EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE AND THE DEPARTMENT OF ENVIRONMENTAL QUALITY

Bank of America Building, 3rd Floor Multipurpose Meeting Room, 1111 East Main Street, Richmond, VA 23219

February 29, 2024
10:30 AM

DRAFT MEETING MINUTES

Committee Members Present	
John Aulbach – Aqua Virginia	Ivy Ozmon – Hampton Roads Planning District Commission
Joey Hiner - SERCAP	Robert Pickett – NN SWCD
Dan Holloway - HRSD	Doug Powell – James City County Service Authority
David Jurgens – City of Chesapeake	Jake Tabor – Virginia Farm Bureau
Preston Kirby - VDH	Nathan Thomson – James River Association
Patrick Fanning – Chesapeake Bay Foundation	

The following committee members were absent from the meeting: Chief Steve Adkins – Chickahominy Tribe; Mark Bennett – USGS; Nina Butler – WestRock; Stewart Leeth – Smithfield Foods; John Loftus – VA Economic Development Partnership; Keith Martin – Chamber of Commerce; Municipal Water – King George County; Al Moor – Western Tidewater Water Authority; John O'Dell – VA Well Drillers Association; Mike Rolband – DEQ; Stephen Schoenholtz – VA Water Research Center; Kellan Singleton – Accomack – Northampton PDC; Kurt Stephenson – Virginia Tech; Robert Wayland – Citizen-at-Large; Andrea Wortzel – Mission H2O

Technical Support Staff Present	
Brendan Brogan - DEQ	Gouri Mahadwar - DEQ
Scott Bruce - DEQ	Liz McKercher - DEQ
Sam Caldwell - USGS	Doug Moyer - USGS
Brian Cambell - DEQ	Wesley Myers - DEQ
Koltyn Caricofe - DEQ	Bill Norris - DEQ
Weedon Cloe - DEQ	Matthew C. Richardson - DEQ
Greg Connock - USGS	Eric Seavey - DEQ
Allison Dorsey - DEQ	Dallin Walker - DEQ

Heather Esposito - DEQ	

Interested Parties	
SERCAP – Jon C. Cawley	Tauxemont Community Association - Glenda Booth
STANTEC – Jason Early	Tauxemont Community Association – John Culbertson
	Tauxemont Community Association – Robert J. Surovell

Meeting Notes

Welcome and Introductions:

Mr. Weedon Cloe, Manager of the DEQ Office of Water Supply, convened the meeting at 10:30 AM. He welcomed members to the second meeting of the Eastern Virginia Groundwater Management Advisory Committee for FY2024. He thanked everyone for attending today's meeting and apologized for the short notice. He noted that the next meeting of the group will be at the end of April and that we would be sending out details regarding the date in the near future so that everyone can get it on their calendars. He identified the available handouts for today's meeting.

Handouts:

- Agenda,
- EVGWMAC Member Contact List,
- Draft Minutes/Notes for the November 28, 2023, EVGWMAC Meeting,
- USGS Presentation

He went over some housekeeping items, including location of facilities and emergency evacuation procedures.

Due to some recent personnel changes, DEQ is trying to get an accurate count of the committee members and to identify any proxies or alternates that are involved. Mr. Cloe asked committee members to introduce themselves and to verify their status on the committee to confirm the makeup and membership of the group. He asked the committee members to confirm their contact information before the end of the meeting. He noted that there were representatives from the Tauxemont Community in attendance. He also noted that members of the DEQ Groundwater Characterization Team, members of the Water Supply and Analysis Team, and Permitting Staff were in attendance at today's meeting. He thanked the representatives from USGS for being in attendance and for preparing today's presentation and noted that VDH was also represented.

Meeting Agenda:

Mr. Cloe went over the planned meeting agenda outline.

