A-NPDC
ACCOMACK-NORTHAMPTON PLANNING DISTRICT COMMISSION
PO BOX 417 • 23372 FRONT STREET • ACCOMAC, VIRGINIA 23301
(757) 787-2936 • TOLL FREE (866) 787-3681 • FAX (757) 787-4221
WEBSITE: www.a-npdc.org

Eastern Shore of Virginia Ground Water Committee
October 17, 2023 10:00a.m.
ESVA Chamber of Commerce
19056 Parkway, Melfa VA

The committee's mandate is to "assist local governments and residents of the Eastern Shore in understanding, protecting and managing ground water resources, to maintain a ground water resources protection and management plan, to serve as an educational and informational resource to local governments and residents of the Eastern Shore, and to initiate special studies concerning the protection and management of the Eastern Shore ground water resource."

Virtual Attendance:
For Joining **via Computer:**
1. Click this link: https://zoom.us/j/7577872936?pwd=QTNJdmhCc3pWdVNUZ0ZWYnVJdWpWUT09
2. If prompted, enter the Meeting ID: 757 787 2936
3. If prompted, enter the Passcode: 7577872936

For joining **via Phone (calling in):**
1. Dial 1-646-558-8656
2. When prompted for meeting code enter 7577872936#
3. When prompted to identify as host or participant, enter #
4. When prompted for password, enter 7577872936#

Translation services available: Call 1-718-838-9317... #6980900. Press 1 for Spanish. Press 2 for Haitian Creole.

Servicios de traducción disponibles: Llame al 1-718-838-9317 ... # 6980900. Presione 1 para español.

Sèvis Tradiksyon Disponib: Rele 1-718-838-9317 ... # 6980900. Peze 2 pou kreyòl ayisyen.

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Meeting Agenda

1. Call to Order
2. Public Participation

10. Attachments

10. Schedule Next Meeting (November 21, 2023 @ 10am; Board Room, Eastern Shore COC)
11. Adjourn

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Kellen J. Singleton
Interdisciplinary Planner
Accomack-Northampton Planning District Commission

DATE: October 17, 2023

SUBJECT: **September 19, 2023 Meeting Minutes**

Please see the attached September 19, 2023 Meeting Minutes for approval.

Approval from the Ground Water Committee is requested to accept the Meeting Minutes.

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Minutes of the September 19th, 2023 Meeting

Eastern Shore of Virginia Ground Water Committee

The meeting of the Eastern Shore of Virginia Ground Water Committee was held at 10:00 AM on Tuesday, September 19th, 2023 in the hybrid format – virtually on the Zoom Platform and in person – in the conference room of the Eastern Shore Chamber of Commerce in Melfa, VA.

Members Present	Members Absent	Others Present
John Coker, Chairman	Mike Mason	Kellen Singleton, A-NPDC
Paul Muhly, Vice Chairman	Charles Kolakowski	Britt McMillan, ARCADIS
Ann Hayward Walker	Elaine Meil, Secretary	Curtis Consolvo, GeoResources*
Sue Mastyl	Steve Sturgis	Jason Pope, USGS*
Paul Grossman		Ken Dufty, Northampton Resident
Daniel Hershey		Granville Hogg, Northampton Resident
Grayson Chesser		Chris Pomeroy, AquaLaw*
		Chad Ballard, Ballard Fish and Oyster Co., LLC*
		Sam Caldwell, USGS*
		Joseph Betit, Earth Systems Management*
		Barrett Magrogan, Captains Cove Resident*
		Sheila Traina, Cheriton Resident

Signifies Zoom participant

1. Call to Order

   Chairman Coker called the meeting to order at 10:01 AM.

2. Public Participation
   a. Potential Impacts of Commercial Groundwater Withdrawal on 21460 Secretairy Road, Cheriton, VA

      Mr. Hogg addressed the GWC Groundwater Withdrawal Permit issued by DEQ GW0046001 and a comment regarding Groundwater Withdrawal Permit Application GW0080100 impact to the groundwater supply for residential use at a farmhouse and associated one acre garden on the parcel Northampton County Tax Map # 83-A-28A.

      Mr. Hogg advised the GWC to take a stronger look at the area of impact e.g., cone of depression's primary impact to residential water supply asking the GWC

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to consider issuing notices to adjacent property owners.

Mr. Hogg also spoke about DEQ's ground water withdrawal application process stating that the DEQ has dissociated itself from the dispute process between applicant/permittee and disputer/claimant.

DEQ process and response time, participation, and withdrawal models discussed.

Mr. Hogg noted that affecting pump record indicated usage beyond permitted volume. Mr. McMillan explained that there are three types of temporal groundwater withdrawal limits and some regulatory framework exist to allow a degree of flexibility and subsequent reduced usage as compensation.

Chmn. Coker requested a letter of suggested actions from Mr. Hogg. The GWC will consider advised actions and forward endorsements to DEQ and state representative.

b. Potential Impacts of Commercial Groundwater Withdrawal on 6182 Wardtown Road Exmore, VA and Virginia Eastern Shore Region

Mr. Dufty addressed the GWC with his groundwater supply availability concerns citing hydrological framework data and conditions at his property.

Two wells located at the south and north ends of his property have experienced increasing silt content and decreasing well water levels.

Mr. Dufty advised that the 19-groundwater withdrawal draft permits pending in the DEQ water department offices for the Eastern Shore of Virginia are unsustainable to the region's groundwater supply.

Mr. Dufty requested the GWC to request/access of well drilling data from 2016-present. Groundwater well data sources and accessibility were discussed.

3. Minutes of August 15th 2023 Meeting

The draft minutes of the August 15th 2023 Meeting was presented.

Mem. Grossman moved to approve the minutes as presented. Seconded by Mem. Walker, the motion carried with Chairman Coker abstaining.

4. August 2023 Financial Report

The FY 2024 Financial Status Report as of August 31, 2023 was presented.

Total Bills Payable equaled $6627.50; Total Revenues Received equaled $0.00; Balance

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equaled $99711.00

Mem. Grossman moved to approve the August FY 2024 Financial Status Report with deletion of Allocated Funds description. Seconded by Mem. Mastyl, the motion carried.

Mr. McMillan updated the committee on Ground Water Plan Project Implementation and Ground Water Modeling Run allocations that include the Protection and Water Supply Plans.

5. September 19, 2023 Staff Report

Staff updated the committee on:

- Virginia Pollutant Discharge Elimination System Permit Numbers VAG-40, -52, -83, -84, -01, -11, -75, -25, -87, -64, VAR-05, -10, VAN-00
- VA Pollution Abatement Program Permit Numbers VPA-01079, -01035, -01080, -01047, -01076.
- Groundwater Withdrawal Permit GW0080100 - Cherrystone Campground; 1511 Townfield Drive, Cape Charles, VA 23310
- September 7, 2023 9VAC25-1880

Committee members discussed the status of VA Pollution Abatement Permits on the Eastern Shore. Staff will reach out to DEQ for status of permit applications.

Borrow pit regulations in relation to dug ponds were discussed by the group. 75% of surface water withdrawals appear to be dug agriculture ponds. Assembly action, best practices, Bureau of Mines, DEQ, and agriculture regulations were discussed as means to alleviate regulatory burden.

Mr. Pope clarified ground water utilization totals - known use, 9 million gallons, compared to - model averages, 15 million gallons.

On July 14, 2023 the Eastern Shore Post republished a June 22, 2023 Virginia Mercury article "Scientist Study Natural Processes Affecting Eastern Shore Aquifers" by Charlie Paullin. Staff presented the Eastern Shore Post Column "'No cause for immediate concern' about Shore's groundwater" by Mem. Mastyl to the GWC - a written response to the article addressing June 14/June 22 inaccuracies.

6. Residential Well Testing Program

The committee discussed project scale, implementation, and financial considerations concerning the testing program. Testing procedures were also discussed. Mem. Mastyl advised the importance of going before Boards of Supervisors and permission for property access. Chmn. Coker advised that testing needs to include a cross section of well

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characteristics including all input and issues discussed. The draft budgets $84,528 for Residential Well Testing Program implementation.

7. September 19, 2023 Ground Water Consultant Report

Mr. McMillan updated the group on the specifics of new draft permits. Ballards and Cherrystone volumes discussed. Mem. Grossman noted that the permitted withdrawal more than doubled with measurable chloride increases. Mr. McMillan explained that the DEQ approach is primarily limited to monitoring and that residential water quality concerns are addressed by VDH. Inconsistencies and misstatements found in recent ground water withdrawal applications discussed. Advisor McMillan will draft comment letter addressing GWC concerns. Potential outreach to State Water Control Board, region representatives, and the need for regular DEQ meeting attendance discussed.

Schedule Next Meeting & Adjournment

The next Committee meeting was scheduled for October 17, 2023 from 10AM-12PM at the ESVA Chamber of Commerce, Melfa, VA.

Mem. Grossman moved to adjourn the meeting. Seconded by Mem. Hershey, the motion carried. The Meeting was adjourned at 12:01 PM.

Paul Muhly, Vice Chairman

Copy test:

Elaine K. N. Meil, Secretary

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Sandy Taylor
Administrative Director
Accomack-Northampton Planning District Commission

DATE: October 17, 2023

SUBJECT: **September 2023 Financial Statement**

Committee approval of the Financial Statement is requested.

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EASTERN SHORE OF VIRGINIA GROUND WATER COMMITTEE

Financial Statement-September 2023 **Fiscal Year 2024**

	Annual Budget	Current Activity	YTD Activity	Balance
Ground Water Consultant Appropriations:				
Accomack County	$ 14,251.00	$ 0.00	$ 3,562.75	$ 10,688.25
Northampton County	7,415.00	$ 0.00	$ 0.00	7,415.00
Subtotal	$ 21,666.00	$ 0.00	$ 3,562.75	$ 18,103.25
Ground Water Modeling Run Appropriations:				
Accomack County	$ 1,500.00	$ 0.00	$ 0.00	1,500.00
Northampton County	1,500.00	0.00	$ 0.00	1,500.00
Subtotal	$ 3,000.00	$ 0.00	$ 0.00	$ 3,000.00
Ground Water Committee Staff Support:				
Accomack County	$ 12,276.00	$ 906.00	$ 2,227.00	10,049.00
Northampton County	7,724.00	$ 580.00	$ 1,416.00	6,308.00
Subtotal	$ 20,000.00	$ 1,486.00	$ 3,643.00	$ 16,357.00
Ground Water Member Fees:				
Accomack County	$ 2,640.00	$ 0.00	$ 218.75	2,421.25
Northampton County	2,640.00	$ 0.00	$ 123.75	2,516.25
Subtotal	$ 5,280.00	$ 0.00	$ 342.50	$ 4,937.50
USGS Ground Water Model:				
Accomack County	$ 7,500.00	$ 0.00	$ 0.00	7,500.00
Northampton County	7,500.00	$ 0.00	$ 0.00	7,500.00
Subtotal	$ 15,000.00	$ 0.00	$ 0.00	$ 15,000.00
Ground Water Plan Project Implementation				
Accomack County	$ 26,854.00	$ 0.00	$ 0.00	26,854.00
Northampton County	15,827.00	0.00	$ 0.00	15,827.00
Subtotal	$ 42,681.00	$ 0.00	$ 0.00	$ 42,681.00
Total Revenues	$ 107,627.00	$ 1,486.00	$ 7,548.25	$ 100,078.75

Bills Payable as of September 30, 2023

DUE TO	DESCRIPTION	DATE	AMOUNT
A-NPDC	Staff Support	9/01/2023 - 9/30/2023	$ 1,486.00
Board Members	Meeting Fees		$ 0.00
Arcadis	Consultant		$ 0.00
		Total Bills Payable	**$ 1,486.00**

Allocated Funds

	Prior Year Funds	Expenditures	Balance
Ground Water Modeling Run	$14,000.00	$14,000.00	$ 0.00
Ground Water Plan Project Implementation	44,847.00	0.00	$ 44,847.00
Total Allocated Funds	$ 58,847.00	$ 14,000.00	$ 44,847.00

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Kellen J. Singleton
Interdisciplinary Planner
Accomack-Northampton Planning District Commission

DATE: October 17, 2023

SUBJECT: **September 19, 2023 Staff Report**

Environmental Reviews and Permits:

Title (Project Name): Causeway Bridge Replacement Project
Description: The National Aeronautics and Space Administration (NASA) is proposing to replace Wallops Island Causeway Bridge in Accomack County. The project area is within the NASA Goddard Space Flight Center's Wallops Flight Facility on Wallops Island. The Wallops Island Causeway crosses Cat Creek and connects the mainland to Wallops Island. The project includes site preparation, construction and removal of temporary construction access, construction of a new bridge parallel to the existing bridge on a new alignment, demolition of the existing bridge after the new bridge opens, and ongoing maintenance and repairs over the bridge's 75-year lifespan. In-water work would include pile driving for bridge construction, temporary construction access, demolition of temporary trestles and/or the use of construction vessels, and bridge demolition. Maintenance and repair may also include in-water work depending on the extent of activities. The proposed activity is subject to review for consistency with the enforceable policies of the Virginia Coastal Zone Management Program.

