charts and texture was described using standard terminology. Data on each shovel test excavation was recorded on standardized forms and the locations of all shovel tests were placed on a site map that were tied to permanent control points.

Gray & Pape also supplemented the shovel testing with 1 by 1-meter (3.3-foot by 3.3-foot) test unit excavations. Test unit placement was based on the surface reconnaissance or shovel test results. For example, test units were placed in areas of high artifact densities as indicated by walkover inspection and/or shovel testing. Test units were excavated by arbitrary 0.10-meter (0.3-foot) levels in order to maintain vertical control. Excavated soils were screened

through 1/4-inch mesh hardware cloth and recovered artifacts were kept separate by arbitrary level and, if appropriate, by natural stratum. Soil color and texture were described using the same procedures noted above, and data on each test unit excavation were maintained on standard forms. Following the completion of a test unit excavation, a measured drawing of at least one test unit profile was prepared and the same profile was recorded with black and white, and color photographs. When encountered, cultural features were sampled or examined using different strategies appropriate for their condition and circumstances.

Mechanical excavation at the site took place entirely within the proposed ROW. The test trenches were dug with the aid of a backhoe and a 4-foot wide smooth-bladed bucket. A total of 8 test trenches was excavated within the proposed ROW in order to search for extant sub-plowzone features relating to Site 44HN314. The excavation of the test trenches was monitored by a Gray & Pape archaeologist. All diagnostic artifacts collected during the mechanical stripping were bagged and labeled in reference to the coordinates of the northeast corner of the test trench from which they originated. Once all of the relevant data from each excavation block was recorded, the backhoe trench was backfilled.

ARCHAEOLOGICAL LABORATORY ANALYSIS

Laboratory analysis provided the foundation for evaluating site chronology and function. Initial processing of recovered artifacts included washing and sorting according to raw material category and provenience. Provenience was maintained throughout the process by the use of a computerized field specimen log, which in turn generated an inventory of materials recovered (Appendix A). Artifacts were then analyzed for chronology and function using the following terminology and methods.

PREHISTORIC ARTIFACT ANALYSIS

For the purpose of this study, technological and morphological attributes of artifacts formed the basis of the analytical process. Artifact classification proceeded by first assigning objects to material groups that reflect technological and/or manufacturing processes. Artifacts were subsequently placed into artifact classes (e.g., debitage, bifaces) and identified according to artifact type (e.g., tertiary flake, projectile point). The assignment of objects to given artifact classes and types was based on morphological attributes. Additional information on each item included descriptive data, such as degree of completeness and raw material type. Subsequent analyses included the identification of artifacts diagnostic of specific cultures or time periods and the identification of activities represented by an assemblage.

A description of the artifact types follows. This discussion is organized by material group. The taxonomy employed for this analysis follows Kozarek (1987) and Taylor and Koldehoff (1991).

Lithics

Bifaces

The biface category includes chipped-stone artifacts comprised of cobbles or flakes which have had flakes removed from both faces. This artifact class may include relatively expedient artifacts, such as choppers, or formalized tools such as projectile points or drills.

Projectile Points (Hafted Bifaces): Finished bifaces used for the tips of projectiles, as knives, or for other purposes. Normally, these items would have been fastened to the end of a projectile, such as an arrow, spear, or dart, or to a handle for use as a knife.

Biface Preforms: Bifaces that have been reduced through the early and perhaps middle stages of manufacture. These items have been initially trimmed and shaped and may exhibit bifacially reduced edges, scars from large reduction flakes, varying amounts of cortex, and lenticular cross sections. They presumably served as blanks to be further reduced into formal tools as needed. They may also have functioned as sources of lithic raw material from which flakes could be removed as needed and made into expedient or finished tools.

Unspecified Bifacial Implement: Items that do not clearly belong to a defined category of biface.

Debitage

Debitage consists of all refuse generated during the process of manufacturing, reworking, or maintaining chipped-stone tools. Further,debitage does not include debris that has been modified or utilized in some way, such as for expedient tools.

Primary decortication flakes: Flakes that retain cortex on 100 percent of the dorsal face. This artifact type represents the first flakes removed from a core during chipped-stone tool manufacture.

Secondary decortication flakes: Flakes that retain cortex on 30 to 99 percent of the dorsal face and that display one or more scars from previously detached flakes. These flakes are also removed during the initial steps in the reduction process.

Primary flakes: Flakes produced during the initial shaping of tools and/or cores. Primary flakes exhibit a triangular platform, a relatively prominent Hertzian cone at the point of impact, and retain cortex on less than 30 percent of their surface. These flakes may exhibit scars of previously detached flakes on their dorsal surface.

Secondary flakes: Flakes produced during the intermediate tool and/or core shaping process. Secondary flakes are typically longer than they are wide and exhibit a lenticular platform. These flakes do not exhibit a prominent Hertzian cone, are considerably thinner than the primary flakes described above, and display many scars from previously detached flakes. General reduction/thinning flakes and bifacial thinning flakes fall into this category. They may be

produced during the middle and late stages of tool manufacture as well as via tool maintenance and reworking.

Tertiary flakes: By-products of biface trimming or sharpening. Tertiary flakes may result during either the final stage of biface manufacture or during maintenance, repair, or reworking of finished bifaces. In the latter case, a bifacial edge is apparent on these flakes where they were removed from a finished product. These flakes are typically ovoid in shape and small, with a typical length ranging from 3 to 10 millimeters, and exhibit point platforms.

Bipolar flakes: Flakes detached from a bipolar core by striking (hard hammer) one edge while the other edge rests on an anvil. This technique may produce two bulbs of percussion at opposing ends of the flake, with concentric rings emanating from each bulb in opposite directions as well as crushed and splintered platforms.

Shatter and blocky fragments: Angular and blocky fragments that lack any evidence of a platform, bulb of force, or negative flake scars. Shatter and blocky fragments may occur during any stage of a reduction sequence; they may also occur as the product of fire-fracture or natural (non-cultural) processes.

Flake fragments: Pieces of debitage on which the primary indicators of type have been lost. This flake type cannot be assigned to any type category and is of limited analytical value.

Utilized Debitage: This category of expedient tool consists of utilized pieces of unmodified debitage. Nearly any type of debitage may have served as a tool in this manner. Such implements were identified on the basis of obvious indications of retouch or edge damage as a result of use.

Checked pebbles: Pebbles or cobbles derived from secondary deposits from which one or more flakes have been chipped, presumably for the purpose of checking the interior quality of the material. Cortex on these pebbles and cobbles is hard, rounded, and patinated due to the manner of transport.

Cores

Bipolar Flake Core: Blocks or cobbles from which flakes have been removed using direct hard-hammer percussion on an anvil. Such cores often possess a tabular shape, display crushing and battering, and flake scars typically run parallel with the long axis of the core. This core type reflects a technique for maximizing available raw materials. The technique primarily produces flakes useful as expedient flake tools.

Multidirectional Flake Core: Blocks or cobbles from which flake detachment has occurred in multiple directions. The process involves holding the core in one hand and delivering blows with a hammerstone held in the other. This technique may produce flakes useful for both expedient tools or for further reduction into formalized tools.

Block Core: Cores produced from primary sources of raw material in block form. These cores cannot be identified beyond this characteristic.

Cobble Core: Cores produced from secondary sources of raw material in cobble form. These cores cannot be identified beyond this characteristic.

Core debris: Spent or exhausted cores that cannot be accurately classified according to specific core type.

Cobble Tools

Cobbles employed for diverse purposes with little or no prior alteration. Uses for these tools typically include hammering, smoothing, grinding, as anvils, or combinations of tasks. These items are distinguished by battered, crushed, pitted, and smoothed surfaces, or combinations of these attributes.

Hammerstones: Cobble tools that exhibit crushing and battering at their margins. These characteristics indicate use of these items for battering stone during chipped-stone tool production, or for other purposes.

Abraders: Tools used to shape and sharpen tools made from various materials. Abraders that possess slots or grooves may represent the manufacture and maintenance of bone and wood tools. Abraders with flat surfaces appear to have been used in the preparation of platform for chipped-stone tool manufacture and maintenance, for polishing ground stone tools, and for use in manufacture of bone and wood tools.

Pitted Stones: Cobble tools that exhibit one or more smooth indentations. These impressions are typically circular or oval. This tool type appears to represent the processing of nuts or other subsistence resources.

Fire-Cracked Rock (FCR)

This class of artifact includes cobbles that have been fractured as a result of exposure to direct heat, as in a hearth. In addition, stones that have broken from exposure to temperature extremes, such as when heated stones are placed in water to boil it, are also included in this category.

HISTORIC ARTIFACT ANALYSIS

The initial steps in historic artifact analysis involve cataloging the assemblage. Data recorded on each artifact include form, material, functional classification, manufacturing technology, and attributes that are chronologically diagnostic. Material classifications are subdivided to afford greater flexibility and detail of inclusive data. The attributes category in the

inventory provides additional information on individual size, condition, or completeness. The examination of the historic artifact inventory focused on functional and chronological data. The following sections include discussions of the descriptive categories utilized to inventory the artifact assemblages.

Typology and Chronology of Manufacture

Standard typological methods were applied to characterize the historic artifact assemblages. The following sections begin with a review of information used to describe the artifact assemblages and delineate their chronological positions. Jones and Sullivan (1985), Miller (1980, 1988), Munsey (1970), Noel Hume (1970), Seidel (1990), and Worthy (1982) provided the basis for this categorization.

Ceramics

After identifying specific items (e.g., vessels, chamber pots, etc.), ceramic artifacts were placed into one of three groups based on paste and manufacturing technique: (1) earthenware; (2) stoneware; or (3) porcelain. Specific artifacts were then categorized by ware type. Date ranges for artifacts were assigned on the basis of ware type and, in some instances, by the techniques employed for manufacture and decoration. If present, makers' marks also provided information on the date of the artifact.

Glass

For the purposes of this analysis, glass was examined principally for chronological and functional attributes. Glass was first sorted according to the type of object from which it derived (e.g., bottle, jar, and tableware). Individual artifacts were then assigned to a functional category based on presumed use. Additional information recorded on each glass artifact included its color and manufacturing technique.

Chronological analysis of the glass sample was based primarily on manufacturing technique and color. Attributes of manufacture that indicate dates for glass artifacts may include finish treatment, mold markings, embossment, makers' marks, and stylistic elements. Colors may also indicate the period during which the glass was produced. In general, dark green glass represents a type popular until the 1860s. Glass that displays a violet tint represents solarized material to which manganese has been added and dates between 1880 and 1914.

Other Artifacts

Changes in nail manufacturing technology provide the basis for determining dates for construction on a site. In general, handmade nails date to the period prior to the 1820s. Machine-

cut nails became common between the 1820s and 1870s. Wire nails, invented in the 1850s, came into popular use in the 1870s.

Other artifact types can provide chronological data. Such information is typically derived from attributes such as material, manufacturing technology, form/function, or makers' marks. This information is recorded when appropriate.

Chronological Analysis

The artifacts recovered from each site indicate the general range of dates during which the site was occupied. In some instances, the same information can be obtained for discrete depositional units at sites (Table 1).

In general, the artifacts that possessed the earliest dates were assumed to suggest the initial occupation of the site. Furthermore, the artifacts with the latest date of manufacture provided a *terminus post quem* (TPQ) that refers to the date after which a deposit was generated. For the purposes of these investigations, TPQs were tentatively utilized to suggest the earliest date the site had been occupied.

Mean ceramic dates (MCD) were also applied when the number of sherds was high enough for a reliable assay. The MCD formula constitutes a method for deriving a weighted mean date of occupation of a site or specific depositional units within a site. The formula places a greater weight on ceramic types present in high numbers and therefore eliminates mean dates skewed by low numbers of early or late ceramic types. The resulting mean dates suggest the period during which a site was most intensively occupied (South 1977).

Functional Analysis

All historic artifacts were classified according to functional category. Sorting the materials in this manner provides a convenient organizational scheme for description of all the historic artifacts and the basis for suggesting what activities occurred at historic components. The initial step in this analysis involved determining the relative frequencies of functional groups represented within a discrete assemblage. In general, it was assumed that high frequencies of domestic artifacts and architectural-related artifacts indicated a domestic occupation. High incidences of artifacts that represent other functional groups could indicate other, specialized activities. For example, a high percentage of horse tack and low frequencies of domestic artifacts might indicate the location of a stable. The functional classes utilized for this study are based on South (1977) and are described below.

Activities Group

The activities group contains objects that have more than one possible function, or those which do not fit into any of the previous functional group classifications. These artifacts include tools, toys, table items, and miscellaneous hardware elements.

Table 1. Manufacturing Dates for Historic Artifacts

MATERIAL-CLASS/TYPE	DESCRIPTION	DATE RANGE
CERAMICS		
Stoneware, Westerwald		ca. 1650-1775
Stoneware, Brown imported		ca. 1690-1775
Domestic stoneware		ca. 1820-1900
Red-bodied slipware		ca. 1670-1850
Agateware		ca. 1750-1810
Buckley		ca. 1740-1850
Delftware		ca. 1625-1800
White salt-glazed stoneware		ca. 1720-1805
Creamware		ca. 1762-1820
Pearlware	Plain	ca. 1775-1840
Whiteware	Plain	ca. 1820-Present
Yellowware	Plain	ca. 1830-1900
Ironstone	Plain	ca. 1840-Present
Ironstone	Decalcomania	ca. 1880-1930
GLASS		
Glass, solarized		ca. 1880-1914
Bottle	Finishing Tool	ca. 1850-1920
Bottle	Machine-made	ca. post-1903
NAILS		
Nail	Wrought	ca. pre-1820
Nail	Machine cut	ca. 1820-Present
Nail	Wire	ca. 1850-Present

Architecture Group

Architecture group artifacts are identified as those elements associated with the building environment. Artifacts included in this group are brick, mortar, nails, window glass, building hardware, cementing agents, shingles, and other materials. Not included in this group are those elements used to enhance the building environment.

Arms Group

The arms group encompasses all forms of weaponry and accessories. This includes gun and pistol parts, ammunition, knives, swords, bayonets, and so forth.

Clothing Group

The clothing group designates artifacts associated with clothing such as cloth, leather, fasteners, etc.; accessory items such as belt buckles, shoe hooks, and shoes; and those items used in the construction and repair of clothing such as needles, pins, scissors, and thimbles.

Domestic Group

Domestic group materials are those items that are directly associated with household activities. Elements of this group include food service and storage vessels; furniture items such as vases, mirrors, building enhancements, etc; and food remains.

Miscellaneous Group

Miscellaneous group artifacts generally include items whose function is indeterminate, ambiguous, or which may fall into more than one of the other groups. Items commonly placed into this category includes glass containers with indeterminate functions (e.g., bottles whose contents cannot be identified); faunal and floral specimens, and unidentified metal, plastic, and other materials.

Personal Group

Personal group artifacts include objects that are associated with an individual or with individual use. Coins, keys, tobacco-related artifacts, items for cosmetics and personal hygiene, combs, brushes, and all writing materials are included in this group.

Transportation Group

The transportation artifact group encompasses items related to physical transportation. For example, automobile parts would be assigned to this group.

Utilities Group

This class of materials includes items related to heating, cooking, lighting, electrical, and plumbing systems, among others. Typical artifacts placed in this category include lamp parts, including glass lamp chimneys), stove parts, and electrical fixtures.

CURATION

Following the completion of this project, artifacts will be prepared for curation according to guidelines specified by the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and the VDHR's "State Curation Standards" (VDHR 1993).

CHAPTER V. RESULTS OF PHASE II FIELD INVESTIGATIONS

INTRODUCTION

Site 44HN314 is located between Route 360 and the Pamunkey River in Hanover County, Virginia (see Figure 1). Site 44HN314 was initially identified by Gray & Pape during a 1998 Phase I survey of the proposed Totopotomoy Wastewater Treatment Plant effluent force main (Blake et al. 1999). The site itself is located on a terrace approximately 30 meters (98.4 feet) to the west of the Pamunkey River. Due to property access restrictions during the initial investigation, the boundaries of the site could not be fully delineated and only those portions of the site that fell within the proposed project area could be investigated. According to the Phase I report, the site measures approximately 122 meters (400 feet) east to west and 7.62 meters (25 feet) north to south (Blake et al. 1999: 39).

Shovel testing at the site yielded a variety of domestic refuse and architectural debris that range in date from the mid-eighteenth century to the second quarter of the nineteenth century. Phase I testing also indicated the survival of a potential sub-plowzone cultural deposit. Based upon the site's proximity to the Newcastle Town Virginia Landmarks Register property and the likelihood for the survival of intact sub-plowzone cultural deposits, Site 44HN314 was determined to be potentially eligible for nomination to the National Register of Historic Places under Criterion D. Further, more focused, archaeological fieldwork and historical research was recommended if any portion of the site was threatened by development.

The site is located in the Coastal Plain physiographic zone and lies within an area of well-dissected terrain. Elevations in the site vicinity are approximately 13.7 meters (45 feet) above mean sea level (amsl). Site 44HN314 occupies part of a relatively level plain that lies to the north and west of the Pamunkey River. At the time of the field investigations, the site was located within an agricultural field planted in soybeans.

The site-specific historical research undertaken in association with this resource served to confirm the site's identity and function, and determine how it related to the historical contexts identified previously. The archaeological work provided information on the cultural features and deposits at the site and how well these reflected the historical and thematic contexts.

PROJECT RESULTS

The Phase II field work at Site 44HN314 consisted of a walkover survey, systematic shovel testing, test unit excavations, and a program of mechanically excavated trenches. The walkover was conducted in order to locate any extant surface artifact concentrations or deposits. The shovel testing confirmed the site limits and produced data concerning the horizontal and vertical artifact distributions across the site. The test unit excavations provided detailed

information on site stratigraphy and the types and range of cultural materials present on the site. The backhoe excavations were designed to document the existence of intact sub-plowzone cultural features or deposits within the proposed corridor. The Phase II archaeological field investigations at Site 44HN314 included the excavation of 68 shovel tests, 2 hand excavated 1-meter by 1-meter (3.3-foot by 3.3-foot) test units, and 8 machine-excavated test trenches.

SHOVEL TESTING

Gray & Pape excavated a series of systematic shovel tests in order to document the extent of the site within the project corridor and understand the vertical extent of the artifact deposits. For the purposes of the survey, the study area was subdivided into two tracts. The edges of Area 1 correspond to the boundaries of the lot for the proposed discharge structure. Area 2 encompasses those portions of the site within the proposed permanent access and utility easement. Fifty shovel tests were excavated within Area 1. Eighteen shovel tests were excavated within the confines of Area 2.

With respect to horizontal distributions across the entirety of the project area, the shovel testing revealed a spread of cultural materials scattered across an area measuring approximately 60.7 meters (200 feet) north to south by 91.4 meters (300 feet) east to west (Figure 3). Due to restricted access to the surrounding property, the site boundaries were not fully delineated. The site appears to be bounded on the east by the Pamunkey River. The site's northern, western, and southern boundaries could not be established during this investigation. Out of 68 total shovel tests, 47 tests yielded positive results. Seven shovel tests were not excavated due to disturbance or excessive slope. Artifact densities within this portion of the site were moderate to high; each positive shovel test yielding an average of nine artifacts. Artifact concentrations occurred in the vicinity of Shovel Tests N480 E360, N520 E420, N580 E460, and N600 E420.

Turning to the vertical extent of the site, all the artifacts recovered during the shovel testing originated from plowzone soil deposits. Soil profiles within Site 44HN314 typically contained two distinct soil strata. Stratum I, the Ap horizon, was typically comprised of 50-60 centimeters (19.68-23.6 inches) of a dark yellowish-brown (10YR4/4) sandy loam. Stratum II, the culturally sterile B horizon, typically consisted of a yellowish-brown (10YR5/6) sandy clay loam.

In total, 408 artifacts were recovered during the shovel testing phase of the field investigations. The artifact assemblage was predominated by fragments of brick (n=190) and bottle glass (n=58). Other artifacts in the collection included: lithic debitage (n=45), unidentified nail fragments (n=25), wrought nail fragments (n=19), window glass (n=15), whiteware (n=11), unidentified metal object fragments (n=9), clam shell (n=6), porcelain (n=5), pearlware (n=4), creamware (n=3), oyster shell (n=3), domestic gray stoneware (n=2), white salt-glaze stoneware (n=2), tooth fragments (n=2), tin-glazed earthenware (n=2), cut nails (n=2), mortar fragments (n=2), redware (n=1), unidentified coarse earthenware (n=1), and a fence staple (n=1).

TEST UNITS

To examine the nature of the site's soil deposits and artifact concentrations in greater detail, Gray & Pape excavated 2, 1-meter by 1-meter (3.3-foot by 3.3-foot) test units. Unit 1 (N600 E382) was excavated in the vicinity of an artifact concentration delineated during the shovel testing phase of the investigation. Stratigraphy within the unit consisted of two distinct soil layers (Figure 4). Stratum I, the Ap horizon, consisted of 50 centimeters (19.68 inches) of a 10YR4/4 dark yellow brown fine sandy loam. Stratum II, culturally sterile subsoil, consisted of a 10YR5/8 yellowish-brown coarse sandy clay loam. No cultural features were observed at the subsoil interface within the unit.

All of the artifacts in Unit 1 were recovered from the Ap horizon. These artifacts consisted of 122 brick fragments, 50 bottle glass fragments, 17 wrought nails, 15 unidentified metal fragments, 12 lithic debitage, 10 bottle glass fragments, 7 unidentified glass fragments, 5 animal bone fragments, 5 tobacco pipe fragments, 4 cut nails, 4 Whieldon sherds, 4 white salt-glaze stoneware sherds, 4 oyster shell, 3 clam shell, 3 porcelain sherds, 2 tin-glazed earthenware sherds, 2 imported brown stoneware sherds, 2 clothing buttons, 2 unidentified nail fragments, 1 coarse earthenware fragment, 1 pearlware sherd, 1 redware sherd, 1 unidentified ceramic sherd, 1 whiteware sherd, 1 metal tack, and 1 non-cultural stone.

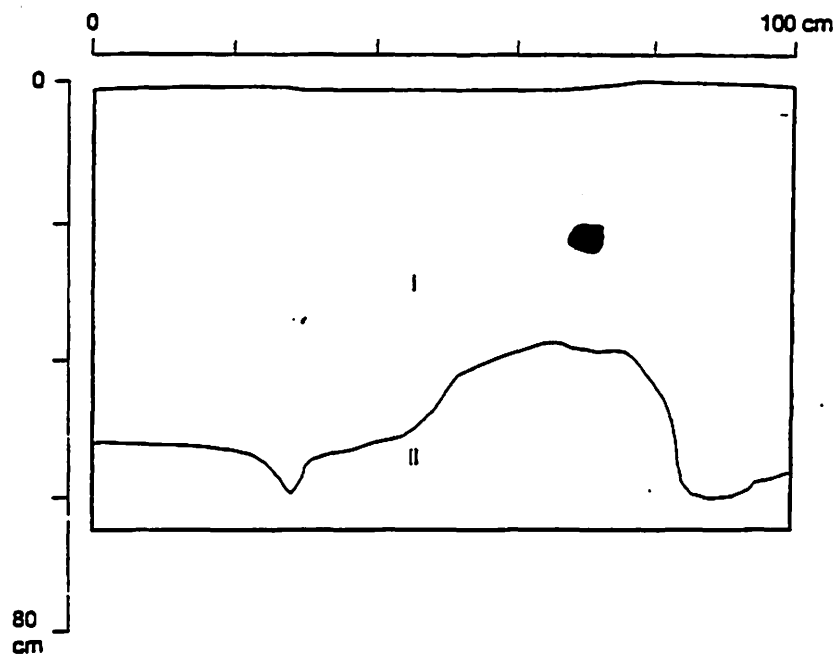
Unit 2 (N483 E340) was excavated in the vicinity of an artifact concentration delineated during the shovel testing phase of the investigation. Stratigraphy within the unit consisted of two distinct soil layers (Figure 5). Stratum I, the Ap horizon, consisted of 53 centimeters (20.86 inches) of a 10YR4/4 dark yellow brown sandy loam. Stratum II, culturally sterile subsoil, consisted of a 10YR5/6 yellowish-brown sandy clay loam. No cultural features were observed at the subsoil interface within the unit.

All of the artifacts in Unit 2 were recovered from the Ap horizon. These artifacts consisted of 38 brick fragments, 19 bottle glass fragments, 16 wrought nails, 11 lithic debitage, 8 cut nails, 5 pearlware sherds, 4 creamware sherds, 4 whiteware sherds, 4 oyster shell fragments, 3 window glass fragments, 3 unidentified nail fragments, 2 tobacco pipe fragments, 1 iron pintle, 1 tin-glazed earthenware, 1 domestic brown stoneware sherd, 1 piece of plastic, and 1 non-cultural stone.

BACKHOE TRENCHES

In addition to the shovel testing and unit excavation, the archaeological investigations at Site 44HN314 also included a program of machine-excavated trenches. These trenches were excavated within the proposed project corridor in order to document the existence of sub-plowzone cultural deposits. A total of eight backhoe trenches was excavated within the site boundaries. Trenches 1, 5, 6, and 9, all located within Area 1, each measured 1.52 meters (5 feet) in width and 10 meters (32.8 feet) in length (see Figure 3). No cultural features were observed at the subsoil interface in any of these trenches.

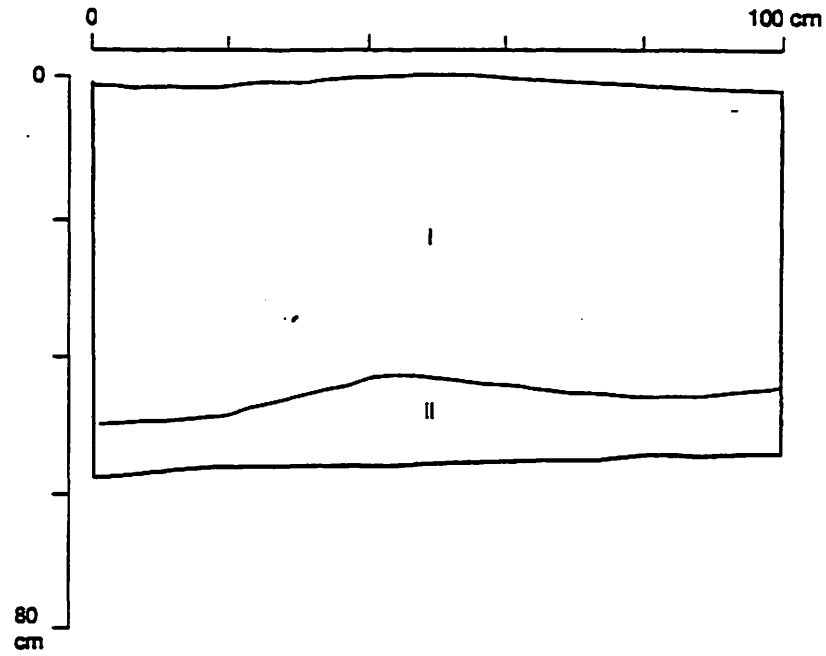
Site 44HN314
Unit 1, N600 E382
West Profile



- Stratum I 10YR4/4 Dark yellowish brown
fine sandy loam
- Stratum II 10YR5/8 Yellowish brown
Coarse sandy clay loam
- Brick

Profile of Test Unit 1 (N600 E382)

Site 44HN314
Unit 2, N483 E340
West Profile



- | | |
|------------|--|
| Stratum I | 10YR4/4 Dark yellowish brown
sandy loam |
| Stratum II | 10YR5/6 Yellowish brown
sandy clay loam |

Profile of Test Unit 2 (N483 E340)

The remaining trenches are located within Area 2 and are concentrated around an intact brick feature (Feature 4) that was observed during the excavation of Trench 2. Trench 2 was located east of Unit 2 and proceeded 10 meters (32.8 feet) to the east. The fill from Trench 2 contained dense concentrations of brick and domestic refuse. Further individual trenches and extensions of Trench 2 to the north and south were excavated due to the presence of an intact cultural feature. Trench 3 began at the western end of Trench 2 and extended 10 meters (32.8 feet) to the west. No cultural features were observed within Trench 3. Trench 4 began at the western end of Trench 3 and extended 10 meters (32.8 feet) to the west. Again, no cultural features were observed within Trench 4.

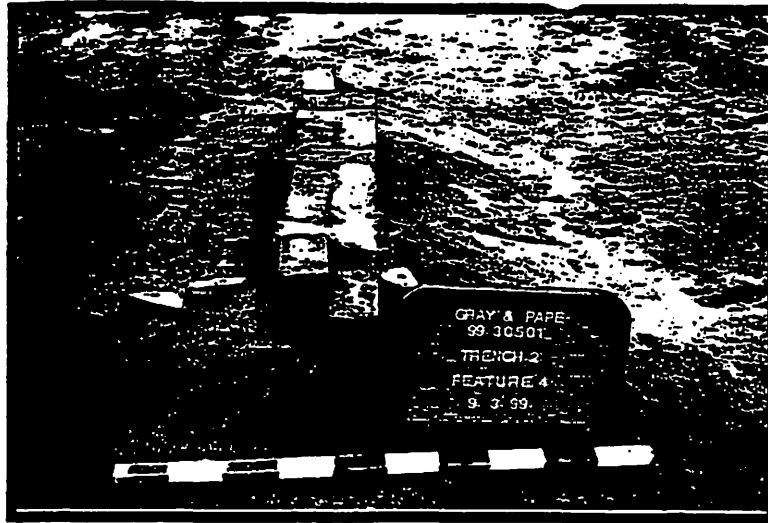
Excavation moved northward from this line of trenches in order to document the survival of any intact sub-plowzone cultural deposits. Trench 7 was located approximately 1.52 meters (5 feet) to the north of Trenches 2 and 3 and extended for a distance of 10 meters (32.8 feet). Trench 8 was located at the southern end of Trench 7 and extended 10 meters (32.8 feet) to the southeast. At the completion of the trench excavation, approximately 160.2 square meters (1,725 square feet) were exposed. The excavations exposed a total of four features.

FEATURES

Features 1, 2, and 3 were all located within Trench 1 in Area 1 at a depth of 51 centimeters (20.07 inches) below the current surface grade. Each of these features possessed an amorphous shape and test excavations revealed that the origin of each of these soil stains was from a tree or root.

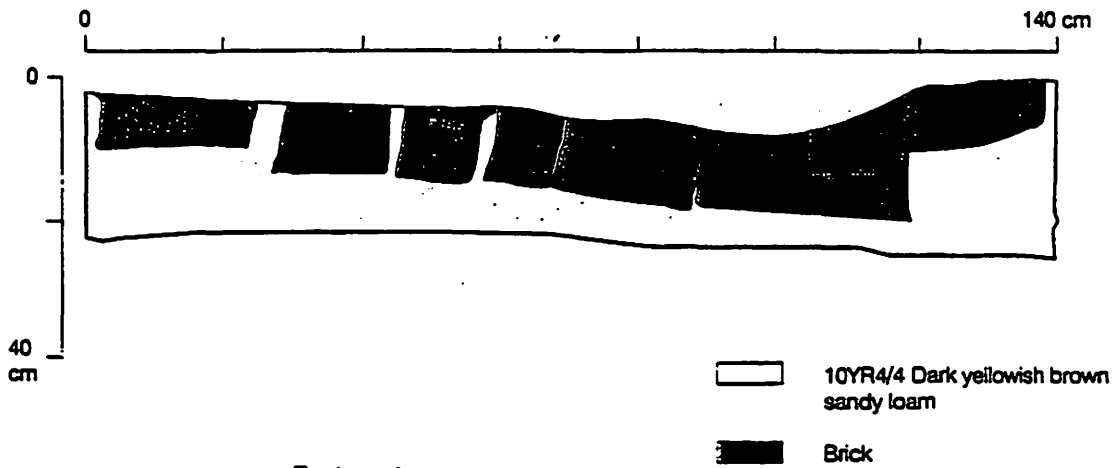
Near the base of Trench 2, a line of in-situ brickwork was observed. Designated as Feature 4, the feature consisted of a single course of brickwork that measured approximately 140 centimeters (55.1 inches) in length (Figure 6). The brickwork measured approximately 20 centimeters (7.87 inches) in width and depth. Feature 4 was located within the plowzone, approximately 10-15 centimeters (3.93-5.9 inches) above the subsoil interface. The feature was encountered at a depth of 45 centimeters (17.7 inches) below the current surface grade. No additional architectural or other cultural features were found in association with Feature 4. Feature 4 may be the remains of a building foundation or a brick walkway, however, because so much of the feature has been lost to plowing, it is difficult to determine its exact function.

The remainder of the artifact assemblage from 44HN314 was collected during the excavation of the test trenches. A total of 117 unprovenienced artifacts were recovered during the monitoring of the trench excavation. The assemblage was comprised of 26 bottle glass fragments, 19 animal bone fragments, 12 pearlware sherds, 10 unidentified nail fragments, 9 creamware sherds, 5 oyster shell, 4 lithic debitage, 3 coarse earthenware fragments, 3 Colono-ware sherds, 2 cut nails, 2 wire nails, 2 wrought nails, 2 iron spikes, 2 window glass fragments, 2 porcelain sherds, 2 tooth fragments, 2 unidentified metal fragments, 1 prehistoric pottery sherd, 1 fragment of tableware glass, 1 redware sherd, 1 whiteware sherd, 1 Black basalt sherd, 1 white salt-glaze stoneware sherd, 1 sherd of unidentified stoneware, 1 tobacco pipe fragment, 1 unidentified glass fragment, and 1 fragment of a Halifax projectile point.

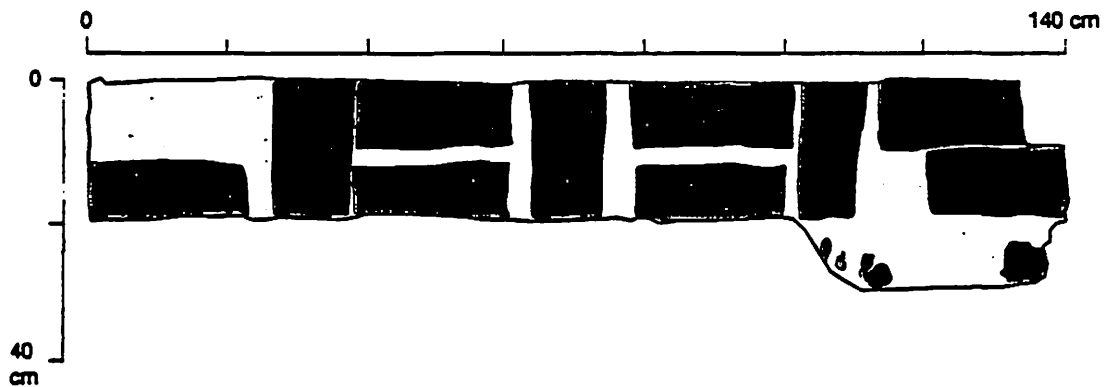


Feature 4, looking east.

Feature 4
North Profile



Feature 4
Plan View



Plan and Profile of Feature 4,
Site 44HN314

To summarize the field data, the entirety of the proposed project area contains Site 44HN314. While the site's boundaries were not fully delineated, it may be assumed that the resource continues to the north, west, and possibly south of the current study area. Phase II investigations recovered evidence of at least two distinct occupations at the site. The first occupation took place during the Late Archaic and possibly Middle Woodland period of prehistory. Due to the low density of artifacts, however, and the lack of a large sample of diagnostic materials, it is difficult to ascertain the exact function and nature of the prehistoric settlement. The site was occupied again during the last quarter of the eighteenth century. The cultural remains at Site 44HN314 appear to be those of a single- or multi-family dwelling that was occupied until the second quarter of the nineteenth century.

ARTIFACT ANALYSIS

The artifact assemblage from 44HN314 includes a total of 952 items. Of these, 76 artifacts are associated with the prehistoric component of the site. The remaining 876 items are associated with the historic occupation of the site. The majority of the prehistoric assemblage (n=71) is comprised of non-diagnostic quartz and quartzite reduction material. The debitage consisted of secondary thinning flakes (n=33), shaping/finishing flakes (n=18), and flake fragments/shatter (n=20). The assemblage also contained 1 core fragment and 2 biface fragments. Diagnostic prehistoric materials included one Halifax projectile point, which is typically characteristic of the later Middle and Late Archaic periods (3700-3000 B.C.). One sherd of prehistoric pottery was also recovered during the excavations. This sherd, possibly diagnostic of the Middle Woodland period (500 B.C.-A.D. 900), possesses a sand/grit temper and has a cord-marked surface decoration.

The historic materials (n=876) are divided into the architecture, clothing, domestic, furnishings, miscellaneous, and personal artifact groups. The architecture group comprises the majority of the historic assemblage, making up 56.8 percent of the total. The domestic and miscellaneous groups constitute the next highest frequencies, 25.7 and 16.2 percent, respectively. Of the balance of the assemblage, no group makes up more than 1 percent (Table 2).