Public comment period: September 25, 2023 to October 23, 2023
Applicant name and project number: National Aeronautics and Space Administration, 23-144F
Facility name and address: NASA Wallops Fight Facility, Accomack County
DEQ Contact (for public comments and additional information): Julia Wellman at Julia.Wellman@deq.virginia.gov

VA Pollutant Discharge Elimination System Program :

- Domestic Sewage Discharges of Less than or Equal to 1,000 Gallons per Day (VAG40)
- Seafood Processing Facilities (VAG52)
- Remediation of Contaminated Sites and Hydrostatic Tests (VAG83)
- Discharges of Stormwater Associated with Industrial Activity (VAR05)
- Non-Metallic Mineral Mining (VAG84)
- Concentrated Animal Feeding Operations (VAG01)
- Concrete Products Facilities (VAG11)
- Vehicle Wash and Laundry Facilities (VAG75)

- Non-Contact Cooling Water Discharges (VAG25)
- Pesticides Discharges (VAG87)
- Watershed Permit for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed (VAN00)
- Potable Water Treatment Plants (VAG64)
- Discharges of Stormwater from Construction Activities (VAR10)
- Discharges of Stormwater from Small MS4s (VAR40)
- Fundraising Car Wash Guidelines

For details please see:

https://www.deq.virginia.gov/permits/water/surface-waters-vpdes#:~:text=The%20Clean%20Water%20Act%20established,Discharge%20Elimination%20System%20(VPDES)

VA Pollution Abatement Program :

Facility	Permit Number	City / County	Permit Action	DEQ Admin Office	Application Received	Application Complete	Draft Permit Sent to Owner
Accomack County Leachate Treatment Facility	VPA01079	Accomack County	Reissuance	Tidewater	12/11/2020	1/20/2021	
Tyson Farms Inc - Temperanceville	VPA01035	Accomack County	Reissuance	Tidewater	10/6/2020	5/12/2021	
Atlantic Town Center Clean Water Plant	VPA01080	Accomack County	Issuance	Tidewater	4/11/2011		
Kuzzens Incorporated	VPA01047	Northampton County	Reissuance	Tidewater	2/28/2022	5/27/2022	
Perdue Foods LLC - Accomack	VPA01076	Accomack County	Reissuance	Tidewater	9/9/2022		

Consent/Enforcement Orders:

N/A

Groundwater Withdrawal Permits:

Groundwater Withdrawal in Accomack County, Virginia - GW0080000
Public comment period: October 6, 2023 – November 6, 2023
Applicant name, address and permit number: Muhammad Arshad; 25380 Dennis Drive Parksley, VA 23421; GW0080000
Name and location of water withdrawal: Afshan Farm; 29246 Hallwood Road, Hallwood, VA 23359

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Groundwater Withdrawal in Accomack County, Virginia - GW0053901
Public comment period: September 29, 2023 – October 30, 2023
Applicant name, address and permit number: Perdue Foods LLC; 22520 Lankford Highway, Accomac, VA 23301; GW0053901
Name and location of water withdrawal: Perdue Foods LLC; 22520 Lankford Highway, Accomac, VA 23301

For details please see: https://www.deq.virginia.gov/permits/public-notices/water/water-withdrawal

Upcoming Events/Meetings:

Date and Time		Meeting Title	Board	Scope
Oct-19 2023 (Thu)	10:00 am	Public Meeting - FY 2024 Virginia Clean Water Revolving Loan Fund Intended Use Plan and Projects Targeted for FY 2024 Loan Assistance	State Water Control Board	G

Old Business:

Allocated Funds in Budget Statement

"Allocated Funds" in the Budget Statement reflect expenditures that are restricted to a specific commitment and are unavailable for other purposes. These include prior fiscal year(s) funding expended in proceeding periods.

"Ground Water Modeling Run" is a joint USGS and GWC effort invoiced the preceding fiscal year following data collection implementation.

"Ground Water Plan Project Implementation" is a NOAA CZM funded effort that includes intermittent updates of the regional Protection and Water Supply Plans often accumulated from past fiscal years and expended in proceeding periods as needed.

For questions concerning Allocated Funds in the Budget Statement please contact Sandy Taylor, ANPDC Director of Administration at (757) 787-2936 Extension 117.

VA Pollution Abatement Program Status Update

Staff contacted DEQ Tidewater Regional Office Deputy Regional Director Janet Weyland for a VA Pollution Abatement Program Status Update on Permit Applications on the Eastern Shore. Updates:

- Until reissuance permits are managed according to their original issuance.
- Atlantic Town Center Clean Water Plant was never constructed and will most likely require a new application if moving forward.
- The Tidewater Regional Office has onboarded six new hires to address workload.
- For further questions please contact Janet Weyland at 757.518.2151

New Business:

Virginia Tech Research Project Focused on PFAS in Well Water

A Virginia Tech research project (IRB #21-492) is being conducted that aims to investigate the presence of polyfluoroalkyl substances (PFAS, a chemical group that includes PFOS, PFOA, GenX, and other similar chemical compounds) in Virginia private well water supplies. The study aims to better understand the occurrence of PFAS in private well water and to identify different factors that may affect their occurrence and levels.

Previous Virginia Cooperative Extension Drinking Water Clinic participants from Floyd, Roanoke, Albemarle, Buckingham, Northampton, or Accomack County are the focus for this program. These counties were selected to allow researchers to answer research questions about how geological conditions, well type, well age, and land use practices affect what we find in the water. Sample collection kits from the Accomack Cooperative Extension office (23185 Front St. Accomac, VA 23301) will be obtained Monday, November 6th and collected Tuesday, November 7th. Information is confidential and participants will also receive information on PFAS levels in their water within 3-6 months, as well as a summary of our study's broad results when the study concludes in 2023.

Interested participants and general questions concerning the study can be directed to Kathleen Hohweiler at khohwe1@vt.edu or 540-231-4372. General questions about water quality or water system can be directed to Erin Ling, M.S., M.EPC, State Coordinator, Virginia Household Water Quality Program, Virginia Tech Biological Systems Engineering Department at 540.231.9058 or ejling@vt.edu

Public Comments to the Virginia Department of Environmental Quality Office of Water Withdrawal Permitting Concerning Permit GW0080100

Please see comments drafted by the following, attached (see related memo below):

- Chmn. John Coker
  Vice Chmn. Paul Muhly
  Sec. Elaine Meil
  Eastern Shore of Virginia Ground Water Committee
  Accomack-Northampton Planning District Commission
  PO Box 417 23372 Front Street Accomac, Virginia 23301
  (757) 787-2936

- Ken Dufty
  6182 Wardtown Road
  Exmore, Virginia 23350
  "northamptonissues@aol.com"
- RH Meyers
  7516 Prettyman Cir, Exmore, VA 23350
  757-442-3814

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Kellen J. Singleton
Interdisciplinary Planner
Accomack-Northampton Planning District Commission

DATE: October 17, 2023

SUBJECT: **GWC Public Comment to DEQ Office of Water Withdrawal Permitting Concerning Permit GW0080100**

GWC advisor Britt McMillan with addition and assistance from Chmn. Coker and staff has drafted and delivered a Public Comment concerning GW0080100 addressing inconsistencies and misstatements found in recent ground water withdrawal applications to Eric Seavey Manager, Office of Water Withdrawal Permitting. See below.

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Eastern Shore *of* Virginia

Ground Water Committee

Mr. Eric Seavey,

We are writing this letter not to complain about the water withdrawal requested by Cherrystone Campground but to bring to your attention the lack of understanding of our sole source aquifer system demonstrated by the author of the Cherrystone draft permit.

As I hope you know, our aquifer system is a critical resource to the Eastern Shore and since we are not connected to the rest of Virginia a significant depletion of our aquifer system could be a catastrophic event for Northampton and Accomack Counties. Our joint county Groundwater Committee has spent decades working with DEQ, state, federal, and private experts to understand and control our aquifer system so a major depletion does not happen. Knowledge of how our aquifer system works is critical to making intelligent decisions about groundwater withdrawal on the Eastern Shore of Virginia.

The Committee has asked our consultant hydrogeologist Britt McMillian to write a summary of our aquifer system and some of the challenges we face which is included below.

Thank you for your time and attention to this critically important resource of Virginia's Eastern Shore.

Yours Respectfully,

John Coker
Chairman, Eastern Shore of Virginia Groundwater Committee
Chairman, Northampton County Board of Supervisors

Paul Muhly
Vice Chairman, Eastern Shore of Virginia Groundwater Committee
Accomack County Supervisor

Elaine Meil
Secretary, Eastern Shore of Virginia Groundwater Committee
Executive Director, Accomack-Northampton Planning District Commission

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Eastern Shore *of* Virginia

Ground Water Committee

To: Eric Seavey, DEQ Central Office

eric.seavey@deq.virginia.gov

Because the Columbia-Yorktown-Eastover aquifer system is designated a Sole Source Aquifer area by the USEPA, preserving this critical resource has been one of the highest priorities for the Eastern Shore. The Eastern Shore of Virginia Groundwater Committee, established in 1990 by Accomack County and Northampton County has, for over the past 20-years, promoted use of the surficial (Columbia) aquifer as a far more sustainable source of groundwater over the confined Yorktown-Eastover aquifer system (YTEO), consisting of three separate aquifers, the upper, middle, and lower YTEO. Over these years, the Groundwater Committee has worked cooperatively with DEQ staff in working to maintain a sustainable water supply. The past over allocation of permitted groundwater withdrawals in the Eastern Virginia Groundwater Management Area and the steps required to correct the overallocation justify the importance of taking proactive steps to maintain a sustainable water supply.

In the past, there has been close communication between DEQ and the Groundwater Committee, in particular regard to groundwater withdrawal permits on the Shore. More recently, with the large number of permits that have been processed this year (2023) and some dating back to the poultry house permits, we have seen statements made in the draft permit documents that contradict information on the Sole Source Aquifers and contradict information presented in other permit documents. These contradictions relate to statements concerning 1) recharge to the aquifers, 2) limitation on aquifer yield, and 3) limitations on aquifer water quality.

The Groundwater Committee does not specifically object to the terms and conditions specified in the draft Cherrystone Campground Groundwater Withdrawal Permit (GW0080100), rather, the Groundwater Committee is concerned that the current understanding of the Sole Source Aquifers on the Eastern Shore is used when developing the permit conditions.