The architecture group is made up principally of brick, nails, and window glass. A total of 350 brick fragments, which comprised the majority of the architecture group assemblage, were recovered from the site during the Phase II investigations. In total, 112 nails and nail fragments were collected. These included 80 wrought nails, 16 cut nails, 2 wire nails, and 14 unidentifiable examples. These items are useful for evaluating the chronology of the site. The high number of wrought nails is consistent with the estimated construction of a domestic structure during the late eighteenth century. The assemblage also included 30 fragments of window glass, 2 mortar fragments, 2 metal spikes, 1 metal pintle, and 1 fence staple.

The domestic artifact group consists mainly of materials associated with food preparation, serving, and storage. Ceramic and glass vessels make up the bulk of this group. The sample of 100 ceramics includes pearlware (n=22), whiteware (n=17), creamware (n=16), porcelain (n=10), white salt glaze stoneware (n=7), coarse utilitarian earthenwares (n=5), tin-glazed earthenwares (n=5), Whieldon (n=4), Colono-ware (n=3), redware (n=3), imported brown

stoneware (n=2), domestic gray stoneware (n=2), unidentified ceramic sherds (n=2), domestic brown stoneware (n=1), and black basalt (n=1). Identifiable vessel types included table and teawares among the refined earthenwares (e.g., creamware, pearlware, and whiteware). The chronological information from this assemblage is consistent with that of the architectural class. The majority of the ceramics are suggestive of a late eighteenth to early nineteenth century occupation. The pearlware (manufactured from 1780 to 1820) comprises the bulk of the ceramics, and the whiteware (1820 to present) makes up the next most prevalent type. Earlier ceramic ware types such as creamware (1762-1820), Whieldon (1740-1770) and Black basalt (1750-1820) were also represented within the ceramic assemblage.

Glass artifacts placed in the domestic category include containers and tablewares used for the storage, serving, and/or preparation of food. The investigation recovered 124 glass tableware fragments. Of these, 115 dark green glass fragments were associated with late eighteenth century, hand-made wine bottles.

The miscellaneous artifact group, the third largest artifact group represented at the site, consists largely of various animal bone fragments (n=49). Although the majority of the fragments appear to be associated with small mammals, most specimens were too small to be positively identified. The second most frequent artifact type within the miscellaneous group were glass container fragments whose function could not be clearly discerned. A total of 29 such fragments were recovered and while they have a limited use for functional analysis, they provide important chronological information about the site. Of the diagnostic glass fragments, several artifacts represent non-machine-made examples that pre-date 1893. None of the collected bottle glass in the assemblage contains either manufacturers or product marks.

Table 2. Historic Artifact Groups from Site 44HN314

Artifact Group	Count	Percentage
Architecture	498	56.8
Clothing	2	0.3
Domestic	225	25.7
Furnishings	1	0.1
Miscellaneous	142	16.2
Personal	8	0.9
TOTAL	876	100.0

Other miscellaneous artifacts include metal objects (n=22) that could not be identified or which do not clearly fit into the other groups. In addition, artifacts made of other materials that could not be identified, such as slate and plastic, were included in this category. The remainder

of the artifacts included in this category were oyster shell (n=16), unidentified glass fragments (n=12), clam shell (n=9), tooth fragments (n=4), and plastic fragments (n=1).

The remaining artifact groups from this site contain only a very limited amount of material. The furnishings group from this site includes one tack. The clothing group includes two clothing buttons. The personal group from this site is comprised of 8 clay tobacco pipe fragments. Two fragments are tobacco pipe bowl fragments. The remaining five specimens are stem fragments. Of these, four possess a 4/64" bore diameter, which is indicative of a manufacture date between 1750 and 1800. The remaining specimen possesses a 5/64" bore diameter, which is indicative of a manufacture date between 1710 and 1750.

SUMMARY

The current investigations were designed to provide more detailed and precise information concerning the internal structure of Site 44HN314 and to generate systematic artifact collections from which questions dealing with site chronology, size, function, and integrity could be addressed. The field investigations included the excavation of 68 shovel tests, 2, 1-meter by 1-meter (3.3-foot by 3.3-foot) test units, and 8 machine-excavated test trenches. Phase II investigations recovered evidence of at least two distinct occupations at the site. The first occupation took place during the Late Archaic and possibly Middle Woodland period of prehistory. All of the prehistoric materials recovered during the investigations (n=76) were recovered from a plowzone context. Due to the low density of artifacts, however, and the lack of a large sample of diagnostic materials, it is difficult to ascertain the exact function and nature of the prehistoric settlement. The site was occupied again during the fourth quarter of the eighteenth century at which time it functioned as a domestic site. The site was most likely abandoned by the second quarter of the nineteenth century. Architectural debris such as brick fragments, nails, and window glass dominated the historic artifact assemblage. Various types of domestic refuse such as ceramic vessel fragments, bottle glass, and tobacco pipe fragments were also well represented within the assemblage.

Although no documentary or cartographic evidence was recovered that could conclusively identify the eighteenth century occupants of Site 44HN314, archaeological field investigations determined that a structure once stood at this location. The archaeological and documentary evidence gathered during the Phase II investigations at Site 44HN314 suggests that the surviving cultural remains are closely related to the period of occupation for the nearby town of Newcastle. Given the proximity of Site 44HN314 to the former location of the town, it is highly likely that the two resources once shared a close association.

CHAPTER VI. CONCLUSIONS AND RECOMMENDATIONS

Gray & Pape, Inc. (Gray & Pape), Richmond, Virginia, conducted a limited Phase II archaeological evaluation of Site 44HN314 in advance of the proposed construction of the Totopotomoy Wastewater Treatment Plant (WWTP) effluent force main and outfall/cascade aerator structure in Hanover County, Virginia. The survey was conducted for Hazen and Sawyer, P.C., Raleigh, North Carolina, under contract to the Hanover County Department of Public Utilities. This project was authorized by the Hanover County Department of Public Utilities in order to meet the terms of its Conditional Use Permit CUP-16-97 (CUP) and to comply with the requirements of Section 106 of the Historic Preservation Act of 1966, as amended.

The intent of a Phase II evaluation is to gather sufficient data to make possible a determination of the site's eligibility for nomination to the National Register of Historic Places. Eligibility for nomination is dependent on the site's ability to satisfy very specific criteria established by the federal government (36CFR 60.4 [a-d]). The field investigations at Site 44HN314 were designed to provide the necessary data for an assessment of the site's integrity and level of potential significance. Because the site is being evaluated under Criterion D, the resource must be capable of yielding additional significant information pertaining to the region's past history. The objective in evaluating this site was to consider how representative it is of particular historic contexts and themes. Historical documentary research served as a means to develop regional and site-specific contexts and to determine commonality or uniqueness of the site as a whole. Archaeological field research was designed to determine the presence and integrity of the site's features, deposits, or other tangible remains that may reflect these contexts and themes.

Site 44HN314 is located between Route 360 and the Pamunkey River in Hanover County, Virginia (Figure 1). Site 44HN314 was initially identified by Gray & Pape during a 1998 Phase I survey of the proposed Totopotomoy Wastewater Treatment Plant effluent force main (Blake et al. 1999). The site itself is located on a terrace approximately 30 meters (98.4 feet) to the west of the Pamunkey River. Due to property access restrictions during the initial investigation, the boundaries of the site could not be fully delineated and only those portions of the site that fell within the proposed project area could be investigated. As such, the site measures approximately 122 meters (400 feet) east to west and 7.62 meters (25 feet) north to south.

The Phase II archaeological field investigations at Site 44HN314 included the excavation of 68 shovel tests, 2, 1-meter by 1-meter (3.3-foot by 3.3-foot) test units, and 8 machine-excavated test trenches. A total of 952 artifacts were recovered during the field investigations. Architectural debris such as brick fragments, nails, and window glass dominated the assemblage. Various types of domestic refuse such as ceramic vessel fragments, bottle glass, and tobacco pipe fragments were also well represented within the assemblage. The investigation also recorded evidence of a prehistoric occupation at the site. Materials diagnostic of the Late Archaic and

Woodland periods were recovered during the investigations. As a result of the field investigations, Site 44HN314 has been defined as a multi-component site that contains sparse evidence of prehistoric occupation during the Archaic and Woodland periods. The site was occupied again during the fourth quarter of the eighteenth century at which time it functioned as a domestic site. The site was most likely abandoned by the second quarter of the nineteenth century.

Subsurface investigations have also indicated that deep plowing has severely impacted the integrity of the cultural deposits at Site 44HN314. In many cases, the plowzone extended as far as 0.6 meters (2 feet) below the current surface. Despite the high density of artifactual material, no intact subsurface cultural features were observed during the investigation.

Due to the disturbed nature of the soil deposits and the lack of intact sub-plowzone cultural features, it is doubtful whether Site 44HN314 will yield any further *significant* information beyond what has already been learned during the Phase II investigations. While the site boundaries were not fully delineated during the excavations, the field investigations were successful in identifying the age and function of the resource. In addition, the investigation of extant documentary records provided only general data pertaining to the site's owners and the length of their stewardship of the property. With the completion of the Phase II archival investigations, the data that may be gleaned from the documentary record appears to have been exhausted. Courthouse documents and other local and state records did not contain any additional information that may lead to revealing the identity of the site's eighteenth century occupants.

As such, those portions of Site 44HN314 that are contained within the proposed development area do not contain sufficient integrity to yield any further significant information about the past. Because the site was not evaluated in its entirety, a final determination of the overall site's eligibility for the National Register of Historic Places is not possible. However, it is recommended that the portion of Site 44HN314 which is located within the proposed development area is not eligible for nomination to the National Register of Historic Places under Criterion D and that the proposed construction will not effect significant archaeological resources.

Table 3. Results and Recommendations for Archaeological Resources Investigated during the Project.

Site Number	Type	Association	Recommendation
44HN314	Prehistoric: Unknown Historic: Domestic	Prehistoric: Late Archaic/Middle Woodland Historic: Late 18th century-early 19th century	Both components not eligible to NRHP under Criterion D

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APPENDIX A
ARTIFACT INVENTORY

**A Limited Phase II Archaeological Evaluation of a Portion of Site 44HN314
Located within the Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main and Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

ARTIFACT INVENTORY

Provenience			Group	Class	Type	Description					
SHOVEL TEST	N480	E240	Vessel	DOMESTIC	CERAMIC	Stoneware	Domestic Gray stoneware	Salt glazed w/cobalt decoration	Fragment		1
SHOVEL TEST	N480	E240	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+	1
SHOVEL TEST	N480	E260	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell		Fragment		1
SHOVEL TEST	N480	E260	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S	1
SHOVEL TEST	N480	E260	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		3
SHOVEL TEST	N480	E260	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Base	1820-1900+	1
SHOVEL TEST	N480	E280	Bottle	DOMESTIC	GLASS	Patinated	Unspecified manufacture	Green	Fragment		1
SHOVEL TEST	N480	E280	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell		Fragment		1
SHOVEL TEST	N480	E280	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment		6
SHOVEL TEST	N480	E300	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Aqua, light	Fragment		10
SHOVEL TEST	N480	E300	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		4
SHOVEL TEST	N480	E320	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment		3
SHOVEL TEST	N480	E320	Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment		3
SHOVEL TEST	N480	E320	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	1
SHOVEL TEST	N480	E320	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment		2
SHOVEL TEST	N480	E320	Fence staple	ARCHITECTURE	METAL	Iron/steel	Wire drawn		Fragment	post 1870s	1
SHOVEL TEST	N480	E320	Unspecified form	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Green, light	Fragment		1
SHOVEL TEST	N480	E340	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+	1
SHOVEL TEST	N480	E340	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S	1
SHOVEL TEST	N480	E340	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		12
SHOVEL TEST	N480	E340	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830	2

**A Limited Phase II Archaeological Evaluation of a Portion of Site 44HN314
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Effluent Force Main and Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

ARTIFACT INVENTORY

Provenience			Group	Class	Type	Description				
SHOVEL TEST	N480	E360	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green	Fragment		2
SHOVEL TEST	N480	E360	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Fragment		45
SHOVEL TEST	N480	E360	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture	Fragment		1
SHOVEL TEST	N480	E380	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	2
SHOVEL TEST	N480	E380	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green	Fragment		3
SHOVEL TEST	N480	E380	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Fragment		16
SHOVEL TEST	N480	E380	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770 1
SHOVEL TEST	N480	E380	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture	Fragment		3
SHOVEL TEST	N500	E260	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Fragment		21
SHOVEL TEST	N500	E260	Unspecified form	MISCELLANEOUS	METAL	Iron/steel	Unspecified manufacture	Fragment		1
SHOVEL TEST	N500	E260	Mortar	ARCHITECTURE	MINERAL	Other mineral	Mixed	Fragment		2
SHOVEL TEST	N500	E260	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	1
SHOVEL TEST	N500	E260	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought	Fragment		1
SHOVEL TEST	N500	E260	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Bone	oyster	Fragment	1
SHOVEL TEST	N500	E280	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua	Fragment	2
SHOVEL TEST	N500	E280	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Fragment		2
SHOVEL TEST	N500	E300	Vessel	DOMESTIC	CERAMIC	Earthenware	Coarse earthenware	Unglazed	Fragment	1
SHOVEL TEST	N500	E300	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	3
SHOVEL TEST	N500	E300		Lithics	Debitage	Thinning	Quartz	0.5-1.0in	Whole	1
SHOVEL TEST	N500	E300	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Fragment		15
SHOVEL TEST	N500	E300	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Rim	1762-1770 1
SHOVEL TEST	N500	E300	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture	Fragment		2
SHOVEL TEST	N500	E300	Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Chinese Export	Rim	1

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Effluent Force Main and Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

ARTIFACT INVENTORY

Provenience					Group	Class	Type	Description				
SHOVEL TEST	N500	E320		Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+	1
SHOVEL TEST	N500	E320		Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830	1
SHOVEL TEST	N500	E320		Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment		1
SHOVEL TEST	N500	E320		Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Base		
SHOVEL TEST	N500	E360		Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		6
SHOVEL TEST	N500	E360		Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+	1
SHOVEL TEST	N500	E400	1		Lithics	Debitage	Flake Fragment	Quartz		Distal Fragment		1
SHOVEL TEST	N500	E400	1	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment		1
SHOVEL TEST	N500	E400	1		Lithics	Debitage	Thinning	Quartz	0.25-0.5in	Whole		1
SHOVEL TEST	N500	E420		Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment		1
SHOVEL TEST	N520	E380	1		Lithics	Debitage	Flake Fragment	Quartz		Indistinguishable		1
SHOVEL TEST	N520	E380	1		Lithics	Debitage	Shatter	Quartz		Indistinguishable		1
SHOVEL TEST	N520	E400	1		Lithics	Debitage	Thinning	Quartz	0.5-1.0in	Whole		1
SHOVEL TEST	N520	E400	1		Lithics	Debitage	Flake Fragment	Quartzite		Indistinguishable		1
SHOVEL TEST	N520	E400	1	Window glass	ARCHITECTURE	GLASS	Flat	Non-machine made Aqua, light		Fragment		1
SHOVEL TEST	N520	E400	1		Lithics	Debitage	Thinning	Quartzite	0.5-1.0in	Whole		1
SHOVEL TEST	N520	E400	1	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		11
SHOVEL TEST	N520	E400	1	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment		2
SHOVEL TEST	N520	E420	1	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment		3
SHOVEL TEST	N520	E420	1		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole		1
SHOVEL TEST	N520	E420	1	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment		1
SHOVEL TEST	N520	E440	1	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		1
SHOVEL TEST	N520	E440	1	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830	1

**A Limited Phase II Archaeological Evaluation of a Portion of Site 44HN314
Located within the Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main and Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

ARTIFACT INVENTORY

Provenience				Group	Class	Type	Description				
SHOVEL TEST	N520	E440	I	Unspecified form	MISCELLANEOUS	METAL	Iron/steel	Unspecified manufacture		Fragment	2
SHOVEL TEST	N520	E440	I	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	1
SHOVEL TEST	N520	E440	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	1
SHOVEL TEST	N520	E440	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+
SHOVEL TEST	N520	E440	I	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N520	E440	I		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N520	E480	I	Bottle	MISCELLANEOUS	GLASS	Transparent	Non-machine made	Green, light	Fragment	1
SHOVEL TEST	N520	E480	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	4
SHOVEL TEST	N520	E480	I		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole	1
SHOVEL TEST	N520	E480	I	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	unidentified	Fragment	1
SHOVEL TEST	N520	E500	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	1
SHOVEL TEST	N520	E500	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+
SHOVEL TEST	N520	E500	I		Lithics	Debitage	Thinning	Quartz	0.5-1.0in	Whole	1
SHOVEL TEST	N520	E500	II		Lithics	Debitage	Thinning	Quartzite	0.5-1.0in	Whole	1
SHOVEL TEST	N520	E500	II		Lithics	Debitage	Flake Fragment	High Qual.Dk. Gray		Distal Fragment	1
SHOVEL TEST	N540	E380	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	
SHOVEL TEST	N540	E380	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	2
SHOVEL TEST	N540	E380	I	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N540	E420	I		Lithics	Debitage	Flake Fragment	High Qual.Dk. Gray		Indistinguishable	1
SHOVEL TEST	N540	E420	I	Unspecified form	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	1
SHOVEL TEST	N540	E420	I		Lithics	Debitage	Secondary Decorticate	Quartz	0.5-1.0in	Whole	1
SHOVEL TEST	N540	E420	I		Lithics	Debitage	Flake Fragment	Quartz		Indistinguishable	1
SHOVEL TEST	N540	E420	I	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N540	E440	I	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	1
SHOVEL TEST	N540	E440	I	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment	1

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ARTIFACT INVENTORY

Provenience				Group	Class	Type	Description				
SHOVEL TEST	N540	E440	1		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole	1
SHOVEL TEST	N540	E460	1	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	1
SHOVEL TEST	N540	E460	1	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Fragment	1
SHOVEL TEST	N540	E500	1	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment	1
SHOVEL TEST	N540	E500	1	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
								Unspecified manufacture			
SHOVEL TEST	N560	E400	1	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
SHOVEL TEST	N560	E400	1		Lithics	Debitage	Flake Fragment	Quartz		Indistinguishable	1
SHOVEL TEST	N560	E420	1	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
SHOVEL TEST	N560	E420	1	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	1
SHOVEL TEST	N560	E420	1	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+ 1
SHOVEL TEST	N560	E440	1		Lithics	Debitage	Thinning	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N580	E380	1	Tooth	MISCELLANEOUS	BIOLOGICAL	Faunal	Tooth		Partial	1
SHOVEL TEST	N580	E380	1	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N580	E380	1		Lithics	Debitage	Shatter	High Qual. Dk. Gray		Indistinguishable	1
SHOVEL TEST	N580	E380	1	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	1
SHOVEL TEST	N580	E400	1	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N580	E400	1	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell		Fragment	1
SHOVEL TEST	N580	E420	1	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell		Fragment	1

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ARTIFACT INVENTORY

Provenience				Group	Class	Type	Description				
SHOVEL TEST	N580	E420	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	1
SHOVEL TEST	N580	E460	I		Lithics	Debitage	Flake Fragment	Quartzite		Indistinguishable	
SHOVEL TEST	N580	E480	I		Lithics	Debitage	Thinning	Quartz	0.5-1.0in	Whole	2
SHOVEL TEST	N580	E480	I		Lithics	Implement	Biface-Implement	Quartz		Indistinguishable	1
SHOVEL TEST	N580	E480	I	Tooth	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	fish	Fragment	1
SHOVEL TEST	N580	E480	I	Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Undecorated	Fragment	1
SHOVEL TEST	N580	E480	I		Lithics	Debitage	Thinning	Quartzite	0.25-0.5in	Whole	1
SHOVEL TEST	N600	E400	I		Lithics	Debitage	Flake Fragment	Quartzite		Distal Fragment	1
SHOVEL TEST	N600	E400	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	2
SHOVEL TEST	N600	E400	I		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N600	E400	I	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment	1
SHOVEL TEST	N600	E400	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	6
SHOVEL TEST	N600	E400	II		Lithics	Debitage	Secondary Flake	Quartz	1.5-2.0in	Whole	1
SHOVEL TEST	N600	E400	II	Unspecified form	MISCELLANEOUS	METAL	Unspecified white metal	Unspecified manufacture		Fragment	1
SHOVEL TEST	N600	E420	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	4
SHOVEL TEST	N600	E420	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Red Paste (coarse) Unglazed		Fragment	1750-1900
SHOVEL TEST	N600	E420	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	13
SHOVEL TEST	N600	E420	I	Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified Blue		Fragment	1
SHOVEL TEST	N600	E420	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	11
SHOVEL TEST	N600	E420	I	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
SHOVEL TEST	N600	E420	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	1
SHOVEL TEST	N600	E420	I	Unspecified form	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Colorless	Fragment	1
SHOVEL TEST	N600	E420	I		Lithics	Debitage	Thinning	Quartz	0.5-1.0in	Whole	1
SHOVEL TEST	N600	E420	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+
SHOVEL TEST	N600	E420	I	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N600	E420	I	Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Molded	Rim	1

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ARTIFACT INVENTORY

Provenience				Group	Class	Type	Description				
SHOVEL TEST	N600	E420	I	Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Molded	Fragment	1
SHOVEL TEST	N600	E420	I	Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Painted, underglazed monochrome	Fragment	1
SHOVEL TEST	N600	E420	I	Unspecified form	MISCELLANEOUS	METAL	Iron/steel	Wrought		Fragment	.
SHOVEL TEST	N600	E420	I	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2
SHOVEL TEST	N600	E440	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	1
SHOVEL TEST	N600	E440	I		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole	1
SHOVEL TEST	N600	E440	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Tin-enamelled earthenware	Painted, underglazed monochrome	Rim	1
SHOVEL TEST	N600	E440	I	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N600	E440	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	7
SHOVEL TEST	N600	E460	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	1
SHOVEL TEST	N600	E460	I	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2
SHOVEL TEST	N600	E480	I		Lithics	Debitage	Thinning	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N600	E480	I	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N600	E480	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	3
SHOVEL TEST	N620	E380	I	Bottle	MISCELLANEOUS	GLASS	Patinated	Non-machine made Green		Fragment	1
SHOVEL TEST	N620	E380	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	2
SHOVEL TEST	N620	E380	I		Lithics	Debitage	Thinning	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N620	E380	I		Lithics	Debitage	Secondary Decorticate	Quartzite	0.5-1.0in	Whole	1
SHOVEL TEST	N620	E380	I	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2
SHOVEL TEST	N620	E380	I	Bottle	MISCELLANEOUS	GLASS	Transparent	Unspecified manufacture	Blue	Fragment	2
SHOVEL TEST	N620	E400	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	1

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Provenience				Group	Class	Type	Description				
SHOVEL TEST	N620	E400	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	2
SHOVEL TEST	N620	E400	I	Vessel	DOMESTIC	CERAMIC	Stoneware	Domestic Gray stoneware	Salt-glazed	Fragment	1
SHOVEL TEST	N620	E420	I		Lithics	Implement	Projectile Point	Quartz		Proximal Fragment	1
SHOVEL TEST	N620	E420	I	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N620	E420	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Painted, underglazed monochrome	Rlm	1820-1900+
SHOVEL TEST	N620	E420	I		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N620	E420	I	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	1
SHOVEL TEST	N620	E420	I		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole	1
SHOVEL TEST	N620	E440	I	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	1
SHOVEL TEST	N620	E440	I		Lithics	Debitage	Thinning	Quartzite	0.5-1.0in	Whole	2
SHOVEL TEST	N620	E440	I	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
SHOVEL TEST	N620	E440	I	Nail	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment	1
SHOVEL TEST	N620	E480	I		Lithics	Debitage	Flake Fragment	Quartz		Indistinguishable	-
SHOVEL TEST	N620	E480	II		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole	
SHOVEL TEST	N640	E380	I		Lithics	Debitage	Flake Fragment	Quartzite		Distal Fragment	1
SHOVEL TEST	N640	E380	I	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell		Fragment	1
SHOVEL TEST	N640	E380	I	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
SHOVEL TEST	N640	E380	II		Lithics	Debitage	Secondary Flake	Quartzite	0.5-1.0in	Whole	1
SHOVEL TEST	N640	E400	I		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole	1
SHOVEL TEST	N640	E420	I	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+
SHOVEL TEST	N640	E420	II	Vessel	DOMESTIC	CERAMIC	Earthenware	Tin-enamelled earthenware	Undecorated	Fragment	1
SHOVEL TEST	N640	E420	II	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1

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ARTIFACT INVENTORY

Provenience				Group	Class	Type	Description				
SHOVEL TEST	N640	E420	II	Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Painted, overglazed enamelled	Fragment	2
SHOVEL TEST	N640	E420	II	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	1
TRENCH	01				Lithics	Core	Flaked Cobble	Quartz		Indistinguishable	1
TRENCH	01			Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770
TRENCH	01			Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	drill	Fragment	1
TRENCH	01			Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Undecorated	Rim	1
TRENCH	01			Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2
TRENCH	01			Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Molded	Fragment	1
TRENCH	01			Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Fragment	3
TRENCH	01				Lithics	Debitage	Secondary Decortical	Quartzite	1.5-2.0in	Whole	1
TRENCH	01			Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment	2
TRENCH	01			Vessel	DOMESTIC	CERAMIC	Earthenware	Red Paste (coarse)	Unglazed	Fragment	1750-1900
TRENCH	01				Lithics	Debitage	Blocky Fragment	Quartz		Indistinguishable	1
TRENCH	01				Lithics	Debitage	Secondary Flake	Quartzite	0.5-1.0in	Whole	1
TRENCH	01			Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Base	1
TRENCH	01			Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	2
TRENCH	01			Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Blue	Fragment	1
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Stoneware	Black Basalt	Molded	Fragment	
TRENCH	02			Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Base	
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Stoneware	Colored paste	Engine turned	Rim	1
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Earthenware	Colonoware/African	Unidentified design	Rim	1
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Earthenware	Colonoware/African	Undecorated	Fragment	2
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Painted, overglazed enamelled	Base	1
TRENCH	02			Unidentified object	MISCELLANEOUS	METAL	Iron/steel	Wrought		Fragment	2
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Painted, underglazed monochrome	Fragment	1780-1830
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Base	1780-1830
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Earthenware	Coarse earthenware	Slip decorated	Fragment	1
TRENCH	02			Tooth	MISCELLANEOUS	BIOLOGICAL	Faunal	Tooth	mammal	Partial	1
TRENCH	02			Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+

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ARTIFACT INVENTORY

Provenience		Group	Class	Type	Description					
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Scallop rim, curved impression	Rim	1780-1830	1
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	8
TRENCH	02	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
TRENCH	02	Tooth	MISCELLANEOUS	BIOLOGICAL	Faunal	Tooth	mammal	Partial		
TRENCH	02	Tableware	DOMESTIC	GLASS	Patinated	Unspecified manufacture	Colorless	Rim		1
TRENCH	02	Spike	ARCHITECTURE	METAL	Iron/steel	Unspecified manufacture		Fragment		2
TRENCH	02	Unspecified form	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment		1
TRENCH	02	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Finish		2
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Coarse earthenware	Undecorated	Rim		1
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Painted, underglazed monochrome	Rim	1780-1830	1
TRENCH	02	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment		1
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Base	1780-1830	1
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Scratch blue	Fragment		1
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Scallop rim, curved impression	Rim	1780-1830	1
TRENCH	02	Vessel	DOMESTIC	CERAMIC	Earthenware	Coarse earthenware	Undecorated	Fragment		1
TRENCH	02	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Unglazed	Stem, 4/64"		1
TRENCH	02	Bone	MISCELLANEOUS	BIOLOGICAL	Faunal	Bone	mammal	Fragment		10
TRENCH	02	Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment		
TRENCH	02	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		4
TRENCH	02	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		4
TRENCH	02	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S	2
TRENCH	02	Bone	MISCELLANEOUS	BIOLOGICAL	Faunal	Bone	mammal	Fragment		9
TRENCH	02	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Partial		1
TRENCH	02	Nail	ARCHITECTURE	METAL	Iron/steel	Wire drawn		Fragment	post 1870s	2
TRENCH	02	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Base		1
TRENCH	02	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment		8
TRENCH	02	Halifax	Lithics	Implement	Projectile Point	Quartzite		Proximal Fragment		1
TRENCH	02		Ceramics	Pottery	Mixed Particle	Sand & Grit	Cordmarked-Eroded	Body		1
TRENCH	02	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment		1
TRENCH	03	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		1
TRENCH	03	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Base	1780-1830	3

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ARTIFACT INVENTORY

Provenience						Group	Class	Type	Description			
UNIT 01	N600	E382	1	1		Lithics	Debitage	Flake Fragment	Quartzite		Distal Fragment	1
UNIT 01	N600	E382	1	1	Shell	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell		Fragment	3
UNIT 01	N600	E382	1	1	Tack	FURNISHINGS	METAL	Copper alloy	Unspecified manufacture		Complete	1
UNIT 01	N600	E382	1	1	Unspecified form	MISCELLANEOUS	GLASS	Flat	Unspecified manufacture	Aqua, light	Burned	
UNIT 01	N600	E382	1	1	Unspecified form	MISCELLANEOUS	GLASS	Flat	Unspecified manufacture	Green	Fragment	2
UNIT 01	N600	E382	1	1	Unspecified form	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Colorless	Fragment	2
UNIT 01	N600	E382	1	1	Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Salt-glazed	Rim	1720-1770 1
UNIT 01	N600	E382	1	1	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
UNIT 01	N600	E382	1	1	Bottle	DOMESTIC	GLASS	Patinated	Unspecified manufacture	Blue	Fragment	1
UNIT 01	N600	E382	1	1	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S 2
UNIT 01	N600	E382	1	1	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	23
UNIT 01	N600	E382	1	1		Lithics	Debitage	Secondary Decortical	Quartzite	1.0-1.5in	Whole	1
UNIT 01	N600	E382	1	1		Lithics	Debitage	Flake Fragment	Quartz		Distal Fragment	1
UNIT 01	N600	E382	1	1	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Color glaze, opaque	Burned	1
UNIT 01	N600	E382	1	1		Lithics	Debitage	Thinning	Quartzite	0.5-1.0in	Whole	1
UNIT 01	N600	E382	1	1	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	5
UNIT 01	N600	E382	1	1	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Unglazed	Stem, 4/64"	1
UNIT 01	N600	E382	1	2	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Fragment	7
UNIT 01	N600	E382	1	2	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S
UNIT 01	N600	E382	1	2	Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Salt-glazed	Rim	1720-1770 1
UNIT 01	N600	E382	1	2	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	2
UNIT 01	N600	E382	1	2	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+ 1
UNIT 01	N600	E382	1	2	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware/Clouded w/ color glaze, re translucent		Fragment	1
UNIT 01	N600	E382	1	2	Vessel	DOMESTIC	CERAMIC	Earthenware	Red Paste (coarse)	Unglazed	Fragment	1750-1900 1
UNIT 01	N600	E382	1	2	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua	Fragment	1
UNIT 01	N600	E382	1	2	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	16
UNIT 01	N600	E382	1	2		Lithics	Debitage	Secondary Decortical	Quartz	0.5-1.0in	Whole	1
UNIT 01	N600	E382	1	2	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	12
UNIT 01	N600	E382	1	2	Unspecified form	MISCELLANEOUS	GLASS	Flat	Unspecified manufacture	Aqua	Fragment	2
UNIT 01	N600	E382	1	2		Lithics	Debitage	Thinning	Quartzite	0.5-1.0in	Whole	1
UNIT 01	N600	E382	1	2	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment	1
UNIT 01	N600	E382	1	2		Lithics	Debitage	Secondary Flake	High Qual. Lt. Gra	0.5-1.0in	Whole	1

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ARTIFACT INVENTORY

Provenience						Group	Class	Type	Description				
UNIT	01	N600	E382	1	3	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Fragment	2
UNIT	01	N600	E382	1	3	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	6
UNIT	01	N600	E382	1	3	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Undecorated	Bowl	1
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Whieldon/Cloudedw	Color glaze, re translucent	Fragment	
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Unidentified type	Unglazed	Fragment	1
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Stoneware	White paste	Molded	Rim	1
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Porcelain	Hard paste	Undecorated	Fragment	1
UNIT	01	N600	E382	1	3	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment	2
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830
UNIT	01	N600	E382	1	3	Bone	MISCELLANEOUS	BIOLOGICAL	Faunal	Bone	mammal	Fragment	1
UNIT	01	N600	E382	1	3	Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Aqua	Fragment	4
UNIT	01	N600	E382	1	3	Bottle	MISCELLANEOUS	GLASS	Patinated	Unspecified manufacture	Aqua, light	Fragment	1
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Tin-enamelled earthenware	Undecorated	Fragment	1
UNIT	01	N600	E382	1	3	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	4
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Stoneware	White paste stoneware	Salt-glazed	Fragment	1720-1770
UNIT	01	N600	E382	1	3	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	60
UNIT	01	N600	E382	1	3		Lithics	Debitage	Secondary Flake	Quartzite	0.5-1.0in	Whole	
UNIT	01	N600	E382	1	3		Lithics	Debitage	Shatter	Quartzite		Indistinguishable	
UNIT	01	N600	E382	1	3		Lithics	Debitage	Secondary Flake	Quartzite	1.0-1.5in	Whole	1
UNIT	01	N600	E382	1	3	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment	23
UNIT	01	N600	E382	1	3		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole	1
UNIT	01	N600	E382	1	3	Vessel	DOMESTIC	CERAMIC	Stoneware	Imported Brown stoneware	Salt-glazed	Fragment	2
UNIT	01	N600	E382	1	4	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	8
UNIT	01	N600	E382	1	4	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Undecorated	Stem, 4/64"	1
UNIT	01	N600	E382	1	4	Bone	MISCELLANEOUS	BIOLOGICAL	Faunal	Bone	unidentified	Fragment	4
UNIT	01	N600	E382	1	4	Vessel	DOMESTIC	CERAMIC	Earthenware	Whieldon/Cloudedw	Color glaze, re translucent	Fragment	1
UNIT	01	N600	E382	1	4	Button	CLOTHING	METAL	Non-ferrous alloy	Stamped		Partial	1
UNIT	01	N600	E382	1	4	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	17
UNIT	01	N600	E382	1	4	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	1
UNIT	01	N600	E382	1	4	Bottle	DOMESTIC	GLASS	Patinated	Unspecified manufacture	Green	Fragment	3
UNIT	01	N600	E382	1	4		Lithics	Debitage	Secondary Decortical	Quartzite	1.5-2.0in	Whole	1

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Provenience						Group	Class	Type	Description					
UNIT	01	N600	E382	1	4	Vessel	DOMESTIC	CERAMIC	Porcelain	White paste stoneware	Salt-glazed	Rim	1720-1770	1
UNIT	01	N600	E382	1	4	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick	Color glaze, opaque	Fragment		2
UNIT	01	N600	E382	1	4	Button	CLOTHING	BIOLOGICAL	Floral	Cui		Fragment		1
UNIT	01	N600	E382	1	4	Vessel	DOMESTIC	CERAMIC	Porcelain	White paste stoneware	Salt-glazed	Fragment	1720-1770	
UNIT	01	N600	E382	1	4	Vessel	DOMESTIC	CERAMIC	Earthenware	Tin-enamelled earthenware	Painted, underglazed monochrome	Fragment		1
UNIT	01	N600	E382	1	4	Unspecified form	MISCELLANEOUS	METAL	Iron/steel	Unspecified manufacture		Fragment		14
UNIT	01	N600	E382	1	4	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment		2
UNIT	01	N600	E382	1	4	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment		1
UNIT	01	N600	E382	1	5	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment		2
UNIT	01	N600	E382	1	5	Bottle	DOMESTIC	GLASS	Patinated	Unspecified manufacture	Green	Fragment		1
UNIT	01	N600	E382	1	5		Mineral	Debitage	Secondary Decortical	Quartz	1.0-1.5in	Whole		1
UNIT	01	N600	E382	1	5	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Green, light	Fragment		1
UNIT	01	N600	E382	1	6	Unspecified form	MISCELLANEOUS	METAL	Iron/steel	Sheet metal		Fragment		1
UNIT	01	N600	E382	1	6	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Undecorated	Stem, 4/64"		1
UNIT	01	N600	E382	1	6	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Undecorated	Stem, 5/64"		1
UNIT	01	N600	E382	1	6	Vessel	DOMESTIC	CERAMIC	Earthenware	Coarse earthenware	Molded	Fragment		
UNIT	02	N483	E340	1	1	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S	2
UNIT	02	N483	E340	1	1		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole		1
UNIT	02	N483	E340	1	1	Bottle	MISCELLANEOUS	GLASS	Transparent	Machine-made	Colorless	Finish	post 1893	1
UNIT	02	N483	E340	1	1	Bottle	DOMESTIC	CERAMIC	Brick	Non-machine made	Green	Fragment		3
UNIT	02	N483	E340	1	1	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770	3
UNIT	02	N483	E340	1	1	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Painted	Fragment	1780-1830	1
UNIT	02	N483	E340	1	1	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment		2
UNIT	02	N483	E340	1	2		Mineral	Miscellaneous	Fire Cracked Rock	Quartzite		Indistinguishable		1
UNIT	02	N483	E340	1	2	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment		2
UNIT	02	N483	E340	1	2	Vessel	DOMESTIC	CERAMIC	Stoneware	Domestic Brown Stoneware	Salt-glazed	Fragment		1
UNIT	02	N483	E340	1	2	Tube	MISCELLANEOUS	SYNTHETIC	Other plastic	Machine-made	orange	Fragment		1
UNIT	02	N483	E340	1	2	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made	Green	Fragment		5

-595-

**A Limited Phase II Archaeological Evaluation of a Portion of Site 44HN314
Located within the Proposed Totopotomoy Wastewater Treatment Plant
Effluent Force Main and Outfall/Cascade Aerator Structure Location,
Hanover County, Virginia**

ARTIFACT INVENTORY

Provenience						Group	Class	Type	Description				
UNIT	02	N483	E340	I	2	Vessel	DOMESTIC	CERAMIC	Earthenware	Tin-enamelled earthenware	Undecorated	Fragment	1
UNIT	02	N483	E340	I	2	Brick	ARCHITECTURE	CERAMIC	Brick	Soft brick		Fragment	38
UNIT	02	N483	E340	I	2	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	7
UNIT	02	N483	E340	I	2	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Fragment	
UNIT	02	N483	E340	I	2	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S
UNIT	02	N483	E340	I	3		Lithics	Debitage	Shaping/finishing	Quartz	0.25-0.5in	Whole	4
UNIT	02	N483	E340	I	3	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S
UNIT	02	N483	E340	I	3	Nail	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	5
UNIT	02	N483	E340	I	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Base	1820-1900+
UNIT	02	N483	E340	I	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Undecorated	Fragment	1780-1830
UNIT	02	N483	E340	I	3		Lithics	Debitage	Thinning	Quartzite	0.25-0.5in	Whole	1
UNIT	02	N483	E340	I	3		Lithics	Debitage	Shaping/finishing	Quartzite	0.25-0.5in	Whole	1
UNIT	02	N483	E340	I	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Whiteware	Undecorated	Fragment	1820-1900+
UNIT	02	N483	E340	I	3	Vessel	DOMESTIC	CERAMIC	Earthenware	Pearlware	Edge decorated	Rim	1780-1830
UNIT	02	N483	E340	I	3	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	5
UNIT	02	N483	E340	II	4		Lithics	Debitage	Secondary Flake	Quartzite	0.5-1.0in	Whole	2
UNIT	02	N483	E340	II	4	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Undecorated	Stem, 4/64"	1
UNIT	02	N483	E340	II	4	Vessel	DOMESTIC	CERAMIC	Earthenware	Creamware	Undecorated	Fragment	1762-1770
UNIT	02	N483	E340	II	4	Pipe, tobacco	PERSONAL	CERAMIC	Earthenware	Ball clay (kaolin)	Undecorated	Bowl	1
UNIT	02	N483	E340	II	4		Lithics	Debitage	Shaping/finishing	Silicified slate	0.25-0.5in	Whole	1
UNIT	02	N483	E340	II	4	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green, dark		Fragment	2
UNIT	02	N483	E340	II	4	Bottle	DOMESTIC	GLASS	Patinated	Non-machine made Green		Fragment	3
UNIT	02	N483	E340	II	4	Nail	ARCHITECTURE	METAL	Iron/steel	Non-machine made		Fragment	3
UNIT	02	N483	E340	II	4	Nail, Wrought head	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	
UNIT	02	N483	E340	II	4	Window glass	ARCHITECTURE	GLASS	Flat	Unspecified manufacture	Aqua, light	Fragment	1
UNIT	02	N483	E340	II	4	Nail	ARCHITECTURE	METAL	Iron/steel	Cut		Fragment	1815-1870S
UNIT	02	N483	E340	II	4		Lithics	Debitage	Flake Fragment	Quartz		Indistinguishable	1
UNIT	02	N483	E340	II	4	Oyster	MISCELLANEOUS	BIOLOGICAL	Faunal	Shell	oyster	Fragment	2
UNIT	02	N483	E340	II	4	Pintle	ARCHITECTURE	METAL	Iron/steel	Wrought		Fragment	1
UNIT	02	N483	E340	II	5	Bone	MISCELLANEOUS	BIOLOGICAL	Faunal	Bone	mammal	Fragment	25

Total: 952



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

PIEDMONT REGIONAL OFFICE

4949-A Cox Road
Glen Allen, Virginia 23060
(804) 527-5020
Fax (804) 527-5106
<http://www.deq.state.va.us>

April 28, 1999

Dennis H. Treacy
Director

Gerard Seeley, Jr.
Piedmont Regional Director

Mr. Frank W. Harksen, Jr., Director
Department of Public Utilities
County of Hanover
P. O. Box 470
Hanover, VA 23069

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Re: Issuance of VPDES Permit No. VA0089915
Totopotomoy WWTP - Hanover County

Dear Mr. Harksen:

The Deputy Director has approved the enclosed effluent limitations and monitoring requirements for the above referenced permit. This approval is in accordance with the enclosed memorandum.