Based on previous discussions and comments by DEQ and the Groundwater Committee, the following are what we believe represents a joint understanding of the Surficial-Yorktown-Eastover aquifer system:

1. **Aquifer Recharge:**
    - The surficial (Columbia) aquifer is recharged by direct precipitation.
        - Most of the precipitation recharging the surficial aquifer is removed through evapotranspiration plus direct discharge to surface water (the Bay, ocean, and its tributaries).
        - A portion is also used for water supply, principally irrigation from ponds.
        - A much smaller percentage recharges the Yorktown-Eastover aquifer system.
    - Because the surficial aquifer is replenished at a much higher rate than the Yorktown-Eastover aquifer system, and because the YTEO is only recharged from the directly overlying surficial aquifer, the surficial aquifer is a far more sustainable source of water than the YTEO aquifers.
2. **Limitations on Aquifer Yield:**
    - Because the surficial aquifer is 1) unconfined and 2) shallow relative to the YTEO, per well yield is usually lower for the surficial aquifer.

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Eastern Shore *of* Virginia

Ground Water Committee

- Based on available well records, most wells in the surficial aquifer provide greater than 20 gpm and some wells have documented flows greater than 100 gpm. These yields are adequate for many of the Shore withdrawals.
- The unconfined condition for the surficial aquifer also results in greater spatial variability in well yield, making site specific determinations more important.
- There is also variability within the YTEO aquifer system. It is not uncommon that one of the three YTEO aquifers is not able to provide the desired yield at a specific location requiring use of one or more of the other aquifers.

3. **Limitations on Aquifer Quality:** All of the aquifers have limitations on water quality.
   - The surficial aquifer is more susceptible to land use related effects. Most common on the Shore is higher nitrate, principally from past agricultural activities.
   - The YTEO aquifer system is more susceptible to saltwater intrusion. Saltwater intrusion through upconing has been directly measured in a number of wells on the Shore as well as predicted through the Model. Saltwater intrusion in the surficial aquifer has not been documented or predicted through the Model.
   - Iron has been cited as an issue specific to the surficial aquifer.
     - However, based on available water quality data, there is little overall difference in iron concentration between the four aquifers.
     - Additionally, it is not uncommon for one or more wells screened in the YTEO aquifer system to require changes in use or require treatment for iron, as has been experienced in wells by the Town of Cape Charles, Captains Cove, and Town of Chincoteague among other CWS on the Shore.

In large part, most of the yield and quality concerns with the surficial aquifer relative to the YTEO aquifer system relates to assessing the YTEO as though it is a single aquifer and not an aquifer system composed of three separate aquifers. If the upper Yorktown-Eastover aquifer has high iron or low yield, then the middle Yorktown-Eastover aquifer is targeted. If the yield and quality assessment was made independently for each aquifer, there would be much less difference between these units.
In the recent past, DEQ has taken these factors into consideration, and has included the requirement in selected permits to complete a suitability assessment of the surficial aquifer within the permit period. Similar to the Ballard Brothers draft permit, for Cherrystone Campground, no site-specific information was presented on the surficial aquifer (although notably, Camp Silver Beach to the south obtains the majority of its potable water from the surficial aquifer).

The Groundwater Committee has noted a number of recent draft Permits that have been submitted for Public Comment that, under the Alternatives Source evaluation, appear to present contradictory assessments in the discussion on alternate sources, including in the draft Cherrystone permit, as outlined below:

- Fact Sheet statement: *"The Columbia aquifer is surficial and recharged locally. The geography of the operation location, being on a peninsula, puts it in close proximity to salt water on three sides. Significant water withdrawal from the Columbia aquifer has the potential to stress the aquifer and increase salt water intrusion. In addition, the use of potable water is required for all plant operations since this water will come in contact with product and surfaces holding and containing product. The Yorktown-Eastover aquifer provides potable groundwater whereas the Columbia aquifer does not. Water treatment for iron and manganese removal would be required*

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Eastern Shore *of* Virginia

Ground Water Committee

prior to use. Should the source become brackish due to heavy pumping then it will become completely unusable for plant production and sanitary purposes."

- The justification provided above is flawed for the following reasons:

  a) It is far more likely saltwater intrusion will occur in the Yorktown-Eastover (YTEO) aquifers, in particular the lower YTEO, which will be used in the aquaculture operations. Both the Columbia aquifer and the YTEO aquifers are recharged locally. Recharge to the YTEO is far more limited than the Columbia aquifer. From consideration of recharge, the Columbia (surficial) aquifer is preferred.

  b) Saltwater intrusion (as upconing) has already been measured in the lower YTEO to the south at Cape Charles. The Technical analysis completed by Aquaveo also found a potential for saltwater intrusion through upconing could occur in the middle and lower YTEO (see model summary figures below with the finding that *"VAHydroGW-ES model results establish a potential for adverse changes to water quality as a result of the proposed withdrawal"*. Therefore, the finding that saltwater intrusion is likely to occur in the surficial aquifer but not the YTEO is not supported by the evidence. Finally, the statement *"Should the source become brackish due to heavy pumping then it will become completely unusable for plant production and sanitary purposes."* more likely applies to the YTEO than the surficial aquifer.

  c) The statement that the YTEO provides *"...potable groundwater whereas the Columbia aquifer does not..."* is not supported by actual use on the Shore. Numerous domestic wells use the surficial aquifer as a source of supply. Additionally, the surficial aquifer is successfully used by some Community Water Systems, including the Town of Chincoteague and YMCA Camp Silver Beach (which is located south of the draft Cherrystone withdrawal). While there are some areas where the water quality of the surficial aquifer would not be considered potable without treatment, the ability of the surficial aquifer to provide potable water in general on the Shore has been demonstrated.

  d) The statement *"Water treatment for iron and manganese removal would be required prior to use."* is a site-specific consideration and not an endemic characteristic of the surficial aquifer. In fact, in some areas of the Shore, concentrations of iron and manganese in the surficial aquifer is lower than the corresponding YTEO. Additionally, it is not uncommon for water systems using the YTEO on the Shore to require iron treatment, including some Community Water Systems. Therefore, without site specific information, the assumption that the surficial aquifer will require treatment for iron while the YTEO is not supported.

Because the Eastern Shore of Virginia is a Sole Source Aquifer, and the fresh groundwater is a limited resource that should be properly managed to maintain a sustainable supply, the Groundwater Committee would appreciate appropriate consideration for use of the surficial aquifer in future permits, as had been assessed in the past.

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Kellen J. Singleton
Interdisciplinary Planner
Accomack-Northampton Planning District Commission

DATE: October 19, 2023

SUBJECT: **Residential Well Testing Program**

Subcommittee Program Scope and Standards Update

Mem. Walker has incorporated the suggestions from Mems. Mastyl and Muhly into the Aug. 8th draft. The following are notes of consideration:

- An update to the ground water resources protection and management plan.
- Residential water testing services procurement and contacts.
- Addition of interior residential water testing to program e.g., lead.
- Development of a "GW 101 Fact Sheet" for domestic use.
- Health and Safety Plan (HASP) development.
- Residential test results distribution methods.

Attached for review is the draft scope as of 10/11/23. GWC Advisor McMillan will complete technical revisions.

The draft budgets $84,528 for Residential Well Testing Program implementation.

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Britt McMillan
Principal Hydrogeologist
Arcadis

DATE: October 17, 2023

SUBJECT: October 17, 2023 Ground Water Consultant Report

Technical/Regulatory/Educational Items

1. Two new draft permits has been published in October 2023: Perdue Farms (GW0053901) and Afshan Farm (GW0080000) for a total of 21 draft permits to date this year. Perdue Farms is a permit renewal for a withdrawal that has been active since 1971. Afshan Farm is a new permit for Poultry House operations. DEQ is accepting public comment on the draft Perdue permit through October 30, 2023 and public comment on the draft Afshan Farm permit through November 6, 2023. Copies of 1) the draft Permit, 2) associated Fact Sheets that provide information on the basis for the permit conditions, and 3) instruction on providing public comment are available on the DEQ website under the heading ***"Contact for public comments, document requests and additional information"***: https://www.deq.virginia.gov/permits/public-notices/water/water-withdrawal

Facility		Type	Aquifers				New	Draft Permit (Gal)		Percen-tile	Public Comment Deadline
				YTEO							
Permit No	Name		S	U	M	L		Monthly	Annual		
GW0079800	Rogers Poultry Farm	A					Y	740,000	3,000,000	3%	6-Mar
GW0070900	Jones 1 Farm	A/P	✓ (98%)	✓			Y	16,570,000	58,000,000	89%	6-Mar
GW0070600	Doughty-Drewer	A		✓			Y	52,281,000	106,009,000	96%	6-Mar
GW0079900	Tram Thoa Farm	A/CA				✓	Y	857,200	3,620,000	5%	6-Mar
GW0044601	Captains Cove	P		✓	✓		N	21,900,000	107,000,000	97%	13-Mar
GW0049900	Tyson Farms	I		✓	✓	✓	N	61,890,000	588,960,000	99%	13-Mar
GW0067101	Bull Farm	A		✓			N	43,700,000	94,700,000	95%	3-Apr
GW0049601	Trails End	P	✓ (½-½)		✓		N	3,740,000	25,200,000	78%	3-Apr
GW0065901	Christian Ames	A/P	✓ (82%)	✓			N	48,060,000	93,660,000	95%	3-Apr
GW0053501	Triangle Mobile Home	P			✓	✓	N	539,400	6,350,000	23%	10-Apr
GW0072400	The Ivy Farm	A		✓	✓		Y	2,250,000	10,000,000	49%	June 12
GW0065701	Machipongo Farm	A	✓ (½%)	✓			N	18,070,000	65,170,000	90%	June 5
GW0069601	Hog Neck Farm	A	✓ (100%)				N	19,059,000	40,780,000	76%	July 3
GW0046001	Ballard Brothers	I		✓	✓	✓	N	1,370,000	12,900,000	62%	July 24
GW0039202	Sunset Beach	P	✓ (90%)		✓			1,600,000	7,500,000	29%	
GW0033101	Accomack Offices	P			✓			600,000	6,000,000	22%	Aug 21
GW0069701	Davids Nursery	A		✓			N	25,877,000	125,261,000	97%	Aug 28
GW0042502	YMCA Silver Beach	P			✓			930,000	5,350,000	17%	Aug 28

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GW0080100	Cherrystone Campground	P			✓	✓	N	3,340,000	11,800,000	60%	Oct 2
GW0053901	Perdue Farms	I		✓	✓	✓	N	78,000,000	700,000,000 to 650,000,000	100%	Oct 30
GW0080000	Afshan Farm	A			UNK		N	1,216,860	4,725,900	13%	Nov 6

Notes:

Type: A = Agriculture
CA = CAFO (Confined Animal Feeding Operation)
I = Industrial
P = Public Water Supply

Aquifers:
S = Surficial aquifer (the % indicates the percent of the total withdrawal from the surficial aquifer)
YTEO = Yorktown-Eastover aquifer system
U, M, L = Upper, Middle, Lower YTEO

New:
Y = New Permit
N = Re-Issued Permit

Percentile: Compares annual amount to other permitted withdrawals on the Eastern Shore. For a percentile of 75%, 75% of the permits are less than the draft permit and 25% are greater. Large withdrawals (> 75-percentile) are presented in orange.

Facility		Special Conditions		
Permit No	Name	WQ	Alt	Other
GW0079800	Rogers Poultry Farm		✓	Geophy Logs, Pump Intake
GW0070900	Jones 1 Farm			Pond Control
GW0070600	Doughty-Drewer		✓	Pump Intake, Pond Control and Metering
GW0079900	Tram Thoa Farm		✓	
GW0044601	Captains Cove	✓		
GW0049900	Tyson Farms	✓	✓	Pump Intake, GW Levels, Two new SOW Well Clusters (8 SOW wells)
GW0067101	Bull Farm		✓	Pond Control
GW0049601	Trails End	✓		
GW0065901	Christian Ames			Geophy Logs, Pump Intake, Pond Control and Metering
GW0053501	Triangle Mobile Home			Geophy Logs
GW0072400	The Ivy Farm			Pump Intake
GW0065701	Machipongo Farm		✓	Aquifer test completed March 12, 2012
GW0069601	Hog Neck Farm			No special requirements
GW0046001	Ballard Brothers	✓		Chloride monitoring. Well video logging and survey.
GW0039202	Sunset Beach			Pump intake and well video logging.
GW0033101	Accomack Offices			Well abandonment.
GW0069701	Davids Nursery		✓	Well abandonment.
GW0042502	YMCA Silver Beach			Pump intake and geophysical logging, well abandonment.
GW0080100	Cherrystone Campground	✓		Chloride monitoring. Well video logging, survey, and pump reset.
GW0053901	Perdue Farms	✓	✓	Tiered (decreasing) withdrawals, Alt Source Development Plan, Well Abandonment
GW0080000	Afshan Farm		✓	Pump intake, Geophy Logs, video logging

Draft Perdue Farms (GW0053901) is for a "renewed" permit for an existing withdrawal. Perdue Farms has been in operation since 1971. Prior to the Groundwater Management Act of 1992, Perdue operated under Permit ES-044. The current permit was issued August 1, 2012 with an expiration date of July 31, 2022. The permit has been administratively continued until a new permit is issued. The amount requested is for the largest single withdrawal on the Shore.

Withdrawal Amounts: The requested withdrawal amount was the same as the current permit (700,000,000 gal/yr and 78,000,000 gal/month). Technical analysis performed for DEQ by Aquaveo

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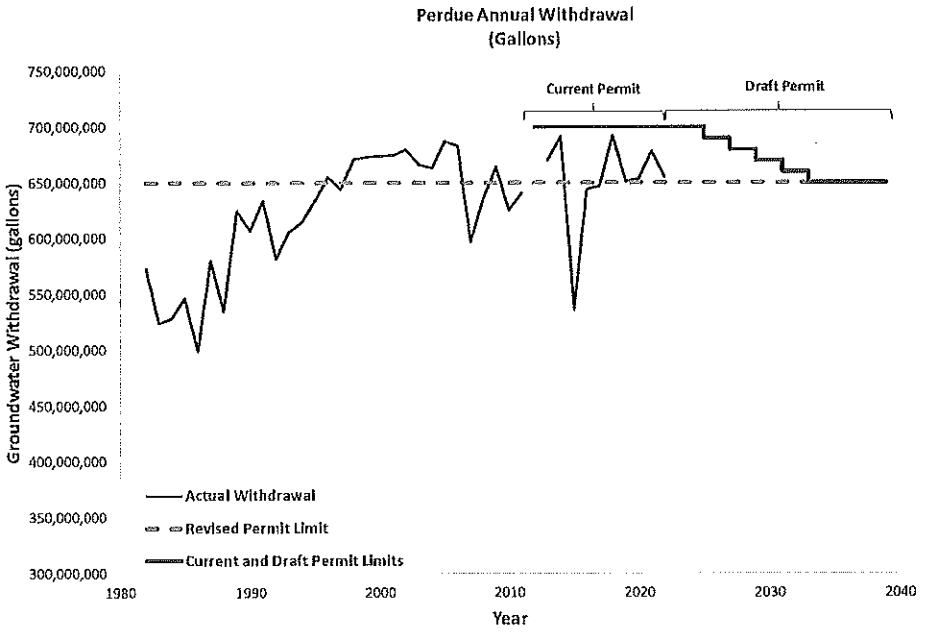
determined that the requested amount (700,000,000 gal/yr) did not meet the 80% drawdown criterion (*see below for definition of the 80% drawdown criterion*). Based on additional modeling, Aquaveo determined that 651,000,000 gal/yr could be withdrawn and still meet the 80% drawdown criterion. To provide Perdue sufficient time to modify their withdrawal to meet the reduced withdrawal amount, DEQ has set the following Tiered scheduled to reduce withdrawal from the current permitted amount to 650,000,000 gal/yr.

Year	Annual Withdrawal (gal/yr)	Number of Years Exceeded by Historical withdrawals
1-2	700,000,000	0
3-4	690,000,000	2
5-6	680,000,000	4
7-8	670,000,000	11
9-10	660,000,000	14
11-15	650,000,000	18

Below is a comparison of historical withdrawals to the current and draft permit limits. Prior to the 2012 permit, the withdrawal was limited to 2,637,850 gal/day under permit ES-044 (issued under the regulations that preceded the Groundwater Management Act of 1992).



The current Permit was issued August 1, 2012. Over the withdrawal period Perdue has maintained the calendar year total below both the original ES-044 and current Gw0053901 limits. However, beginning with the first Tier reduction to 690,000,000, there have been historical withdrawals that have exceeded the draft Permit amount (see table above). Groundwater use since 1996 has, with few exceptions, exceeded the draft Permit amount that will be in effect by year 11 of the Permit. Based on the historical withdrawals, it is reasonable to assume Perdue will need to find alternatives to the withdrawal specified in the draft Permit.

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The source of the reduction is the exceedance of the 80% drawdown criterion. The 80% drawdown criterion is established to prevent dewatering an aquifer and permanently reducing its potential yield (transmissivity or hydraulic conductivity). This is achieved by not allowing the water level in a confined aquifer from being lowered below the top of the aquifer (a confined aquifer, by definition, is groundwater that is under "pressure", and the water level extends above the top of the aquifer. The specific definition of the 80% criterion is: *"80% of the distance between the land surface and top of the aquifer"* and is evaluated using the DEQ model for all permitted withdrawals in confined aquifers within the Area of Impact for that withdrawal (defined as the 1-foot drawdown). *A more detailed discussion of the 80% drawdown criterion will be provided separately.*

Permit/Model	Model		Middle Yorktown-Eastover Aquifer		
	Row	Col	Water Level (ft MSL)	80% Allowable Level (ft MSL)	Water (Head) above 80% Criterion (ft)
2012 Perdue Permit (700 MG/yr)			-125	-135	+10
2023 Perdue Permit (700 MG/yr)	121	51	-141	-131	-10
2023 Perdue Permit (651 MG/yr)	121	51	-130	-131	+1

Based on the Technical Analysis completed in 2012, there was 10-feet of head (water level) above the 80% allowable level in 2012. For the 2023 Technical Analysis (dated April 7, 2023), groundwater level for same amount (700 MG/year) was 10-feet below the 80% allowable level, for a change of 20-feet in the model simulated water levels over the past approximate 10-years.

Reducing the withdrawal amount to 650 MG/yr meets the criteria with 1-foot of head above the 80% allowable level.

Special Conditions:

a) Tiered groundwater withdrawal step-down from the current permit amount of 700 MG/year to 650 MG/year by the 11th year of the permit.
b) Alternatives Source Analysis and Development Plan. Due within 1-year after the permit is issued. The Plan must include:
    a. Site specific investigations for alternative sources of water, including alternative source aquifers. The alternative source investigation must include evaluating water quantity and water quality and the potential to replace "all or a portion of the groundwater currently being withdrawn from the upper, middle, and lower Yorktown-Eastover aquifers.
    b. An Aquifer Test Plan and Aquifer Testing will be completed for any potential alternative aquifer.
    c. The Plan will be implemented within 1-year after approval by DEQ.
    d. An Alternatives Source Plan will be developed within two years following completion of the site specific investigations.
c) Water Quality Monitoring quarterly (every 3 months) from four wells.
d) Abandon Well #4 within 1 year after the permit is issued.

Additional Remarks:

The current amount Perdue is allowed to withdrawal (700 MG/year) cannot be re-permitted due to an exceedance of the 80% drawdown criterion. This is the first permit in the Eastern Shore of Virginia Groundwater Management Area where an existing permitted amount cannot be renewed.

We currently do not have sufficient information to determine why the previously (2012) acceptable withdrawal is not acceptable in 2023. It may be due to one or more changes over the past 10-years, including the model recalibration in 2019 and/or additional groundwater withdrawals permitted over the past 10-years.

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It is important to note that the exceedance of the 80% drawdown criteria occurred:

- Only in the middle Yorktown-Eastover aquifer and
- Only in a limited area within the Perdue well field

And does not mean the overall aquifer system is at capacity, rather only one aquifer (middle Yorktown-Eastover) in a limited area is at capacity.

While this principally affects the Perdue withdrawal, it could affect other (new or existing) permitted groundwater users that are using the middle Yorktown-Eastover aquifer and have either a large enough withdrawal or are close enough that their area of impact (1-foot drawdown) extends to the critical area.

There is one other area where permitted groundwater levels are approaching the 80% drawdown criteria (as previously discussed in the May 2023 Groundwater Committee Meeting). This area is associated with the Tyson Farms permit. Based on modeling associated with the draft Tyson Farms permit (February 2023), there is an area within the Tyson well field where there is only 3-feet of available head (water level) for the upper Yorktown-Eastover aquifer:

Permit/Model	Model		Middle Yorktown-Eastover Aquifer		
	Row	Col	Water Level (ft MSL)	80% Allowable Level (ft MSL)	Water (Head) above 80% Criterion (ft)
Dec 2022 Tyson Permit (589 MG/yr)	61	54	-65	-68	+3

Like the limited head available for the middle Yorktown-Eastover aquifer in the Perdue area, there is limited head available for the upper Yorktown-Eastover aquifer in the Tyson area. This has the potential to affect other (new or existing) permitted groundwater users that are using the upper Yorktown-Eastover aquifer and have either a large enough withdrawal or are close enough that their area of impact (1-foot drawdown) extends to the critical area.

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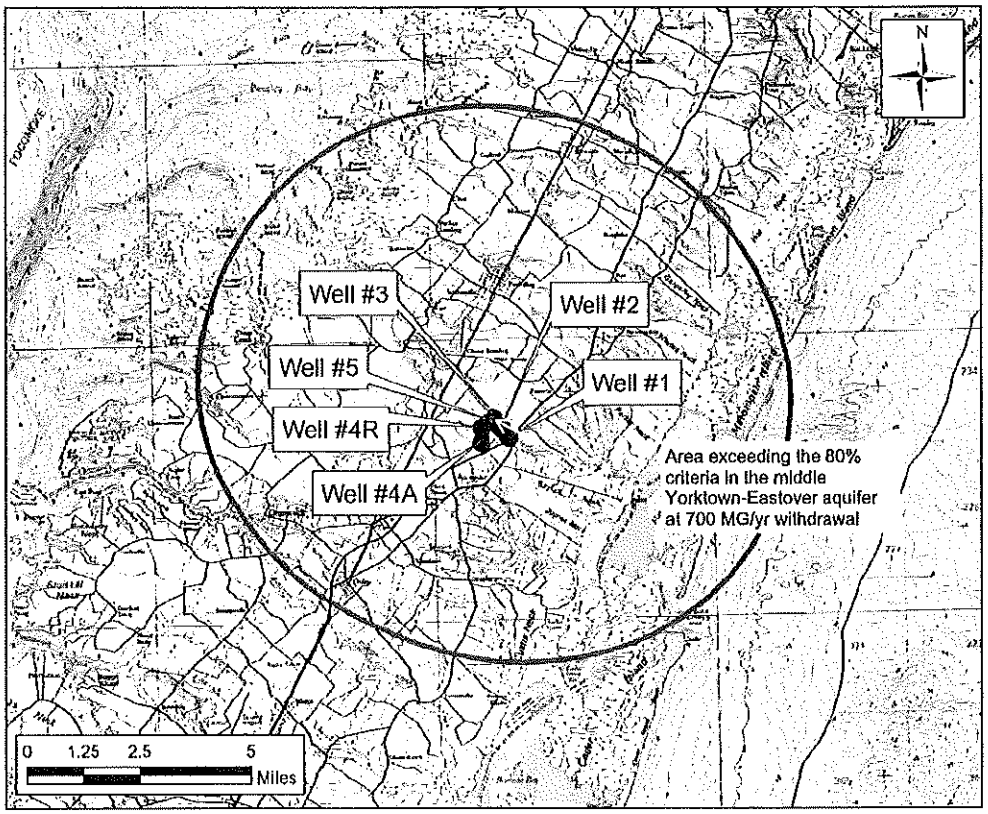
Model Simulated Area of Impact for Current Permit Amount

Perdue Foods
Area of Impact - Middle Yorktown-Eastover Aquifer



MYE New Critical Cell

Perdue Foods Wells

Middle Yorktown-Eastover Aquifer Area of Impact

Simulated drawdown at or exceeding one foot in the Middle Yorktown-Eastover aquifer resulting from a 700,000,000 gallon per year, 50 year, multi-aquifer (Upper, Middle, and Lower Yorktown-Eastover) withdrawal using the VESM.