Your permit is also enclosed. In accordance with the permit, you are required to submit Discharge Monitoring Reports (DMRs) to:

Department of Environmental Quality
Piedmont Regional Water Office
4949-A Cox Road
Glen Allen, VA 23060

The reporting form is included with the permit. You will be responsible for obtaining additional copies of the DMR. The first DMR for the month in which the discharge commences is due by the 10th day of the following month.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty days from the date of service (the date you actually received this decision or the date it was mailed to you, which ever occurred first) within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Virginia Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period.

Alternatively, any owner under Section 62.1-44.16, 62.1-44.17 and 62.1-44.19 of the State Water Control Law aggrieved by any action of the State Water Control Board taken without a formal hearing, or by inaction of the Board, may demand in writing a formal hearing of such owner's grievance, provided a petition requesting such hearing is filed with the Board. Said petition must meet the requirements set forth in Section 1.23(b) of the Board's Procedural Rule No. 1. In cases involving actions of the Board, such petition must be filed within thirty days after notice of such action is mailed to such owner by certified mail.

1
An Agency of the Natural Resources Secretariat

Mr. Frank W. Harksen, Jr.
April 28, 1999
Page 2

A Reliability Class I is assigned to this facility and this facility has a class I licensed operator requirement.

If you have any questions, please call Mr. Allan Brockenbrough at 527-5027.

Sincerely,


James J. Golden
Regional Permit Manager

AB/
Enclosures: Memorandum
Permit No. VA0089915

cc: DEQ-DWPC
VDH-ECEEFO
EPA, Region III (3WP12)

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060

804/527-5020

SUBJECT: Issuance of VPDES Permit No. VA0089915
Totopotomoy WWTP - Hanover County

TO: James J. Golden
Regional Permit Manager

FROM: Allan Brockenbrough, II *ABII* via J. R. Bell, Jr. *JRB*
Environmental Engineer Senior Water Permits Manager

DATE: April 28, 1999

COPIES: DEQ-DWPC, EPA Region III, VDH-ECEEFO

Legal Name of Owner: County of Hanover

Application Submitted By: Richard R. Johnson
County Administrator

Application Date: The initial application and permit fee were received on May 11, 1997. Supplemental information was received on June 25, 1997, July 31, 1997, April 20, 1998, May 6, 1998 and October 13, 1998. The application was considered complete on October 13, 1998.

Type of Discharge: Proposed municipal sewage discharge.

Wastewater Treatment Facilities: The proposed treatment facility consists of screening, grit removal, an activated sludge treatment plant (biological nutrient removal mode), effluent filtration, UV disinfection and post aeration. Sludge will be aerobically digested, dewatered and either land applied or sent to a landfill for disposal.

<u>Receiving Stream:</u>	Stream:	Pamunkey River
	Basin:	York River
	Subbasin:	N/A
	Section:	1
	Class:	II
	Special Standards:	a

Public Notice: The application and draft permit have received public notice in accordance with the VPDES Regulation and responses to the public notice indicated that the discharge is controversial. A public hearing on the proposed permit issuance was held in Hanover Courthouse on January 19, 1999. Issues raised during the public hearing and the public comment period included 1.) impact on dissolved oxygen levels

MEMORANDUM - Issuance of VPDES Permit No. VA0089915
Totopotomoy WWTP - Hanover County
Page Two

Public Notice (cont.): in the Pamunkey River, 2.) possible toxic impacts in the river, 3.) impact on endangered species, 4.) discharge location, 5.) wetlands impacts, 6.) nutrient impacts, 7.) water supply issues, 8.) temperature impacts and 9.) other miscellaneous issues unrelated to water quality and the VPDES permit. These issues were summarized in a memorandum to the Board dated March 3, 1999.

Planning: The discharge is not addressed in any planning document but will be included when the plan is updated.

EPA Comments: By letters dated August 5, 1998, November 6, 1998 and March 29, 1999, EPA indicated that they had no objections to the permit issuance.

VDH Comments: By letters dated June 3, 1998 and July 20, 1998, the Virginia Department of Health stated that they had no objections to the permit issuance.

Previous Board Action: On March 11, 1999, the Board approved issuance of the VPDES permit with three modifications as recommended by the staff. The modifications were made in response to public comments and included 1.) a reduction of the monthly average TSS limitations to 10 mg/l, 2.) an increase in the minimum DO limitation to 6.5 mg/l and 3.) inclusion of a special condition requiring the permittee to perform an instream benthics monitoring program.

Staff Comments: The proposed discharge is controversial. With the inclusion of the three modifications outlined above under Previous Board Action, the staff believes that all of the issues raised during the public hearing and comment period have been adequately addressed. Hanover County projects completion of the wastewater treatment plant in 2003.

By letter dated March 11, 1999, the U.S. Fish and Wildlife Service (USFWS) requested that the permit not be issued until the applicant perform a second mussel survey to determine whether any endangered or rare species are present in the vicinity of the proposed discharge. The staff proposes to issue the permit as approved by the Board but has agreed that the permit may be modified if any endangered species are found and it is demonstrated that the present permit requirements are not protective of the species.

Issuance of the VPDES permit has been delayed due to the public hearing, the need for EPA to review modifications approved by the Board and by the need to respond to USFWS comments received after the Board action.

MEMORANDUM - Issuance of VPDES Permit No. VA0089915
Totopotomoy WWTP - Hanover County
Page Three

Staff Comments (cont.): The staff believes that the attached effluent limitations will maintain the Water Quality Standards adopted by the Board.

Basis for Effluent Limits: Best engineering judgement.

Licensed Operator Requirements: The staff believes that a class.I licensed operator is required.

STAFF RECOMMENDATIONS:

The staff recommends that the following be approved for the Deputy Director:

1. Approve the attached effluent limitations and monitoring requirements.
2. Issue VPDES Permit No. VA0089915.
3. Approve the discharge proposal as being subject to the requirements of a Reliability Class I facility.

APPROVED: _____

James J. Golden
Regional Permit Manager

DATE: _____

4/26/99

PERMITTEE NAME/ADDRESS (INCLUDE FACILITY NAME/LOCATION IF DIFFERENT)

FACILITY Totopotomoy WWTP

DEPT. OF ENVIRONMENTAL QUALITY
(REGIONAL OFFICE)

**Piedmont Regional Office
4949-A Cox Road
Glen Allen VA 23060**

(804) 527-5020

**NOTE: READ PERMIT AND GENERAL INSTRUCTIONS
BEFORE COMPLETING THIS FORM.**

VA0089915

PERMIT NUMBER

001

**DISCHARGE
NUMBER**

MONITORING PERIOD

FROM

to

-602-

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW (M G.)	TOTAL BODS (K G.)	OPERATOR IN RESPONSIBLE CHARGE			DATE		
I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECT SUPERVISION OR ACTING UNDER A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PARTICIPATE IN GATHER AND EVALUATE THE INFORMATION SUBMITTED BASED ON MY KNOWLEDGE OF THE PERSONNEL WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION. THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE MINOR MISTAKES IN THIS INFORMATION BUT NOTHING THAT AFFECTS THE RELIABILITY OF THE INFORMATION. I AM AWARE THAT THERE ARE MINOR MISTAKES IN THIS INFORMATION BUT NOTHING THAT AFFECTS THE RELIABILITY OF THE INFORMATION. I AM AWARE THAT THERE ARE MINOR MISTAKES IN THIS INFORMATION BUT NOTHING THAT AFFECTS THE RELIABILITY OF THE INFORMATION.				TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.	YEAR	MO.	DAY
				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE			
				TYPED OR PRINTED NAME	SIGNATURE	AREA CODE	NUMBER	YEAR	MO.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
 DISCHARGE MONITORING REPORT (DMR)

Municipal Major 04/28/1999
DEPT. OF ENVIRONMENTAL QUALITY
 (REGIONAL OFFICE)
 Piedmont Regional Office
 4949-A Cox Road
 Glen Allen VA 23060

PERMITTEE NAME/ADDRESS (INCLUDE
 FACILITY NAME/LOCATION IF DIFFERENT)

NAME County of Hanover
 ADDRESS P. O. Box 470
 HANOVER VA 23069

FACILITY Totopotomoy WWTP

VA0089915			001		
PERMIT NUMBER			DISCHARGE NUMBER		
MONITORING PERIOD					
YEAR	MO	DAY	YEAR	MO	DAY
FROM			TO		

(804) 527-5020

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS
 BEFORE COMPLETING THIS FORM.

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
159 CBOD5	REPORTED				*****						
	PERMIT REQUIREMENT	189	284	KG/D	*****	10.0	15.0	MG/L		1/DAY	24HC
	REPORTED										
	PERMIT REQUIREMENT										
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	PERMIT REQUIREMENT										

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS

BYPASSES AND OVERFLOWS	TOTAL OCCURRENCES	TOTAL FLOW (MG)	TOTAL BOD5 (KG)	OPERATOR IN RESPONSIBLE CHARGE			DATE					
I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE BEST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. (SEE 18 U.S.C. § 1001 AND 18 U.S.C. § 1010. Penalties under these statutes may include fines up to \$10,000 and/or maximum imprisonment of between 6 months and 5 years.)												
				TYPED OR PRINTED NAME		SIGNATURE		CERTIFICATE NO.	YEAR	MO.	DAY	
				PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT								
								TELEPHONE				
				TYPED OR PRINTED NAME		SIGNATURE		AREA CODE	NUMBER	YEAR	MO.	DAY



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit No.: VA0089915
Effective Date: April 28, 1999
Expiration Date: April 28, 2004

**AUTHORIZATION TO DISCHARGE UNDER THE
VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM
AND
THE VIRGINIA STATE WATER CONTROL LAW**

In compliance with the provisions of the Clean Water Act as amended and pursuant to the State Water Control Law and regulations adopted pursuant thereto, the following owner is authorized to discharge in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this permit.

Owner: County of Hanover
Facility Name: Totopotomoy WWTP
City: N/A
County: Hanover
Facility Location: north of Pole Green Rd., Hanover County

The owner is authorized to discharge to the following receiving stream:

Stream: Pamunkey River
River Basin: York River
River Subbasin: N/A
Section: 1
Class: II
Special Standards: a

The authorized discharge shall be in accordance with this cover page, Part I - Effluent Limitations and Monitoring Requirements and Part II - Conditions Applicable To All VPDES Permits, as set forth herein.


Deputy Director, Department of Environmental Quality

4/28/99
Date

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date the permittee is authorized to discharge from outfall 001.

Upon commencement of discharge from the 5 MGD treatment facilities, such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS		
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD) ²	NL		NA		NA	NL	Continuous	TIRE *
CBOD ₅	10.0 mg/l	189 kg/d	15.0 mg/l	284 kg/d	NA	NA	1/Day	24 HC
Suspended Solids	10.0 mg/l	189 kg/d	15.0 mg/l	284 kg/d	NA	NA	1/Day	24 HC
TKN	3.0 mg/l	57 kg/d	4.5 mg/l	85 kg/d	NA	NA	1/Day	24 HC
Total Phosphorus	2.0 mg/l	38 kg/d	NA		NA	NA	1/Day	24 HC
Total Nitrogen	NL	NL	NA		NA	NA	1/Week	24 HC
Fecal Coliform	200 N/100 ml ³		NA		NA	NL	1/Day between 10 am and 4 pm	Grab
pH (standard units)	NA		NA		6.0	9.0	1/Day	Grab
Dissolved Oxygen	NA		NA		6.5 mg/l	NA	1/Day	Grab

NL = No Limitation, monitoring only

NA = Not Applicable

* = Totalizing Indicating and Recording Equipment

2. The design flow of this treatment facility is 5.0 MGD.

3. Geometric mean

4. There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date the permittee is authorized to discharge from outfall 001.

Upon commencement of discharge from the 10 MGD treatment facilities, such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS		
	MONTHLY AVERAGE		WEEKLY AVERAGE		MINIMUM	MAXIMUM	FREQUENCY	SAMPLE TYPE
Flow (MGD) ²	NL		NA		NA	NL	Continuous	TIRE *
CBOD ₅	10.0 mg/l	379 kg/d	15.0 mg/l	568 kg/d	NA	NA	1/Day	24 HC
Suspended Solids	10.0 mg/l	379 kg/d	15.0 mg/l	568 kg/d	NA	NA	1/Day	24 HC
TKN	3.0 mg/l	114 kg/d	4.5 mg/l	170 kg/d	NA	NA	1/Day	24 HC
Total Phosphorus	2.0 mg/l	76 kg/d	NA		NA	NA	1/Day	24 HC
Total Nitrogen	NL	NL	NA		NA	NA	1/Week	24 HC
Fecal Coliform	200 N/100 ml ³		NA		NA	NL	1/Day between 10 am and 4 pm	Grab
pH (standard units)	NA		NA		6.0	9.0	1/Day	Grab
Dissolved Oxygen	NA		NA		6.5 mg/l	NA	1/Day	Grab

NL = No Limitation; monitoring only

NA = Not Applicable

* = Totalizing Indicating and Recording Equipment

2. The design flow of this treatment facility is 10.0 MGD.

3. Geometric mean

4. There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. SEWAGE SLUDGE LIMITATIONS AND MONITORING REQUIREMENTS

Paragraphs A.5. and A.6. only apply to sludges which are land applied.

5. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorize to manage sewage sludge according to the approved Sludge Management Plan.

The pollutants in sewage sludge shall be limited and monitored by the permittee as specified below:

a. Annual Sludge Production Data

Report annual total amount of sludge produced, in dry metric tons, by your facility and annual amount of sludge, in dry metric tons, used or disposed in various methods.

b. Chemical Pollutant Limitations

SLUDGE CHARACTERISTICS	LIMITATIONS		MONITORING REQUIRMENTS	
	CEILING CONCENTRATION MAXIMUM (mg/kg) [*]	MONTHLY AVERAGE (mg/kg) [*]	FREQUENCY	SAMPLE TYPE
Percent Solids	NA	NL	1/Quarter	Composite
Total Arsenic	75	41	1/Quarter	Composite
Total Cadmium	85	39	1/Quarter	Composite
Total Copper	4,300	1,500	1/Quarter	Composite
Total Lead	840	300	1/Quarter	Composite
Total Mercury	57	17	1/Quarter	Composite
Total Molybdenum	75	NA	1/Quarter	Composite
Total Nickel	420	420	1/Quarter	Composite
Total Selenium	100	100	1/Quarter	Composite
Total Zinc	7,500	2,800	1/Quarter	Composite

NL = No Limitation, monitoring only

^{*} Dry weight basis, unless otherwise stated.

c. **Pathogen Reduction Limitations**

Class B, Alternative 2, aerobic digestion - Sewage sludge shall be treated by a process of agitating sludge with air or oxygen to maintain aerobic conditions for a period ranging from 60 days at 15°C to 40 days at 20°C.

d. **Vector Attraction Reduction Limitations**

Alternative 4, SOUR - The specific oxygen uptake rate (SOUR) for the aerobically treated sewage sludge shall be equal to or less than 1.5 mg of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20°C.

6. All samples shall be collected and analyzed in accordance with the approved O & M Manual.

B. Other Requirements or Special Conditions

1. A written notice and a plan of action for ensuring continued compliance with the terms of this permit shall be submitted to the DEQ, Piedmont Regional Office when the monthly average flow influent to the sewage treatment works reaches 95 percent of the design capacity authorized in this permit for each month of any three consecutive month period. The written notices shall be submitted within 30 days and the plan of action shall be received at the Piedmont Regional Office no later than 90 days from the third consecutive month for which the flow reached 95 percent of the design capacity. The plan shall include the necessary steps and prompt schedule of implementation for controlling any current or reasonably anticipated problem resulting from high influent flows. Failure to submit an adequate plan in a timely manner shall be deemed a violation of the permit.
2. The permittee in accordance with the Sewerage Regulations shall obtain a Certificate to Construct (CTC) and a Certificate to Operate (CTO) from the DEQ, Water Division Regional Office prior to constructing wastewater treatment facilities and operating the facilities respectively. The permittee shall submit an Operations and Maintenance (O&M) manual to the Piedmont Regional Office for approval prior to submittal of a statement of completion for the construction of the facility. Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Noncompliance with the CTC, CTO, or O&M manual shall be deemed a violation of the permit.
3. The permittee shall employ or contract at least one wastewater works operator who holds a current wastewater license appropriate for the permitted facility. A Class I licensed operator is required for this facility. The license shall be issued in accordance with Title 54.1 of the Code of Virginia and the regulations of the Board for Waterworks and Wastewater Works Operators. The permittee shall notify the Department in writing whenever he is not complying, or has grounds for anticipating he will not comply with this requirement. The notification shall include a statement of reasons and a prompt schedule for achieving compliance.
4. This permit shall be modified or alternatively revoked and reissued to include new or alternative nutrient limitations should the Board adopt nutrient standards for the Chesapeake Bay and tributary river basins, or if a future water quality regulation, statute, or water quality management plan requires new or alternative nutrient control.
5. Indirect Dischargers

The permittee shall provide adequate notice to the Department of the following:

- a. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Section 301 or 306 of Clean Water Act and the State Water Control Law if it were directly discharging those pollutants; and
- b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of this permit.

Adequate notice shall include information on (i) the quality and quantity of effluent introduced into the treatment works, and (ii) any anticipated impact of the change on the

quantity or quality of effluent to be discharged from the treatment works. Reports made to DEQ under the Industrial Pretreatment Program requirements (Part I.C.) may be used to fulfill this requirement.

6. The Board may promptly modify or revoke and reissue this permit if any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the Clean Water Act is more stringent than any requirements for sludge use or disposal in this permit, or controls a pollutant or practice not limited in this permit.
7. The Sludge Management Plan (SMP) is conditionally approved with the issuance of this permit, provided that a complete SMP is submitted and approved prior to implementation of the specific sludge use or disposal practices. Upon approval, the SMP becomes an enforceable part of the permit. The permit may be modified or alternately revoked and reissued to incorporate limitations/conditions necessitated by the chosen sewage sludge use or disposal practices.

Special Conditions Nos. 8 and 9 only apply to sludges which are land applied.

8. The permittee is required to retain the following information for at least 5 years:
 - a. The concentration of each pollutant in Part I.A.5.;
 - b. The description of how the pathogen reduction requirements in Part I.A.5.c. are met;
 - c. A description of how the vector attraction reduction requirements in Part I.A.5.d. are met;
 - d. A description of how the management practices specified in the approved Sludge Management Plan and/or this permit are met;
 - e. A description of how the site restrictions specified in the approved Sludge Management Plan and/or this permit are met;
 - f. The following certification statement shall be signed by a responsible official and provided with each of the quarterly Pathogen Reduction and Vector Attraction Reduction demonstrations included in the annual report required under B.9. below:

"I certify, under penalty of law, that the pathogen requirements in 9 VAC 25-31-710 A, vector attraction reduction requirements in 9 VAC 25-31-720 B.4., the management practices in 9 VAC 25-31-550, and the site restrictions in 9 VAC 25-31-710 B.5. have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, vector attraction reduction requirements, site management practices, and site restrictions have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."
9. The permittee shall provide the results of all monitoring performed in accordance with Part I.A., and information on management practices, land application sites, site restrictions (if applicable), and appropriate certifications not later than February 19 of each year to the regional office of the Department of Environmental Quality. Each report is for the previous calendar year's activity. If no sewage sludge was applied to the land during the reporting period, "no sewage sludge was applied" shall be reported.

C. Pretreatment Program

1. Within 60 days of the issuance of a Certificate to Construct for the Totopotomoy WWTP, the permittee must submit a Plan of Study to the Department of Environmental Quality (DEQ) which describes in detail the steps it will undertake to develop a pretreatment program. At a minimum, the Plan of Study shall include specific dates by which the following activities will be accomplished.
 - a. Survey of Industrial Users, including identification of Significant Industrial Users* and the character and volume of pollutants contributed to the treatment works by each discharger. The DEQ Discharger Survey Form, or equivalent form that includes the quantity and quality of the wastewater shall be used.
 - b. Submission of results of the discharger survey required in (a).
 - c. Submission of the data and calculations used to develop technically-based local limits.
 - d. Development and submission of the legal authority, permit boiler plate, an ERP, and interjurisdictional agreements, where necessary, to the DEQ for approval.
 - e. Submission of an evaluation of financial programs, revenue sources and qualified personnel necessary to implement a pretreatment program.
 - f. Submission of a detailed description of the procedures to design and implement a monitoring and enforcement program, including a description of the required monitoring equipment to be utilized for monitoring or analysis of industrial wastes.
 - g. Submission of a request for pretreatment program approval of all required elements within one year of the effective or modification date of this permit. This request must be accompanied by a statement of endorsement by the local board or governing body responsible for the program and an attorney's evaluation of the POTW's authority to implement the program.
2. Within 60 days of its receipt, the DEQ shall evaluate the Plan of Study and shall establish a schedule of compliance for the development and submission of a pretreatment program. Upon written approval by the DEQ, this schedule shall become an enforceable condition of this permit.
3. Should evaluation by the DEQ of results of the Industrial User survey conducted in accordance with (1) (a) and (1) (b) above indicate that the permittee is not required to implement a pretreatment program, the requirements for program development described in (1) (c) through (1) (g) above may be suspended by the DEQ.
4. Notwithstanding Paragraph (1)(a) above, unless the DEQ determines (in accordance with Paragraph (3) above), that the permittee is not required to implement a pretreatment program, the permittee shall:
 - a. Submit to the DEQ a progress report on actions taken to develop a pretreatment program within 90 days of the effective or modification date of this permit.

- b. Submit to the DEQ an approvable pretreatment program and a request for approval within one year of the effective or modification date of this permit.
- c. Upon approval, the program implementation becomes a part of this permit.

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- A significant industrial user is one that: (a) has a process wastewater** flow of 25,000 gallons or more per average work day; (b) contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW; (c) is subject to categorical pretreatment standards; or (d) has significant impact, either singularly or in combination with other Industrial Users, on the treatment works or the quality of its effluent.
 - ** Process wastewater excludes sanitary wastewater, non-contact cooling water and boiler blowdown.

D. Toxics Management Program

1. Biological Monitoring:

- a. In accordance with the schedule in (3) below and commencing within three months following issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities, the permittee shall conduct quarterly acute and chronic toxicity tests for a period of one year using 24-hour flow- proportioned composite samples of final effluent from outfall 001. The acute tests shall be 48-hour static tests using Ceriodaphnia dubia and Pimephales promelas, both conducted in such a manner and at sufficient dilutions for calculation of a valid LC_{50} . The chronic tests shall be static renewal tests using C. dubia and P. promelas. The C. dubia test shall be a 3-brood survival and reproduction test and the P. promelas test shall be a 7-day larval survival and growth test. These chronic tests shall be conducted in such a manner and at sufficient dilutions to determine the "No Observed Effect Concentration" (NOEC) for survival and reproduction or growth. The permittee may provide additional samples to address data variability during the one year period of initial data generation. These data may be included in the evaluation of effluent toxicity. The results of all such additional analyses shall be reported. Technical assistance in developing the procedures for these tests shall be provided by the Department of Environmental Quality staff, if requested by the permittee. Test protocols and the use of alternative species shall be approved by the Department of Environmental Quality staff prior to initiation of testing.
- b. The following criteria shall be used in evaluating the toxicity test data generated in 1.a. above:
 - (1) LC_{50} greater than or equal to 100% effluent in six of the total of eight acute toxicity tests, or in at least 75% of the tests conducted, if more than eight tests are conducted, and
 - (2) No Observed Effect Concentration (NOEC) greater than or equal to the Instream Waste Concentration (IWC) of 9.4% for the 5 MGD facility and 18.7% for the 10 MGD facility, in six of the total of eight chronic toxicity tests, or in at least 75% of the tests conducted if more than eight tests are conducted.

Any effluent failing either of the above criteria shall be considered to have demonstrated actual or potential toxicity and a Toxicity Reduction Evaluation (TRE) will be required.
- c. If, prior to completing the monitoring requirements specified in 1.a. above, it is determined that the effluent fails the decision criteria outlined in 1.b., a TRE may be required. Upon notification by the DEQ that a TRE is required, the permittee shall initiate a TRE and may stop conducting the toxicity tests of 1.a.
- d. Following completion of the testing of the outfall as above, the permittee shall continue acute and chronic toxicity testing of the outfall annually. The first annual tests shall be conducted within three months from the last quarterly tests. The test organisms shall be those identified as the most sensitive species from the quarterly acute and chronic tests or alternative species approved by the Department of Environmental Quality staff. Annual testing of the outfall is not required in cases where the need for a TRE of the outfall has been established.

- e. If, in the testing according to 1.d. above, any of the annual acute toxicity tests yields an LC_{50} of less than 100% effluent or any annual chronic toxicity test yields an NOEC of less than the IWC of 9.4% for the 5 MGD facility and 18.7% for the 10 MGD facility, the test shall be repeated within three months.
- (1) If the retest also indicates an LC_{50} of less than 100% effluent or an NOEC of less than the IWC, quarterly toxicity testing as in 1.a. above shall commence within three months. The results of these tests will be included in the evaluation of the need for toxicity reduction.
 - (2) If the retest does not confirm the results of the first test, then annual testing in accordance with the annual compliance schedule shall resume.

2. Toxicity Reduction Evaluation:

- a. If the results of this Toxics Management Program or other available information indicate that the wastewaters are actually or potentially toxic, the permittee shall submit:
- (1) a Toxicity Reduction Evaluation (TRE) plan, or
 - (2) at the permittee's option, an instream impact study plan, and
 - (3) an accompanying implementation schedule
- within 120 days of the notification of such a determination by the Department of Environmental Quality.
- b. The requirement of this plan shall be to:
- (1) assure the absence of actual or potential toxicity, or
 - (2) to demonstrate that there is, or would be, no adverse impact from the discharge on all reasonable and beneficial uses of the state's waters.
- c. Upon completion of the review of the plan, the permittee shall implement the plan and the permit may be modified or alternatively revoked and reissued in order to reflect appropriate permit conditions and a compliance schedule.

3. Reporting Schedule:

The permittee shall submit 2 copies of the results of the toxicity tests analyses specified in this Toxics Management Program in accordance with the following schedule:

a. Submit toxicity test protocols for approval	Within two months following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
b. Conduct first quarterly biological tests	Within three months following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities

c. Submit results of all tests conducted during the first quarter	With the Discharge Monitoring Report (DMR) for the fourth month following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
d. Conduct second quarterly biological tests	Within six months following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
e. Submit results of all tests conducted during the second quarter	With the DMR submitted for the seventh month following the permit effective date
f. Conduct third quarterly biological tests	Within nine months following the issuance of the Certificate to Operate (CTO's) for the 5 MGD and 10 MGD facilities
g. Submit results of all tests conducted during the third quarter	With the DMR submitted for the tenth month following the issuance of the Certificates to Operate (CTO's) of the 5 MGD and 10 MGD facilities
h. Conduct fourth quarterly biological tests	Within twelve months following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
i. Submit results of all tests conducted during the fourth quarter	With the DMR submitted for the thirteenth month following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
j. Conduct first annual biological tests	Within fifteen months following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
k. Submit results of first annual biological tests	With the DMR submitted for the sixteenth month following the issuance of the Certificates to Operate (CTO's) for the 5 MGD and 10 MGD facilities
l. Conduct subsequent annual biological tests	Within subsequent twelve month periods from 3.j.
m. Submit results of subsequent annual biological tests	With the DMR submitted every 12 months from 3.k.

4. In-Stream Macroinvertebrate Monitoring

The permittee shall perform an annual quantitative benthic macroinvertebrate study on the Pamunkey River to assess impacts of the Totopotomoy WWTP discharge. The study shall be conducted between August 15th and October 15th beginning in 2002. The study design, including sampling locations, survey methods, data analysis, etc. shall be submitted to and approved by DEQ Water Division staff prior to initiation of testing.

E. Chemical Monitoring

The permittee shall monitor the effluent at Outfall 001 for the following substances according to the indicated sample type and frequency. The data shall be submitted with the DMR following the month in which the analyses were conducted. It is the responsibility of the permittee to ensure that proper QA/QC protocols are followed during the sample gathering and analytical procedures. The Department will use this data for making specific permit decisions in the future. This permit may be modified or alternatively revoked and reissued to incorporate limits for any substance listed below.

Substance	Analysis Number	Quantification level	Sample Type	Frequency
Metals				
Arsenic (dissolved)	(i)	(i)	3g	A
Cadmium (dissolved)	(i)	(i)	3g	A
Chromium III (dissolved)*	(i)	(i)	3g	A
Chromium VI (dissolved)*	(i)	(i)	3g	A
Copper (dissolved)	(i)	(i)	3g	A
Lead (dissolved)	(i)	(i)	3g	A
Mercury (total recoverable)	(i)	(i)	3g	A
Nickel (dissolved)	(i)	(i)	3g	A
Selenium (dissolved)	(i)	(i)	3g	A
Silver (dissolved)	(i)	(i)	3g	A
Zinc (dissolved)	(i)	(i)	3g	A
Pesticides/PCB's				
Aldrin	608	0.5	3g	B
Chlorpyrifos (Dursban)	622	0.2	3g	B
Chlordane	608	0.2	3g	B
DDT	608	0.1	3g	B
Demeton	(ii)	---	3g	B
2,4 Dichlorophenoxy acetic acid (2,4-D)	(ii)	---	3g	B
Dieldren	608	0.1	3g	B
Endosulfan I	608	0.1	3g	B
Endosulfan II	608	0.1	3g	B
Endosulfan sulfate	608	0.1	3g	B
Endrin	608	0.1	3g	B
Guthion	622	---	3g	B
Heptachlor	608	0.1	3g	B

Substance	Analysis Number	Quantification level	Sample Type	Frequency
Lindane (Hexachlorocyclohexane)	608	0.1	3g	B
Malathion	(ii)	—	3g	B
Methoxychlor	(ii)	0.2	3g	B
Mirex	(ii)	—	3g	B
Parathion	(ii)	—	3g	B
PCB-1016	608	1.0	3g	B
PCB-1221	608	1.0	3g	B
PCB-1232	608	1.0	3g	B
PCB-1242	608	1.0	3g	B
PCB-1248	608	1.0	3g	B
PCB-1254	608	1.0	3g	B
PCB-1260	608	1.0	3g	B
2,4,5-Trichlorophenoxy propionic acid (Silvex)	(ii)	—	3g	B
Toxaphene	608	5.0	3g	B
Base/Neutral Extractables				
Anthracene	625	10.0	3g	B
Benzo(a)anthracene	625	10.0	3g	B
Benzo(b)fluoranthene	625	10.0	3g	B
Benzo(k)fluoranthene	625	10.0	3g	B
Benzo(a)pyrene	625	10.0	3g	B
Chrysene	625	10.0	3g	B
Di-2-Ethylhexyl Phthalate	625	10.0	3g	B
Dibenzo(a,h)anthracene	625	20.0	3g	B
Indeno(1,2,3-cd)pyrene	625	20.0	3g	B
1,2-Dichlorobenzene	625	10.0	3g	B
1,3-Dichlorobenzene	625	10.0	3g	B
1,4-Dichlorobenzene	625	10.0	3g	B
2,4-Dinitrotoluene	625	10.0	3g	B
Fluoranthene	625	10.0	3g	B
Fluorene	625	10.0	3g	B
Pyrene	625	10.0	3g	B

Substance	Analysis Number	Quantification level	Sample Type	Frequency
Naphthalene	625	10.0	3g	B
Isophorone	625	10.0	3g	B
Volatiles				
Benzene	624	10.0	3g	B
Bromoform	624	10.0	3g	B
Carbon Tetrachloride	624	10.0	3g	B
Chlorodibromomethane	624	10.0	3g	B
Chloroform	624	10.0	3g	B
Chloromethane	624	20.0	3g	B
Dichloromethane	624	20.0	3g	B
Dichlorobromomethane	624	20.0	3g	B
1,2-Dichloroethane	624	10.0	3g	B
Ethylbenzene	624	10.0	3g	B
Monochlorobenzene	624	50.0	3g	B
Tetrachloroethylene	624	10.0	3g	B
Toluene	624	10.0	3g	B
Trichloroethylene	624	10.0	3g	B
Vinyl Chloride	624	10.0	3g	B
Acid Extractables				
Pentachlorophenol	625	50.0	3g	B
Phenol	625	10.0	3g	B
2,4,6-Trichlorophenol	625	10.0	3g	B
Miscellaneous				
Cyanide	EPA 335.2 or 335.3	10.0	g	B
Dioxin	EPA 1613	0.00001	c	C
Hardness	(ii)	---	c	A
Tributyltin	NBSIR 85- 32.95 or (ii)	---	c	C
Xylene (total)	EPA SW 846 Method 8020	---	3g	B

If the result of a Total Chromium analysis is less than or equal to the QL of the method used to measure Total Chromium and that QL is less than or equal to the Target QL identified below for Chromium VI, the results for Chromium III and Chromium VI can be reported as not quantifiable.