Maximum radius of one foot drawdown (Area of Influence) extends approximately 7.3 miles from the pumping center.

Technical evaluation performed by Aquaveo, LLC for the Virginia DEQ, Office of Water Supply
April 11, 2023

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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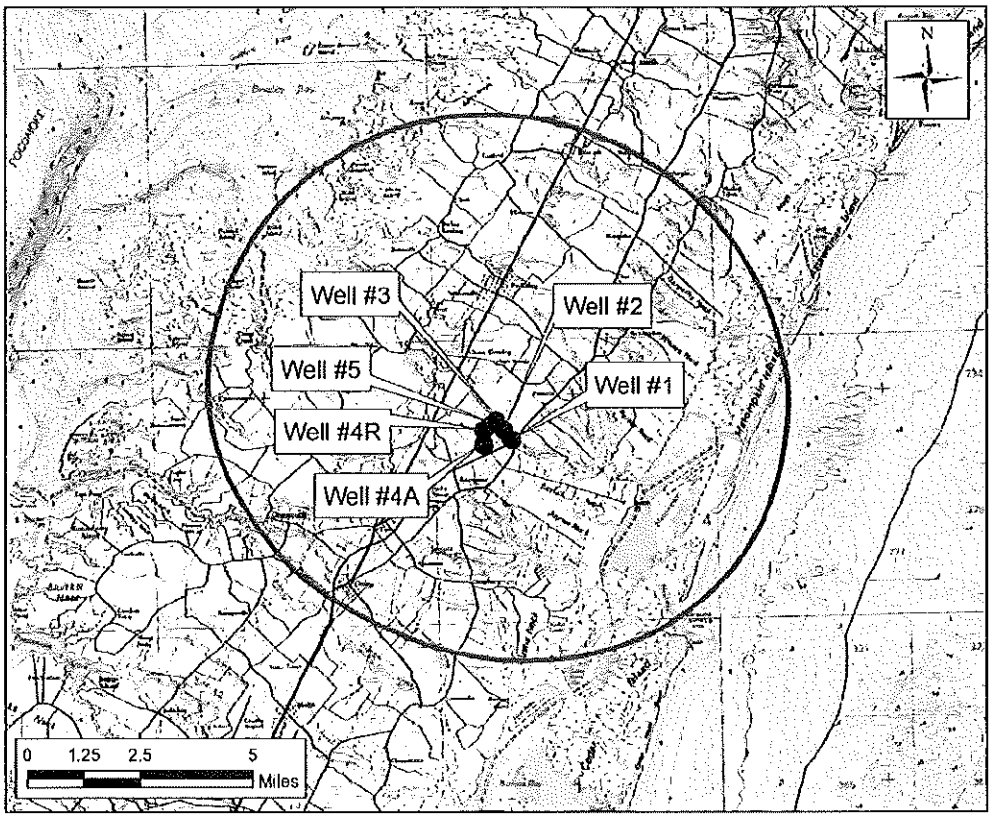
Model Simulated Area of Impact for draft Permit Withdrawal

Perdue Foods
Area of Impact - Middle Yorktown-Eastover Aquifer



● Perdue Foods Wells

◯ Middle Yorktown-Eastover Aquifer Area of Impact

Simulated drawdown at or exceeding one foot in the Middle Yorktown-Eastover aquifer resulting from a 50-year, multi-aquifer (Upper, Middle, and Lower Yorktown-Eastover) withdrawal using the VESM. Withdrawal amount varies per pumping schedule described previously (starting at 700 MGY and decreasing 10 MGY every two years until it reaches 650 MGY).

Maximum radius of one foot drawdown (Area of Influence) extends approximately 7.1 miles from the pumping center.

Technical evaluation performed by Aquaveo, LLC for the Virginia DEQ, Office of Water Supply
May 16, 2023

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

2. **Afshan Farm (GW0080000)** is for a new permit for six existing poultry houses. The poultry farm was previously named Banty Shanty Poultry Farm, and had applied for an initial groundwater permit in April 2021. The amount requested is for a relatively small amount, approximately 13% of the current permitted withdrawals are lower.

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Withdrawal Amounts: Projected groundwater demand was based on metered data from Holland Poultry Facility. Holland Poultry Facility has similarly sized houses. Well depths of 300-feet below ground surface are reported for three of the four wells. One well does not have a reported depth but is believed to be 300-feet also.

Alternative Sources: There is no discussion on use of the surficial aquifer as a potential alternative source of water. There is a statement that *"Site-specific data will be necessary to determine the viability of the surficial aquifer and to determine what portions of the use it can supply"*.

Special Conditions:

- Geophysical Boreholes: within 5-years of permit issuance, at least one borehole will be advanced and geophysical logs (SP, single point, short normal, long normal, and gamma) will be logged at a location and to a depth approved by DEQ. The geophysical logs will be used by DEQ to establish aquifer top and bottom depths.
- Well construction: within 5-years of permit issuance, a camera survey will be completed for all four production wells to determine 1) well depth, 2) casing size, 3) material, and 4) screen interval. Pump intake depth and well capacity will also be determined.
- Pump Intake Depth and Reset: within 90-days of pump intake determination, documentation from a certified well driller, or other source accepted by DEQ, will be submitted that the pump intakes are all above the depth established by DEQ.
- Alternative Source Analysis and Development Plan: *"While the application states generally that the surficial aquifer would not be viable, site-specific investigation is necessary to evaluate the surficial aquifer quality and availability."* By 2033, an alternative source investigation must be completed and results submitted to DEQ by 2034 for review and acceptance. The investigation must provide pump test and water quality data from a test or production well screened in the surficial aquifer on or near the poultry farm.

Remarks: This is a relatively small withdrawal (87% of the permitted withdrawals are greater). While the surficial aquifer was not evaluated, there is the requirement to evaluation the source within 10-years of the permit issuance (by 2033) with results submitted to DEQ. The area is close to Tyson Farms although the area of impact does not quite extend to the Tyson Farms well field.

Based on well depth, it is likely that the wells are screened in either the middle or lower Yorktown-Eastover aquifer. If, based on the geophysical logs and camera survey, the wells are screened in the upper Yorktown-Eastover aquifer, it is likely the withdrawal will lower water levels in the Tyson Farms well field area where there is less than 3-feet of head (water level) remaining above the 80% drawdown criterion (critical surface).

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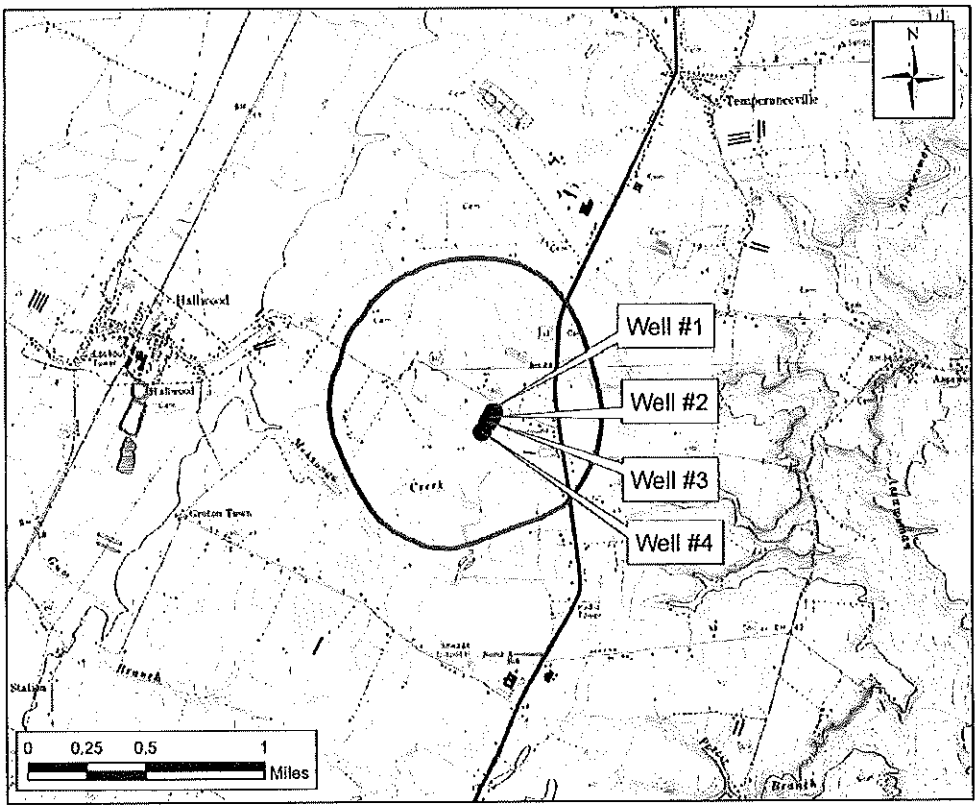
Model Simulated Area of Impact for draft Permit Withdrawal

Afshan Farm LLC
Area of Impact - Lower Yorktown-Eastover Aquifer



● Afshan Farm LLC Wells

Lower Yorktown-Eastover Area of Impact

Simulated drawdown at or exceeding one foot in the Lower Yorktown Eastover (MYE) aquifer resulting from a 4,725,900 gpy, 50 year withdrawal from the Lower Yorktown-Eastover aquifer using the VAHydroGW-ES.

Maximum radius of one foot drawdown (Area of Impact) extends approximately 0.7 miles from the pumping center.

Technical evaluation performed by Aquaveo, LLC for the Virginia DEQ, Office of Water Supply March 30, 2023

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

3. **80-Percent Drawdown Criteria:** The recent new and renewed groundwater withdrawal permits increase the allowable withdrawals in the confined Yorktown-Eastover aquifer. The primary technical limitation to how much groundwater can be withdrawn from the confined aquifers is based on lowered water levels, as established in the regulations under 9VAC25-610 as the 80-percent Drawdown Criteria.

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WEBSITE: www.a-npdc.org

a. Within the Groundwater Management Area, the 80% drawdown criteria applies to confined aquifers. Surficial (Columbia) aquifers are exempt.
b. The 80% drawdown criteria sets the limit on how much the water levels can be lowered in a confined aquifer.
    i. Before a permit is issued, as part of the technical evaluation,
    ii. The criteria is defined as *"...a point that represents 80% of the distance between the land surface and the top of the aquifer."*
    iii. *"Compliance with the 80% drawdown criteria will be determined at the points where the predicted one-foot drawdown contour is predicted for the proposed withdrawal."*
    iv. The elevation that defines the 80% drawdown criteria is also referred to as the "Critical Surface".
c. The 80% drawdown criterion was exceeded in an area within the Perdue Foods well field for the middle Yorktown-Eastover aquifer for the current Perdue Foods permit, resulting in a reduction in the draft permitted amount. Additionally, there is less than 3-feet of water level (head) remaining above the 80% drawdown criterion for the upper Yorktown-Eastover aquifer in an area within the Tyson Farms well field.
d. Understanding how much water (drawdown) remains available and where groundwater is most limited are important in understanding future limitations to groundwater use and sustainability of the Yorktown-Eastover aquifer system.
e. A presentation will be provided that:
    i. Illustrates application of the 80% drawdown criteria to the Eastern Shore.
    ii. How exceedance of the criteria has affected withdrawals in the Eastern Virginia Groundwater Management Area.
    iii. Identifies areas, based on the Aquaveo model simulations where drawdown from existing withdrawals will most likely limit future withdrawals on the Shore.

4. **Public Comments:** Previously, the Groundwater Committee responded to all draft Permits as part of the public comment phase. These comments were provided at a time DEQ gave the Groundwater Committee a "courtesy copy" of the draft Permit prior to the 30-day comment period. After DEQ ceased providing the courtesy copy and given the shorted time frame to address comments, this practice ceased. With the large number of recent draft permits it would be beneficial to comment on draft permits as necessary. Given the shortened response period (compared to the past), it is helpful to have structured response options along with individualized comments. Four structured response options are provided below:

    a. "The Committee believes that the proposed withdrawal is consistent with the intent of the *Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia* and the *Virginia Ground Water Management Act*, and that the draft permit provides adequate protection for the ground water resource. Therefore, the Eastern Shore of Virginia Groundwater Committee supports the proposed Ground Water Withdrawal Permit." *{add qualifying text, such as citing beneficial uses or concerns regarding implementation}*
    b. "The Committee believes that the proposed withdrawal is substantially consistent with the intent of the *Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia* and the *Virginia Ground Water Management Act*, and that the draft permit provides protection for the ground water resource. Therefore, the Eastern Shore of Virginia Groundwater Committee does not object to the proposed Ground Water Withdrawal Permit." *{add qualifying text, such as citing beneficial uses or concerns regarding implementation}*
    c. "Based on the information provided, the Committee believes that the proposed withdrawal may conflict with the intent of the *Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia* and the *Virginia Ground Water*

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Management Act, and may have a detrimental effect on the ground water resource. Therefore, the Eastern Shore of Virginia Groundwater Committee would like several issues clarified before the Ground Water Withdrawal Permit is issued." *{add qualifying text that specifies the issues, such as definition of the impact area, water conservation requirements, or monitoring}*

d. "Based on the information provided, the Ground Water Committee believes that the proposed withdrawal may conflict with the intent of the *Ground Water Supply Protection and Management Plan for the Eastern Shore of Virginia* and the *Virginia Ground Water Management Act*, and may have a detrimental effect on the ground water resource. Therefore, the Eastern Shore of Virginia Groundwater Committee has concerns about the Draft Ground Water Withdrawal Permit and believes that a Public Hearing is appropriate to resolve these concerns." *{add qualifying text that specifies the issues, such as definition of the impact area, water conservation requirements, or monitoring}*

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MEMORANDUM

TO: Eastern Shore of Virginia Ground Water Committee

FROM: Kellen J. Singleton
Interdisciplinary Planner
Accomack-Northampton Planning District Commission

DATE: October 17, 2023

SUBJECT: **Committee Attendance Record**

Committee Attendance Record
The FY2024 Committee Attendance Records are attached.

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EASTERN SHORE of VIRGINIA Ground Water Committee

EASTERN SHORE OF VIRGINIA GROUND WATER COMMITTEE
FY 2024 ATTENDANCE RECORD

Member	Term Exp.	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
ACCOMACK COUNTY													
Paul Muhly	*Chair; Next vote: July 2023*	*	X	X									
Dan Hershey	*June 2025*	*	X	X									
Grayson Chesser	*June 2023*	*	X	X									
Sue Mastyl	*April 2025*	*	X	X									
NORTHAMPTON COUNTY													
John Coker	*Vice Chair; Next Vote: July 2023*	*		X									
Paul Grossman	*March 2024*	*	X	X									
Steve Sturgis	*July 2024*	*	X										
Ann Hayward Walker	*December 2024*	*-	X	X									
NON-VOTING EX-OFFICIO MEMBERS													
Charles Kolakowski	*NA*	*											
Mike Mason	*NA*	*											
Elaine Meil	*NA*	*											

-	Not a Member	X	Member Present	()	Alternate Present
*	No Meeting Held	NA	Not Applicable		

6182 Wardtown Road
Exmore, Virginia 23350
"northamptonissues@aol.com"

October 2, 2023
Eric Seavey
Director Water Withdrawal Permitting
PO Box 1105
Richmond, Virginia 23218

Re: **Request to Amend Twenty (20) Groundwater Withdrawal Permits Pending** for Approval in the ESVA Groundwater Management Area. **Also Request for Public Hearing o**n GW0080100 as statements that permit regarding alternative source are factually wrong, misleading, and set a dangerous precedent.

Dear Mr. Seavey:

After attending the ESVA Groundwater Committee meeting held in the Chamber of Commerce office on September 19, 2023, it has come to my attention that there are 20 groundwater withdrawal permits within the Eastern Shore of Virginia Groundwater Withdrawal Management Area pending for approval before your department. While six (6) of these are applications for new withdrawals, the rest are renewals with many representing modifications of original withdrawal permits.

In reviewing the two most recent applications, with the Cherrystone Campground permit having a public comment period ending on October 2, 2023 and Perdue Processing Plant public comment period ending on October 30, 2023, it is apparent that the "alternative source consideration" wording in these permits is in violation of the spirit and intent of the General Assembly and was signed into law as the 2019 Acts of Assembly Chapter 755 as well as inconsistent with past permit conditions approved by the State Water Control Board for the poultry industry.

I. Background

In 2018, this writer contacted staff of your department in an effort to determine how much water was being withdrawn by the existing and proposed poultry broiler houses in Accomack County. To the dismay of many of the folks

we were working with at the time to determine this withdrawal rate and its current and potential impacts on our sole-source aquifer, we discovered, perhaps at the same time as the DEQ, that there were never any groundwater withdrawal permits issued (or even applied for) for over 50 industrial poultry house operations (several of which had over a dozen large broiler facilities on site). Hence DEQ entered into a Consent Order with the poultry house operators to bring them into compliance with the permitting requirements in Groundwater Management Area, of which the ESVA is one of only two in the Commonwealth of Virginia.

Working with Scott Kudlas and David Paylor at the time, citizens became very engaged in the new permitting process and actively participated in the effort to bring this industry into compliance. The reason why permits were never applied for, in my understanding, is that multiple groundwater wells were being utilized for each group of 2-3 broiler houses so that the 300,000 gallons per month (gpm) trigger that requires a groundwater withdrawal permit was never reached.

Citizens and elected officials, as well as those on the ESVA Groundwater Committee, actively and aggressively argued that our surficial aquifer, the Columbia, needed to be assessed and indeed tapped to meet many of the poultry industry's need for non-potable water. The DEQ staff and director agreed, and a very long and arduous process was undertaken to ensure that issue was addressed in the manner it deserved.

In reaction to the large public outcry, Senator Lynwood Lewis introduced SB1599 which made it easier to for all large groundwater users to utilize the surficial aquifer and the bill was signed into law by the Governor as the 2019 Acts of the Assembly Chapter 755.

This law requires the State Water Control Board to develop regulations to provide incentives and other modifications to promote the use of the surficial aquifer on the Eastern Shore of Virginia. [See page 8 of the 2020 Accomack County Poultry Report 1/1/2019-12/31/2019].

Adhering to that mandate, in December 2019 the State Water Control Board approved Groundwater Withdrawal Permits for 45 Poultry houses. While your DEQ department staff and director only recommended requiring 26 poulltry house facilities to investigate the use of the Columbia Aquifer for alternative uses such as cooling and washing, the **State Water Control Board overrode that recommendation and required that *all 45 poultry houses prove*, empirically through quality and quantity well monitoring, that the Columbia could not be**

tapped to provide an alternative source for cooling and other groundwater needs and requirements.

Indeed, alternative source investigations required that the poultry house groundwater withdrawal permittees "**provide pump tests and water quality data from a test or production well screened in the surficial aquifer on the facility site as well as conclusions on the capability of the surficial aquifer *to supply all or part of the needs of the facility"*** [See page 8 of the Accomack County-Annual Poultry Report 1.1/2019-12/31/2019].

II. It appears as if the precedent set for alternative use considerations has been abandoned in the draft groundwater withdrawal permits pending before the DEQ at this time.

In attending the ESVA Groundwater Committee meeting last week, this writer became aware of the fact that there is a backlog of over 19 groundwater withdrawal permits pending before your department and seeking approcal. It also was revealed by the Committee that there are two (2) newer pending applications for GWP's by Cherrystone Campground as well as the Perdue Processing plants.

An informal and lay-person's calculations on the total groundwater that is being proposed be withdrawn from our four aquifers (Columbia and Upper, Middle, and Lower Yorktown-Eastover) is over 1/3 of a billion gallons of our confined and unconfined finite groundwater **each month).** Note that only six (6) of those pending permits are using the Columbia aquifer for the irrigation and agricultural needs, with three of those six also tapping the confined aquifers for their groundwater needs...which could include filling of farm ponds that can be used for irrigation during drought conditions.

During the citizen participation in the permitting process by the DEQ on the poultry issue during the 2018-19 timeframe referenced above, it was determined that recharge through rain water to our Yortown/Eastover complex was approximately 9 million gallons of fresh water each day, but at that time, our withdrawal was estimated to be approximately 10 million gallons per day from the confined aquifer. This recharge deficit exacerbates the encroachment of chlorides, the increase of which are now being experienced in drinking water accesssed from our Upper and Middle Yorktown aquifer complex. Further, the over-pumping of our confined aquifers will undoubtedly exacerbate subsidence, or the sinking of our land surface, as it is the pore pressure in these lower aquifers that suspends and upholds our ground levels on the ESVA/

The total groundwater withdrawal rate from the pending 21 groundwater withrawal permits appears to be 10 million gallons of groundwater **per day**, and this withdrawal rate, if my calculation is correct, could result in a catastophic impact to the sustainability of life and crops on the ESVA. Indeed, unlike our neighbors across the Bay who over-pumped the mighty Potomac aquifer-under DEQ's "watchful eye"- to the point they had to build a 78 mile pipe from Lake Gaston to the Hampton Roads area, and now are forced to recycle their wastewater through the SWIFT initiative, we do not have any alternative to supplying our drinking water needs....except for an increased reliance on the Columbia...which is immune to chloride encroachment..unlike the lower aquifers.

III. This petition requests that the "alternative source" investigations in these permits be changed to reflect the permit conditions the State Water Control Board imposed on the poultry industry as referenced above, and become compliant with state law and precedent. It also requests a public hearing so that this issue can be thoroughly commented upon by the general public, who, like myself, only became aware of the severity of this process very recently.

The "alternative source" consideration requied in the new groundwater withdrawal permt applications is not even remotely reflective of the laudable and indeed legally-required investigation included in the December 2019 poultry processing withdrawal permits.

Indeed, it only triggers an alternative source investigation if the applicant determines that there is a viable alternative for their processing groundwater needs. As one can see in the pending Perdue Groundwater Permit application, the word "Columbia" or "surficial" aquifer is not even mentioned. See Page 10 of Perdue's Groundwater Withdrawal permit aka GW0053901, which only requires an analysis of an alternative source if the applicant states that there is a viable one available, leaving an open door to make statements to evade the technical investigation of an alternative by simply bending the truth in and around itself by arguing that the Columbia is not suitable for that designation.

For instance, as an example of this very point, in the Cherrystone Groundwater Withdrawal permit aka GW0080100 which seeks to withdraw over 3 million gallons of groundwater from both our Middle and Lower Yorktown-Eastover aquifers each month with an annual rate much higher than that, the applicant attempts to evade the requirement previously placed upon the Poultry industry in the 2019 permit awards by the State Water Control Board

by simply stating the Columbia is not a viable alternative to reduce reliance on the confined and minimally-recharged deeper aquifers because "**(s)ignificant water withdrawal from the Columbia aquifer has the potential to *stress the aquifer and increase salt water intrusion".***

Either the applicant has confused the surficial aquifer's hydrogeological traits in regard to the propensity to draw in chlorides-a trait exclusive only to the deeper aquifer regime- or they are engaged in a prevarification that will have disastrous consequences if adopted by the DEQ, and will set an incredibly dangerous precedent for the prospective and pending groundwater withdrawal permitting procedures.