Units for the quantification level are micrograms/liters unless otherwise specified.

Dashes (—) mean that the QL is at the discretion of the permittee.

Sample Type: c = 24 hour composite unless otherwise specified
 g = Grab
 3g = 1 grab sample every eight hours. Permittee shall analyze each sample individually and report the average of the three samples. Alternative laboratory compositing procedures may be approved on a case by case basis.

Frequency: A = Once per 6 months
 B = Once per year
 C = Once per permit term

Quality control/assurance information shall be submitted to document that the required quantification level has been attained for all parameters listed above. Alternatively, the permittee may retain the QA/QC information on file and submit a statement certifying that the required quantification levels have been attained.

- (i) A specific analysis is not specified for these materials. An appropriate analysis shall be selected from the following list of EPA methods to achieve a quantification level (QL) that is equal to or less than the target QL listed in the following table:

<u>Parameter</u>	<u>Target QL (ug/l)</u>	<u>EPA Methods</u>
Arsenic	409	206.2, 206.3, 200.7, 200.8, 200.9, 1632
Cadmium	1.2	213.1, 213.2, 200.7, 200.8, 200.9, 1637, 1638, 1639, 1640
Chromium	217	218.1, 218.2, 218.3, 200.7, 200.8, 200.9, 1639
Chromium VI	26	218.4, 1636
Copper	12	220.1, 220.2, 200.7, 200.8, 200.9, 1638, 1640
Lead	9	239.1, 239.2, 200.8, 200.9, 1637, 1640
Mercury	0.037	245.1, 200.7, 200.8, 1631
Nickel	21	249.1, 249.2, 200.7, 200.8, 200.9, 1638, 1639, 1640
Selenium	12	270.2, 200.7, 200.8, 200.9, 1638, 1639
Silver	1.6	272.1, 272.2, 200.7, 200.8, 200.9, 1638
Zinc	108	289.1, 289.2, 200.7, 200.8, 1638, 1639

- (ii) Any approved method presented in 40 CFR Part 136

CONDITIONS APPLICABLE TO ALL VPDES PERMITS

A. Monitoring.

1. Samples and measurements taken as required by this permit shall be representative of the monitored activity.
2. Monitoring shall be conducted according to procedures approved under Title 40 Code of Federal Regulations Part 136 or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this permit.
3. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will insure accuracy of measurements.

B. Records.

1. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) and time(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
2. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years, the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the permittee, or as requested by the Board.

C. Reporting Monitoring Results.

1. The permittee shall submit the results of the monitoring required by this permit not later than the 10th day of the month after monitoring takes place, unless another reporting schedule is specified elsewhere in this permit. Monitoring results shall be submitted to:

Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060

2. Monitoring results shall be reported on a Discharge Monitoring Report (DMR) or on forms provided, approved or specified by the Department.

3. If the permittee monitors any pollutant specifically addressed by this permit more frequently than required by this permit using test procedures approved under Title 40 of the Code of Federal Regulations Part 136 or using other test procedures approved by the U.S. Environmental Protection Agency or using procedures specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the Department.

4. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

D. Duty to Provide Information.

The permittee shall furnish to the Department, within a reasonable time, any information which the Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Board may require the permittee to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

E. Compliance Schedule Reports.

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized Discharges.

Except in compliance with this permit, or another permit issued by the Board, it shall be unlawful for any person to:

1. Discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances; or
2. Otherwise alter the physical, chemical or biological properties of such state waters and make them detrimental to the public health, or to animal or aquatic life, or to the use of such waters for domestic or industrial consumption, or for recreation, or for other uses.

G. Reports of Unauthorized Discharges.

Any permittee who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance into or upon state waters in violation of Part II.F; or who discharges or causes or allows a discharge that may reasonably be expected to enter state waters in violation of Part II.F, shall notify the Department of the discharge immediately upon discovery of the discharge, but in no case later than 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the Department, within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;

4. The length of time that the discharge continued;
5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

Discharges reportable to the Department under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of Unusual or Extraordinary Discharges.

If any unusual or extraordinary discharge including a bypass or upset should occur from a treatment works and the discharge enters or could be expected to enter state waters, the permittee shall promptly notify, in no case later than 24 hours, the Department by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse affects on aquatic life and the known number of fish killed. The permittee shall reduce the report to writing and shall submit it to the Department within five days of discovery of the discharge in accordance with Part II.1.2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;
2. Breakdown of processing or accessory equipment;
3. Failure or taking out of service some or all of the treatment works; and
4. Flooding or other acts of nature.

I. Reports of Noncompliance

The permittee shall report any noncompliance which may adversely affect state waters or may endanger public health.

1. An oral report shall be provided within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which shall be reported within 24 hours under this paragraph:
 - a. Any unanticipated bypass; and
 - b. Any upset which causes a discharge to surface waters.
2. A written report shall be submitted within 5 days and shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
 - c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Board may waive the written report on a case-by-case basis for reports of noncompliance under Part II.1 if the oral report has been received within 24 hours and no adverse impact on state waters has been reported.

3. The permittee shall report all instances of noncompliance not reported under Parts II.1.1 or 2, in writing, at the time the next monitoring reports are submitted. The reports shall contain the information listed in Part II.1.2.

NOTE: The immediate (within 24 hours) reports required in Parts II G, H and I may be made to the Department's Regional Office at (804) 527-5020 (voice) or (804) 527-5106 (fax). For reports outside normal working hours, leave a message and this shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Services maintains a 24 hour telephone service at 1-800-468-8892.

J. Notice of Planned Changes.

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
 - a. The permittee plans alteration or addition to any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:
 - (1) After promulgation of standards of performance under Section 306 of Clean Water Act which are applicable to such source; or
 - (2) After proposal of standards of performance in accordance with Section 306 of Clean Water Act which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal;
 - b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations nor to notification requirements specified elsewhere in this permit; or
 - c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
2. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

K. Signatory Requirements.

1. Applications. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or

operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

- b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a public agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
2. Reports, etc. All reports required by permits, and other information requested by the Board shall be signed by a person described in Part II.K.1, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- a. The authorization is made in writing by a person described in Part II.K.1;
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and
 - c. The written authorization is submitted to the Department.
3. Changes to authorization. If an authorization under Part II.K.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part II.K.2 shall be submitted to the Department prior to or together with any reports, or information to be signed by an authorized representative.
4. Certification. Any person signing a document under Parts II.K.1 or 2 shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Duty to Comply.

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the State Water Control Law and the Clean Water Act, except that noncompliance with certain provisions of this permit may constitute a violation of the State Water Control Law but not the Clean Water Act. Permit noncompliance is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this permit has not yet been modified to incorporate the requirement.

M. Duty to Reapply.

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. All permittees with a currently effective permit shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Board. The Board shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

N. Effect of a Permit.

This permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State Law.

Nothing in this permit shall be construed to preclude the institution of any legal action under, or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by Section 510 of the Clean Water Act. Except as provided in permit conditions on "bypassing" (Part II.U), and "upset" (Part II.V) nothing in this permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

P. Oil and Hazardous Substance Liability.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Sections 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

Q. Proper Operation and Maintenance.

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the

operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

R. Disposal of solids or sludges.

Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering state waters.

S. Duty to Mitigate.

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to Halt or Reduce Activity not a Defense.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

U. Bypass.

1. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II.U.2 and U.3.

2. Notice

- a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, prior notice shall be submitted, if possible at least ten days before the date of the bypass.
- b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part II.I.

3. Prohibition of bypass.

- a. Bypass is prohibited, and the Board may take enforcement action against a permittee for bypass, unless:
 - (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (3) The permittee submitted notices as required under Part II.U.2.

- b. The Board may approve an anticipated bypass, after considering its adverse effects, if the Board determines that it will meet the three conditions listed above in Part II.U.3.a.

V. Upset.

1. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of Part II.V.2 are met. A determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is not a final administrative action subject to judicial review.
2. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - b. The permitted facility was at the time being properly operated;
 - c. The permittee submitted notice of the upset as required in Part II.I; and
 - d. The permittee complied with any remedial measures required under Part II.S.
3. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

W. Inspection and Entry.

The permittee shall allow the Director, or an authorized representative, upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act and the State Water Control Law, any substances or parameters at any location.

For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. Permit Actions.

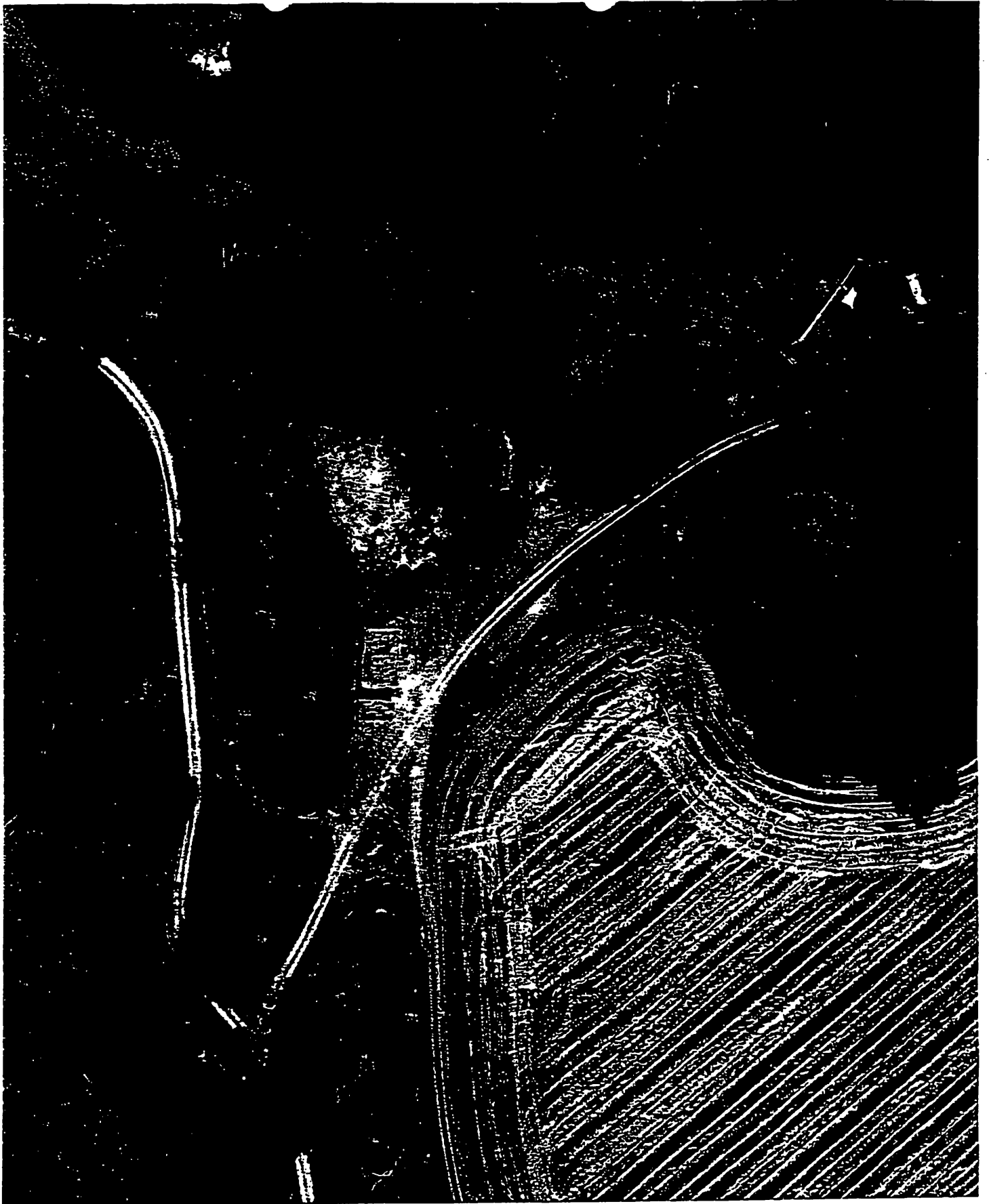
Permits may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Y. Transfer of permits.

- 1. Permits are not transferable to any person except after notice to the Department. Except as provided in Part II.Y.2, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued, or a minor modification made, to identify the new permittee and incorporate such other requirements as may be necessary under the State Water Control Law and the Clean Water Act.**
- 2. As an alternative to transfers under Part II.Y.1, this permit may be automatically transferred to a new permittee if:**
 - a. The current permittee notifies the Department at least 30 days in advance of the proposed transfer of the title to the facility or property;**
 - b. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and**
 - c. The Board does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part II.Y.2.b.**

Z. Severability.

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.







United States Department of the Interior
FISH AND WILDLIFE SERVICE

Ecological Services
6669 Short Lane
Gloucester, Virginia 23061



September 8, 1999



Mr. Ronald L. Taylor, P.E.
Hazen and Sawyer, P.C.
4011 WestChase Boulevard
Raleigh, North Carolina 27607

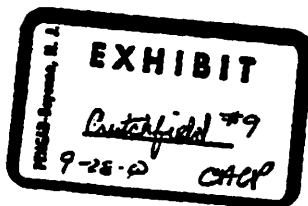
Re: Wastewater Treatment Plant
VPDES permit VA0089915,
Hanover County, Virginia

Dear Mr. Taylor:

This responds to the September 3, 1999 correspondence submitted as part of ongoing coordination with the U.S. Fish and Wildlife Service regarding the referenced project. In the Service's March 11, 1999 and May 11, 1999 letters, we indicated that the Pamunkey River should be re-surveyed during summer months in a more rigorous manner for appropriate habitat for the federally listed endangered dwarf wedge mussel (*Alasmodonta heterodon*) which may occur within the influence of the proposed wastewater discharge.

The Service has reviewed the freshwater mussel survey report performed by Creek Laboratory in conformance with additional requirements set forth by the Service. Based on the August 19, 1999 survey report, it is the opinion of the Service that appropriate habitat for this species does not occur at the project site and, therefore, this project is not likely to adversely affect the dwarf wedge mussel.

If project plans change or portions of the proposed project were not evaluated, it is the Service's recommendation that the changes and/or remainder of the project be submitted for our review. If



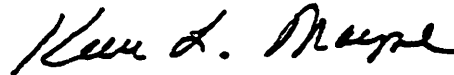
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Ronald L. Taylor, P.E.

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you have any questions or need further assistance, please contact Cindy Kane of this office at (804) 693-6694, extension 109.

Sincerely,



Karen L. Mayne
Supervisor
Virginia Field Office

cc:

Department of Public Utilities, Hanover County, VA

(ATTN: Mr. Steven Herzog, Utility Engineer)

Virginia Department of Environmental Quality, Glen Allen, VA

(ATTN: Mr. Allen Brockenbrough)

001586

McSWEENEY, BURTON & CRUMP

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June 30, 2000

RECEIVED

JUL 10 2000

STATE OF VIRGINIA
 OFFICE OF THE ATTORNEY GENERAL

By Hand

Mr. Bevill M. Dean
 Clerk
 Richmond Circuit Court
 John Marshall Courts Building
 400 North Ninth Street
 Richmond, Virginia 23219

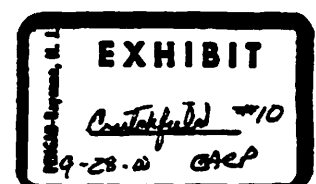
**Frances Broadus Crutchfield and Henry Ruffin Broadus v.
 State Water Control Board and Department of Environmental Quality
 Chancery No.: 760CH99K01193-00**

Dear Mr. Dean:

Enclosed for filing please find a First Amended Petition for Appeal in the above referenced matter.

Hanover County has been added as a party to this lawsuit. I have enclosed an additional copy of the First Amended Petition to be prepared for service on Sterling Rives, Esquire, County Attorney for Hanover County, 6497 County Complex Road, Hanover, Virginia 23069. Please prepare the Subpoena in Chancery and call my secretary, Sara Manuel, at (804) 783-6842 when it is ready for pick up. I will have the pleading served by a private process server.

I have also enclosed a copy that I would appreciate your file stamping and returning to the courier.



VIRGINIA:

**IN THE CIRCUIT COURT OF THE CITY OF RICHMOND
John Marshall Courts Building**

**FRANCES BROADDUS CRUTCHFIELD and
HENRY RUFFIN BROADDUS**

Petitioners,

v.

STATE WATER CONTROL BOARD

and

DEPARTMENT OF ENVIRONMENTAL QUALITY

and

COUNTY OF HANOVER, VIRGINIA,

Serve: Sterling Rives, Esquire

County Attorney

Hanover County

6497 County Complex Road

Hanover, Virginia 23069

Respondents.

**Chancery No.:
760C1199K01193-00**

FIRST AMENDED PETITION FOR APPEAL

1. Petitioners, Frances Broaddus Crutchfield and Henry Ruffin Broaddus, by counsel, file this petition for appeal of the issuance on April 28, 1999, by the respondents of VPDES Permit No. VA0089915 to the County of Hanover for the County's Totopotomoy Wastewater Treatment Plant. The permit allows the County to discharge up to ten million gallons a day of treated waste into the Pamunkey River.

2. Petitioners contend that, in issuing this permit, the State Water Control Board ("SWCB") failed to observe the duties imposed on it by the State Water Control Law and the SWCB's own regulations. The discharge at issue will contribute to and aggravate existing violations of water quality standards in the Pamunkey River, contrary to law. These violations of water quality standards are serious and by definition adversely affect aquatic life using the Pamunkey River in the vicinity of the proposed discharge and downstream. Species likely to be affected — but given inadequate consideration by the SWCB --- include freshwater mussels and anadromous fish such as American shad, currently the target of an intensive recovery effort to restore decimated populations in the Chesapeake Bay. The proposed discharge will also adversely affect existing recreational uses of the Pamunkey River in violation of law. In addition to violating its duty to refrain from issuing permits for discharges that will contribute to violations of water quality standards, the SWCB failed its duty to adequately address these issues and acted arbitrarily and capriciously by failing to consider the applicant's candid admission that other available discharge locations would have less adverse effects on water quality and other affected resources.

Parties

3. Frances Broaddus Crutchfield ("Crutchfield") is a citizen of the Commonwealth of Virginia and is a riparian co-owner of property known as Newcastle Farm, the site of the proposed outfall and discharge to the Pamunkey River.

4. Henry Ruffin Broaddus ("Broaddus") is a riparian co-owner of Newcastle Farm.

5. The SWCB is a state agency established under Va. Code § 62.1-44.7 (Repl. Vol. 1998) and has the authority, pursuant to Va. Code § 62.1-44.15(5), to issue certificates for the discharge of sewage, industrial wastes and other wastes into state waters.

6. The Department of Environmental Quality ("DEQ") is an agency of the Commonwealth of Virginia with responsibility for administering environmental regulatory matters within the jurisdiction of the SWCB.

7. The County of Hanover is a political subdivision of the Commonwealth of Virginia and is the holder of VPDES Permit No. VA0089915.

Jurisdiction and Venue

8. The SWCB issued VPDES Permit No. VA0089915 ("the permit") on April 28, 1999. The petitioners filed a timely notice of appeal on May 27, 1999. Therefore, this Court has jurisdiction over this petition under Va. Code § 62.1-44.29 (Repl. Vol. 1998), Va. Code § 9-6.14:16 (Repl. Vol. 1998) and Part Two A of the Rules of the Supreme Court of Virginia.

9. Venue is proper in this court under Va. Code § 8.01-261(1) (Cum. Supp. 1998).

Errors Assigned

10. The SWCB violated the State Water Control Law, Va. Code § 62.1-44.2 *et seq* (Repl. Vol. 1998) ("SWCL"), and the SWCB's own implementing regulations by issuing a permit for a proposed discharge that, in combination with other existing sources of pollution, will contribute to and exacerbate significant, existing violations of Virginia's applicable water quality standards for dissolved oxygen downstream from the proposed discharge.

11. The SWCB violated the SWCL and implementing regulations by failing to consider adequately evidence that the proposed discharge, in combination with other sources of pollution, will contribute to and exacerbate significant, existing violations of Virginia's applicable water quality standards for dissolved oxygen downstream from the proposed discharge.

12. The SWCB violated the SWCL and implementing regulations by issuing this permit notwithstanding that aquatic life currently using the vicinity of the proposed discharge and downstream areas, including rare, threatened and endangered freshwater mussel species and anadromous fish, will be significantly and adversely affected by the proposed discharge.

13. The SWCB violated the SWCL and implementing regulations by failing to consider adequately the aquatic life currently using the vicinity of the proposed discharge and downstream areas and the adverse effects the proposed discharge will have on the species present, including rare, threatened and endangered freshwater mussels and anadromous fish.

14. The SWCB violated the SWCL and implementing regulations by failing to consider adequately that issuance of the proposed permit will terminate significant, existing recreational uses of the Pamunkey River in the vicinity of the proposed discharge.

15. The SWCB acted arbitrarily and capriciously by issuing a permit for the proposed discharge prior to collecting sufficient information and performing sufficient analyses with respect to the foregoing matters to reach a rational conclusion that existing aquatic resources and beneficial uses of the Pamunkey River will be adequately protected.

16. The SWCB acted arbitrarily and capriciously by failing to consider the applicant's admission that other available discharge locations would have less adverse effects on aquatic resources the SWCB is charged by law to conserve and protect.

The Facts

17. Newcastle Farm, which has been owned by the Broadus family for six generations, consists of approximately 900 acres of land located on the Pamunkey River in the County of Hanover. Newcastle Farm is the location of the historic Town of Newcastle, which is listed in the Virginia Landmarks Register.

18. In March of 1997, the County of Hanover agreed to purchase land near the Totopotomoy Creek on which the County proposed to locate a sewage treatment plant

19. In April of 1997, the County informed Broadbus that Newcastle Farm had been identified by the County as the location for the sewage treatment plant's discharge and outfall pipe to the Pamunkey River.

20. As proposed by the County, the project would 1) include 5,000 linear feet of discharge pipe crossing Newcastle Farm, 2) require an ingress/egress easement road approximately 50 feet in width which would encompass approximately 5.8 acres of land, and 3) require up to an acre of land on Newcastle Farm in order to construct recreation and discharge structures.

21. Hanover County applied for a VPDES permit to discharge wastewater at a discharge and outfall location on Newcastle Farm on April 4, 1997. The application reflected a discharge location that became known as the "Original Site."

22. During the next several months, the County conducted feasibility studies of other potential discharge locations that might have less adverse impacts on the Pamunkey River, Newcastle Farm, and historic resources.

23. As a result of the feasibility studies, the County decided to move the discharge and outfall pipe from the Original Site to a site downstream that became known as the Downstream II location. The County's own analysis indicated that the Downstream II site was superior based on three criteria including 1) the protection of water quality in the Pamunkey River, 2) minimizing impacts to the Town of Newcastle archaeological site and 3) minimizing impacts to Newcastle Farm.

24. The County maintained that protection of water quality was of the highest importance in selecting a location for the discharge and outfall pipe and on April 20, 1998, the County amended its permit application to select the Downstream II location for the discharge and outfall pipe.

25. On October 8, 1998, the County again amended its permit application to return the proposed discharge to the Original Site, without any new information indicating it was superior from the perspective of water quality.

26. On January 19, 1999, the SWCB conducted a public hearing at the Hanover County Office Complex. Ms. Crutchfield, Mr. Broadus and their counsel presented information orally at the hearing.

27. On February 4, 1999, counsel, on behalf of Crutchfield and Broadus, submitted timely written comments to the DEQ regarding the proposed VPIDES permit for the County's Wastewater Treatment Plant. See Comments attached hereto as Exhibit A.

28. On March 11, 1999, the SWCB approved the permit. On April 28, 1999, the permit was issued to Hanover County.

Existing Water Quality Violations

29. Like all Virginia waters, the Pamunkey River at the site of the proposed discharge is designated for uses including swimming and the propagation and growth of a balanced, indigenous population of aquatic life which might reasonably be expected to inhabit them.

9 VAC 25-260-10.

30. In order to achieve these uses, the SWCB has determined that the daily average concentration of dissolved oxygen in the Pamunkey River cannot be permitted to fall below

5mg/l, and that dissolved oxygen concentrations can never be permitted to fall below 4mg/l.

9 VAC 25-260-50, 25-260-530.

31. Data collected by the DEQ shows that the Pamunkey River already experiences severe and persistent violations of both of these water quality standards for dissolved oxygen at river mile 48.80. River mile 48.80 is approximately 6 miles downstream from Hanover County's proposed discharge of treated sewage at river mile 54.89.

32. In stream conditions such as those in the segment of the Pamunkey River involved here, the effect of a pollutant discharge is generally greatest at a point several miles downstream.

33. During a 5-month period of continuous monitoring in 1995, the daily mean standard for dissolved oxygen was violated 40 times. The first daily mean violation occurred on June 24th, and the last occurred on October 8^m.

34. During that period of 106 days, there were 40 daily mean violations, indicating that dissolved oxygen concentrations were below the standard for 38% of the time. Furthermore, the instantaneous dissolved oxygen standard of 4 mg/l was violated 10 times for up to four hours at a time.

35. The lowest dissolved oxygen level recorded at river mile 48 was found by accident in a monthly grab sample taken on September 11, 1996, when the dissolved oxygen in the Pamunkey was a mere 2.8 mg/l.

36. The DEQ researcher who collected these data recommended further study to check whether dissolved oxygen violations occur prior to June 1 and to confirm dissolved oxygen sag areas. The DEQ elected not to better define or document this problem despite its knowledge at the time that Hanover County would be proposing a significant discharge of treated

sewage upstream. A DEQ memorandum dated June 2, 1997, noted that the assimilative capacity of the Pamunkey with respect to dissolved oxygen is considered to be fully allocated.

37. In the three years since dissolved oxygen problems in the Pamunkey River were discovered, the DEQ has not undertaken any research or analyses sufficient to document the reasons for the dissolved oxygen sag at river mile 48.80. Instead, it has continued to issue permits for substantial discharges of treated sewage — including oxygen consuming pollutants — to upstream waters.

38. Specifically, the SWCB issued a discharge permit for the King William County Sewage Treatment Plant on Moncuin Creek. When operational, this plant will discharge treated sewage to Moncuin Creek just 3.88 miles upstream from its confluence with the Pamunkey River at river mile 48.80.

39. Without performing the analyses or adhering to the procedures required in such cases, the SWCB issued a VPDES to Hanover County to discharge up to 10 mgd of effluent with a significant load of oxygen-consuming pollutants and nutrients including chemical oxygen demand, biological oxygen demand, suspended solids, phosphorus and nitrogen

40. These pollutants would be mixed with the modest flow in the Pamunkey River and carried downstream until the river deepens and slows near river mile 48.80. There, with similar pollutants from the King William County Sewage Treatment Plant, they will settle out, consume oxygen, and promote the growth of oxygen-demanding microbes and bacteria. The result will necessarily be even lower levels of dissolved oxygen, for longer periods, over an even wider geographic area.

41. The DEQ has never conducted any field investigation or modeling of these effects.

The Pamunkey River is an Impaired Water

42. Section 303(d) of the Clean Water Act (the "CWA") requires states to identify their waters that do not meet water quality standards, even after treatment required by the CWA or when other controls are in place. The state must consider all existing and readily available water quality related data and information in preparing the list of waters identified as impaired.

43. For each of the waters on the list, the state is required to develop a Total Maximum Daily Load ("TMDL") of pollutants. A TMDL calculates how much of a pollutant can be put into the entire watershed without violating water quality standards. Permits for discharges of pollutants into the watershed may only be issued if the total amount of pollutants to be discharged by all dischargers to the watershed is below the TMDL.

44. The development and implementation of TMDLs has become the focal point for water quality protection. TMDLs are based on sound water quality standards but must be calculated and faithfully applied by the SWCB in permit decisions.

45. Notwithstanding the clear violations of water quality standards for dissolved oxygen in the Pamunkey River, the SWCB and DEQ failed and refused to identify it as an "impaired water" subject to Section 303(d). As a result, the United States Environmental Protection Agency ("EPA") was compelled to exercise its oversight authority and designate the Pamunkey River -- and many other Virginia waters -- as "impaired" for the SWCB and DEQ.

46. On December 16, 1998, the EPA published notice of its proposal to designate numerous Virginia waters as "impaired" owing to the failure to the SWCB and DEQ to do so.

47. On May 12, 1999, the EPA placed the tidal portion of the Pamunkey River, including the area of the proposed discharge and river mile 48.80, on the list of impaired waters

This decision was made based on existing and readily available water quality-related data in the possession of the DEQ.

48. The SWCD issued the sewage discharge permit here with full knowledge of EPA's proposal and the "impaired" nature of the receiving water body, yet failed to consider adequately evidence that the proposed discharge, in combination with other sources of pollution, will contribute to and exacerbate significant, existing violations of Virginia's applicable water quality standards for dissolved oxygen downstream from the proposed discharge.

Rare, Threatened or Endangered Mussels

49. There is strong evidence that rare, threatened or endangered mussel species use the vicinity of the proposed discharge and will be adversely affected by the proposed discharge. Despite this evidence, the DEQ refused to perform work adequate to detect their presence in the Pamunkey River, and issued a permit without adequate information to make a rational and informed decision.

50. A study conducted in 1972 and 1973 surveyed the Pamunkey River for the presence of mussels. At a location just upstream from the proposed discharge location, the surveyor found four species of mussels, including the rare *Lampsilis radiata* (Eastern Lampmussel) and the rare *Lasmigona subviridis* (green floater), as well as *Elliptio complanatus* and *Ligumia pasuta*. At the next station upstream, the surveyor found another rare mussel, *Lampsilis curiosa* (yellow lampmussel).

51. The Virginia Department of Conservation and Recreation shares the assessment that rare, threatened or endangered mussel species are likely to be at or near the proposed discharge site. Due to this possibility, the department strongly recommended a survey to determine which species may occur in the vicinity of the discharge site.

52. The County of Hanover arranged for a field survey of mussels which took place in November of 1998. The investigation consisted of approximately one hour of search time at each of four stations, a total of 2.5 hours of stream bank searching, and 54 minutes of waterscoping. The survey was submitted to the DEQ.

53. This survey was reviewed by Dr. Richard Neves of Virginia Tech. who considered the work inadequate for several reasons. Among these, the survey was not conducted in the late spring or early summer and thus was unlikely to find all the species present. Furthermore, the amount of time spent searching for the mussels was inadequate.

54. In addition, the surveyor was under the mistaken belief that the U.S. Route 360 bridge, where the surveyor in the 1972-73 study conducted her sampling was several miles upstream from the survey area. This error cast doubt on the researcher's knowledge and understanding of the site.

55. According to Dr. Neves, only a more thorough survey would determine whether any mussel species resided within the survey reach. Until such a survey is conducted, the best available evidence indicates that rare, threatened or endangered mussels occupy the very stretch of river into which the County proposed to discharge treated sewage.

56. According to the Virginia Department of Conservation and Recreation, the *Lasmigona subdiridis* (green floater) is believed to be declining to the point that it may warrant federal listing as a threatened or endangered species.

57. The United States Fish and Wildlife Service also did not concur with the findings of the County's mussel report. In a letter to the DEQ, the Fish and Wildlife Service concurred with Dr. Neves' concerns which included the time-of-year that the survey was conducted and the

level of effort spent sampling. The letter noted that the Virginia Department of Conservation and Recreation, Division of Natural Heritage had also indicated concern about this survey report.

58. The Fish and Wildlife Service recommended that another freshwater mussel survey be conducted in May or June 1999 and that the survey effort be two to three times greater than the effort put forth in the original survey.

59. Importantly, the Fish and Wildlife Service stated that until the additional survey is conducted, no state or federal permits should be issued for the proposed project to ensure compliance with the Endangered Species Act.

60. Nevertheless, the SWCB issued a permit to allow the County to discharge ten million gallons per day of treated sewage immediately upstream from this known freshwater mussel habitat that has historically included rare, threatened or endangered species. During slack tides and low flow conditions in the Pamunkey, these mussels will be exposed to large quantities of concentrated sewage effluent.

61. Despite the comments by Dr. Neves and the Fish and Wildlife Service and evidence presented by Crutchfield and Broadus, the SWCB issued the VPDHS permit to the County. This action violates Virginia's SWCI and implementing regulations, and was arbitrary and capricious.

Anadromous Fish

62. The SWCB also failed to consider adequately that the proposed discharge will have a significant adverse effect on anadromous fish spawning and migration

63. The populations of anadromous fish in the York River system, including the Pamunkey, are in serious trouble. Among the reasons cited by researchers for the collapse of the shad population is pollution that blocks migratory pathways, making it impossible for adults to

reach or return from spawning habitat, and impossible for juveniles to migrate successfully to bay and ocean waters. Spawning and nursery habitat is eliminated upstream from dissolved oxygen sags that anadromous fish cannot, and will not, traverse.

64. Historically, anadromous fish have used almost the entire Pamunkey River as spawning and nursery habitat. Spawning adults have been documented in the South Anna River, in the North Anna and throughout the Pamunkey. For shad, spawning occurs during the spring and extends into June, with juvenile fish migrating downstream thereafter. Other species spawn earlier as well as later in the year.

65. The existing dissolved oxygen problem in the Pamunkey at river mile 48.80 poses a significant obstacle for migratory shad and other anadromous fish because such fish cannot swim through waters with inadequate levels of dissolved oxygen to sustain their respiration.

66. The evidence before the SWCB indicated that the Pamunkey may be effectively closed to migratory fish passage at river mile 48.80 during a significant portion of the year extending from late spring through early fall.

67. The precise times the Pamunkey may be blocked to migratory fish is not known because the SWCB and DEQ failed to develop adequate data on the problem.

68. The licensed discharge will make the situation for anadromous fish worse. The DEQ could not properly issue the permit without sufficient information to assess the possible effect of the proposed discharge on passage of migratory fish.

69. As a result of the issuance of the VPDES permit, the use and enjoyment of anadromous fish by Crutchfield and Broadus on their property will be diminished and impaired.

Recreational Uses

70. At the public hearing on the proposed discharge on January 19, 1990, several speakers informed the DEQ that they have used the area at and immediately downstream from the proposed discharge for swimming for many years.

71. Several troops of Boy Scouts regularly use this area of the property for camping, picnicking, swimming and other forms of outdoor recreation and nature observation. The area is highly prized and regularly used by canoeists, fishermen and others for a variety of primary contact recreation.

72. Crutchfield and Broaddus have personally witnessed such usage over the years and confirm that the portion of the Pamunkey bordering Newcastle Farm downstream from the proposed discharge site is heavily used for all manner of primary contact water-based recreation.

73. At the public hearing, several individuals who have used this stretch of the Pamunkey for recreation uniformly said they would not continue to do so if the County is permitted to discharge treated sewage immediately upstream.

74. The Virginia Department of Health has advised numerous members of the public that primary contact recreation should be avoided downstream from discharges of treated sewage such as are at issue.

75. Water is not "swimmable" if the Health Department recommends that the public not swim there. Nor can water be considered "swimmable" if no reasonable person in fact would ever swim in it.

76. Crutchfield and Broaddus have used the Pamunkey River and Newcastle Farm at the proposed discharge location and upstream and downstream of the proposed discharge for recreational uses including, but not limited to, swimming, fishing, canoeing and camping.

77. As a result of the issuance of the VPDES permit, Crutchfield and Broadus will cease using the Pamunkey River and Newcastle Farm at the proposed discharge location and upstream and downstream of the proposed discharge location for recreational uses, including, but not limited to, swimming, fishing, canoeing and camping.

78. The SWCB violated the SWCL and implementing regulations by issuing this permit notwithstanding its effective termination of existing beneficial uses of the Pamunkey River for recreation.

Alternative Locations for Discharge

79. According to a letter to the DEQ from the County, the most important siting criteria applicable to this discharge of treated sewage are the protection of water quality, historic resources and property interests.

80. The site licensed by the SWCB for this discharge, the Original Site, is by the County's own admission more damaging to water quality, historic resources and property interests than other, equally available alternatives.

81. The issuance of the VPDES permit and construction of the discharge pipe and outfall will result in damage to documented historic resources at Newcastle Farm including the colonial era Town of Newcastle -- a listed Virginia Historic Landmark -- and a portion of Marlbourne, which is listed on the National Register of Historic Places.

82. The issuance of the VPDES permit also damages the aesthetic and conservation interests of Crutchfield and Broadus at Newcastle Farm because it permits the discharge of treated sewage into the Pamunkey River at Newcastle Farm and will lead to the construction of the outfall and associated structures on Newcastle Farm.

83. Newcastle Farm has been faithfully preserved, husbanded and conserved by the Broaddus family for six generations. The present owners repeatedly have rejected offers to develop or otherwise disturb the integrity of this land. This activity and these goals will be greatly diminished as a result of the issuance of the VPDES permit.

84. As a result of the issuance of this permit, the Pamunkey River and Newcastle Farm will be aesthetically less pleasing to Crutchfield and Broaddus and their enjoyment of their property will be impaired.