In short, the new wording by DEQ in the applications for groundwater siwhdrawals in our Groundwater Management Area simply leaves it up to the applicant to determine "IF" there is an alternative source that needs explicit investigation to rule out. Indeed, as we see in the Cherrystone application, this perversion of Senator Lewis's ***alternative source law*** as well as the SWCB's inisitence that ALL the broiler growing operations in Accomack County explicitly PROVE that the Columbia is not a viable source, is violative of both and ***it must not be allowed.***

Therefore, I am requesting that all further processing of the 21 groundwater withdrawal permits pending before the department be immediatly suspended until the language in the permit applications regarding alternative source investigations can be brought into compliance with state law and SWCB precendent, and am formally requesting a public hearing be scheduled and held on the ESVA at your department's earliest convenience, but with a 30-day notice to the public to be published in the Eastern Shore Post in two consecutive weeks prior to the 30 day notice period.

IV. Conclusion

In the McFarland/Pope "Hydrogeologic Framework of the Eastern Shore of Virginia" (2019), there is an extensive discussion on the encroachment of chlorides in the lower aquifers on the ESVA. It is stated that the rise in chlorides in our Upper, Middle and Lower Yorktown/Eastover aquifer complex that we are experiencing now is only reflective of the groundwater withdrawals pre-industrial and commercial build out (including the poultry industry in Accomack County).

Maryland farmers on the Eastern Shore have lost tens of thousands of tillable land on farms just north of the Virginia line, and farmers in Bloxom and

south have abandoned their fields due to saltwater intrusion from both above and below ground encroachment.

It is imperative that we all work together to get as many groundwater users relying much more on the **Columbia aquifer** than the Yorktown-Eastover resource, as our surficial aquifer has potable, clean, and unlimited potential to meet a vast majority of our groundwater needs without exacerbating salt water intrusion and encroachment.

Sincerely,

Kenneth Dufty

757-442-7889

cc. ESVA Groundwater Committee
Northampton County BOS
Accomack County BOS
State Water Control Board
Governor Glenn Youngkin
Senator Lynwood Lewis
Director of DEQ

Name and Location of Water Withdrawal: Cherrystone Campground; 1511 Townfield Drive, Cape Charles, VA 23310

Comments from RH Meyers
7516 Prettyman Cir, Exmore, VA 23350
757-442-3814

Mr Seavey, the comments below are a summary of my **very strong objection** to this permit as it appears in the draft that I expressed to you by phone call on Sep 19th.

The amount of this proposed withdrawal from the Yorktown aquifer for uses that are non potable is contrary to all the data, evidence and warning that Mr. Randy McFarland of USGS presented to the Eastern Shore Groundwater Committee in the recent past with DEQ present. His findings were also discussed at length with the DEQ permit leadership who are no longer with you. Their knowledge has apparently been lost to the current leadership and this draft is evidence of that lacking.

In summary, Mr. McFarland documented and cautioned that withdrawal from the Yorktown aquifers for non potable use will cause their degradation as has already happened in Cape Charles less than 1.5 miles south. He urged that all withdrawal for non potable use be from the Columbia aquifer with monitoring for salt intrusion. In addition, his test wells for documenting saline intrusion from excessive withdrawal indicated that this is happening both in the Cape Charles area and on the "seaside" north east of Cape Charles on a farm property that uses irrigation close to the shoreline. If saline free water is not available to mix and dilute potable water for consumption, desalination plants will become necessary and are very expensive. This cost may be transferred to the entire population for the benefit of a a particular use permit that was granted by those who are lacking the experience or knowledge to accurately assess the available natural resources.

The withdrawal amounts proposed for this applicant are excessive. The sources proposed are wrong. Having a facility built that is highly dependent on large water sources in an area that is clearly documented to have limited supplies and then granting a water withdrawal permit for it as submitted, indicates a serious lack of knowledge by the permitting authority.

Please DO NOT grant this permit as it is currently written.

Sincerely,

RH Meyers

Eastern Shore Ground Water Committee (GWC)

Residential Water Well Testing Program

The GWC's mandate is:

> *"to assist local governments and residents of the Eastern Shore in understanding, protecting, and managing ground water resources, to maintain a ground water resources protection and management plan, to serve as an educational and informational resource to local governments and residents of the Eastern Shore, and to initiate special studies concerning the protection and management of the Eastern Shore ground water resource."*

A high priority of the GWC is undertaking a comprehensive residential well testing program, which will extend over multiple years. This is an initial description of the program to conduct testing of drinking water from residential wells.

Program Scope

The program will target Low-to Moderate Income (LMI) neighborhoods, where it is more likely to find older drinking water wells and wastewater septic fields that may not meet current standards. These systems have a higher likelihood of having water quality issues than recently constructed systems. The purpose of the program is to help residents learn about drinking water quality and address potential concerns they have about the quality of their drinking water from individual wells serving their homes. The GWC will invite the Board of Supervisors representatives in both counties to help identify initial priority stakeholders and areas to be tested. The Program also will engage Eastern Shore residents in groundwater testing and in the process of using and interpreting that data to help build confidence and credibility in residential drinking water test results.

Data collected from the well testing program will be input into the ground water geographic information system model. Past research has documented areas in the surficial aquifer where nitrate exceeds the drinking water MCL. Limited data has indicated that shallow wells are at greatest risk of contamination. Other research has documented areas where there are excessive levels of salt in deeper wells that may be a result of saltwater intrusion. Water Quality Testing of Wells in the Surficial Aquifer, Testing of On-Site Systems, and Identifying Emerging Contaminants are GWC High Priorities of Concern.

This residential well testing program is voluntary and separate from any required testing by the Virginia Dept. of Health (VDH) and Dept. of Environmental Quality (DEQ). Testing of drinking water from community water systems, which is regulated under VDH, is excluded from this program.

Program Goals

To improve the understanding of drinking water quality in LMI neighborhoods, specific activities in this monitoring program will be implemented to achieve the following goals:

1. Develop and implement a residential well testing program, in accordance with appropriate testing protocols provided by certified laboratories and/or agency guidelines, e.g., Virginia Division of Consolidated Laboratory Services (DCLS) Drinking Water Sample Collection Guide.
2. Coordinate the communication and exchange of resulting data with local, state, and federal drinking and groundwater stakeholders.
3. Institute educational activities about drinking water quality for eastern shore communities.

Sampling Area, Annual Objectives, and Testing Standards

This program will test the quality of groundwater in residential wells, i.e., the source of their drinking water. To this end, samples will be taken from either from an outside faucet prior to any home treatment system or a tap at the well head, rather than interior faucets. This is because drinking water quality can be altered in delivering water from the well to the faucet, depending upon the age and materials used in the interior plumbing system and other aspects, e.g., home water treatment system and water heaters. This program will test the source of drinking water in individual residences, quantitatively analyze samples using certified laboratories, and compare results to acceptable standards set by the US EPA, as well as the Commonwealth of Virginia.

The following objectives will guide the development of annual activities:

1. Annual sampling of the Bi-County area. Initial target LMI communities identified by the Board of Supervisors. The number of residences to be tested will vary as the program ramps up and learns more from annual test results. Tested residences with results that exceed standards will be eligible for more extensive quantitative testing.
2. Prioritize communities with a majority of the domestic wells that are greater than 40-years old.
3. Prioritize wells that are screened in the Columbia (surficial) aquifer.
4. Compare results to the corresponding standards (see table below) and identify residences that warrant more intensive testing.
5. Communicate results with the individual residents.
6. Carry out educational activities to promote citizen learning about drinking water quality, such as the use of home test kits by high school science classes.

The principal measures for safe drinking water are the Environmental Protection Agency (EPA) drinking water standards. EPA has established two principal sets of standards:

- *Primary* Drinking Water Standards to *protect public health*, and
- *Secondary* Drinking Water Standards are for constituents that are *nuisances but not health threatening* and can have objectionable effects on the water, including 1) aesthetic effects (undesirable taste or odor), 2) cosmetic effects (staining or deposits) or 3) technical effects (can damage equipment).

The complete set of drinking water standards can be found at: https://www.epa.gov/dwreginfo/drinking-water-regulations

On the Shore, the constituents most likely to exceed a primary or secondary drinking water standards are listed in the table below along with the limits and effects. Note that on the Shore, the most likely source of lead is from old lead pipes used in plumbing or some older copper pipes that used lead solder. Lead normally does not exceed levels of concern in the groundwater itself.

Primary Drinking Water Standards *(Health)*		
Constituent	Limit	Effects
Arsenic	0.01 mg/L	Skin damage or problems with circulatory systems. May have increased cancer risk.

Lead	0.015 mg/L	Infants and children: delays in physical or mental development. Adults: kidney problems, high blood pressure.
Nitrate*	10 mg/L	Infants below 6-mos could become seriously ill and if untreated may die.
Total coliforms*	5%	An indicator that other, potentially harmful bacteria may be present. Not a health threat itself.
Secondary Drinking Water Standards *(Nuisance)*		
Chloride	250 mg/L	Salty taste
Color*	15 color units	Visible tint
Surfactants / Foaming Agents	0.5 mg/L	Frothy, cloudy, bitter taste, odor
Iron	0.3 mg/L	Rusty color, sediment, metallic taste, reddish or orange staining
Odor	3 TON (threshold odor number)	"rotten egg", musty or chemical smell
pH (acidity)*	6.5 to 8.5	Low pH: bitter metallic taste, corrosion High pH: slippery feel, soda taste, deposits
Sulfate	250 mg/L	Salty taste
Total dissolved solids (TDS)*	500 mg/L	Hardness, deposits, colored water, staining, salty taste

*Components to be analyzed in FY2024 residential well tests (Water Testing Labs of MD, Inc. analysis for Conventional Loans, i.e., bacteria, nitrates, sand, turbidity, pH, chlorine).

Year 1/Initial Activities (FY 2023)

1. Establish a Subcommittee of the GWC to scope and lead in the detailed planning and oversight of the Residential Well Testing Program (quantitative) to achieve the Program Goals (above).

2. Identify a preliminary water screening activity (qualitative home tests) to begin to involve the community and learn about community concerns, testing protocols and kits which will be used to develop subsequent activities to support Goal #3.

    - Initiated the identification of a home drinking water screening kit to meet the initial Year 1 objective community representatives, potentially also including high school science classes. Examples to consider include: Hach test kits and a variety of home water test kits. One example is the H2O OK Drinking Water Analysis Test Kit at Lowes which contains litmus paper type tests for total chorine, total hardness, iron, pH, total alkalinity, copper, iron bacteria, nitrates, nitrites, and hydrogen sulfide.

- Contacted Northampton High School to inform them about the program, and inquired if science classes would be interested in incorporating drinking water testing into the curriculum.

Year 2 Activities (FY2024: July 1, 2023 – June 30, 2024)

Goal #1

1. Finalize constituents to be analyzed and note in the table on pages 2 and 3.
2. Obtain Board of Supervisor (BOS) recommendations for 3-4 LMI communities in each county for residential well testing (approximately 5 residences in each community).
3. Identify and train staff to conduct residential well testing. This may include consultant staff and/or GWC members.
    a. Develop sample collection protocols (Attachment 1)
    b. Consultant to develop/use Health and Safety Plan for field sampling
    c. Purchase sampling supplies, e.g., containers, markers, Ziplock bags, gloves, cooler, etc.
    d. Establish contract with certified analysis laboratory
4. Develop Groundwater 101 Fact Sheet
5. ANPDC work with BOS input and community stakeholder representatives to identify target residences and coordinate with property owners.
6. Conduct initial sampling and deliver samples to certified laboratory for analysis, e.g., Water Testing Labs of MD, Inc.

Goal #2

1. Develop format protocol for data reporting, presentation, and sharing with local, state, and federal drinking and groundwater stakeholders.
    a. The protocol should enable data to be added to existing databases, such as the Accomack-Northampton WQ Summary and the ground water geographic information system model.
2. Develop results interpretation guide for residents (Attachment 2).
    a. Include language for recommended additional action if standards are exceeded.