85. The SWCB's approval of an admittedly inferior discharge location is arbitrary and capricious.

Relief Requested

WHEREFORE, Crutchfield and Broaddus, by counsel, move this Court to declare that VPDES Permit No. VA0089915, issued on April 28, 1999, by the State Water Control Board, was issued in violation of the State Water Control Law and implementing regulations and is therefore invalid, void and of no effect.

Crutchfield and Broaddus also move this Court to award them reasonable costs and attorneys' fees incurred in bringing this appeal as provided for under Va. Code § 9-6.14:21 (Repl. Vol. 1998).

Respectfully submitted.

FRANCES BROADDUS CRUTCHFIELD
AND HENRY RUFFIN BROADDUS

By: 

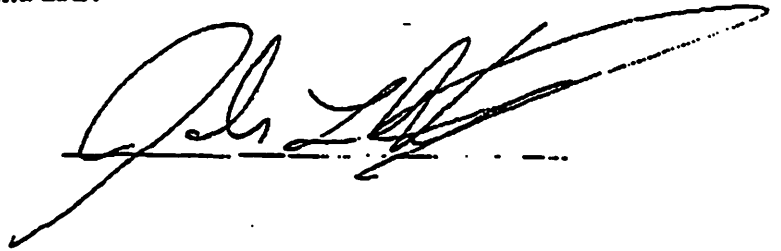
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CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing "First Amended Petition for Appeal"

was mailed this 30th day of June, 2000, by first-class mail, postage prepaid, to:

Deborah Love Feild, Assistant Attorney General
Office of the Attorney General
900 East Main Street
Richmond, Virginia 23219

A handwritten signature in black ink, appearing to read "Deborah Love Feild", is written over a horizontal dashed line.

McSWEENEY, BURTON & CRUMP

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February 4, 1999

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BY HAND

Mr. Allan Brockenbrough
Virginia Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060Re: County of Hanover, Totopotomoy Wastewater
Treatment Plant; Proposed Permit No. VA0089915

Dear Mr. Brockenbrough:

Thank you very much for the opportunity to comment on the proposed VPDES permit for Hanover County's planned Totopotomoy Wastewater Treatment Plant. The comments presented in this letter are made on behalf of Mrs. Frances Broadus-Crutchfield and her son, Mr. Henry Ruffin Broadus. Mrs. Broadus-Crutchfield and Mr. Broadus are among the persons who would be most affected by the proposed discharge because they own Newcastle Farm, the site of the proposed outfall to the Pamunkey River. While I know that you will attempt to evaluate all comments on this proposal conscientiously, please make a special effort to see that the concerns of these landowners are considered carefully and completely.

Newcastle Farm has been in my clients' family for six generations. It is an historic property which each generation has faithfully preserved, husbanded and conserved. The present owners repeatedly have rejected efforts to develop or otherwise disturb the integrity of this land. Now however, its rich resources are being threatened by others as never before. Its proximity to U.S. Route 360 and the Pamunkey River make it a convenient location from which to dispose of treated sewage.

However, convenient, easy and cheap solutions are not always best in the long term. Before issuing the proposed permit, there are substantial reasons to stop, gather additional information, and consider more carefully than has been possible on the basis of the existing record. Please consider the following points.

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1. There is Strong Evidence that Rare, Threatened or Endangered Mussel Species Will Be Adversely Affected by the Proposed Discharge, But No Work Adequate to Detect Their Presence Has Been Performed.

- a. The Riddick Study

In 1972 and 1973, Ms. Marceile B. Riddick surveyed the Pamunkey River for the presence of mussels. Her work, part of a master's thesis supervised by Dr. James R. Reed (then a professor at Virginia Commonwealth University) is reported in *Freshwater Mussels of the Pamunkey River System, Virginia* (1973). A copy of this thesis is enclosed as Exhibit 1.

Ms. Riddick's sampling station 48 was located at the U.S. Route 360 bridge, just upstream from the proposed sewage discharge location. At that location, Ms. Riddick found four species of mussels, including the rare *Lampsilis radiata* (Eastern lampmussel) and the rare *Lasmigona subviridis* (green floater), as well as *Elliptio complanata* and *Ligumia pasuta*. At the next station upstream (station 47, at State Route 602), Ms. Riddick found another rare mussel, *Lampsilis cariosa* (yellow lampmussel). According to a letter from the Virginia Department of Conservation and Recreation dated November 20, 1998 (Exhibit 2), *Lasmigona subviridis* (green floater) "is believed to be declining throughout its range to the point that it may warrant Federal listing as Threatened or Endangered."

While the documented occurrence of three rare mussel species in the general vicinity of the proposed discharge is significant, it is even more remarkable when one recalls the limitations of this work.

Ms. Riddick's survey of mussels in the Pamunkey covered a wide area, with sampling performed at a total of 50 stations located on the North Anna, South Anna, Little River, and Pamunkey River. As befits a general geographic survey such as this, the amount of effort at individual sampling stations was necessarily quite limited. Nor was it possible given Ms. Riddick's limited resources to conduct the sampling at each station at the time when mussels are most likely to be found.

According to a letter of January 8, 1999, from Dr. Richard Neves, a professor at Virginia Tech, "a mussel survey at the site would be effective only in late spring or early summer." Please refer to Exhibit 3. This is because mussels burrow into river substrates during winter months, and when they are otherwise not reproductively active. That means that if one genuinely wishes to know if rare, threatened or endangered species are present at a given location, one must look for them during the late spring or early summer months. However, Ms. Riddick's field work was conducted "during summer, fall, and winter of 1972 and the early spring of 1973" (at 10). She did not record when sampling was performed at each station, but clearly the odds are that the timing of this work resulted in many mussels -- and especially any rare mussels -- being missed.

Under these circumstances, the documented occurrence of three rare mussel species in the area

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is strong evidence that these -- and perhaps other rare, threatened or endangered species -- are likely to be present today at and below the proposed discharge site.

b. The Natural Heritage Division Findings and Recommendation

The Virginia Department of Conservation and Recreation, Natural Heritage Division, shares the assessment that rare, threatened or endangered mussel species are likely to be at or near the proposed discharge site. In a letter dated January 8, 1999 (Exhibit 4) it stated:

Three rare species, the green floater (*Lasmigona subviridis*), yellow lampmussel (*Lampsilis cariosa*), and eastern lampmussel (*Lampsilis radiata*), have been documented a short distance upstream of Newcastle Farm and there is a high probability that one or more occurs at or near the discharge site. The Federally-listed dwarf wedge mussel (*Alasmodonta heterodon*) has been recorded in the watershed and is also possible at the site.

Due to the possibility of rare mussel species, we strongly recommend a survey to determine which species may occur in the vicinity of the discharge sites.

On January 12, 1999, after the Natural Heritage Division wrote this letter, a consultant to Hanover County prepared a report describing its prior field search for mussels in the Pamunkey River near the proposed discharge site. Unfortunately, that effort was manifestly inadequate and likely would not have found any rare, threatened or endangered mussel species even if they are present, as expected.

c. Hanover's Survey of November 1998

In late 1998, long after it had committed to this stretch of the Pamunkey River as its discharge location, Hanover County arranged for a field survey for mussels. The survey was conducted on November 6, 7, 8, 18, and 20, 1998. The investigation consisted of approximately one hour of search time at each of four stations, a total of 2.5 hours of stream bank searching, and 54 minutes of waterscoping. A final report setting forth the results was not prepared until January 12, 1999. It says this work located two common mussel species in the vicinity of the proposed discharge, *Anodonta cataracta* (Eastern floater) and *Elipitio complanata* (Eastern elliptio). By far the greatest numbers of these mussels were found approximately 1,000 feet downstream of the proposed discharge point, at a sampling point dubbed "Tributary Station." There, notwithstanding the time of year, mussels were found at a rate of 30 per hour. The next most productive station produced 10 mussels per hour.

Hanover County's mussel survey has been reviewed by Dr. Richard Neves of Virginia Tech, who considers the work inadequate for several reasons. Among these, the survey was not conducted in

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the late spring or early summer and thus was unlikely to find all of the species present. That is especially true for rare, threatened or endangered species that are difficult to find even under ideal conditions. Furthermore, the amount of time spent searching for mussels was woefully insufficient to the task. Rare mussels are hard to find -- especially in November. The failure to search for a reasonable time made it very unlikely that any rare, threatened or endangered mussels would be found even if they are present. Please refer to the attached letter from Professor Richard Neves to Frances Broadbush-Crutchfield dated February 2, 1999 (Exhibit 5).

It should also be noted that the County's investigator was under the mistaken belief that the U.S. Route 360 bridge -- where Riddick conducted her sampling at Station 48 -- was "several miles upstream from the survey area" (at 14). This error casts doubt on the researcher's knowledge and understanding of the site, as well as his evaluation of Riddick's work and conclusions based on it.

To put matters simply, Hanover County made very little effort to find mussels, and what little effort it did make came at a time when mussels were very unlikely to be found. The survey is completely inadequate and unreliable. According to Dr. Neves, "only a more thorough survey would determine whether any other mussel species reside within the surveyed reach." Exhibit 5 at 2. Until a full and complete mussel survey is performed that satisfies the recommendations of the Natural Heritage Division and Dr. Neves, the best available evidence indicates that rare, threatened or endangered mussels occupy the very stretch of river into which Hanover proposes to discharge treated sewage.

d. The Water Quality Needs of Freshwater Mussels

Freshwater mussels are notoriously sensitive to water pollution. Time and again, they have disappeared from streams in the mid-Atlantic area following pollution that was previously undetected and in compliance with all established water quality standards. In the attached article published by the American Fisheries Society (Exhibit 6), several experts including Dr. Neves report that there are 297 varieties of native freshwater mussels in the United States and Canada -- of which 213 (71.7%) "are considered endangered, threatened, or of special concern." Mussels are sensitive to water pollution as miners' canaries are sensitive to dangerous gases. Their deaths warn of water quality problems that otherwise may go undetected. This explains why many freshwater mussels are joining the ranks of rare, threatened and endangered species. See letter from Virginia Department of Conservation and Recreation dated April 22, 1997 (Exhibit 7).

Yet, Hanover County has proposed to discharge 10 million gallons per day of treated sewage immediately upstream from known freshwater mussel habitat that probably includes rare, threatened or endangered species. During slack tides and low flow conditions in the Pamunkey, these mussels will be exposed to large quantities of concentrated sewage effluent.

Given these facts, one would expect that before this permit issues the record would contain an assessment of the sensitivity of freshwater mussels to all of the expected constituents in the proposed

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effluent, and a demonstration that all of the relevant species can tolerate the concentrations and durations of the predicted exposure. However, no such assessment or demonstration has been made. Issuance of a permit for this discharge should be postponed until the likely effects are thoroughly examined and understood.

2. The Proposed Discharge Would Contribute to Existing Violations of Water Quality Standards in the Pamunkey River, But No Assessment Has Been Prepared.

Like all Virginia waters, the Pamunkey River at the site of the proposed discharge is designated for uses including swimming and the propagation and growth of a balanced, indigenous population of aquatic life which might reasonably be expected to inhabit them. 9 VAC 25-260-10.

In order to achieve these uses, the Board has determined that the daily average concentration of dissolved oxygen in the Pamunkey River cannot be permitted to fall below 5 mg/l, and that dissolved oxygen concentrations can never -- not even for an instant -- be permitted to fall below 4 mg/l. 9 VAC 25-260-50, 25-260-530. According to the Environmental Protection Agency, these levels of dissolved oxygen are the threshold at which lethal effects (suffocation) begin for fish and other aquatic life.

a. The Pamunkey River Already Experiences Significant and Persistent Violations of Water Quality Standards for Dissolved Oxygen.

Data collected by the Virginia Department of Environmental Quality shows that the Pamunkey River presently experiences severe and persistent violations of the water quality standard for dissolved oxygen at river mile 48.80. River mile 48.80 is approximately 6 miles downstream from Hanover County's proposed discharge of treated sewage at river mile 54.89. During a 5-month period of continuous monitoring in 1995, the daily mean standard for dissolved oxygen was violated 40 times. The first daily mean violation occurred on June 24, and the last occurred on October 8. During that period of 106 days, there were 40 daily mean violations, indicating that dissolved oxygen concentrations were below the standard for 38% of the time. Furthermore, the *instantaneous* dissolved oxygen standard of 4 mg/l was violated 10 times for up to four hours at a time.

The lowest dissolved oxygen level recorded at river mile 48 was found by accident in a monthly grab sample taken on September 11, 1996. On that date, dissolved oxygen in the Pamunkey river was a mere 2.8 mg/l -- a level lethal to all but the hardiest of species. All of these data on dissolved oxygen levels in the Pamunkey are collected in Exhibit 8 to these comments.

The DEQ researcher who collected these data recommended deployment of a datasonde beginning May 1, 1996 "to check whether mean daily DO violations occur prior to June 1, the start

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date of this [1995] study." He also recommended continuing datasonde deployments throughout the summer "to confirm the results of the 1995 deployments" and "perform[ing] more longitudinal DO surveys to confirm DO sag areas." Exhibit 9 at 3. However, DEQ -- then under the administration of Governor George Allen -- elected not to better document or define this problem. DEQ made that decision notwithstanding its knowledge at the time that Hanover County would be proposing a significant discharge of treated sewage upstream.

A DEQ memorandum from Jon van Soestbergen to Curt Linderman dated June 2, 1997, sheds further light on this situation (Exhibit 10). Based on the dissolved oxygen data discussed above, it concludes that *"the assimilative capacity of the river with respect to DO is considered to be fully allocated"* (emphasis added).

Consultants to Hanover County were not aware of this dissolved oxygen problem in the Pamunkey River until March 1996, when Hazen & Sawyer were provided these data. Thus, the condition simply was not taken into account in any of the prior studies performed for the County. The County nevertheless continues (improperly) to cite those earlier reports for the proposition that its proposed discharge would neither cause nor contribute to violations of water quality standards.

In the three years since dissolved oxygen problems in the Pamunkey were discovered, the DEQ has not undertaken any research or analyses sufficient to document the reasons for the dissolved oxygen sag at river mile 48.80. Instead, DEQ simply has assumed that the condition is the result of "natural conditions caused by extensive marshlands that border the tidal Pamunkey River" (Exhibit 10). However, the researcher who collected the data in 1995 and 1996 suspected that it was due in part to nonpoint sources of pollution including agricultural runoff. See Exhibit 9. His suspicion is supported by the levels of fecal coliform recorded in the data. See Exhibit 8. The Pamunkey River tends to be shallow and fast-moving as one progresses downstream from the U.S. Route 360 bridge, until just above river mile 48.80. There, the river becomes deeper and slower. Water there has a greater residence time, tending to slosh back and forth on each tidal cycle with less net downstream displacement. In this environment, pollution that remained suspended in the water upstream tends to settle out, including oxygen-demanding materials and nutrients. This provides an ideal habitat for microbes to grow, reproduce and consume available dissolved oxygen -- thus accounting for the dissolved oxygen sag.

Whatever the cause, the important points are: (1) a severe and persistent dissolved oxygen sag occurs in the Pamunkey River a short distance downstream from the proposed discharge, (2) the problem has not been adequately documented, and (3) the assimilative capacity of the Pamunkey River for dissolved oxygen has already been fully allocated.

- b. The Proposed Discharge Will Contribute to these Existing Water Quality Violations.

The sewage discharge proposed by Hanover County would add a large amount of additional

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oxygen demand to the river, making this existing water quality problem worse. It would permit discharge of up to 10 mgd of effluent (20% of the 7Q10 river flow) with a significant load of oxygen-consuming pollutants and nutrients including chemical oxygen demand, biological oxygen demand, suspended solids, phosphorus and nitrogen. These pollutants would be mixed with the modest flow in the Pamunkey River and carried downstream until the river deepens and slows near river mile 48.80. There, they will settle out, consume oxygen, and promote the growth of oxygen-demanding microbes and bacteria. The result necessarily must be even lower levels of dissolved oxygen, for longer periods, over an even wider geographic area.

The DEQ has not conducted any field investigation or modeling of these effects. Nor are the proposed effluent limitations as strict as prior DEQ practice would require.

Hanover County employees have attempted to characterize the effluent limitations in this proposed permit as "strenuous." At best, that description is inaccurate. Our examination of DEQ permits indicates that the proposed limitations are merely "typical" of modern treatment plants on streams that *exceed* water quality standards. They are positively "lax" when compared to the significantly more stringent limitations applied by DEQ to streams with existing downstream water quality problems, such as the Pamunkey has with dissolved oxygen.

In early 1997, you made essentially the same observation. Your memorandum to Maynard D. Phillips dated February 26, 1997 (Exhibit 11), noted dissolved oxygen problems in the Pamunkey and observed that no validated model existed to evaluate the likely effects of Hanover County's proposed sewage discharge on stream dissolved oxygen levels. The memorandum observed that it was therefore impossible to show that the effect of the proposed discharge on dissolved oxygen levels would be small, and suggested that this situation called for more stringent effluent limitations than are applied commonly to streams without water quality problems.

Several months later, the DEQ memorandum of June 2, 1997 (Exhibit 10), adopted this approach and recommended discharge limits that are significantly more stringent than those in the proposed permit:

	June 2, 1997 Recommendation Based on BPJ	Proposed Effluent Limitation
cBOD ₅	10 mg/l	15 mg/l
TSS	10 mg/l	22.5 mg/l
TKN	3 mg/l	4.5 mg/l

The recommended effluent limitations were based on the "Best Professional Judgment" of DEQ staff and were backed by DEQ's Water Permits Support Division.

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Almost a year later, DEQ staff was still recommending this approach. A DEQ memorandum dated April 15, 1998 (Exhibit 12 at 5), states:

The Pamunkey River at the point of discharge is not modellable by conventional means due to the tidal influence upon the river. DEQ has recommended that, in such cases, VPDES permit limits should be set at "self-sustaining" levels. "Self-sustaining" is defined by DEQ as an effluent that causes virtually no degradation to the river water quality. Traditionally, "self-sustaining" limits have been in the range of BOD₅ = 10 mg/l, TSS = 10 mg/l, and TKN = 3 mg/l.

The record contains no evidence or analysis sufficient to justify DEQ's last minute rejection of these recommended effluent limitations. Without explanation or supporting evidence, the proposed permit would allow a 50% increase in BOD₅ over staff recommendations, a 125% increase in TSS, and a 50% increase in TKN. The resources of the Pamunkey are too important to risk in this fashion.

Furthermore, DEQ cannot avoid its obligation to designate the Pamunkey River in the vicinity of river mile 48.80 as a nutrient enriched, water quality impaired stream segment merely by refusing to further document the problem. It is required to perform sufficient investigation to determine the sources of pollution contributing to the water quality standard violations, and to determine the total maximum daily load of pollutants that may be introduced into these waters consistent with meeting the water quality standard. It is required to adopt and enforce effective limitations on both point sources and nonpoint sources in order to achieve those water quality standards. If DEQ wishes to contend that the existing water quality problems at river mile 48.80 are caused *entirely* by natural phenomena and are not contributed to by point or nonpoint sources of pollution, then it must perform sufficient investigations and documentation using the processes provided for in its rules. Unless and until it does so, it is improper to issue discharge permits with obvious potential to make existing violations of water quality standards worse.

This situation is made worse by the recent issuance of a discharge permit by DEQ for the King William County Sewage Treatment Plant on Moncuin Creek. This plant, now under construction, will soon begin discharging treated sewage to Moncuin Creek just 3.88 miles upstream from its confluence with the Pamunkey River -- at river mile 48.80. There is no record that the combined, cumulative effects of the King William and Hanover County discharges on the existing dissolved oxygen sag in the Pamunkey have been properly considered.

In short, DEQ has not performed the investigations necessary to demonstrate that the permit limitations it has proposed will protect water quality standards downstream from the proposed discharge site.

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3. The Proposed Discharge Will Interfere with Existing Uses of the Pamunkey River.

a. Recreation

During the public hearing on the proposed discharge on January 19, 1999, several speakers mentioned that they have used the area immediately downstream from the proposed discharge for swimming for many years. Those using this area are not limited to the property owners. Several troops of Boy Scouts regularly use the property for camping, picnicking, swimming, and other forms of outdoor recreation and nature observation. Please refer to the enclosed letter from Mr. David Estes, Scoutmaster of Troop 879, dated February 2, 1999 (Exhibit 13), and to the enclosed letter from Mr. J. Harry Davis, Scoutmaster of Troop 876, dated January 31, 1999 (Exhibit 14). Furthermore, the area is highly prized and regularly used by canoeists, fisherman and others for a variety of primary contact recreation. Mrs. Broaddus-Crutchfield and Mr. Henry Ruffin Broaddus have personally witnessed such usage over the years and confirm that the portion of the Pamunkey bordering Newcastle Farm downstream from the proposed discharge site is heavily used for all manner of primary contact water-based recreation.

At the public hearing, several individuals who have used this stretch of the Pamunkey River for recreation uniformly said that they would not continue to do so if the County is permitted to discharge treated sewage immediately upstream. Several reported advice they had received from the Virginia Department of Health that primary contact should be avoided downstream from treated sewage effluent. Despite claims from DEQ staff at the hearing that swimming in this effluent would not be harmful to human health and that the area would remain "swimmable," it is clear that allowing the proposed discharge would in fact terminate the existing use of a significant stretch of the Pamunkey River for primary contact recreational uses -- including swimming -- from the proposed discharge location downstream for a considerable distance.

Water is not in fact "swimmable" if the Health Department recommends against swimming there. Nor does it satisfy the purposes of DEQ's regulations or applicable law for water to be technically "swimmable" according to DEQ's criteria, if no person in fact would ever swim there given the risks cited by the Health Department.

b. Shellfish Habitat

As noted above, the Pamunkey River currently is used as shellfish habitat by several freshwater mussel species. The areas immediately upstream and downstream from the proposed discharge in particular are documented habitat for mussels, including rare, threatened or endangered species. This existing use of the Pamunkey River is to be maintained, but would likely be terminated by the proposed discharge. Until such time as it is demonstrated that all mussel species likely to be present in the discharge area will survive the proposed discharge during all stream conditions, issuance of the proposed permit is premature.

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c. Anadromous Fish Spawning and Migration

Anadromous fish are those species that migrate from saltwater to freshwater to spawn, but return to saltwater to live most of their adult lives. The reproductive strategies of these species require that spawning adults be free to swim up coastal rivers to freshwater spawning habitat during their annual spawning migrations, and free to return to bays and ocean waters once spawning is complete. Newly spawned fish larvae live and grow into juvenile fish in upstream freshwater nursery habitats, then migrate downstream to bays and ocean waters to complete their maturation into reproducing adults.

There is no doubt that populations of anadromous fish in the York River system, including the Pamunkey River, are in serious trouble. In 1994, the Virginia Marine Resources Commission ("VMRC") imposed a total ban on in-shore fishing for migratory fish "after it became obvious that shad populations in tidal rivers across the state had collapsed. . . ." Recently, the VMRC voted again to extend that ban for at least another year. *Richmond Times-Dispatch*, "Shad fishing ban is extended a year" (Dec. 22, 1998), Exhibit 15. Among the reasons cited by researchers for the collapse of the shad population is pollution that blocks migratory pathways, making it impossible for adults to reach or return from spawning habitat, and impossible for juveniles to migrate successfully to bay and ocean waters. In effect, spawning and nursery habitat is eliminated upstream from dissolved oxygen sags that anadromous fish cannot, or will not, traverse.

Historically, anadromous fish have used almost the entire Pamunkey River as spawning and nursery habitat. Spawning adults have been documented in the South Anna at the U.S. Route 1 bridge, in the North Anna, and throughout the Pamunkey. For shad, spawning occurs during the spring and extends into June, with juvenile fish migrating downstream thereafter. Other species spawn earlier as well as later in the year.

The existing dissolved oxygen problem in the Pamunkey River at river mile 48.80 may pose a significant obstacle for migrating shad or other anadromous fish. Fish cannot swim through waters with inadequate levels of dissolved oxygen. The existing evidence indicates that the Pamunkey may be effectively closed to migratory fish passage at river mile 48.80 during a significant portion of the year extending from late spring through early fall. The precise times the Pamunkey may be blocked to migratory fish is not known because DEQ failed to follow the advice of its research employees to develop additional data on the problem. However, it is clear that the proposed discharge will make this situation worse. Until a thorough study of the possible effect of the proposed discharge on passage of migratory fish is performed, issuance of the proposed permit is premature.

Mr. Allan Brockenbrough
February 4, 1999
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4. The County Requires, But Probably Cannot Obtain, A Federal Permit to Construct the Outfall at the Proposed Location.
 - a. The Proposed Outfall Location May Have Significant Adverse Effects on Federally Protected Resources, Including Endangered Species and Historic Resources.

The outfall structure proposed by the County will involve discharges of fill material in areas subject to the jurisdiction of the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act, 33 U.S.C. § 1344. Ordinarily, construction of such outfall structures can be expected to produce only "minimal" effects on protected resources and is thus eligible for use of a "Nationwide" permit. In this case however, there are substantial reasons to suspect that the effects of constructing the outfall at the proposed location will be "more than minimal." The potential effects of this discharge location on rare, threatened or endangered species protected by the federal Endangered Species Act, and on anadromous fish protected by the federal Fish and Wildlife Coordination Act, have already been discussed.

In addition, the location of the proposed outfall may have significant and adverse effects on historic resources protected by the National Historic Preservation Act ("NHPA").

Section 106 of the NHPA requires federal agencies to consider carefully the effects of undertakings they fund, perform or approve on historic resources that may be eligible for listing on the National Register of Historic Places. It also requires the Corps to provide the Advisory Council on Historic Preservation with an opportunity to comment on such undertakings. When the Advisory Council determines that an undertaking would have an adverse effect on an eligible resource, the federal agency may proceed only after an elaborate review process has been completed and it has evaluated and rejected other alternatives and mitigation.

In the present case, Newcastle Farm contains significant, documented historic resources that would indeed be adversely affected by construction of the proposed discharge pipe, reaeration structure, and outfall. These include the colonial era Town of Newcastle -- a listed Virginia Historic Landmark -- and a portion of Marlbourne, which is already listed on the National Register.

Newcastle Town was founded by William Meriwether in 1738. It became an important cross-roads, with major highways leading to Williamsburg, Hanover Courthouse, and Philadelphia. Ocean going vessels docked at its wharfs, and it was a regional center for both culture and commerce. When removal of the colonial capital from Williamsburg was contemplated by the House of Burgesses in 1751, Newcastle fell just two votes shy of being selected as the new capital of the Virginia Colony. It is where Patrick Henry rallied volunteers in 1775 to march on Williamsburg and protest Governor Dunmore's seizure of the colony's gunpowder.

Marlbourne is where Edmund Ruffin, sixth generation ancestor of Mr. Henry Ruffin Broadus,

Mr. Allan Brockenbrough
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conducted his famous agricultural experiments concerning the effects of various fertilizers on crop production. Often called the "father of soil chemistry in America," Ruffin is credited with pioneering scientific agriculture in the New World. His farm, Marlbourne encompassed a portion of Newcastle Farm and is listed on the National Register of Historic Places. Additional information on these two sites, prepared by the Virginia Department of Historic Resources, is set forth in Exhibit 16.

Now, this historic property is where Hanover County proposes to pipe, reacrate and discharge its sewage. Clearly, doing so may have "adverse effects" on historic resources. Because of these and the other impacts cited above, the Corps will be required by its regulations to consider alternatives to the proposed discharge location in an individual permit process.

b. The County Has Admitted that Superior Alternatives Exist.

Despite knowledge of the historic importance of this property, Hanover County has not performed any survey for or evaluation of historic resources at its proposed discharge site. Earlier, it had Gray & Pape perform a "Phase I" evaluation of two potential downstream discharge locations, known as "Downstream I" and "Downstream II." Virginia's Department of Historic Resources responded to that study by recommending additional investigations and suggesting that alternative discharge sites should be explored. Letter from David Dutton dated July 7, 1998 (Exhibit 17). The County itself has concluded, based in part on the Gray & Pape report, that impacts to historic resources would likely be more severe at its proposed discharge location (called the "original site") than at an equally available alternative location (Downstream II).

According to a letter to DEQ by Mr. Steven P. Herzog, Utility Engineer for Hanover County's Department of Public Utilities, dated March 25, 1998 (Exhibit 18), the most important siting criteria for treated sewage discharges are protection of water quality, historic resources, and property interests. He further has stated that Hanover County's proposed discharge location would have *greater* impacts to *each* of these resources than would other, equally available alternatives. According to Mr. Herzog, the Downstream II location remained superior to the County's proposed location after considering additional factors including "safety, access from Route 360, cost and wetlands impacts."

c. A Federal Permit Probably Cannot Be Obtained for an Admittedly Inferior Location.

Hanover County has admitted that its proposed "original" discharge location is inferior to an equally available alternative with respect to water quality and every other relevant factor, including wetland impacts. Nevertheless, it has asked the DEQ to approve that location by means of a letter from Mr. Steven P. Herzog dated October 8, 1998. The request cited no reasons why the discharge should be located at the inferior "original" site, and offered only that it is not much worse -- from a water quality perspective only -- than the Downstream II site. The request ignores the other "primary" and secondary site evaluation criteria earlier applied by the County itself, and which will be applied by

Mr. Allan Bröckenbrough
February 4, 1999
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the U.S. Army Corps of Engineers. These criteria include impacts to historic resources, property interests, safety, access, cost, and wetlands.

The County's request that DEQ approve an admittedly inferior discharge location appears on its face to be arbitrary and irrational. To grant such a request without supporting justification would be even more so.

Whatever response the State Water Control Board may make to this request, the Corps of Engineers is required by federal law and regulations to issue a permit only for the least environmentally damaging, practicable alternative. The record demonstrates -- from the County's own statements -- that the least damaging site is not the proposed "original" site. Accordingly, no federal permit is likely to issue for it. If the applicant should obtain such a permit, it will be vulnerable to judicial challenge.

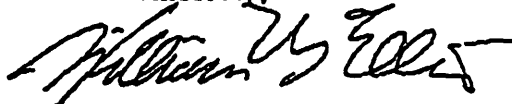
Conclusion

The State Water Control Board should not issue the proposed permit. Impacts to freshwater mussels have not been adequately explored or considered. The discharge would contribute to and aggravate existing water quality problems in the Pamunkey River. The DEQ should address those problems before permitting the discharge of pollutants that would make them worse. The existing violations of water quality standards in the Pamunkey are serious and are adversely affecting aquatic life, possibly including anadromous fish such as American shad. The proposed effluent limitations are not sufficient to prevent such adverse effects according to the best professional judgment of DEQ employees themselves. The proposed discharge also would adversely affect existing recreational uses of the Pamunkey, including swimming and camping. These matters need to be examined carefully, but have not been thus far.

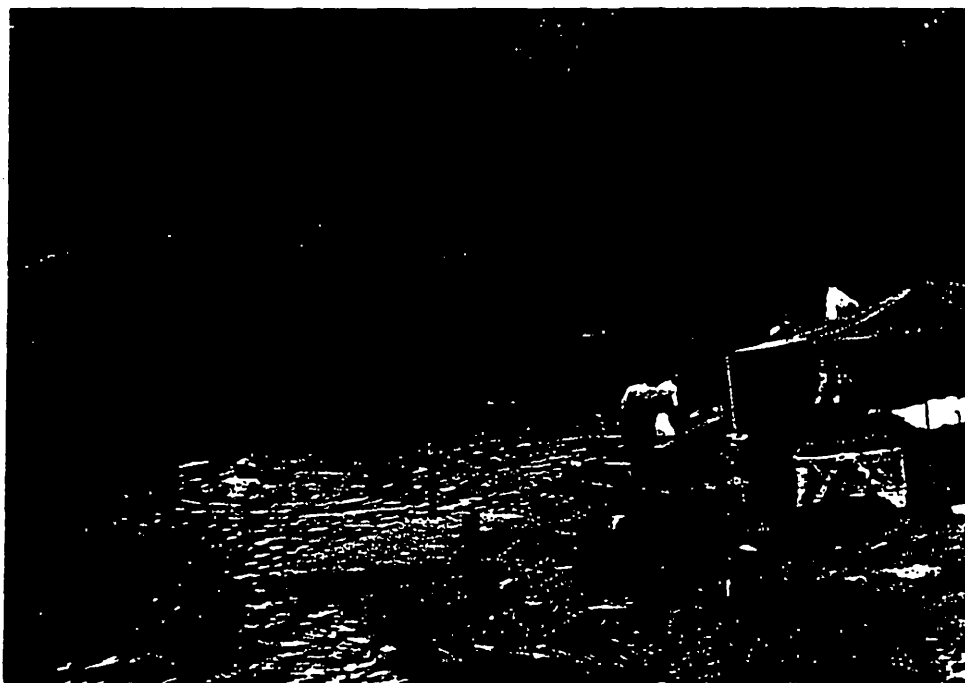
Finally, Hanover County has not yet obtained a federal permit its proposal requires -- and there are strong reasons to believe the County will not obtain one for the proposed discharge site. That site admittedly would have more severe impacts on numerous protected resources than other practicable alternatives. It therefore is ineligible for federal permitting under Corps rules. If a federal permit should issue, it would be vulnerable to challenge in federal court.

On behalf of Mrs. Frances Broaddus-Crutchfield and Mr. Henry Ruffin Broaddus, thank you very much for the opportunity to express these views.

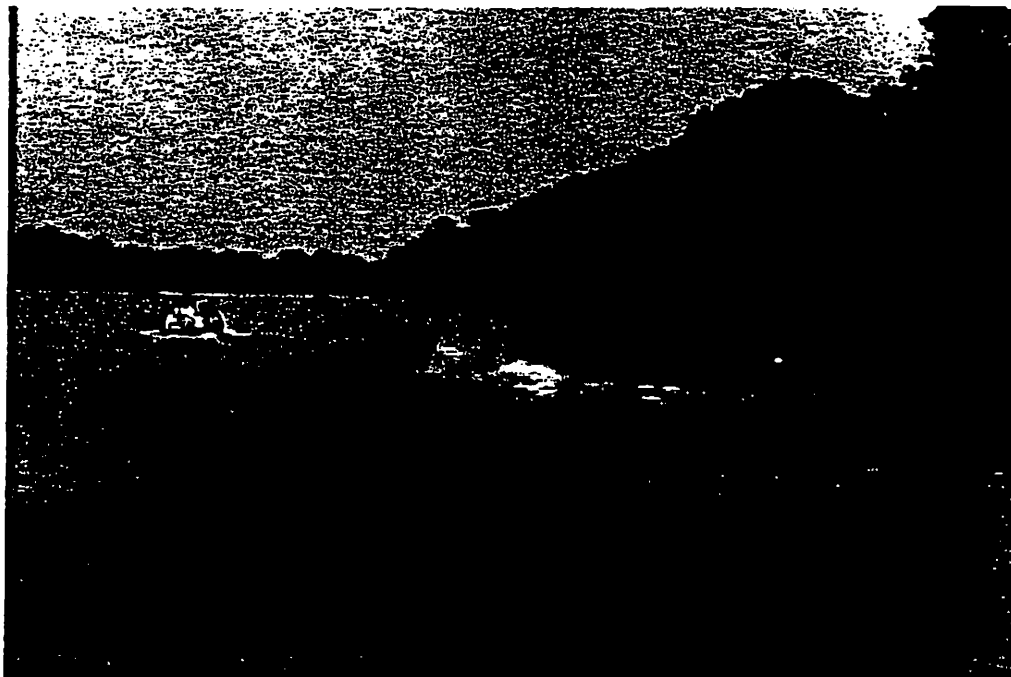
Sincerely,



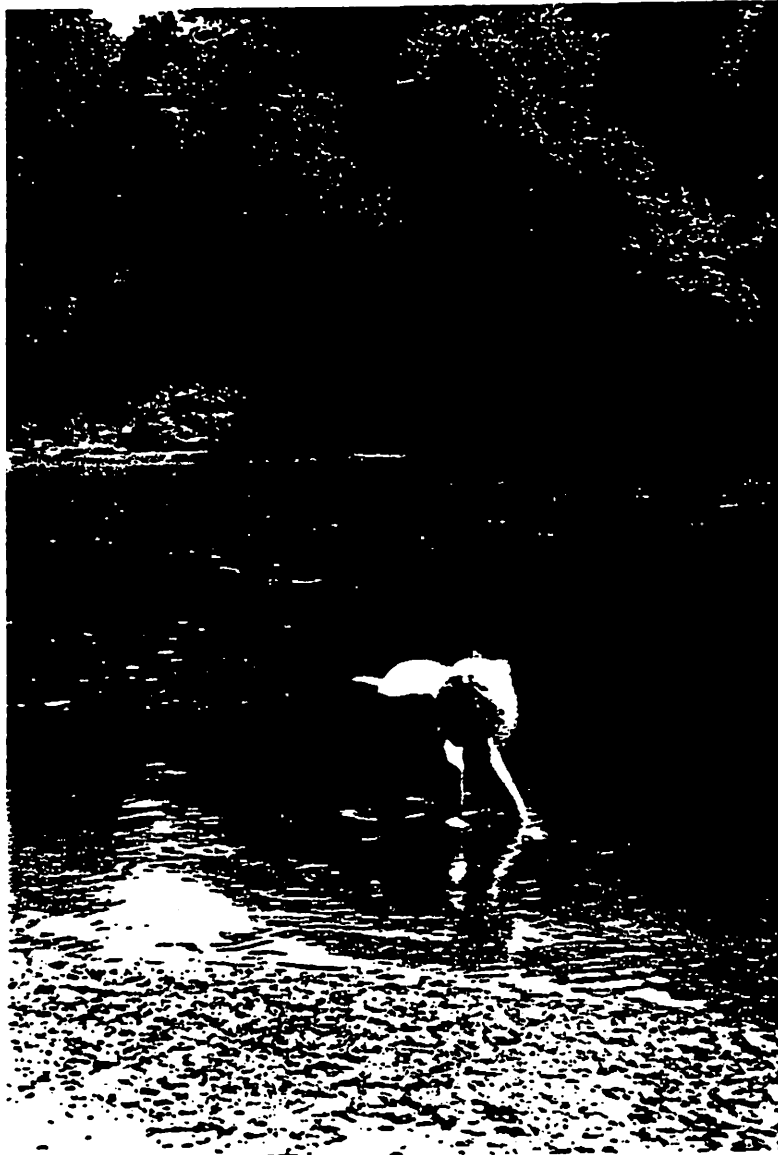
William B. Ellis



FBI - BOSTON, M. I.
EXHIBIT
 9-26-00 CAC







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VIRGINIA:

IN THE CIRCUIT COURT OF THE COUNTY OF HANOVER

FRANCES BROADDUS CRUTCHFIELD
and
HENRY RUFFIN CRUTCHFIELD

vs.

STATE WATER CONTROL BOARD
and
DEPARTMENT OF ENVIRONMENTAL QUALITY

RECEIVED
JUN 22 2001

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CIRCUIT COURT
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BEVERLY J. GERRI
By: [Signature] D.C.

CHANCERY NO.
760CH99K01193-00

The deposition of HENRY RUFFIN BROADDUS, a plaintiff herein, called on behalf of the defendants, before Connie Alys Crane Pryor, a Registered Court Reporter and a Notary Public in and for the State of Virginia at Large, pursuant to Notice, beginning at 12:25 p.m. on September 28, 2000, at the offices of McSweeney, Burtch & Crump, 11 South 12th Street, Richmond, Virginia; said depositions taken pursuant to the rules of the Supreme Court of Virginia.

CRANE-SNEAD & ASSOCIATES, INC.
4914 Fitzhugh Avenue - Suite 203
Richmond, Virginia 23230
Tel. No. (804) 355-4335

ORIGINAL

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4 Counsel for the plaintiffs

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7 By: Mr. John R. Butcher,

Senior Assistant Attorney General

8 and

COUNTY OF HANOVER

9 7497 County Complex Road

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10 Hanover, Virginia 23069

By: Ms. Yvonne S. Wellford,

11 Assistant County Attorney

and Ms. Barbara M. Rose, Deputy County Attorney

12 Counsel for the defendants

13 COUNTY OF HANOVER

14 Department of Public Utilities

7496 County Complex Road

15 Hanover, Virginia 23069

By: Mr. Steven P. Herzog, P.E.

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I N D E X

	DIRECT	CROSS	REDIRECT	RECROSS
Henry Ruffin Broadus	4	8		
		(Wellford)		
		11	20	26
		(Marshall)		(Wellford)

E X H I B I T S

PAGE

(No exhibits were introduced)

1
2
3 HENRY RUFFIN BROADDUS, a plaintiff herein,
4 called on behalf of the defendants, first being duly
5 sworn, testifies as follows:

6 DIRECT EXAMINATION

7 BY MR. BUTCHER:

8 Q Mr. Broaddus, would you state your
9 full name and your home address, please?

10 A Sure. Henry Ruffin Broaddus. My
11 current mailing address is 1196 Huguenot Trail,
12 Midlothian, Virginia. I have been sleeping and
13 camping in an Airstream trailer on Newcastle Farm
14 since, gosh, early September.

15 Q That's September of this year?

16 A Yes.

17 Q Mr. Broaddus, have you testified
18 in a trial or a deposition before today?

19 A On the appeal, I did testify at
20 the appeal of the County's use of the quick take. So,
21 yes. That's the short answer to your question.

22 Q Are you aware that the oath that
23 you took today is the exactly the same oath that you
24 took on that occasion and has exactly the same effect?

25 A I am.

Broadbuss - Direct

1 Q Are you subject to any physical
2 disability, or taking any drugs, or otherwise under
3 any influence that would interfere with your ability
4 to answer my questions today?

5 A No, sir.

6 Q What happens to the sewage from
7 the Airstream?

8 A It has a holding tank, 20 gallon
9 holding tank, and a port-a-potty on the way.

10 Q What happens to the contents of
11 the holding tank?

12 A I have not filled it up, yet, I'm
13 pleased to say. But we get it pumped when that
14 happens. It's actually not that difficult to plan
15 one's day around that fact. I go to the library where
16 I check e-mail and use the bathroom.

17 Q You have heard your mother's
18 testimony here this morning. Have you not?

19 A I have.

20 Q Do you agree with her -- Do you
21 disagree with anything that she said to any
22 significant degree?

23 A No, sir.

24 Q With respect to the effect of the
25 County's project on the property and on your use of

Broaddus - Direct

1 the property, do you have any uses that you could add
2 to your mother's testimony?

3 A Um, no. But I would like to
4 reiterate them. Is that acceptable?

5 Q Speak right up.

6 A You know, I camp there. I swim in
7 that river. I fish in that river. Friends of mine
8 camp there. I derive tremendous aesthetic and
9 recreational value from that property.

10 Further more, that property is
11 really the only artifact of my father that I have.
12 And I have tried to treat it in a reverent manner for
13 that reason. That is, in itself, a use that gives me
14 great pride.

15 Q Have you had an opportunity to
16 review the NPDES permit that the Water Board issued
17 for this project?

18 A I saw it upon issuance. I would
19 not say that I have reviewed it to the extent that I'm
20 very familiar with it at this point.

21 Q Is there any change that the Water
22 Control Board can make to that permit that would make
23 this discharge acceptable to you?

24 A The only change that the Water
25 Control Board could make would be not to issue the

Broadbuss - Direct

1 permit.

2 Q Is it true then that even if this
3 discharge were the quality of drinking water, you
4 would still abandon your, or decrease your uses of the
5 river for fishing, swimming, recreation?

6 A That's correct. No matter what
7 the quality of the effluent is, it will impoverish the
8 historic value of that place. I would liken it to
9 graffiti that is adjacent the Washington Monument. It
10 might not be part of that property, but it is
11 unsightly, and it does inhibit the experience of
12 enjoying that historic resource.

13 Q Do they use tractors on this
14 property to farm it?

15 A They do, yes, sir.

16 Q Are tractors the same kind of
17 machinery that was historically used to farm the
18 property?

19 A No, sir.

20 Q Does the presence of tractors and
21 diesel fuel, and the noise, and the stench of tractors
22 interfere with your use of this historic resource?

23 A It does not. Because the use of
24 tractors is consistent with what the historic use of
25 the property has been, which is farming.

Broaddus - Direct

1 MR. BUTCHER: That's all I have.
2 It's yours, ma'am County Attorney.
3
4
5

6 CROSS-EXAMINATION

7 BY MS. WELLFORD:

8 Q Mr. Broaddus, you have been living
9 on the farm since sometime earlier this month.

10 A That is correct.

11 Q Okay. And prior to that, tell me
12 about your residential history of, if you could, sort
13 of -- I don't need every street address, but, you
14 know, what towns you were living in.

15 A Sure. I lived on the farm until
16 '80 or '81. From birth to '80 or '81, at which point
17 I moved with my mother to Powhatan.

18 I resided there during high
19 school. We did reside in a condominium in Midlothian
20 for a short time.

21 Following that, I attended college
22 at Dartmouth College, in Hanover, New Hampshire. Upon
23 graduation in 1997, I worked as Assistant Director of
24 Admissions in Hanover, New Hampshire for three years
25 before returning.

Broadbuss - Cross (Wellford)

1 Q So between 1980 and 2000, you did
2 not live on the farm?

3 A That's correct. It was
4 impossible, given that I had to go to college and get
5 an education required by law. Not the college part,
6 but the high school part, anyway.

7 Q Dartmouth would like to see it
8 that way.

9 A Right.

10 Q You returned from Hanover in, at
11 some point this year?

12 A In June.

13 Q Okay. What prompted you to
14 return?

15 A This threat to what I still
16 consider to be my father's farm, though it legally is
17 mine.

18 Q Absent the threat, what were your
19 plans?

20 A I would have stayed at my job as
21 Assistant Director of Admissions. And you're
22 certainly welcome to ask my boss, my former boss --

23 Q I'm not questioning that.

24 A -- is well versed --

25 Q I'm just trying to find out what

Broadbuss - Cross (Wellford)

1 your plans had been, otherwise.

2 So you intended to stay in Hanover
3 for how long?

4 A That's hard to say. Certainly,
5 this is my first job after college, and I haven't
6 mapped out my future. I know what exists in my
7 future. I would like at some point to complete the
8 house that is on Newcastle Farm. I have always seen
9 that as my ultimate residence.

10 Professionally, the professional
11 considerations have required that I not be a resident
12 in Virginia for some short time after college. It's
13 always my plan to return. More specific than that, I
14 can't be, because I haven't figured it out.

15 Q In terms of how soon that might
16 have occurred?

17 A That's correct.

18 Q What are you -- What are you
19 doing currently? Have you found other employment in
20 the area or --

21 A No, ma'am, I have not. And in
22 fact, I have not sought employment, because I consider
23 this to be a full time job.

24 MS. WELLFORD: Thank you very
25 much.

Broaddus - Cross (Wellford)

1 A It's a good thing. I'd be missing
2 work right now, wouldn't I?

3 MR. BUTCHER: We don't have any
4 further questions.

5

6

7

8 CROSS-EXAMINATION

9 BY MR. MARSHALL:

10 Q All right. We're back on the
11 record.

12 For the record, my name is John
13 Marshall, I'm the attorney representing the
14 petitioner, Frances Broaddus Crutchfield and Henry
15 Ruffin Broaddus.

16 Good afternoon, Mr. Broaddus.

17 Would you describe the land that
18 you own in Hanover County, please?

19 A Sure. I own 878 acres of what is
20 called Newcastle Farm. It consists of the
21 archeological site of Newcastle colonial town, part of
22 the National Historic Landmark, Marlbourne, which was
23 the home of Edmund Ruffin, many wet lands, and a lot
24 of river front.

25 Q You are a riparian co-owner of

Broadus - Cross (Marshall)

1 Newcastle Farm, is that correct?

2 A That's correct.

3 Q What is your understanding of what
4 the County plans to do at Newcastle Farm on the
5 Pamunkey River?

6 A The County intends to construct an
7 aeration facility and discharge for sewage into the
8 Pamunkey River. To that end, they will run pipes
9 through Marlbourne and adjacent to the Newcastle
10 archeological site.

11 They will retain a right of access
12 that will permit them to enter the property at will.
13 Often, one or more times per day.

14 And they will be discharging,
15 ultimately, up to 30 million gallons of sewage into
16 the Pamunkey River, itself.

17 Q You own -- The land that you own
18 contains the town of Newcastle and a portion of
19 Marlbourne, correct?

20 A It does.

21 Q And tell me what value, if any,
22 those historic and archeological resources have for
23 you, personally.

24 A Well, the Marlbourne was, again,
25 home of Edmund Ruffin, who was my three greats (sic.)

Broadbuss - Cross (Marshall)

1 grandfather. He was a direct ancestor. His great
2 contribution to the world really was the discovery of
3 particular kind of fertilization technique. And
4 publishing that was a tremendous nationally important
5 advance in agriculture. So that's a source of
6 personal pride, and certainly, historic value.

7 What I find incredibly
8 disheartening is that this project preverts what was
9 really the basis for that historic significance in
10 that the river, which provided a valuable agricultural
11 resource to Ruffin, indeed, has provided water for
12 irrigation for present farmers there, will become a
13 repository for waste.

14 Q Given that, what impact does the
15 issuance of this VPDES permit have on your use and
16 enjoyment of the archeological and historic resources
17 at Newcastle?

18 A But for the issuance of the
19 permit, there would not be an aeration structure.
20 There would not be these pipes which will be -- It
21 will hinder my enjoyment of those historic resources,
22 will hinder my enjoyment of the recreational
23 activities that I previously enjoyed on the farm. It
24 will be intrusive, as well.

25 Q If you were to stand on your

Broadus - Cross (Marshall)

1 property in the town of Newcastle, which is a listed
2 Virginia Historic Landmark, or on the portion of
3 Marlbourne that you, which is on the National Register
4 of Historic Places, would you be able to see the
5 discharge and outfall location and related structures?

6 A I will. And that, again, will
7 impair my enjoyment of those historic resources. In
8 fact, the Airstream trailer, where it is right now, is
9 very much in sight of where that outfall will be
10 located.

11 Q I note that earlier you basically
12 incorporated your mother's testimony regarding uses.
13 But I did want to ask you for what personal
14 recreational purposes have you used, and do you use
15 the Pamunkey River at and around the proposed
16 discharge of Newcastle Farm?

17 A I swim in the Pamunkey River,
18 especially now, with tremendous frequency, approaching
19 once per day.

20 I have fished in the Pamunkey
21 River many times, most recently, Labor Day weekend.

22 I enjoy taking pictures in that
23 area. We have a blue heron.

24 There are many marine resources
25 and aquatic life there that I find visually very

Broadus - Cross (Marshall)

1 interesting.

2 And I enjoy the serenity that
3 exists there. The sense of peace that one can gain
4 from that environment.

5 Q As a result of the issuance of the
6 VPDES permit that we've challenged in this litigation,
7 will you continue to swim in the Pamunkey River?

8 A I will not.

9 Q As a result of the issuance of
10 this permit, will you fish in the Pamunkey River?

11 A No, I will not.

12 Q Describe, if you will, what impact
13 the issuance of this permit will have on canoeing and
14 camping and those kinds of recreational activities for
15 you, personally.

16 A It will inhibit what one can enjoy
17 in such an outing. Obviously, I wouldn't really want
18 to use sewage to clean a pot, or rinse out a pot, or
19 to boil and use as drinking water. So it will impair
20 my ability to have that kind of recreation.

21 Q Other than the fishing that we've
22 talked about, how else, what other ways, if any, do
23 you enjoy use and enjoy the aquatic species of the
24 Pamunkey River?

25 A I have just great pride in knowing

Broadbuss - Cross (Marshall)

1 that we have done nothing to endanger them and
2 permitted no outside forces to endanger them. The
3 Nature Conservancy in the late '80's, I believe it was
4 declared the Pamunkey River the most pristine stretch
5 of certain kinds of wetlands on the entire East Coast.
6 So I have just taken great pleasure in being a steward
7 of that in protecting it from any potential impacts.

8 Q So then you have no plans to
9 develop or sell the property for profit in any way?

10 A That is correct. In fact, it has
11 been rented to the same family that rented it after my
12 father's death. That arrangement has been maintained.
13 Really, it has been a decision not to make as much
14 money as possible, because that family understands the
15 principles that I and my mother employ in terms of how
16 we want that land to be managed. And they respect
17 that. So we leave it in their trust to handle the
18 details.

19 Q You heard your mother's deposition
20 testimony earlier today, correct?

21 A I did.

22 Q Do you incorporate each of her
23 concerns and the impacts that she described to me that
24 will result from the issuance of this VPDES permit?

25 A I do.

Broadbuss - Cross (Marshall)

1 Q If I could just quickly show you
2 what has been previously marked as Crutchfield,
3 Exhibits 11, 12, 13 and 14. Can you identify those
4 documents?

5 A I can. These are pictures of me
6 and of my mother, and of other friends and family
7 using the Pamunkey River.

8 Q Okay. The picture at the bottom
9 of Exhibit 13 shows what?

10 A That shows me holding a fish that
11 I caught in the Pamunkey River in, looks like June of
12 '95. I'm not sure of the date.

13 Q That activity will stop as a
14 result of the issuance of this permit?

15 A Absolutely.

16 Q In laymen's terms, can you
17 describe for me, given that you don't have a Ph.D in
18 science, your understanding of what is going to be
19 coming through the discharge and outfall structure at
20 Newcastle Farm?

21 A Sure. It is my understanding that
22 existing sewage lines in the County will be rerouted
23 to a new treatment facility that is proposed. And
24 that that existing sewage, as well as a tremendously
25 increased capacity for additional sewage will exist.

Broadbus - Cross (Marshall)

1 I believe it is the County's hope that whoever created
2 that infrastructure will ultimately also promote the
3 need for it. At present, Hanover County does not need
4 30 million gallons per day worth of discharge. But
5 they hope to reach that stage. And this plant would
6 treat all of the waste that is received there.

7 According to standards that would be set, that have
8 been set in the permit issued by the State Water
9 Control Board and other regulatory agencies. Then
10 that waste would be released into the Pamunkey River.

11 Q And that waste that's going to be
12 released into the Pamunkey River, what's going to be a
13 part of that waste, in laymen's terms? Do you have
14 any idea?

15 A Well, fecal matter, industrial
16 refuse, things that, I think it would be impossible to
17 say it will have a positive impact on the aquatic life
18 there.

19 Furthermore, the volume of that,
20 alone, will disturb that ecosystem. You know, the
21 flow in the Pamunkey River varies tremendously in that
22 it is a tidal body of water. So there will be impacts
23 to the aquatic life there, to the marine resources
24 there. And again, the historic resources that are
25 there will be impaired.

Broaddus - Cross (Marshall)

1 Q And you are an Eagle Scout, is
2 that correct?

3 A That's correct.

4 Q And do you camp with Boy Scouts
5 today, or do you have plans to do so with local
6 troops?

7 A I will be camping there this
8 weekend with a Boy Scout troop.

9 Q And that activity for you will
10 stop as a result of the issuance of this permit,
11 should it be sustained?

12 A That is correct.

13 Q What impact would smell from the
14 pipes and discharge structure have on your use and
15 enjoyment of the property in the ways that you've
16 described?

17 A What I expect the smell to be will
18 reduce my enjoyment of those historic resources, as
19 well as those natural resources.

20 I have visited a treatment plant
21 before. There's actually one in Hanover, New
22 Hampshire that I have smelled before. It was
23 unattractive. Smells badly.

24 MR. MARSHALL: All right. I don't
25 have anything further.

Broaddus - Cross (Marshall)

He'll read and sign.

REDIRECT EXAMINATION

BY MR. BUTCHER:

Q Mr. Broaddus, if you were to read a report from the Water Control Board showing that in the last couple of years, 30-some percent of the water samples in the Pamunkey at the 360 bridge violated the water quality standard for fecal coliform, would that cause you to rethink your recreational uses of this river?

A It would cause me to rethink them. I don't know that that would cause me to cease using the river. I don't know what's causing that. I don't know whether that's naturally occurring.

This plant, the discharge of this sewage would be a known quantity. And that known quantity is something that I fear would have negative impacts on me, personally. So I'm not sure. It would cause me to certainly to think about it. And I was not aware that that was the case.

Q Does your, would your fear of negative impacts from the County's project continue

Broadbuss - Redirect

1 even if the permit required that the effluent be the
2 same quality as drinking water?

3 A Um, my fear of its impacts to
4 those resources that I enjoy--namely the--again, the
5 volume alone, I think would have serious repercussions
6 for the aquatic life.

7 Furthermore, the visibility of the
8 structure would inhibit my enjoyment of the historic
9 resources. So, yes.

10 Q What impact would you expect the
11 discharge five or ten million gallons of treated
12 effluent quality authorized by the permit that is
13 before us would have?

14 A What effect on me, personally?

15 Q What effect would it have on the
16 river?

17 A I don't -- I don't know for sure.
18 I mean, I'm not a qualified marine biologist. But I
19 fear it will have a negative impact on the marine life
20 there.

21 I think the Virginia Marine
22 Resources Commission had its doubts about what impact
23 this is going to have on ANAGOMOUS (sic.) fish, for
24 example. So although I don't know with any certainty,
25 because I lack the background to be able to say that,

Broaddus - Redirect

1 I have, you know, I think found it, well-founded fears
2 that this will have only a negative impact.

3 Q Would those fears persist even if
4 the water were treated to the purity of mountain
5 stream water?

6 A Certainly, I think those impacts
7 would be diminished in that case. But I do think that
8 the volume, alone, of that water will have an impact.
9 Absolutely.

10 Q And if this effluent were treated
11 to the quality of mountain stream water, would you,
12 nonetheless, discontinue your use of the water, river
13 to fish, swim, camp?

14 A If it were treated to the degree
15 of mountain stream water, I would not discontinue my
16 use of it to fish, swim and camp. However, the
17 structure, itself, the apparatus, the intrusiveness of
18 County employees coming onto my land, would,
19 nonetheless, inhibit my enjoyment of those resources
20 and of those historic resources.

21 Q What level would it be necessary
22 for the Water Control Board to require the treatment
23 in order for you to continue to fish, swim and camp in
24 the river?

25 A Um, you're asking me to cite

Broadbuss - Redirect

1 specifically the 056 to the 5th, whatever it is, the
2 chemistry, the parts in that report? Is that -- I
3 don't -- I don't know how to quantify a level of
4 treatment.

5 Q Well, we've established the two
6 ends of the scale. You've said that what the permit
7 authorizes is unacceptable.

8 A Uh huh. (Indicating in the
9 affirmative.)

10 Q And you've said that if it were
11 the quality of mountain stream water, you would not
12 discontinue your uses.

13 MR. MARSHALL: Certain uses.

14 Let's be clear on that.

15 Q Are there any uses that you would
16 discontinue if it were mountain stream water?

17 A Yes. If it were -- If it were
18 mountain stream water, I think that my ability to fish
19 would be impaired. Because, again, I think the volume
20 is going to negatively impact those natural resources.

21 Further more, I believe that all
22 of the uses, as I've described, would nonetheless, be
23 impaired by the presence of the treatment apparatus,
24 the discharge apparatus.

25 So whether I would use it or not,

Broadbuss - Redirect

1 ultimately, I think it's somewhat irrelevant, because
2 it's not going to be enjoyed in the same manner that
3 it is at present.

4 Q On what information do you base
5 your concern that the volume of the discharge will
6 disturb the ecosystem?

7 A Um, nothing that I have ever seen
8 or heard indicates that, I mean, the sheer existence
9 of these regulatory agencies means that this is going
10 to have an impact. Those agencies are charged with
11 restricting those impacts to what is legally
12 acceptable. But what is a legally acceptable impact
13 for that agency is not necessarily a personally
14 acceptable impact in terms of my enjoyment of those
15 resources. So I base it on that fact. Is that clear
16 to you?

17 Q What is your understanding of what
18 the aeration structure and discharge facility will
19 look like from the Newcastle Farm?

20 A There will be a concrete -- My
21 understanding of it is that there will be a concrete
22 building that will be where the final mixing stage of
23 the sewage occurs, at which point it will follow a
24 pipe down the bank of the river and will actually be
25 discharged from the river floor, sort of bubble up in

Broadbuss - Redirect

1 a cauldron-like sense.

2 Q How high will this concrete
3 structure be?

4 A I can't recall, specifically.

5 Q If I were to tell you that the
6 plans I saw said two or three feet, would that
7 surprise you?

8 A Given that I don't remember what
9 it was, no.

10 Q Are you aware of any other
11 facilities that will be visible at this site, other
12 than the head of the aeration structure?

13 A Well, I think people visiting the
14 apparatus will be visible, and I will hear them. I
15 think any sort of efforts to create a parking lot of
16 sorts will be visible. So those.

17 MR. BUTCHER: That's all I have.

18 Thank you.

19

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Broaddus - Recross (Wellford)

1 RECROSS-EXAMINATION

2 BY MS. WELLFORD:

3 Q If we were to, in Figure 5 of
4 Exhibit No. 1, I think it is, which appears on Page
5 31, does that show the Marlbourne site in yellow? Are
6 we looking at the same thing?

7 A It's this?

8 Q Yes.

9 A I believe that this is the, these
10 are boundaries for Marlbourne, correct.

11 Q In looking at this map, are you,
12 Mr. Broaddus, able to determine where the County's
13 proposed facility will be located?

14 A I am.

15 Q Would it be fair to say that it
16 would be about the point at which the red dotted line
17 which says project corridor on the legend ends, just
18 above the crescent that is the Newcastle archeological
19 site?

20 A That would be fair.

21 Q Okay. And my question to you is,
22 from the edge, the closest edge of the Marlbourne site
23 as depicted on this map, do you have any knowledge as
24 to whether, in fact, the proposed discharge structure
25 will be visible?

Broadbuss - Recross (Wellford)

1 A It is my expectation that it would
2 be visible, yes.

3 Q But do you know that with any
4 certainty?

5 A Well, it hasn't been built, yet,
6 so I have not seen it, yet.

7 Q So it's entirely possible that
8 from even the closest point, you could not see it from
9 the Marlbourne site?

10 A I'd say that's possible. But
11 again, I have not seen it.

12 Q You mentioned your trip to a
13 Hanover, New Hampshire waste water treatment plant.
14 Is that what it was?

15 A Yes.

16 Q Waste water treatment?

17 A Uh huh. (Indicating in the
18 affirmative.)

19 Q Were you at the treatment plant,
20 itself, or were you at a discharge structure?

21 A It was a discharge structure.

22 Q Do you know whether this is a
23 similar discharge structure to the one that the County
24 intends to build?

25 A Inherently, it is the same. I

Broadbuss - Recross (Wellford)

1 mean, it's performing at least the same functions. So
2 I would say while I am not versed in the specifics of
3 what their treatment process is, it is by definition,
4 similar, yes.

5 Q But you don't know what permitting
6 limitations may have been imposed on that, that
7 structure as opposed to what is being imposed by the
8 State Water Control Board with respect to Hanover's
9 facility?

10 A That is correct.

11 Q You have made reference to the
12 fact that you're not a marine biologist and so forth.
13 I'm just curious. What is the nature of your
14 educational background?

15 A I'm curious as to why that's
16 important. Again, that's not --

17 Q What is your degree?

18 A It's in English and creative
19 writing.

20 Q So you have no science background
21 from an undergraduate or a graduate degree standpoint?

22 A That's correct. I characterize
23 myself as an enthusiast. That's never stopped me
24 from --

25 Q You've described the visual impact

Broadbuss - Recross (Wellford)

1 of this structure from your perspective as having a
2 negative impact on your enjoyment of the property.

3 A (Nodding head indicating yes.)

4 Q If that structure were built in a
5 way that would make it appear in the nature of a farm
6 structure of some sort, a barn, shed, that kind of
7 thing, would it then be acceptable to you?

8 A No. Because the substance of what
9 is being done and what -- The same reason that a
10 tractor is acceptable to me in an aesthetic way,
11 despite it's modernity. You can dress this up as
12 whatever you want. But the fact of the matter is,
13 what it's doing is antithetical (sp.) to what this
14 historic land has been used for. And I derive a great
15 deal of pleasure in continuing and preserving that
16 tradition of use, which is irrevocably altered by this
17 project.

18 Q How would your, for lack of a
19 better term, viewscape be altered if this structure
20 were constructed in a way that would be consistent
21 with other farm structures on the property?

22 A Well, I think whenever one looks
23 at something, the aesthetic value of it is greater
24 than what is readily visible. It's what something
25 represents. It's what something connotes. And so

Broadbuss - Recross (Wellford)

1 again, if this were to look like a barn, it's not a
2 barn. So my appreciation of that space has been
3 changed.

4 MS. WELLFORD: That's all we've
5 got.

6 MR. BUTCHER: I trust you want him
7 to sign?

8 MR. MARSHALL: Yes.
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13 And further this deponent saith not.
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16 DEPOSITION CONCLUDED AT 1:05 P.M.
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COMMONWEALTH OF VIRGINIA,
CITY/COUNTY OF: _____, to wit:

I, HENRY RUFFIN BROADDUS, do hereby certify
that I have read the foregoing pages of typewritten
matter numbered 1 through 30, and that the same
contains a true and correct transcription of the
deposition given by me on the 28th day of September,
2000, at Richmond, Virginia, to the best of my
knowledge and belief.

Date Henry Ruffin Broaddus

Subscribed and sworn to before me this
_____ day of, 2000.

My commission expires _____.

1 COMMONWEALTH OF VIRGINIA,
2 COUNTY OF HENRICO, to-wit:
3
4

5 I, Connie Alys Crane Pryor, a Registered
6 Professional Reporter and Notary Public for the State
7 of Virginia at Large, do hereby certify that the
8 foregoing deposition of HENRY RUFFIN BROADDUS was duly
9 taken and sworn to before me at the time and place set
10 out in the caption hereto.

11 Further, that the transcript of the
12 deposition is true and correct to the best of my
13 ability, and that there were no exhibits filed with me
14 during the taking hereof.

15 Given under my hand this 11th day of
16 October, 2000.
17
18

19 Connie Alys Crane Pryor
20 Connie Alys Crane Pryor - RPR
21 Notary Public for the State of Virginia
at Large

22 My Commission expires:

23 August 31, 2002
24
25

VIRGINIA:

**IN THE CIRCUIT COURT OF THE CITY OF RICHMOND
John Marshall Courts Building**

**FRANCES BROADDUS CRUTCHFIELD and
HENRY RUFFIN BROADDUS**

Petitioners,

v.

STATE WATER CONTROL BOARD

and

DEPARTMENT OF ENVIRONMENTAL QUALITY

and

COUNTY OF HANOVER, VIRGINIA,

Respondents.

**Chancery No.:
760CH99K01193-00**

**MEMORANDUM IN SUPPORT OF
PETITION FOR APPEAL**

INTRODUCTION

This case challenges the issuance of a permit by the State Water Control Board (the "Board") to the County of Hanover (the "County"). The permit, issued in reliance on the State Water Control Law, Va. Code § 62.1-44.2 *et seq.* (Michie 1998 and Supp. 2000), is known as a Virginia Pollution Discharge Elimination System ("VPDES") permit. It authorizes the County to discharge up to 10 million gallons per day ("mgd") of treated sewage into the Pamunkey River from a location on Newcastle Farm, which is owned by petitioners Frances Broaddus Crutchfield ("Crutchfield") and her son, Henry Ruffin Broaddus ("Broaddus").

Newcastle Farm has been owned by the Broaddus family for six generations, and is an historic property. (R. at 895.) It is the location of the colonial-era Town of Newcastle (a listed Virginia Historic Landmark), and it also encompasses a portion of Marlbourne (which is listed on the National Register of Historic Places). (R. at 895, 1401-1403.) Each preceding generation of the Broaddus family has faithfully preserved Newcastle Farm and passed it on without damage to the next generation. (R. at 895.) The present owners have intended to do the same, and have rejected every offer to develop or otherwise disturb the integrity of its land and water resources. *Id.*

The care of Newcastle Farm exercised by the Broaddus family throughout the generations stands in stark contrast to the Board's lack of care in issuing the challenged VPDES permit. Before issuing such a permit, the Board is supposed to make particular findings based on substantial evidence in the record. Among the findings the Board is supposed to make are: (1) that the proposed discharge will neither cause nor contribute to violations of water quality standards, and (2) that the proposed discharge is compatible with existing uses of the waterbody, including use as fish habitat and use for recreation. *See* 9VAC 25-31-50 and 9 VAC 25-260-20. In this case however, the Board failed to make these necessary findings.

Nor is there any record evidence from which the Board could have made such findings. The evidence shows that the Pamunkey River is suffering from substantial violations of water quality standards downstream from the proposed discharge. (R. at 20, 26, 57, 899, 1162-1247, 1248-91.) The Board nevertheless authorized discharges of large volumes of pollutants that will tend to make that situation worse. It did so without adequate information to understand the geographic extent, duration, or severity of the existing water quality problems. And, it did so without any adequate or reasonable basis to conclude that the discharge it authorized will not

make existing violations of water quality standards worse. The Board's action jeopardizes ongoing efforts by other state and federal agencies to restore collapsed populations of fish such as shad, river herring and striped bass. And, the Board's action would sacrifice existing recreational activities on the Pamunkey River for miles downstream.

In this memorandum, counsel for Crutchfield and Broaddus will demonstrate that the Board failed its responsibility to make the necessary findings it is required to make. They will also explain that the record does not contain any evidence or analyses that would support the required findings. For these reasons, the challenged permit must be set aside.

PROCEDURAL HISTORY

In 1995, the Virginia Department of Environmental Quality ("DEQ") documented extensive violations of water quality standards in the Pamunkey River at mile 48.80. On April 4, 1997, the County applied to the Board for a Virginia Pollution Discharge Elimination System permit to discharge wastewater to the Pamunkey River from an outfall structure to be built on Newcastle Farm about six miles upstream from river mile 48.80. (First Amended Petition ¶ 21; Answer of Hanover ¶ 21; Answer of Board ¶ 21.) In November 1998, owing to the failure of the Board to act on numerous violations of water quality standards in the Pamunkey River, the federal Environmental Protection Agency proposed to designate the Pamunkey River as an "impaired water" for the Board. See EPA Identification of Additional Waters to be Added to Virginia's Clean Water Act Section 303(d) List of Impaired Waters, Correction, 64 Fed. Reg. 1340-41 (1999). On January 19, 1999, while EPA's proposal was pending, the Board conducted a public hearing on the County's pending application. Broaddus and counsel (on behalf of Crutchfield) presented information orally at the hearing. (*Id.* at ¶ 26, ¶ 26, ¶ 26.) On February 4, 1999, counsel, on behalf of Crutchfield and Broaddus, submitted timely written comments to the

Board regarding the proposed permit. (*Id.* at ¶ 27, ¶ 27, ¶ 27.) Among other things, those comments asserted that the proposed discharge, in combination with other known sources of pollution, would exacerbate existing violations of water quality standards in the Pamunkey to the detriment of aquatic species including anadromous fish. Those comments also brought to the Board's attention extensive recreational uses of the Pamunkey River that would be adversely affected by the proposed discharge. Nevertheless, on March 11, 1999, the Board approved issuance of the permit. On April 28, 1999, the Board issued the permit to the County. (*Id.* at ¶ 28, ¶ 28, ¶ 28.) On May 12, 1999, the EPA formally added this portion of the Pamunkey River to the official list of "impaired waters" due to its frequent violations of water quality standards. Permits for new pollutant discharges may not issue if the proposed discharge, in combination with other sources of pollution to the waterbody, will cause or contribute to violations of water quality standards. 9VAC 25-31-50(C)(9). Similarly, permits may not issue for new discharges that would impair existing uses of a waterbody, such as for fish habitat or recreation. 9 VAC 25-260-20. Crutchfield and Broaddus filed a timely Notice of Appeal with respect to the Board's action on May 27, 1999, and a timely Petition for Appeal on June 28, 1999.

BACKGROUND

Dissolved Oxygen in the Pamunkey River

Perhaps the single most important indicator of water quality is the level of dissolved oxygen in a waterbody. Put simply, dissolved oxygen is to aquatic life as air is to humans. Without adequate levels of dissolved oxygen at all times, fish and other aquatic life perish. The Pamunkey River, at the site of the proposed discharge and downstream, is designated for uses including swimming and the propagation and growth of a balanced, indigenous population of aquatic life including fish. 9 VAC 25-260-10(A). In order to ensure the survival and growth of

aquatic life, the Board itself has determined that the daily average concentration of dissolved oxygen in the Pamunkey River cannot be permitted to fall below 5 milligrams per liter ("mg/l"), and that dissolved oxygen concentrations can never – not even for an instant – be permitted to fall below 4 mg/l. 9 VAC 25-260-50, 25-260-530. According to the Board and the Environmental Protection Agency, these are the threshold levels of dissolved oxygen below which lethal effects, such as suffocation, begin for fish and other aquatic life. *Id.*; see also United States Environmental Protection Agency, Quality Criteria for Water 1986 (1986) (commonly known as "The Gold Book") (availability announced in 52 Fed. Reg. 6213 (March 2, 1987)) (available online at <<http://www.epa.gov/cgi-bin/claritgw>>, document number 440586001 at PB86-208253).

As far back as 1995, the Board was aware of serious violations of these water quality standards for dissolved oxygen in the Pamunkey River. (R. at 57, 727, 1162-1247, 1248-91.) Limited data collected for the Board by the Virginia Department of Environmental Quality ("DEQ") in that year showed that the Pamunkey River experiences severe and persistent violations of water quality standards for dissolved oxygen at river mile 48.80. (R. at 1162-1247.) This is approximately 6 miles downstream from the County's proposed discharge of treated sewage at Newcastle Farm at river mile 54.89. (R. at 899.) The data for 1995, limited as they are, showed the daily mean standard for dissolved oxygen was violated *40 times* during a 5-month period of continuous monitoring. (R. at 727-35, 1162-1247.) The first daily mean violation occurred on June 24, and the last occurred on October 8. (R. at 1175, 1233.) During this monitoring period, dissolved oxygen concentrations were *below the required standard 38% of the time*. (R. at 899.) Furthermore, the instantaneous dissolved oxygen standard of 4 mg/l

was violated 10 times for up to four hours at a time. (R. at 728, 1182-83, 1190, 1196-98, 1217-18, 1221.)