Goal #3

1. Plan for educational activities to be conducted in FY2024.
    a. If high school science classes will be given home test kits, select test kit, define which schools, coordinate with them, develop schedule, provide training protocols and record keeping spreadsheet.
        i. These tests are not limited to LMI students or individual wells. That is, some samples may be taken from homes that have community water systems.
    b. Provide Groundwater 101 Fact Sheet to schools.
    c. Provide testing and record keeping (spreadsheet) instructions (Attachment 3).
    d. Email a copy of the spreadsheet from each school to the GWC.

Safety

A Health and Safety Plan (HASP) will be prepared by the consultant for the field testing. The HASP will identify potential hazards including biological (e.g., animals and insects), chemicals (including sample preservatives), and physical (such as slips, trips, and falls) and appropriate responses to these hazards. Information on steps that will be taken if an injury occurs will be provided in the HASP. GWC will be held harmless for any liability.

Points of Contact

Eastern Shore Ground Water Committee Chairs (GWC)

- Paul Muhly, Accomack County Board of Supervisor (pmuhly1@verizon.net)
- John Coker, Northampton County Board of Supervisor (johncoker@aol.com)

A-NPDC Staff

- Kellen Singleton (ksingleton@esvaplan.org)

Subcommittee for the Residential Well Water Testing Program

- Paul Muhly (pmuhly1@verizon.net)
- Daniel Hershey, Accomack County member (danhershey1947@gmail.com)
- Ann Hayward Walker, Northampton County (ahwalker@seaconsulting.com)

Technical Advisor to the GWC

- Britt McMillan, ARCADIS

Attachment 1

Quantitative Residential Well Testing: Sample Collection, Handling, and Data Collection

This water quality testing will analyze drinking water samples from wells for individual residences (not community water wells). The samples will be taken from a tap prior to any home water treatment system. For homes with no treatment system, sample locations will be determined on a case-by-case basis with a preference on a location used for drinking.. This is because drinking water quality can be altered in delivering water from the well to the faucet, depending upon the age and materials used in the interior plumbing system and other aspects, e.g., home water treatment systems or water heaters. Samples will be delivered to a VELAP or DCLS certified laboratory for quantitative analysis and results compared to acceptable standards set by the US EPA. Tested residences with results that exceed standards will be eligible for more extensive quantitative testing.

A Shore representative as part of the well testing team to accompany the sampling personnel.

Results will be shared with the homeowners. The data will be input into the Accomack-Northampton WQ Summary and the ground water geographic information system model.

Collect the following information and record on the spreadsheet:

- Sample location – 911 address
- Household name
- Testing date
- Sample location (GPS)
- Photographs of well location and water appearance
- Label individual sample containers:
    1. Accomack County: A – (district # 1-9) – sample number. **Example: A – 4 – 1** (Accomack, 4th district, 1st sample taken in the county)
    2. Northampton County: N – (district # 1-4) – sample number. **Example: N – 2 – 5** (Northampton, 2nd district, 5th sample taken in the county)
    3. Write code on container with a Sharpie
    4. There will be two samples at each location – see #1 and #8 below. The 120 mL container should be labeled **a** (example **A – 4 – 1a**) and the 250 mL container should be labeled **b** (example **A – 4 – 1b**)

Sample Collection Procedure for Private Homes (from Water Testing Labs of MD, Inc.)

1. Nitrile exam gloves (powerless) will be worn at all times.
2. Obtain a sterilized container of approximately 4.0 oz. capacity (120 ml). There should be a powder or small amount of liquid preservative in the bottle. Care must be taken not to touch the inside of the container or lid. Some of the preservatives are strong acids or bases and care must be taken to avoid spilling any liquid. Contact with the preservatives must be avoided. If contact occurs flush with copious amounts of water.
3. Run the COLD water from an outside tap with no aerators, swivel taps, or filters for 15-20 seconds.
4. Remove the seal completely and take the cap off the container (use powerless nitrile gloves, and/or be sure not to place fingers on top or any part of the container to avoid contamination).
5. Fill the container to just below the neck, AT LEAST to the 100 mL line marked the bottle (be sure not to dump any out after sampling).
6. Place cap back on the container, tighten, and return to the Ziplock bag.

7. Keep the container iced in a cooler or in a refrigerator until analysis is performed.
8. Make sure the sample is returned to the laboratory **within 24 hours** after sampling or the sample may be rejected.
9. Obtain a (non-sterile) 250 mL container and fill it with water from the same tap. This is for chlorine residual and requested chemical testing.

Samples will be accepted 8:30 AM – 4 PM, Monday – Friday, excluding holidays.
If you have any questions, please call us at 410-546-1318. Carrie Myers, Lab Director.

Attachment 2

An Example: Interpreting Water Quality Test Results

Consider also adding some language about what do to if their sample result exceeds a primary drinking water standard. Would additional sampling be appropriate? Be sure to have this consistent with the table on pages 2 and 3, including noting primary and secondary contaminates.

Example from Idaho https://www.deq.idaho.gov/water-quality/groundwater/wells/

1. *If your well water tests positive for a contaminant, discuss your test results and determine any health risks with your local* public health department..
2. *If your water is contaminated to a point that it may harm your health, fix the problem as soon as possible. You may need to find an alternative drinking water source (for temporary or permanent use), disinfect your well, repair your system.*

What We Test and... Acceptable Levels*	
Primary Drinking Water Standards Protect from Potential Adverse Health Effects	
Total Coliforms	Absent
Nitrate	< 10 mg/L
Turbidity	< 1 NTU
Secondary Drinking Water Standards Protect from Objectionable Taste, Odor, Color	
Total Dissolved Solids	< 500 mg/L
Surfactants (Foaming Agents)	< 0.5 mg/L Note: in groundwater, presence of surfactants may indicate influence from nearby waste disposal such as septic systems
Iron	< 0.3 mg/L
pH	6.5 to 8.5 SU
Sulfate	< 250 mg/L
No Established Drinking Water Contaminant Level	
Salinity	Measures dissolved solids with results similar to Total Dissolved Solids. Measurement units are ‰.
Specific Conductance	Measures dissolved conductive solids (such as sodium). Measurement units are mS/cm.
Phosphate	High levels are an indirect indicator of influence from influence from nearby waste disposal such as septic systems.
Dissolved Oxygen	Influences mobility of metals such as iron.
*By the Safe Drinking Water Act and United States Environmental Protection Agency (EPA) Regulations. < means less than > means greater than mg/L means milligram per liter or part per million NTU means Nephelometric Turbidity Unit SU means Standard Unit ‰ means part per thousand mS/cm means millisiemens per centimeter	

Attachment 3

Qualitative Home Well Water Quality Testing for High School Science Classes

1. Teacher to train students
    a. Show constituents in the kit to be tested and explain the difference between primary and secondary constituents. Prepare them to be able to explain the difference to home owners.
    b. Refer to Groundwater 101 Fact Sheet for Residences
    c. Develop class data reporting sheet (school, class name and instructor, sample code for school and class and individual sample, and date of sample collection)
    d. Sample Collection Protocols (follow test kit instructions)
    e. Sample labeling (code)
2. Students collect the following information and data as conditions allow:
    a. Water test location – 911 address
    b. Does the home have a drinking water treatment system (yes or no)?
    c. What is the location of the drinking water faucet from which the sample was taken (e.g., kitchen, bathroom?)
    d. Was the sample collected from a faucet ***after*** the treatment system?
    e. Household name
    f. Testing date
    g. Photographs of well location and water appearance
3. Evaluate samples
    a. Compare test results to metrics in the test kit, note any exceedances on sample collection form
    b. Students return samples to school with completed sample form
    c. Add each test location result to class reporting sheet
    d. Plot water test locations on ES map (GPS?)
    e. Classroom discussion – What did we learn?
    f. Email completed data tracking sheet to A-NPDC
4. Share results
    a. Share results with homeowner by showing them and discussing the results compared to the result interpretation sheet
    b. For results that exceed a metric which is health-related (primary constituents only), homeowners could use an alternative drinking water source, e.g., bottled water, and should contact their local health department for additional information or suggestions,
        i. For– note the exceedances on the class spreadsheet

Background

Input from Dixon Tucker via email to AHW on 6/25/23

For your sampling, are you wanting to just do PMCLs (primary maximum contaminate levels/health effects), or general nuisance parameters?
There are some known high levels of nitrates near some septage lagoons. The arsenic, nitrate, and PFAS mentioned here.
Cape Charles might have a bit of saltwater intrusion (something is causing their DBPs to be more of the brominated rather than the chlorinated species).
The impact crater plays havoc with the geology Eastville and south.
There are plenty of places with sulfur, iron, and manganese.

Input from Britt via email on 6/28/23

For water quality testing I think what is important is a blend of the PMCLs (as Dixon mentioned) and SMCLs (nuisance/taste-odor-color) customized for the Shore groundwater – my suggested short list (ones most important to test) are:

- **pH, total coliforms, nitrate, turbidity, total dissolved solids, surfactants (foaming agents), iron, sodium, sulfate, hardness.** Lead is not an issue for groundwater, but it could be an issue for some houses with old piping.

Notes from Subcommittee Meeting on August 4, 2023

If the annual budget exceeds $5000, granting agencies will probably require that a request for professional services (RFPS) or request for proposal (RFP) be issued. After subcommittee discussion, the following points were agreed for A-NPDC to use in developing an RFP to procure services to carry out the residential well testing scope of work.

We only discussed quantitative sampling. What about the qualitative high school testing?

Budget

1. Administrative Labor (preferably $25, or not to exceed $50 per hour). Consider an ESCC intern. Labor rate will include liability insurance.
    a. GWC update Groundwater 101 Fact Sheet for Residential use (Britt developed the original fact sheet)
    b. Coordinate with homeowners to schedule sampling and find out location of testing faucet
    c. Purchase supplies (or does A-NPDC do this?)
        i. For quantitative testing?
        ii. Also, high school test kits? Which ones, cost?
    d. Establish contract with certified laboratory (or does A-NPDC do this?)
    e. Data entry – sample tracking and results
    f. Reporting to GWC

2. Field Labor (preferably $25, or not to exceed $50 per hour). Consider an ESCC intern. Labor rate will include liability insurance. HASP – Use their own or provided by A-NPDC?
    a. Obtain supplies from Administrative
    b. Carry out sampling
        i. Complete Well Testing Field Work Sheet
        ii. Deliver samples to laboratory for analysis
3. Sample analysis - Use cost estimate from Water Testing Labs of MD, Inc. Salisbury Md.

Cost assumptions for FY 2024

- Sample analysis: 2 counties (9 districts in AC, 5 districts in NC) 10 samples/county district: 140 samples at $80/sample = $11,200 ($80 for coliform bacteria, nitrates + nitrites, sand turbidity, pH. If also Iron, add $10; if also hardness, add $10. If also the previous plus lead and copper, analysis is $129)
- Field travel time for sample location: 30 minutes to each site x 10 sites = 5 hr./day. Double = 10 hours /day
- Field travel time to deliver samples to Salisbury lab: 2.5 hrs. RT from AC; 4.5 hrs. RT from NC

Milestones

Quantitative Testing

- September 2023 – develop, issue RFP
- November – select contractor (s)
- December 2023 - complete administrative tasks 1. A
- January 2024 – complete administrative tasks 1. B – D (above)
- February - March – collect samples
- April – Complete Analysis
- May – Compile results and deliver to GWC and other agencies for model input
- June – GWC to review, present/report to A and N county BoS, and plan for FY 2025

Qualitative Testing

- September, October 2023 – contact schools, assess interest, confirm which schools and teachers
- Purchase test kits (how many, which ones?)
- November 2023 – coordinate with teachers to prepare for testing in the Spring Semester
- December 2023 – deliver test kits and Groundwater 101 Fact Sheet
- January to March 2024 – carry out testing (too long?)
- April – share results with GWC
- May – GWC follow up and plan for FY 2025