Although continuous monitoring of dissolved oxygen in the Pamunkey was not continued after 1995, a few "spot" or "grab" samples were collected in 1996. (R. at 1276). Such samples provide an instantaneous "snapshot" of the dissolved oxygen level at the time. The lowest dissolved oxygen level recorded at river mile 48.80 was found in one such grab sample taken on September 11, 1996. *Id.* On that date, dissolved oxygen at this location in the Pamunkey River was a mere 2.8 mg/l – a level lethal to most aquatic species. *Id.* In all likelihood, continuous monitoring at this or other locations in the Pamunkey River would have revealed even lower dissolved oxygen levels lasting for prolonged periods.

Realizing the seriousness of the dissolved oxygen problem in the Pamunkey River, the DEQ researcher who collected these data recommended that additional testing (deployment of datasonde to collect continuous recordings of dissolved oxygen levels) be conducted beginning May 1, 1996, "to check whether mean daily [dissolved oxygen] violations occur prior to June 1, the start date of this [1995] study." (R. at 727, 729.) The researcher also recommended continuing datasonde deployments throughout the summer "to confirm the results of the 1995 deployments" and "perform[ing] more longitudinal DO surveys to confirm DO sag areas." *Id.* These additional tests might have provided the Board with information sufficient to understand the geographic extent of the dissolved oxygen violations, their duration each year, and their severity. However, the DEQ elected not to conduct the additional studies that were

recommended.¹ As a result, the extent, duration and severity of this problem remain poorly defined.

The decision not to conduct further studies was made notwithstanding the Board's knowledge at the time that the County would be proposing to discharge 10 million gallons a day (mgd) of treated sewage six miles upstream from the confirmed dissolved oxygen violations in the Pamunkey River. Moreover, subsequent to the 1995 study the Board has permitted three other discharges of treated sewage to this section of the Pamunkey River. On May 18, 1998, the Board issued a permit for the Cumberland Wastewater Treatment Plant in New Kent County. On May 5, 1999, it issued a permit for the King William Sewage Treatment Plant. And on November 8, 1999, it issued a permit to New Kent County for the Parham Landing Wastewater Treatment Plant. (R. at 1347). The King William County Sewage Treatment Plant on Moncuin Creek, for example, will discharge treated sewage to Moncuin Creek just 3.88 miles upstream from its confluence with the Pamunkey River at river mile 48.80 -- the location of the known dissolved oxygen violations.² (R. at 902.)

Treated sewage lowers dissolved oxygen levels in the stream to which it is discharged. This happens in several ways. First, the treated sewage contains chemicals and compounds that react with and thereby consume oxygen directly ("chemical oxygen demand" or "COD"). Second, the treated sewage contains bacteria that respire as they feed on decaying organic

¹ The DEQ assumed (without analysis) that the dissolved oxygen violations were due entirely to "natural conditions" such as the microbial decay of marsh vegetation. However, the data suggest (and DEQ's researcher pointed out) that the low dissolved oxygen levels were accompanied by elevated levels of fecal coliform. This suggests pollution from agricultural operations may play a substantial role. In any event, the cause of the dissolved oxygen violations is not relevant -- rather, the Board is required to make every effort to assure those violations are not exacerbated.

² This Court may take judicial notice of official DEQ records demonstrating persistent, on-going violations of effluent limitations by two of these three facilities (the King William and Parham Landing plants).

matter, consuming oxygen in the process ("biologic oxygen demand" or "BOD"). Third, treated sewage contains large amounts of "nutrients" such as nitrogen and phosphorus that promote the growth of additional oxygen-consuming bacteria. For these reasons, treated sewage is notorious for lowering dissolved oxygen levels in the streams to which it is discharged. (R. at 900-01.)

Typically, the most severe oxygen depletion occurs several miles downstream from a discharge of treated sewage. This is particularly the case when a narrow, relatively fast-flowing stream like the Pamunkey River at Newcastle Farm becomes wider, deeper and more stagnant in its tidal reach, as does the Pamunkey at river mile 48.80. There, the river water tends to move back and forth on each tidal cycle, but there is little net downstream flow relative to the volume of water there. (R. at 728 (noting that the dissolved oxygen sag occurred at high and low slack tides).) The flow is insufficient to flush out accumulating sediments and pollutants, and this allows oxygen-consuming pollutants and nutrients to concentrate in one location, where they deplete oxygen in the water — oxygen that is not replenished as it would be in a rapidly flowing, churning stream.

Based on its 1995 study of dissolved oxygen levels, the DEQ arrived at the rather obvious conclusion that the Pamunkey River was already then receiving all the oxygen-demanding pollutants it could handle. In the words of DEQ's researcher, "the assimilative capacity of the river with respect to [oxygen-demanding pollutants] is considered to be fully allocated." (R. at 1301.) The permit at issue in this appeal nevertheless authorizes the daily discharge of 10 million gallons of treated sewage containing additional oxygen-consuming pollutants and nutrients including phosphorus, nitrogen, suspended solids, chemical oxygen demand and biological oxygen demand. (R. at 1378-90.) And that permit was issued only *after* the Board allowed *three more* discharges of treated sewage, each containing additional oxygen consuming

pollutants. All of these pollutants will be mixed with the modest flow in the Pamunkey River and carried downstream until the river widens, deepens, and slows near river mile 48.80. (R. at 729.) There, the combined pollutant loads from these and other sources will settle out, consume oxygen, and promote the growth of oxygen-demanding microbes and bacteria. *Id.* As Crutchfield and Broaddus explained in comments to the Board, the result will almost certainly be even lower levels of dissolved oxygen, for longer periods of time, over an even wider geographic area. (R. at 900-02.)

Notwithstanding the effort by Crutchfield and Broaddus to focus the Board's attention on this problem, there is nothing in the record indicating that the Board considered the combined, cumulative effects of these discharges and other sources of pollution on the existing dissolved oxygen violations in the Pamunkey River. Even the permit writer, Mr. Allan Brockenbrough, conceded the existence of dissolved oxygen problems in the Pamunkey River and observed that no validated model existed to evaluate the likely effects of the County's proposed sewage discharge on dissolved oxygen levels. (R. at 1391.) Brockenbrough observed that it had not been shown that the effect of the proposed discharge on dissolved oxygen levels would be small. Instead of conducting further investigation and obtaining sufficient information to allow the Board to make an informed decision, the DEQ simply *assumed* that the permit limitations imposed would result in no further depletion of dissolved oxygen.³ However, there is absolutely no evidence or analysis in the record to support that assumption, and no finding by the Board to that effect.

³ A DEQ memorandum noted that it historically *assumed* that the effluent limitations used in these permits would be "self sustaining," that is, that they would result in no further depletion of stream dissolved oxygen levels. But there is no support for that proposition in the record, either in general or in the particular and unique circumstances of the Pamunkey River at river mile 48.80. Furthermore, the Board made no finding that dissolved oxygen violations in

EPA Designates the Pamunkey River as "Impaired"

In December 1998, while the County's permit application was pending, the federal Environmental Protection Agency stepped in to designate the Pamunkey River as an "impaired" water. Section 303(d) of the federal Clean Water Act (the "CWA"), 33 U.S.C. §1313(d), requires states to identify their waters that do not meet water quality standards. 33 U.S.C. § 1313(d)(1)(A). The state must consider all existing and readily available water quality related data and information in preparing the list of waters identified as impaired. 40 C.F.R. § 130.7(b)(5). Ultimately, for each of the waters on the list, the state is required to develop a Total Maximum Daily Load ("TMDL") of pollutants. 33 U.S.C. § 1313(d)(1)(C). A TMDL calculates how much of a pollutant can be put into a waterbody without resulting in violations of water quality standards. Permits for discharges of pollutants into the waterbody will be issued thereafter only if the total amount of pollutants to be discharged by all dischargers to the watershed is below the TMDL. 33 U.S.C. § 1313(d)(1)(C).

Notwithstanding the clear violations of water quality standards for dissolved oxygen in the Pamunkey River, the Board failed and refused to identify it as an "impaired water" subject to Section 303(d). As a result, the EPA was compelled to exercise its oversight authority to do so. On January 26, 1999, the EPA published notice of its proposal to designate numerous waters of Virginia -- including the Pamunkey -- as "impaired" because the Board refused to do so. *See* EPA Identification of Additional Waters to be Added to Virginia's Clean Water Act Section 303(d) List of Impaired Waters, Correction, 64 Fed. Reg. 3940 (1999). Rather than addressing the dissolved oxygen problem, the Board actively opposed EPA's proposed designation.

the Pamunkey River will not be caused or contributed to by the proposed discharge, either by itself or in combination with other known sources of pollution.

Meanwhile, the Board hurried to issue this permit notwithstanding EPA's pending rulemaking. On April 28, 1999, the Board issued the permit with full knowledge of EPA's proposed designation of the tidal Pamunkey as "impaired" and without any information on the cumulative effects of the proposed discharge, in combination with other sources of pollution, on dissolved oxygen levels in the Pamunkey River. On May 10, 1999, the EPA formally completed its rulemaking and placed the tidal portion of the Pamunkey River, including the area from Newcastle Farm downstream past river mile 48.80, on the list of impaired waters. See Availability of Final Decision Document on Virginia's Section 303(d) Waters, 64 Fed. Reg. 26,959 (1999). EPA's decision was based on the same data as contained in this record showing severe and persistent violations of water quality standards for dissolved oxygen in the Pamunkey River.

Fish

Anadromous fish are those species that migrate from saltwater to freshwater to spawn, but return to saltwater to live most of their adult lives. (R. at 904.) The reproductive strategies of these species require that spawning adults be free to swim up coastal rivers to freshwater spawning habitat during their annual spawning migrations, and free to return to bays and ocean waters once spawning is complete. *Id.* Newly spawned fish larvae live and grow into juvenile fish in upstream freshwater nursery habitats, then migrate downstream as young-of-the-year to bays and ocean waters to complete their maturation into reproducing adults. *Id.*

There is no doubt that populations of anadromous fish in the York River system, including the Pamunkey River, are in serious trouble. In 1994, the Virginia Marine Resources Commission ("VMRC") imposed a total ban on in-shore fishing for migratory fish "after it became obvious that shad populations in tidal rivers across the state had collapsed" (R. at

904, 1400.) Recently, the VMRC voted again to extend that ban for at least another year. (R. at 1400.) Among the reasons cited by researchers for the collapse of the shad population is pollution that blocks migratory pathways, making it impossible for adults to reach or return from spawning habitat, or impossible for young-of-the-year to migrate successfully to bay and ocean waters. In effect, all spawning and nursery habitat can be eliminated upstream from areas of dissolved oxygen violations because anadromous fish cannot, or will not, cross them. (R. at 904, 1400.)

Historically, anadromous fish have used almost the entire Pamunkey River as spawning and nursery habitat. Spawning adults have been documented in the South Anna at the U.S. Route 1 bridge, in the North Anna, and throughout the Pamunkey. (R. at 833, 904, 1400.) For shad, spawning occurs during the spring and extends into June, with juvenile fish migrating downstream thereafter. Other species spawn earlier as well as later in the year. (R. at 904.)

Comments filed by Crutchfield and Broaddus in this case pointed out to the Board that the existing dissolved oxygen problem in the Pamunkey River at river mile 48.80 may pose a significant obstacle for migrating shad or other anadromous fish. (R. at 895, 904.) Fish cannot or will not swim through waters with inadequate levels of dissolved oxygen. (R. at 904.) The Board was made aware of the negative impacts of low dissolved oxygen levels on anadromous fish that use the Pamunkey River for spawning. Several commenters raised questions about the cumulative effects of the proposed discharge and other sources of pollution in the Pamunkey River on anadromous fish. The Pamunkey Indian Tribe specifically asked the Board about the cumulative effect of the multiple discharges permitted in this area of the Pamunkey River on its fish hatchery (which is located downstream from the proposed discharge) and the spawning activities of shad, river herring and rockfish. (These comments were not bates stamped by the

Board, but appear in the record between R. 824 and 825.) Comments raising these same concerns were also filed by, among others, the Virginia Bass Federation, (R. at 894), and Crutchfield and Broadus (R. at 904).

Although these issues were brought to the Board's attention, it failed to deal with their substance in any meaningful way. The existing evidence indicates that the Pamunkey may be effectively closed to migratory fish passage at river mile 48.80 during a significant portion of the year extending at least from late spring through early fall. The precise times the Pamunkey may be blocked to migratory fish are not known because DEQ failed to follow the advice of its own researchers and public commenters to develop additional data on the problem. (R. at 729.) Furthermore, the exact times of year various fish species may attempt to use this stretch of the Pamunkey River has not been determined by the Board.

Despite the foregoing evidence, the Board failed completely to address whether issuance of this permit for the proposed discharge is consistent with use of the Pamunkey River by anadromous fish.

Recreational Uses

The Pamunkey River at the location of the proposed discharge and downstream has been enjoyed by Crutchfield, Broadus and other individuals and families for recreational purposes for many years. During the public hearing on January 19, 1999, several speakers told the Board that they used the Pamunkey River immediately downstream from the proposed discharge for swimming. Several troops of Boy Scouts have used the property and the river for camping, picnicking, swimming, canoeing and other forms of outdoor recreation and nature observation. (R. at 903.) The Boy Scouts were so concerned about the impacts of the discharge on their use of the river that they sent letters to the Board asking that the County's permit application be

denied. (R. at 903, 1398-99.) This area of the Pamunkey River is also regularly used by canoeists, fishermen and others for a variety of water recreation.

Individuals who have used this stretch of the Pamunkey River for recreation uniformly said at the public hearing they would not continue to do so if the Board issued this permit. The basis for their testimony was official advice they received from the Virginia Department of Health that primary contact with the water should be avoided downstream from a treated sewage discharge. (R. at 903.) Despite claims to the contrary by DEQ, water is not swimmable if the Health Department recommends against swimming there.

The Board failed to address these concerns and evidence in any manner whatsoever.

STANDARD OF REVIEW

This Court must decide whether the Board satisfied an affirmative legal duty to find that the County's proposed discharge will not cause or contribute to the violation of applicable water quality standards. "Where the legal issues require a determination by the reviewing court whether an agency has, for example, accorded constitutional rights, failed to comply with statutory authority, or failed to observe required procedures, less deference is required and the reviewing courts should not abdicate their judicial function and merely rubber stamp an agency determination." *Johnston-Willis v. Kenley*, 6 Va. App. 231, 243, 369 S.E. 2d 1, 7-8 (1988). When deciding whether an agency has followed proper procedures or complied with statutory authority, an inquiry into whether there is substantial evidence in the record is wholly inappropriate.

In reviewing an agency's factual findings on appeal, the circuit court is to determine whether substantial evidence in the agency record supports its decision. *See State Bd. of Health v. Godfrey*, 223 Va. 423, 435, 290 S.E.2d 875, 881 (1982). The reviewing court should reject the

agency's findings of fact if, considering the record as a whole, a reasonable mind would necessarily come to a different conclusion. *Virginia Real Estate Comm'n v. Bias*, 226 Va. 264, 268-69, 308 S.E.2d 123, 125 (1983); *Johnston-Willis*, 6 Va. App. at 232, 369 S.E. 2d at 7.

ARGUMENT

The Board violated its regulations and applicable federal regulations by issuing the VPDES permit for the Totopotomoy Sewage Treatment Plant. Sections 25-31-50(C)(1) and (C)(9) of the regulations promulgated pursuant the State Water Control Law (the "SWCB regulations") require the Board to determine that the proposed discharge will not cause or contribute to violations of water quality standards, impair the designated uses of the receiving water, or harm human, animal, plant, or other aquatic life. *See* 9 VAC 25-260-20(A); 25-31-50(c)(1); 25-31-50(c)(9). *See also* 40 C.F.R. § 122.4(a) and (i). The Board issued this permit without making these required findings. Furthermore, the record contains no substantial evidence regarding these factors that would support the Board's decision to issue the challenged permit.

I. The Permit Must be Set Aside Because the Board Failed to Make Necessary Findings Regarding Dissolved Oxygen Levels in the Pamunkey River, And There Is No Substantial Evidence in the Record to Support Such Findings.

Section 25-31-50(C)(9) of the SWCB regulations requires the Board to determine, before issuing a new permit, that the discharge will not "cause or contribute to the violation of water quality standards." *See also* 40 C.F.R. § 122.4(i). The obligation to make this determination is also imposed by section 25-31-50(C)(1) which states that, "[n]o [VPDES] permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the [federal] CWA of the [State Water Control] law, or regulations promulgated under [either law]." *See also* 40 C.F.R. § 122.4(a). SWCB regulations clearly require that all

state waters be free from, "substances attributable to sewage . . . in amounts . . . which contravene established standards." 9 VAC 25-260-20(A). The Board failed to make any such finding regarding the proposed Totopotomoy Sewage Treatment Plant in spite of repeated, credible, and justified assertions that the proposed discharge will exacerbate existing and continuing violations of the dissolved oxygen standard, 9 VAC 25-260-50, downstream from the proposed discharge point. Furthermore, the record contains no substantial evidence to support such a finding, were it made.

The State Water Control Law ("SWCL") was enacted to protect and restore state waters at a level of quality that allows for all reasonable public uses, including swimming, and will ensure the propagation and growth of all aquatic life that might reasonably be expected to inhabit them. The law requires the Board to prevent any increases in pollution and to reduce existing pollution in the waters of the Commonwealth. *See* Va. Code § 62.1-44.2. The Board itself by regulation has designated the Pamunkey River at the site of the proposed discharge and downstream for uses including swimming and the propagation and growth of aquatic life. 9 VAC 25-260-10. To sustain those uses, the Board has required that the daily average concentration of dissolved oxygen in the Pamunkey River cannot be permitted to fall below 5 mg/l, and that dissolved oxygen concentrations can never be permitted to fall below 4mg/l. 9 VAC 25-260-50, 25-260-530. The Board's regulations prohibit it from issuing any permit for a discharge that would cause or contribute to violations of these "water quality standards." 9 VAC 25-31-50(C)(9). Furthermore, no new discharge of pollutants can be allowed into waters that violate water quality standards unless the applicant bears the burden of proving that there is sufficient assimilative capacity in the water body for the pollutant load, or that other sources of pollution will be sufficiently reduced to accommodate it. *Id.*

The Board's decision to issue this permit must be set aside because the record evidence plainly indicates that the proposed discharge will contribute to persistent violations of the water quality standard for dissolved oxygen in the Pamunkey River in the vicinity of river mile 48.80. Furthermore, there is no substantial evidence that the proposed discharge will not contribute to those violations. The permit must also be set aside because the County failed to introduce substantial evidence that the Pamunkey River has adequate assimilative capacity for oxygen-consuming pollutants to accommodate its discharge without additional violations of water quality standards.

Despite acknowledging the existence of the dissolved oxygen violations and despite recommendations from researchers that it do so, the Board failed to conduct any additional studies or analysis of the effects or impacts of additional pollutants being added to the Pamunkey River. The record is devoid of any evidence concerning the likely effects of this pollution, and the Board in fact did not analyze the likely effects of the proposed discharge, either by itself or in combination with other known sources of pollution, on dissolved oxygen levels in the Pamunkey River. The Board did not make any finding that the proposed discharge will not contribute to violations of the water quality standard for dissolved oxygen in the Pamunkey River, and indeed there is no evidence in the record that could have supported such a finding.

The limited, but undisputed, data in the record show that the daily mean standard for dissolved oxygen was violated 40 times during a 5-month period of continuous monitoring from June, 1995 through October, 1995. (R. at 727-35, 1162-1247.) Thus, dissolved oxygen concentrations violated the Board's required standard 38% of the time. The instantaneous dissolved oxygen standard of 4 mg/l was violated 10 times for up to four hours at a time. (R. at 728, 1182-83, 1190, 1196-98, 1217-18, 1221.) The lowest dissolved oxygen level recorded at

river mile 48.80, found in a grab sample taken on September 11, 1996, was a mere 2.8 mg/l. (R. at 1276.) These data reveal the seriousness of the dissolved oxygen violations in the Pamunkey. Yet, the Board ignored a recommendation from the DEQ researcher who collected these data and failed to determine the geographic extent of the dissolved oxygen violations, their duration each year, or their severity. (R. at 729.) The DEQ itself determined that "the assimilative capacity of the river with respect to [oxygen-demanding pollutants] is considered to be fully allocated." (R. at 1301.)

Any possible doubt about the status of the Pamunkey River with respect to dissolved oxygen levels was put to rest when the EPA stepped in and designated named the tidal portion of the River, including the area from Newcastle Farm downstream past river mile 48.80, as an "impaired" water. EPA's decision was based on the same data as are in this record showing severe and persistent violations of water quality standards for dissolved oxygen in the Pamunkey River.

The Board issued this permit with full knowledge of the existing violations of dissolved oxygen standards in the Pamunkey River, but without any evidence that the proposed discharge will not make these existing violations worse. The Board's action is made even more unreasonable because subsequent to the 1995 study, the Board permitted three other discharges to this section of the Pamunkey River for the King William Sewage Treatment Plant, the Cumberland Wastewater Treatment Plant and the Parham Landing Wastewater Treatment Plant. (R. at 1347.) Each of these discharges contains pollutants that will consume oxygen and promote the growth of oxygen-demanding microbes and bacteria, thus resulting in even lower levels of dissolved oxygen, for longer periods of time, over an even wider geographic area.

Though the DEQ *assumed* that the effluent limitations used in these permits would result in no depletion of dissolved oxygen levels in the Pamunkey, that assumption is not supported by substantial evidence in the record. Nor has the Board made the necessary finding that the proposed discharge will not exacerbate existing violations of water quality standards. Nor has the County demonstrated that adequate assimilative capacity exists in the Pamunkey River to accommodate the proposed discharge. For these reasons, the permit must be set aside.

II. The Permit Must be Set Aside Because the Board Failed to Find that Usage of the Pamunkey River by Anadromous Fish Will Be Protected, And There Is No Substantial Evidence to Support Such a Finding.

Section 25-31-50(C)(1) of the SWCB regulations requires the Board to find, before issuing a permit, that the permit will comply, "with the applicable requirements of the [federal] CWA of the [State Water Control] law, or regulations promulgated under [either law]." *See also* 40 C.F.R. § 122.4(a). This includes determining that the proposed discharge will not impair the designated uses of the receiving water or harm human, animal, plant, or other aquatic life. 9 VAC 25-260-20. The Pamunkey River, like virtually all state waters, is designated for the "propagation and growth of a healthy, indigenous population of aquatic life." 9 VAC 25-260-10(A); *see also* 40 C.F.R. § 131.10(a). In spite of repeated and verified assertions that the proposed discharge will harm anadromous fish, the Board failed to find that the permit will adequately protect animals and aquatic life. Furthermore, the record contains no substantial evidence upon which such a finding could be made.

The Board has a statutory duty to protect state waters from pollution such that the waterbody will support the propagation and growth of all aquatic life, including anadromous fish. Va. Code § 62.1-44.2(1). The Board's regulations designate the Pamunkey River for use by aquatic life, including anadromous fish. 9 VAC 25-260-10. To maintain water quality in the Pamunkey

River at a level that supports use by aquatic life the Board has required that the average daily concentration of dissolved oxygen in the Pamunkey cannot be permitted to fall below 5mg/l, and that dissolved oxygen concentrations can never be permitted to fall below 4 mg/l. 9 VAC 25-260-50, 25-260-530.

Historically, anadromous fish have used the Pamunkey River as spawning and nursery habitat. Spawning adults have been documented throughout the Pamunkey. (R. at 833, 904, 1400.) For shad, spawning occurs during late spring and early June, with juvenile fish migrating downstream later in the summer. Unfortunately, anadromous fish populations are severely threatened due to pollution in the waterbodies they use. Presently existing dissolved oxygen violations at river mile 48.80 pose a great threat to fish populations in the Pamunkey River because fish cannot or will not swim through waters with inadequate levels of dissolved oxygen. In 1994, the VMRC imposed a total ban on in-shore fishing for migratory fish because shad populations in tidal rivers have collapsed across the state, including the Pamunkey River. (R. at 904, 1400.) This ban was recently renewed. (R. at 1400.)

Several commenters raised these very concerns with the Board and pointed to evidence that the Pamunkey may be effectively closed to migratory fish passage at river mile 48.80 during spawning season. (R. at 894, 904, and letter from Pamunkey Indian Tribe.) Despite record evidence indicating that the proposed discharge will exacerbate existing violations of the water quality standard for dissolved oxygen, the Board failed to adequately consider the effects of the proposed discharge and its cumulative effects in combination with other known sources of pollution on anadromous fish populations. This failure was an abdication of the Board's statutory duty and could result in the destruction of anadromous fish populations in the Pamunkey River. The Board failed to make any finding that fish populations in the Pamunkey

River will be protected notwithstanding the proposed discharge, in combination with known violations of water quality and other sources of pollution. Furthermore, there is no substantial evidence in the record from which the Board could rationally make such a finding. Accordingly, the Board's decision must be reversed.

III. The Permit Must be Set Aside Because the Board Failed to Find That Existing Recreational Uses of the Pamunkey River Will Be Protected, And There Is No Substantial Evidence to Support Such a Finding

Section 25-31-50(C)(1) of the SWCB regulations requires the Board to find, before issuing a permit, that the permit will comply, "with the applicable requirements of the [federal] CWA of the [State Water Control] law, or regulations promulgated under [either law]." *See also* 40 C.F.R. § 122.4(a). This includes determining that the proposed discharge will not impair the designated uses of the receiving water. 9 VAC 25-260-20(A). The Pamunkey River, like virtually all state waters, is designated for "recreational uses, e.g. swimming and boating." 9 VAC 25-260-10(A); *see also* 40 C.F.R. § 131.10(a). In spite of repeated and verified assertions that the proposed discharge will render the portion of the Pamunkey River downstream from the proposed discharge unsuitable for virtually all recreational uses, the Board failed to find that the permit will protect recreation uses. Furthermore, the record contains no substantial evidence upon which such a finding could be made.

The Board has a statutory duty to protect water quality so that the citizens of the Commonwealth can use waterbodies such as the Pamunkey River for swimming and other recreational activities. *See* Va. Code § 62.1-44.2; 9 VAC 25-260-10. Despite this statutory mandate, the Board completely failed to address recreational uses of the River in any way.

The Pamunkey River has been used and enjoyed for recreational purposes by Crutchfield, Broaddus and others for many years. The record contains evidence of uses of the River at the

point of the proposed discharge and downstream for swimming, fishing, canoeing, nature observation and many other kinds of primary contact water-based recreation. (R. at 903.) The record also contains evidence that these uses will stop because the proposed discharge of pollutants. *Id.* The Virginia Department of Health has made clear its view that primary contact with the water should be avoided downstream from a discharge of treated sewage. *Id.* In light of this recommendation, no reasonable person would swim in such water and the proposed discharge would effectively terminate such recreational uses.

Notwithstanding this evidence, the Board failed to address the potential loss of recreational issues in any way. Thus, although one DEQ employee hazarded a guess (admittedly outside his expertise) that the water may be technically "swimmable," the Board has made no finding that permit issuance is compatible with existing recreational uses of the Pamunkey River. Nor is there any substantial evidence that could possibly support a finding that these important recreational uses will be maintained notwithstanding this discharge and the three other recently permitted discharges to this area of the Pamunkey River. For these reasons, the permit must be set aside.

CONCLUSION

The Board may not issue permits for discharges that will cause or contribute to violations of water quality standards. Yet, no case could be more clear than this one that the Board has done so. The permit in this case would authorize discharges of oxygen-consuming pollutants into a water body that regularly violates water quality standards for dissolved oxygen. Similarly, the Board is not to issue permits for discharges that will impair the existing uses of a waterbody. Yet once again, the record plainly shows the Board has done so here. Although the use of the

Pamunkey by anadromous fish and recreational enthusiasts has been documented in the record, the Board has approved a discharge that will discourage both from using the River.

If the purposes of the State Water Control Law are to be achieved, this Court will have to hold the Board to its legal obligations. For these reasons, the issuance of this permit by the Board should be set aside.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing "Memorandum in Support of Petition for Appeal" was sent via facsimile and by first-class mail, postage prepaid, this 10th day of October, 2000, to:

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A handwritten signature in black ink, appearing to be "David E. Evans", written over a horizontal line.

VIRGINIA:

IN THE CIRCUIT COURT OF THE CITY OF RICHMOND
John Marshall Courts Building

FRANCES BROADDUS CRUTCHFIELD, et al.,

Petitioners,

v.

Chancery No. 760CH99K01193-00

STATE WATER CONTROL BOARD, et al.,

Respondents.

**JOINT BRIEF OF RESPONDENTS STATE WATER
CONTROL BOARD AND COUNTY OF HANOVER, VIRGINIA
IN OPPOSITION TO PETITIONERS' PETITION FOR APPEAL**

This is an appeal of the State Water Control Board's issuance of a Virginia Pollutant Discharge Elimination System ("VPDES") permit ("Permit"), Tab 1,¹ to the County of Hanover (the "County" or "Hanover") to discharge highly treated wastewater from the County's planned Totopotomoy Wastewater Treatment Plant (the "Plant" or "Project") into the Pamunkey River.

I. SUMMARY

The Project is one of the most carefully planned and thoroughly evaluated municipal wastewater treatment facilities ever proposed in Virginia. Every aspect of the Project has been closely examined to ensure that it protects the environment while meeting Hanover's essential needs.

¹ For the Court's convenience, accompanying this brief is an Appendix containing copies of all agency file documents referenced herein. References are to Tab numbers in the Appendix and Bates stamp numbers for individual pages where pages are Bates stamped. Where pages are not Bates stamped, references are to Appendix Tab numbers and pages within the document, where appropriate.

Hanover applied for the Permit in 1997 after almost 30 years of planning, study, and evaluation established that the Plant was the only feasible alternative for the County to meet its future wastewater needs and only after the discharge location was determined to have the least impact on the environment and residents. Following a thorough evaluation of the application and additional information submitted by Hanover, and after consultation with other state and federal agencies, the State Water Control Board (the "Board" or "SWCB") issued public notice and received comment on the draft permit during the public hearing and the written comment period that followed. The draft permit contained, among other requirements, stringent limitations in the discharge of oxygen demanding pollutants to prevent any adverse impact on dissolved oxygen ("DO") levels in the Pamunkey River. The Board also included other conditions in the draft permit to ensure that beneficial uses of the river, including aquatic life, fishing and swimming, would be protected. In response to concerns expressed during the public hearing and comment period, the Board undertook a further evaluation of the proposed discharge and added new and more stringent requirements to provide added assurance that water quality and beneficial uses would be protected.

The result is a final permit that protects water quality and beneficial uses of the Pamunkey River.

II. NEED FOR AND DESCRIPTION OF THE PROJECT

A. The Project Is a Critical Component of Hanover's Comprehensive Plan
Beginning with the County's 1972 Comprehensive Plan, and in each subsequent revision of the Plan, Hanover has proposed the construction of a wastewater treatment plant to serve its

Suburban Service Area – a compact area in which Hanover now provides or plans to provide public water and sewer services.²

Through careful study beginning in 1968, Hanover explored alternatives to provide wastewater treatment services to its citizens in the Suburban Service Area. Hanover's current long-term contract with Henrico County, which provides 5.4 million gallons per day (mgd) of wastewater treatment capacity to Hanover, has delayed the need for Hanover to build its own plant. However, Hanover's current projections for wastewater demand predict that Hanover will exceed its 5.4 mgd limit with Henrico County in less than three years, and Henrico has advised Hanover that it is unable to provide any additional wastewater treatment capacity to Hanover. Tab 5C at 917-937, and at 988-992.

Hanover also has explored a partnership with the City of Richmond. Ultimately, however, this option was determined not to be viable because the City lacked capacity, and because the cost of transporting the wastewater would be prohibitive. *Id.*

Hanover's evaluation of wastewater alternatives culminated in studies finalized for the County in 1993 and 1995 by two different consultants. Both studies concluded that Hanover needed to construct its own wastewater treatment facility, and that the most viable location for the discharge from the facility would be the tidal Pamunkey River. *Id.*

B. The Plant Will Employ Advanced Treatment Technology

In August, 1997 Hanover's Board of Supervisors issued a conditional use permit for a wastewater treatment plant on a 128-acre tract of land located off of Pole Green Road, at the

² The area of the County that falls outside the Suburban Service Area – roughly 80 percent of the total land area of the County – is rural. By concentrating most of the County's residential growth in the Suburban Service Area, the County can preserve the rural nature of the majority of the land area and enhance its ability to provide public facilities and services to the Suburban Service Area.

edge of Hanover's Suburban Service Area.³ At the same time, the Board of Supervisors issued a conditional use permit for the effluent force main from the Plant to the Pamunkey River and the related discharge structure. The Plant is designed to be an advanced wastewater treatment facility that will meet or exceed the limits imposed by the VPDES permit issued by the SWCB. The Plant's design also includes biological nutrient removal (BNR) technology, which will allow the Plant to comply with a non-regulatory nutrient reduction strategy that will provide added protection to the Pamunkey River, York River and Chesapeake Bay. *Id.*; Tab 5B at 1652-1655.

C. Hanover Selected the Discharge Location That Will Have Minimum Impact on the Environment and Residents

The discharge structure will be located on the Pamunkey River approximately 1.98 miles downstream of the Route 360 bridge, and approximately eight miles from the Plant. Highly treated effluent from the Plant will be conveyed to the discharge structure through an entirely buried 36-inch diameter force main that will run from the Plant along Tate Lane, Pole Green Road and Route 360, and then cross Petitioners' farm following an existing farm road. Tab 2; Tab 5B at 1652-1655.

The discharge structure will consist of a reaeration structure and a discharge diffuser. The reaeration structure will enclose concrete steps over which the treated effluent will cascade before passing through a pipe into the discharge diffuser and then into the river. All but about three feet of the reaeration structure will be constructed below grade. The discharge diffuser will extend about a third of the way across the river – just above the river bottom – and will feature

³ Although the Plant will be constructed with an initial capacity of 5.0 mgd, the conditional use permit allows for the Plant ultimately to be expanded to 15.0 mgd, a capacity that Hanover projects will meet its wastewater treatment needs through about 2030.

multiple ports through which the effluent will be discharged. This technology is designed to promote very rapid mixing of the effluent. *Id.*

Hanover selected the discharge site with the guidance of its consultants who identified the tidal area of the Pamunkey River where Petitioners' farm is located as the best location. This particular site will have minimal impact on residents, with the closest residences about one mile downstream. The elevation of this site also means that the structure will have minimal impact on wetlands and will not be subject to flooding. The discharge structure at this site will have no impact on cultural resources or endangered species. Further, construction costs at this site will be the least expensive of all alternatives considered. All these factors combined to make this site the ideal location for the discharge structure.⁴ Tab 5B at 1653-1655.

D. All the State and Federal Agencies That Have Reviewed the Project Have Found That It Will Protect Water Quality

The SWCB approved issuance of the Permit at its meeting on March 11, 1999, (Tab 7A, Minute No. 11 of SWCB 3/11/99 meeting), and the Board, acting through its staff, the Department of Environmental Quality ("DEQ"), issued the Permit on April 28, 1999. Tab 1. Before deciding to issue the Permit, the Board solicited comments from both the United States Environmental Protection Agency ("EPA") and the Virginia Department of Health ("DOH"). In letters dated July 31, 1998, November 6, 1998 and March 29, 1999, the EPA stated that it had no objection to issuance of the Permit. Tab 6C at 619, Tab 6D at 663, Tab 6I at 1543. Likewise, in letters dated June 3, 1998 and July 20, 1998, the DOH confirmed that it, too, had no objection to issuance of the Permit. Tab 6A at 421-22, Tab 6B at 618. In addition, after issuance of the

⁴ Petitioners' farm is some 820.9 acres, with approximately three miles of river frontage. Hanover did consider some other sites on Petitioners' farm, at the suggestion of Petitioners. However, when it became apparent that Petitioners found no site on their farm acceptable for the location of the discharge structure, Hanover abandoned its efforts to consider other sites and returned to the site originally selected. Tab 5A at 1349.

Permit, the United States Fish and Wildlife Service issued a letter confirming its opinion that issuance of the Permit is "not likely to adversely affect the dwarf wedge mussel," the only federally endangered species thought to be potentially affected by the proposed discharge. Tab 6N at 1585-86. In summary, those agencies charged with protecting water quality have concluded that issuance of the Permit is in compliance with all applicable legal requirements and will not cause or contribute to violation of water quality standards or impair beneficial uses of state waters.

III. DESCRIPTION OF THE SWCB PERMIT PROCESS

A. Statutory and Regulatory Basis

Virginia first enacted its State Water Control Law in 1946 to "safeguard the clean waters of the State from pollution, prevent any increase in pollution, and reduce pollution existing when this law is adopted." 1946 Va. Acts, Ch. 63B at § 1514-b 1. That law now is codified at Va. Code §§ 62.1-44.2 through 62.1-44.34:13.

The State Water Control Law prohibits any discharge of pollutants to Virginia's waters except in compliance with a permit issued by the SWCB. Va. Code § 62.1-44.5. Under authority of the Water Control Law the Board issues VPDES permits to industrial wastewater treatment facilities and to municipal sewage treatment plants. *See* 9 VAC 25, Ch. 31 (Virginia Pollutant Discharge Elimination System Permit Regulation).

The VPDES permit does not grant a blanket authorization to discharge. Instead, it imposes elaborate requirements on the management of the treatment facility, 9 VAC 25-31-190, pretreatment of wastes from industries, 9 VAC 25-31-220, disposal of sludge, *Id.*, monitoring of the discharge, 9 VAC 25-31-190.K, and, at issue here, the kinds and amounts of pollutants that the permittee may discharge (the "effluent limitations"), 9 VAC 25-31-220. As required by

federal law, 33 U.S.C. § 1342, the permit cannot issue if EPA objects to its terms. 9 VAC 25-31-50.C.3.

As to effluent limitations, the permit must at a minimum impose nationwide "technology-based" limitations applicable to the type of facility, 9 VAC 25-31-220, and it must impose any applicable limits for toxic pollutants, *Id.* Finally, the permit must impose any more stringent limits necessary to achieve the applicable water quality standards. 9 VAC 25-31-220.D.

The Board can enforce the permit in state court by suit for injunctive relief and civil penalties. Va. Code §§ 62.1-44.23 and 62.1-44.32. Both private citizens and the EPA can enforce the permit in federal court. 33 U.S.C. §§ 1365 and 1319.

B. Description of the Pamunkey River

1. Dissolved Oxygen

In 1995, personnel from the DEQ performed a study of low DO levels that were known to occur with some frequency in parts of the Pamunkey River. Tab 3. Concurrently, Hanover personnel performed low and high water slack tide DO surveys from the Route 360 bridge in Hanover downstream for 23 miles to the Whitehouse railroad bridge. Tab 5A at 1347.

The Pamunkey River in this region is a deep, channeled estuary with strong tidal action. The river is bordered by thousands of acres of tidal marsh. The studies showed that there were persistent, summertime low DO occurrences ("DO sag" or "sags") in the river, most commonly below two large swampy tributaries.⁵ The upper sag occurs just below where Moncuin Creek enters the river after traveling through an approximately 700-acre wetland area known as "The

⁵ The applicable water quality standard in estuarine waters such as the Pamunkey requires an average DO of 5.0 mg/l (PPM) and a minimum of 4.0 mg/l. 9 VAC 25-260-50.

Island." This sag is approximately six miles downstream of the proposed discharge site. The second DO sag appears approximately 20 miles below the discharge site, below where Black Creek enters the river and adjacent to several thousand acres of swamp/marsh land. Tab 3; Tab 5A at 1346; Tab 7B, at 1672-1675.

Some have suggested that the reason for the low DO levels in the Pamunkey estuary is that upstream nonpoint source oxygen-demanding wastes settle out in the slower moving estuarine portion of the river and are exerted as sediment oxygen demand. The second, and more likely, explanation is that the swampy tributaries and thousands of acres of tidal marsh continually deliver a naturally occurring DO demand on the river with every tidal cycle. This second explanation is supported by the location of the two seemingly persistent DO sags in the vicinity of the two largest swamp-like tributaries and tidal marshes. This same phenomenon occurs on almost any coastal stream dominated by a large system of tidal marshes.⁶ DEQ staff believe that the extensive marshes are the cause of the low DO conditions in the river. Tab 2 at 1422-1423.

Since 1987, the SWCB has used effluent limitations of 10 mg/l CBOD₅,⁷ 10 mg/l TSS,⁸ and 3 mg/l TKN⁹ for discharges to waters that do not meet water quality standards due to swamp and marsh-like conditions. These so-called "10-10-3" limitations establish a level of treatment that, in the best professional judgment of the Board's staff, will not contribute to lower DO levels

⁶ The Board's water quality standards recognize that water quality may not always comply with the standards due to naturally occurring conditions such as the impact of the marshes in this region of the Pamunkey River. See 9 VAC 25-260-250.

⁷ Carbonaceous five-day biochemical oxygen demand. A measure of the amount of oxygen-consuming material in the water.

⁸ Total Suspended Solids.

⁹ Total Kjeldahl Nitrogen, a measure of the ammonia nitrogen in the water. Ammonia nitrogen is toxic in its own right, and it exerts an oxygen demand.

in the receiving stream, regardless of the size of the discharge. In other words, at this level of treatment, the concentrations of oxygen demanding pollutants in the discharge are low enough that they will not consume oxygen in the receiving water. *Id.*; Tab 4A at 697-699. This same standard has been used to establish effluent limitations for three other discharges to this section of the Pamunkey River (King William STP on Monquin Creek, and Cumberland WWTP and Parham Landing WWTP on the Pamunkey River). Tab 4B at 700-01; Tab 4C at 702; Tab 4D at 703-05.

2. Pamunkey Fishery

The Pamunkey estuary supports a rich and diverse fishery. The Pamunkey is home to anadromous fish¹⁰ as well as various species of mussels. The water quality standards adopted by the Board are established at levels designed to protect all species, including anadromous fish fry and mussels.¹¹

A comparison of the Commonwealth's water quality standards to a published listing of contaminant concentrations that are toxic to mussels shows that the Commonwealth's standards are far more stringent and based upon the protection of even more sensitive species. Indeed, it is generally accepted that the single most important threat to mussel populations is the destruction of habitat due to sedimentation or eroded soils. Additional threats include predation and the spread of non-native species. Tab 5A at 1345-1350.

¹⁰ Anadromous fish such as shad ascend rivers from the sea for breeding.

¹¹ The Board's Water Quality Standards provide:

9 VAC 25-260-10. Designation of uses.

A. All state waters, including wetlands, are designated for the following uses: recreational uses, e.g., swimming and boating; the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources, e.g., fish and shellfish.

The only special provision for endangered species in the water quality standards is a halogen ban that prevents the use of chlorine as a wastewater disinfectant. 9 VAC 25-260-110. Hanover has always proposed the use of ultraviolet (UV) disinfection, and the Permit does not authorize the use of chlorine. The possibility of rare, threatened or endangered species has no impact on the effluent limitations included in the Permit because the water quality standards adopted by the Board are designed to protect all species whether or not they are endangered. Tab 5A at 1348.

3. Recreation

The original location for the discharge site was the center of Petitioners' farm, near an existing boat ramp and irrigation withdrawal system. At the request of Petitioners, Hanover evaluated one upstream alternative at the Route 360 bridge and two downstream alternatives. The original and all three alternative locations were also located on Petitioners' farm. Hanover then selected the site identified as "Downstream II" and modified the application accordingly. However, Petitioners were unwilling to sell, regardless of the location. Hanover also determined that the downstream site, although on the same farm, was not located on the same tax parcel and had not been included in the local conditional use permit (CUP). Use of the "Downstream II" location would require that the County go back through the local CUP approval process. Hanover moved the discharge location back to the original site. Tab 5A at 1349.

Either discharge site is acceptable from a water quality standpoint. The permitted site is located approximately 50 yards upstream from an irrigation withdrawal system, boat ramp and an area that has been used for swimming. The downstream site is located approximately 100 yards above a neighboring property owner's boat dock. Effluent limitations are set to establish a

level of disinfection, which meets the regulatory definition of "swimmable" waters. Tab 5A at 1345-1350.

C. The SWCB Fully Addressed the Public Comment Issues in Its Consideration and Issuance of the Permit, With Stringent Treatment Levels and Annual Study Requirements.

The SWCB held a duly advertised public hearing on January 19, 1999, to receive comments on the proposed issuance of the Permit. Approximately 65 individuals attended this meeting. In addition, written comments were taken until February 4, 1999, and 25 to 30 such comments were received. Tab 7B at 1672.

Allan Brockenbrough, Piedmont Regional Office Permit Engineer for the DEQ, prepared a detailed summary of the comments received during the January 19th public hearing and a summary of issues raised by public comments on the Permit and the staff response. Tab 5A at 1345-1350, two-sided, 8 page document with no Bates stamps on the even numbered pages, entitled "Summary of Issues and Staff Responses." These summaries were provided to the SWCB in a March 3, 1999 memorandum of Gerry Seeley, Piedmont Regional Office Director for the DEQ, approximately one week before the Board's March 11, 1999 meeting to consider the issuance of the Permit. *Id.* at 1344.

The major issues raised in the public comments were the impact of the proposed discharge on (i) DO levels in the Pamunkey River, (ii) anadromous fish as well as various species of mussels in the river, and (iii) recreational uses of the river, including swimming, fishing and canoeing, in conjunction with the location for the discharge. These issues were also discussed at the SWCB meeting on March 11, 1999, by Mr. Brockenbrough. Tab 7B at 1672-1696. A summary of staff responses and recommendations on these issues considered by the SWCB and staff recommendations adopted by the Board in the Permit are discussed below.

1. The SWCB Adopted Enhanced Permit Requirements to Address DO Concerns Raised in Public Comments and to Ensure That the Discharge Will Not Cause or Contribute to Lower DO Levels in the River.

Following the January 19, 1999 public hearing, the DEQ staff took a further look at the conditions in the river, including the results of the 1995 special study and low and high water slack tide DO surveys. This re-examination was in response to public comment concerns over the impact of Hanover's proposed effluent discharge in light of the DO sag approximately six miles downstream from the proposed discharge site. As a result of this examination, DEQ staff recommended to the Board modifications to the draft permit.

First, they recommended changing the TSS limitations to 10 mg/l from the draft permit's 15 mg/l limit. Second, they recommended raising the minimum DO limitation from 5.0 mg/l to 6.5 mg/l. Tab 5A at back of 1347 (p. 2 of Summary of Issues and Staff Response). The staff reported that the TSS 10 mg/l limitation would lead to better reliability and lower TSS levels, as well as reduce CBOD₅. *Id.* This limit also would be similar to the high level of treatment provided by Richmond, Henrico and Chesterfield for their discharges to the James River. Raising the minimum DO effluent limitation would ensure that the DO in the discharge will be at or above the background level in the river. *Id.*

The Board adopted these enhanced permit requirements, thereby addressing the DO concerns raised in public comments and establishing permit limitations that "will not further contribute to lower dissolved oxygen levels in the [river.]" Tab 5A at 1347.

2. The SWCB Fully Addressed the Public Comments on Anadromous Fish and Mussels in Its Water Quality Standards, "10-10-3" Permit Limits, and An Annual Macroinvertebrate Study Requirement.

There was a great deal of public comment regarding the impact of the proposed discharge on anadromous fish as well as various species of mussels, including endangered species. These

concerns were addressed through a variety of means outlined by the staff and considered by the SWCB.

First, DEQ staff recommended and the Board added to the Permit a requirement for a yearly study to assess the impact of the discharge on macroinvertebrates. Tab 5A at 1348. In addition, the water quality standards adopted by the Board are at levels expected to protect all species, including anadromous fish fry and mussels. The standards require staff to use mixing zone concepts in establishing effluent limitations. Here the project will use a multi-port diffuser, which ensures rapid mixing of the effluent in a relatively small mixing zone. A conservative approach was taken by ignoring tidal action in the area to establish instream waste concentrations for the effluent. *Id* Finally, the "10-10-3" limitations in the Permit typically show no toxic impact on aquatic life, including anadromous fish fry and mussels, at the instream waste concentrations expected for the Project. *Id*

With respect to endangered mussels, staff noted that the water quality standards adopted by the Board are protective of endangered species. Tab 5A at back of 1348 (page 4 of the Summary of Issues and Staff Responses). The SWCB's water quality standards contain a halogen ban, which prevents the use of chlorine as wastewater disinfectant to protect endangered species. The Project has always proposed the use of ultra violet disinfection and the Permit does not authorize the use of chlorine. Thus, the possibility of endangered species has no impact on the effluent limitations included in the Permit. Tab 5A at 1347-50.

Further, after the public hearing, the County provided the Board's staff with a mussel study performed in November 1998. Tab 6F at 829-849. This study concluded that "[n]o specimens of any protected mussel species were found" in the vicinity of the discharge. Tab 6F at 847. The study further concluded that the proposed construction site appears to be especially poor habitat for

protected species. *Id.* A second mussel study completed by the County in August of 1999 likewise found no endangered species. In a letter, the U.S. Fish and Wildlife Service referenced this study and similarly concluded that the project site was not an appropriate habitat for endangered dwarf wedge mussels. Tab 6N at 1585.

Finally, in noting that the water quality standards adopted by the Board are protective of mussels generally (whether endangered species or not), staff pointed out that the Commonwealth's water quality standards as compared to a published listing of contaminant concentrations which are toxic to mussels shows that the Commonwealth's standards are far more stringent and based upon the protection of even more sensitive species. Tab 5A at back of 1348 (page 4 of the Summary of Issues and Staff Responses).

3. The SWCB Adopted Permit Limits That Maintain the Water as Fishable and Swimmable.

Petitioners indicate that they and others have used the river bordering their property for swimming, fishing and canoeing. Pet. Br. at 13-14 and 22.

The SWCB's established water quality standards are designed to maintain state waters as fishable and swimmable. Tab 7B at 1677. The evidence in the agency file shows that the effluent limits are set to establish a level of disinfection, which meets the regulatory definition of "swimmable waters." Tab 5A at 1349.

The public comments received by DEQ raised issues concerning the selection of the site of the discharge. In response, staff and the Board's counsel noted that the SWCB's authority does not extend to selecting or establishing appropriate discharge locations, except to the extent a discharge location impacts water quality. Tab 7B at 1685. Selection of the site is a local decision. In this case Hanover was required to obtain a conditional use permit for the proposed discharge site location. Tab 5A at 1349.

4. Other Public Comment Issues and Staff Response

Other issues raised during the public comment period included concerns over temperature levels, nutrient impacts and water supply issues. Tab 5A at back of 1349 and at 1350. Staff presented the following responses to these issues for the Board's consideration in issuing the Permit:

(i) Temperature levels - Municipal effluent, such as Hanover's, typically does not vary significantly in temperature and thus impacts on the receiving stream or rivers are negligible. Tab 5A at 1350.

(ii) Nutrient impacts - The draft permit and the permit as approved by the SWCB conservatively include phosphorous limits as if the river segment is nutrient enriched, although it is not, and Hanover has committed to include biological nutrient removal in the wastewater treatment plant design. Tab 5A at back of 1349.

(iii) Water supply impact - No current plans for water supply use of the Pamunkey River were known; this issue can be addressed if the river is ever designated for public water supply. Tab 5A at 1350.

Finally, several other issues were raised during the public comment process (e.g., impacts on historic resources and impact on wetlands). While these issues are appropriate for consideration by other agencies, in particular, the U.S. Army Corps of Engineers, they are not related to water quality and therefore, not related to the Permit. Thus, no action thereon was recommended by the staff and the Board took no action. Tab 5A at back of 1349; Tab 5A at 1350.

In summary, the Board considered the public comments, and responded by approving an enhanced permit with more protective permit limits than originally proposed as well as an annual

macroinvertebrate study. The resulting Permit protects aquatic life, including anadromous fish, and protects recreational uses, including fishing and swimming. Tab 5A at 1347.

IV. PETITIONERS DO NOT HAVE STANDING

The General Assembly has designated the two classes of persons who may bring appeals of VPDES permits: (1) owners aggrieved by the SWCB's decision; and (2) persons who have participated in the public comment process related to the decision and who meet "the standard for obtaining judicial review of a case or controversy pursuant to Article III of the United States Constitution." Va. Code § 62.1-44.29.

The State Water Control Law defines an "owner," in relevant part, as "any person or group of persons acting individually or as a group that owns, operates, charters, rents, or otherwise exercises control over or is responsible for any actual or potential discharge of sewage, industrial wastes, or other wastes to state waters, or any facility or operation that has the capability to alter the physical, chemical, or biological properties of state waters in contravention of Va. Code § 62.1-44.5. Va. Code § 62.1-44.3. An "owner," then, is the owner of a facility that is the subject of the SWCB's action. See *Environmental Defense Fund v. Virginia State Water Control Board*, 12 Va. App. 456, 404 S.E.2d 728 (1991). Petitioners are not "owners" within the meaning of Va. Code § 62.1-44.29.

Thus, to have standing, Petitioners must satisfy the second test of Va. Code § 62.1-44.29: They must show that they are persons who participated in the public comment process and who satisfy the requirements for Article III standing. The Board does not dispute that Petitioners submitted both oral and written comments. Article III standing is another matter.

The law of this case, as set forth in the Court's letter opinion of May 24, 2000, is that Petitioners' sole averment of harm is that the outfall location will damage historic places on their

land. Letter Op., May 24, 2000, given effect by the Court's Order of June 14, 2000.

Accordingly, we turn to those historic resources.

The former Edmund Ruffin Plantation, Marlbourne, and the Newcastle archeological site are located in the vicinity of the proposed discharge site. See Crutchfield Deposition Exhibit 1, Figure 5. Marlbourne was listed as a National Historic Landmark in 1964 and listed on the Virginia Landmarks Register in 1969. The Newcastle Town Archeological Site also is listed in the Virginia Landmarks Register.

The underground force main leading to the discharge structure will traverse the edge of the Marlbourne plantation property for approximately 2,500 ft. adjacent to an existing farm road. *Id.* No part of the force main is within the boundary of the Newcastle archaeological site. Crutchfield Deposition Exhibit 2. A portion of the underground force main is northwest of and separated from that archeological site by an abandoned railroad bed. *Id.*

Mr. Broaddus owns, and Ms. Crutchfield has a dower interest in, a strip of the former Marlbourne plantation, northeast of the main property, under which a portion of the force main will run. Mr. Broaddus owns, and Ms. Crutchfield has a dower interest in, the farm property that includes the Newcastle archeological site. Neither Petitioner has an ownership interest in the historic structures located on the Marlbourne property.

A cultural resources investigation has concluded that the Project "will not have an effect on the location, setting, or use that contribute to Marlbourne's significance." Crutchfield Deposition Exhibit 1 at i. A later archeological evaluation reported on the 1.28 acre site for the outfall and reaeration structure. Crutchfield Deposition Exhibit 5. That evaluation concluded that deep plowing has impacted the integrity of the site and that the portions of the site to be

developed "do not contain sufficient integrity to yield any further significant information about the past." *Id.* at i.

Ms. Crutchfield contends that installation of the pipe across the edge of the Marlbourne site will disturb "things unknown" under the ground. Aside from the odor she expects from the project and her knowledge that it will "be there" and her expectation it will be unsightly, she does not know any facts to contradict the cultural resources investigation that concludes: "This project will not have an effect on the location, setting, or use that contribute to Marlbourne's significance." Crutchfield Deposition Exhibit 1 at i; Crutchfield Deposition 20/16 *et seq.*¹² Ms. Crutchfield does not claim any economic harm; she says she is aggrieved that the Project "will be an ever present cloud of man's ruination of his environment sitting there, smelling." Crutchfield Deposition 37/3-5. She claims the same harm to the historic value of the Newcastle archeological site, which is a farm field.

Ms. Crutchfield objects to the granting of any permit with any effluent limits. She contends that whatever the effluent limitations might be, the sight and smell will harm her enjoyment of the historic resources. Crutchfield Deposition 44/22-45/5. The project, she alleges, would be harmful to the historic resources even if Hanover were to clean the effluent up to the quality of drinking water. *Id.* 45/6-10.

Although she did not plead it, Ms. Crutchfield further testified at deposition that she enjoyed the use of the property for fishing, swimming, and camping, and that the presence of the project would impair those uses. Nonetheless, Ms. Crutchfield has no specific information upon which to base her conclusion that the discharge would harm the fish, mussels, swimming,

¹² Ms. Crutchfield testified that she was concerned about the effect of the discharge pipe on the marl in the river bottom. However, the Commonwealth owns the river bottom. Va. Code § 28.2-1200.

recreation, camping, water for cooking, or use by Boy Scouts. *Id.* 52/13-22.¹³

Mr. Broaddus would abandon or decrease his uses of the river for fishing, swimming, and recreation even if the effluent were the quality of drinking water. Broaddus Deposition 7/2-6. No matter what the quality of the effluent, Mr. Broaddus holds that "it will impoverish the historic value of the place." *Id.* 7/6-8.

Va. Code § 62.1-44.29 sets out the three conditions that a person must meet in order to have Article III standing:

1. Such person has suffered an actual or imminent injury which is an invasion of a legally protected interest and which is concrete and particularized;
2. Such injury is fairly traceable to the decision of the Board and not the result of the independent action of some third party not before the court; and
3. Such injury will likely be redressed by a favorable decision by the court.

These standing requirements serve "to filter the truly afflicted from the abstractly distressed." *Friends of the Earth v. Gaston Copper Recycling*, 204 F.3d 149, 154 (4th Cir. 2000). Petitioners fall in the latter category.

¹³ Specifically:

Q Do you have any basis beyond what your lawyers have told you for thinking that the effluent limitations in this permit are insufficient to protect the fish, the swimming, the recreation, camping, water for cooking, bringing of Boy Scouts and the mussels?

A I have done some limited novice category reading. And such limited investigation on my part causes doubts in my mind as to what will harm what.

A. The SWCB's Decision Has Not Harmed Petitioners

The first element of Article III standing under Va. Code § 62.1-44.29 is "an actual or imminent injury which is an invasion of a legally protected interest and which is concrete and particularized." Petitioners will not suffer any such injury at the hands of the Board.

At most, Petitioners claim that they do not like the idea of the discharge emanating from their property. They do not claim objective harm to a personal or property or aesthetic interest; they merely admit an "abstract distress" at the idea of having a wastewater discharge nearby. Indeed, they are so offended by the aeration structure (a concrete structure perhaps three feet high) that they would find it unacceptable even if it were concealed under a barn or shed.

Broadbuss Deposition 29/4-30/3.

As to the historic resources that Petitioners have pled, it is clear that the Project, especially as regulated by the Permit, will cause no harm. Even as to the uses of the stream (that Petitioners did not think important enough to plead), the focus of Petitioners' concern is the Project itself, not the Board's limits upon the discharge.

The State Water Control Law protects reasonable beneficial uses, not personal preferences. Petitioners are attempting to pervert that law into a zoning statute. In any event, they fail the first element of the statutory test for standing because their prejudices against the Project are not legally protected.

B. No Harm to Petitioners is Traceable to the State Water Control Board

The Permit does not authorize Hanover to harm Petitioners. Indeed, at Part II.N the Permit provides: "This permit does not... authorize any injury to private property or invasion of personal rights." Tab 1 at 1489.

Petitioners' complaint is not that the Permit must be more stringent to protect beneficial uses. Their complaint is that the Project will exist at all. Thus, the Board's decision to impose a CBOD limit of 10 mg/l does not harm Petitioners any more or less than a limit of 5, or 1, or 50. Petitioners' claimed injury is not caused by the SWCB decision.

Indeed, the Permit contains limitations designed to protect the beneficial uses of the Pamunkey River for use by Petitioners and by the public in general. Even assuming that Petitioners might be harmed, the harm would not come from any action of the SWCB.

Accordingly, Petitioners also fail the second element of the statutory test for standing.

C. Petitioners' Complaint Cannot Be Redressed by a Favorable Decision in This Appeal

Finally, even if there were a defect in the Permit, curing that defect would not remedy Petitioners' complaint. The Board cannot refuse to issue, and the Court cannot overturn, a permit that protects beneficial uses and meets the regulations. Yet Petitioners admit that only denial of any permit at all will satisfy them.

Thus, Petitioners also fail the third element of the statutory test for standing.

V. STANDARD OF REVIEW: UNDER THE ADMINISTRATIVE PROCESS ACT THE BOARD'S DECISION MUST BE SUSTAINED IF IT IS SUPPORTED BY SUBSTANTIAL EVIDENCE

The Petitioners bring this appeal under Va. Code § 62.1-44.29, which provides that appeals of the Board's permits are to be decided under the Administrative Process Act. The purpose of the Act is to "standardize court review" of case decisions such as the decision to issue the Permit. Va. Code § 9-6.14:3.¹⁴

¹⁴ The Permit is a "case decision" under the Act because it is a decision that the County is "in compliance with [the] existing requirement for obtaining or retaining a license or other right or benefit." Va. Code § 9-6.14:4.

In judicial review of an agency action under that Act, the burden is on the party challenging the agency action to "designate and demonstrate an error of law subject to review by the court." Va. Code § 9-6.14:17.

The issues of law subject to appeal are:

- constitutionality,
- "compliance with statutory authority, jurisdiction limitations, or right as provided in the basic laws as to subject matter [and] the stated objectives for which regulations may be made,"
- observance of required procedure, where not harmless error, and
- substantiality of the evidence supporting findings of fact.

Id.

The Court of Appeals classifies these issues in two categories: "first, whether the agency decision maker acted within the scope of his authority, and second, whether the decision itself was supported by the evidence." *Johnston-Willis, Ltd. v. Kenley*, 6 Va. App. 231, 242, 369 S.E.2d 1 (1988).

Where the issue is whether there is substantial evidence to support findings of fact, great deference is to be accorded the agency decision. Where the issue falls outside the specialized competence of the agency, such as constitutional and statutory interpretation issues, little deference is required to be accorded the agency decision. Where, however, the issue concerns an agency decision based on the proper application of its expert discretion, the reviewing court will not substitute its own independent judgment for that of the agency but rather will reverse the agency decision only if that decision was arbitrary and capricious. Finally in reviewing an agency decision, the courts are required to consider the experience and specialized competence of the agency and the purposes of the basic law under which the agency acted.

Holzman Oil Corp. v. Commonwealth, 32 Va. App. 532, 539, 529 S.E.2d 333 (2000) (emphasis in original), quoting *Johnston-Willis*.

“The rationale of the statutory scheme is that the [agency] shall apply expert discretion to the matters coming within its cognizance, and judicial interference is permissible only for relief against the arbitrary or capricious action¹⁵ that constitutes a clear abuse of the delegated discretion.” *Schmidt v. Board of Adjustment*, 9 N.J. 405, 423, 88 A.2d 607, 615-16 (1952), quoted with approval in *Virginia Alcoholic Beverage Control Comm’n v. York Street Inn*, 220 Va. 310, 315, 257 S.E.2d 851 (1979).

Stated otherwise, as to fact issues:

In considering whether the record evidence is sufficient to support a factual finding made by an agency, we apply the substantial evidence standard of review. Under that standard, substantial evidence is “such relevant evidence as a reasonable mind *might* accept as adequate to support a conclusion.” An agency’s factual findings should only be rejected if, “considering the record as a whole, a reasonable mind would *necessarily* come to a different conclusion.”¹⁶

State Health Commissioner v. Sentara Norfolk General Hospital, Record No. 992018 (Va., September 15, 2000), quoting *Virginia Real Estate Comm’n v. Bias*, 226 Va. 264, 268-69, 308 S.E.2d 123, 125 (1983) (citations omitted).

¹⁵ The “arbitrary and capricious” standard and the substantial evidence test are the same. *State Bd. of Health v. Godfrey*, 223 Va. 423, 290 S.E.2d 875 (1982).

¹⁶ *State Health Commissioner v. Sentara Norfolk General Hospital*, Record No. 992018 (Va., September 15, 2000), quoting *Virginia Real Estate Comm’n v. Bias*, 226 Va. 264, 268-69, 308 S.E.2d 123, 125 (1983) (citations omitted).

VI. ARGUMENT

A. The SWCB Concluded That the Discharge Will Not Cause or Contribute to the Violation of the Water Quality Standards For Dissolved Oxygen, and That Conclusion Is Supported By Substantial Evidence in the Board's Files

Citing 9 VAC 25-31-50(C)(9) and 9 VAC 25-31-50(C)(1),¹⁷ Petitioners assert that the SWCB was obligated to make a "finding" that the Hanover discharge would not cause or contribute to violation of water quality standards, impair the designated uses of the receiving water, or harm human, animal, plant, or other aquatic life. Pet. Br. at 15. Petitioners further assert that the SWCB failed to make this finding with respect to the DO standards for the Pamunkey River. Pet. Br. at 15-16. With these assertions, Petitioners seek to establish that the SWCB failed to follow proper procedure or comply with its statutory authority, and thereby avoid the deference accorded agency factual determinations on judicial review.¹⁸

The Petitioners did not plead this issue and the law does not require the findings the Petitioners now demand. The Court should reject this attempt to create a procedural or statutory authority claim out of what is, in reality, a substantial evidence claim.

¹⁷ C. No permit may be issued:

1. When the conditions of the permit do not provide for compliance with the applicable requirements of the CWA or the law, or regulations promulgated under the CWA or the law;

• • •

9. To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards even after the application of the effluent limitations required by the law and Va. Code §§301(b)(1)(A) and 301(b)(1)(B) of the CWA, and for which the department has performed a pollutants load allocation for the pollutant to be discharged, must demonstrate, before the close of the public comment period, that:

a. There are sufficient remaining pollutant load allocations to allow for the discharge; and

b. The existing dischargers into that segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards.

¹⁸ See *Johnston-Willis Ltd. v. Kenley*, *supra*, where the court explains that while agency action is given little deference where the issue involves procedure or statutory interpretation, great deference is accorded agency decisions where the issue is whether there is substantial evidence to support the decision. 6 Va. App. 231, 243, 369 S.E. 2d 1, 7.

Rule 2A:4 requires that the Petition for Appeal "specify the errors assigned." The Amended Petition for Appeal does not assign error to any alleged failure to make a finding that the discharge would not cause or contribute to violation of water quality standards. Petitioners may not now assert an issue they have not pled.

Moreover, the SWCB is not required to make the explicit "finding" now asserted by Petitioners. Rather, as the two regulations (9 VAC 25-31-50(C)(9) and 9 VAC 25-31-50(C)(1)) cited by Petitioners make clear, the SWCB's permits must require compliance with the applicable provisions of federal and state law, including water quality standards.

Absent this imagined requirement for "findings," the sole issue raised by the Petitioners is whether the agency file contains substantial evidence to support a conclusion that the discharge will not violate the standard for dissolved oxygen.

The fundamental flaw in Petitioners' substantial evidence argument is their unsupported assumption that any new discharge will necessarily contribute to the existing DO standards violations. Pet. Br. at 17. This assumption is clearly refuted by the expert opinions of the Board staff's scientists and engineers who concluded that with the stringent "10-10-3" limits imposed in the Permit, Hanover's discharge will not cause or contribute to lower DO levels in the river regardless of the size of the discharge. Tab 2 at 1422-1423; Tab 5A at 1347 (front and back).

Petitioners' related arguments are flawed for the same reason. The fact that the SWCB did not require additional DO data as Petitioners contend it should have (Pet. Br. at 17-18), means simply that the staff and the Board did not believe additional data were necessary because the "10-10-3" limits would protect existing water quality conditions. In fact, several failed attempts to model the area of the river below the proposed discharge suggest it is unlikely that additional DO data or studies would have had any impact on the final limits in the Permit. Indeed, the same DEQ

researcher quoted by Petitioners as recommending the additional data also recommended the "10-10-3" limits. *Compare* Tab 3 at 729 with Tab 2 at 1422-1423.

Petitioners also argue that Hanover's discharge will exacerbate existing water quality standards violations because the river already is fully allocated with respect to oxygen-demanding pollutants. Petitioners' argument relies on a July 2, 1997, staff memorandum from Jon van Soestbergen to Curt Linderman. Tab 2 at 1422-1423. However, that memorandum goes on to recommend treatment levels to be used in cases where the DO resource is already fully allocated. Those recommended treatment levels are the very limits adopted by the Board here, the so-called "10-10-3" limits mentioned above. Tab 5A at 1347. The July 2, 1997, memorandum states that because of such full allocation, "a best professional judgment (BPJ) approach to establishing VPDES permit limits to maintain DO concentrations in the Pamunkey River is recommended." Tab 2 at 1422. The memorandum also contains references showing the basis for the BPJ approach.

The Petitioners also argue that the Board's prior issuance of permits for three other dischargers to the river will only make the DO situation worse. This argument fails because these dischargers were required to meet the same "10-10-3" limits imposed on Hanover.

Finally, Petitioners' rely upon the EPA's decision to list the Pamunkey River as impaired. Yet the EPA subsequently concurred in the issuance of the Permit (Tab 6I at 1543), and the Board has determined (with the EPA concurring) that notwithstanding the listing, the discharge will not cause or contribute to a violation of water quality standards.

Petitioners have not carried their burden under Va. Code § 9-6.14:17 to demonstrate the absence of substantial evidence in the agency file to support the conclusion that issuance of the Permit will not cause or contribute to a violation of the DO standards in the Pamunkey River.

On the contrary, the agency file plainly supports the conclusion that the Permit would not cause or contribute to lower DO levels in the river. It is also clear from the agency file that the Board made every reasonable effort to respond to concerns expressed by Petitioners and others, even to the point of making already stringent permit limits in the draft permit even more stringent following receipt of public comments. Therefore, it is clear that Petitioners' claim must be dismissed given the overwhelming evidence in the agency file to support the Board's decision, the experience and specialized competence embodied in the decision, and the considerable deference accorded the exercise of such discretion.¹⁹

B. The SWCB Concluded That Anadromous Fish Will Be Protected, and That Conclusion is Supported by Substantial Evidence in the Board's Files

As discussed above, the Board is under no obligation to make the "finding" asserted by Petitioners. Petitioners did not plead the issue. Petitioners have cited no authority for such an obligation other than the Board's duty not to issue any permit unless it contains conditions that comply with applicable requirements of federal and state law. Therefore, Petitioners' claim that the Board failed to follow proper procedure or comply with statutory authority is totally without merit, and the sole question is whether there is substantial evidence in the agency file to support a conclusion that issuance of the Permit would not harm anadromous fish species in the Pamunkey River. The agency file makes clear that this question must be answered in the affirmative.

Petitioners cannot prevail in their anadromous fish claim for the same reason they cannot prevail on their DO claim. Their anadromous fish claim is based on the same erroneous assumption; namely, that the Hanover discharge will cause or contribute to lower DO levels in

¹⁹ *Johnston -Willis Ltd. v. Kenley, supra*, at footnotes 66 and 71.

the Pamunkey River. Pet. Br. at 20. As demonstrated above, the agency file contains abundant evidence that the Hanover discharge would not lower DO levels in the river.

Petitioners cannot show, and indeed, have not even claimed, that the discharge would endanger anadromous fish species in other ways. It is undisputed that the Board's water quality standards are protective of all aquatic life, including anadromous fish, and Petitioners have alleged only that the Hanover discharge will cause or contribute to violation of the DO standards. Not only did the Board take the added precaution of making several limits in the proposed permit more stringent to protect DO levels in the river, it went so far as to add to the permit a requirement for a yearly macroinvertebrate study to ensure that there are no potential toxic impacts associated with the discharge. The success of the Board's efforts to protect aquatic life in the Pamunkey River is further buttressed by the approvals of the Permit by the Virginia Department of Game & Inland Fisheries and the U.S. Fish & Wildlife Service. Tab 6G at 883; Tab 6N at 1585.

Therefore, it is clear from the agency file that Petitioners have not carried their burden under Va. Code § 9-6.14:17 to demonstrate the absence of substantial evidence in the agency file to support a conclusion that the Permit will protect anadromous fish species in the Pamunkey River.

C. The SWCB Concluded That Existing Recreational Uses of the Pamunkey River Will Be Protected, and That Conclusion is Supported by Substantial Evidence in the Board's File

The Petitioners again argue an issue they did not plead. The Board is no more required to making a "finding" that recreational uses will be protected than it is required to make the other findings that Petitioners now assert it must make. Therefore, as with Petitioners' two previous

claims, the sole question here is whether there is substantial evidence in the agency file to support a conclusion that the Permit will protect recreational uses of the Pamunkey River.

The Board has adopted fecal coliform (bacteria) standards to protect recreational uses of state waters such as swimming and boating. The agency file shows that the fecal coliform limits in the Permit were established at levels to meet this standard. Tab 5A at 1349. Petitioners have not offered, or even suggested that the bacteria standards will not be maintained by the Permit. Rather, the sole basis for Petitioners' contention are comments from Petitioners and others that they would choose not to swim or boat in the river with the discharge because of the perception that it may not be safe.

That Petitioners and others say they would not swim or boat near the discharge even though it meets the "swimmable" standards, is a matter of personal preference, not a legal standard. Petitioners have not offered, and cannot offer any evidence that the discharge will not meet the swimmable standards, and, therefore, have failed to carry their burden under Va. Code § 9-6.14:17 to show a lack of substantial evidence to support the Board's decision.

VII. CONCLUSION

The Board imposed stringent limitations and monitoring requirements to protect water quality and beneficial uses of the Pamunkey River. The Board responded to every substantive comment on the proposed permit, and as evidence of its sensitivity to the concerns of those who commented on the Permit, made an already stringent draft permit an even more stringent final permit. In the final analysis, there can be no question that the agency file clearly demonstrates that the Board's decision was sound, well reasoned, and based on a thorough analysis of the facts and law. Accordingly, the Board and Hanover ask that the Board's issuance of the permit be affirmed, and this appeal dismissed.

Respectfully Submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing Joint Brief of Respondents State Water Control Board and County of Hanover, Virginia in Opposition to Petitioners' Petition for Appeal was hand delivered to: William B. Ellis and John L. Marshall, Jr., McSweeney, Burtch & Crump, P.C., Post Office Box 1463, 11 South Twelfth Street, Richmond, Virginia 23218-1463, counsel for Petitioners this 1st day of November, 2000.