1. Welcome and Introductions – Confirmation of EVGWMAC Representation

2. Review and Approval of 02/29/2024 Agenda

3. Review and Approval of the 11/28/2023 Meeting Minutes

4. USGS Presentation – Gregory T. Connock, Ph. D and Samuel H. Caldwell – *"Towards a better understanding of the Virginia Coastal Plain North of Fredericksburg"* (Samuel H. Caldwell, Gregory T. Connock, and Jason P. Pope, USGS VA-WV Water Science Center, 2024)

5. Public Comment Forum

6. Next Meeting

Approvals:

- **Agenda:** The committee approved the tentative agenda as presented.
- **Meeting Minutes – 11/28/2023:** Mr. Cloe noted that the meeting notes had been revised slightly to qualify some statements made related to future discussions related to groundwater trading and to correct the attendee list. The handout provided includes those changes. He asked for any edits to the minutes. The committee approved the minutes as presented.

ACTION ITEM: DEQ staff will finalize the meeting minutes and post them as "Final" to Town Hall.

Presentation: USGS Presentation – Gregory T. Connock, Ph. D and Samuel H. Caldwell – *"Towards a better understanding of the Virginia Coastal Plain North of Fredericksburg"* (Samuel H. Caldwell, Gregory T. Connock, and Jason P. Pope, USGS VA-WV Water Science Center, 2024)

Mr. Cloe introduced today's presentation by noting that we will be talking about the Eastern Virginia Groundwater Management Area, specifically the Virginia Coastal Plain area that is north of Fredericksburg. The Groundwater Management Act of 1992 formed two distinct groundwater management acres, the Eastern Shore Groundwater Management Area and the Eastern Virginia Groundwater Management Area. In the Eastern Virginia Groundwater Management Area, which is represented by the members of this committee, there was an expansion in 2014, north from King and Queen County and Caroline County up through Fairfax County. What we are going to be discussing today is the study area located north of Fredericksburg. We are focused on this area because it is a complex area, the hydrogeology that underlies that area has very limited data available. It lies outside of the 2006 Hydrologic Framework and the 2009 Groundwater Flow Model. We are looking to eventually incorporate the overall area into the models and framework. That incorporation is going to require a substantial investment and research to adequately characterize this area. Mr. Cloe noted that today's USGS presentation is the first step of this DEQ

funded preliminary assessment of the available data and some of the data gaps that exist and ways that we are looking forward to filling those gaps to better characterize the area.

Weedon Cloe introduced Dr. Gregory Connock and Mr. Sam Caldwell from the USGS who will be giving the presentation today.

> Greg Connock joined the U.S. Geological Survey in 2021 as a Geologist. He received his B.Sc. in Environmental Sciences from the University of Virginia, followed by a M.Sc. and a Ph.D. in Geology from the University of Oklahoma. Currently, his primary role with the USGS is as project chief overseeing the expansion of the Virginia Extensometer, Climate Response, and Chloride Monitoring networks in collaboration with VADEQ and the USGS Research Drilling Program. He is also part of the Virginia-West Virginia Water Science Center Land Subsidence Team, where he is leading a multi-disciplinary group of USGS scientists and academic investigators that seek to quantity the magnitude of anthropogenic land subsidence across the mid-Atlantic.
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> Sam Caldwell joined the USGS as a Pathways Student in 2018 and was converted to a Hydrologist in 2019. He received a B.A. in Geology from Amherst College and a M.S. in Earth Science (now Earth and Environmental Science) from Syracuse University. Sam's work is mainly centered on understanding groundwater dynamics in the Virginia Coastal Plain using groundwater level analysis, electromagnetic resistivity techniques, photogrammetry, and various scales and types of other remote sensing data. He leads a groundwater monitoring program in Virginia Beach and a geophysical logging network to observe saltwater movement on the Eastern Shore. Sam has recently published "Revisions to the Virginia Coastal Plain hydrogeologic framework southwest of the James River."

Sam Caldwell started the USGS presentation. Sam noted that he and Greg will be presenting some work that they have done with Virginia DEQ, evaluating what data is out there about the coastal plain north of Fredericksburg. His presentation included the following information:

- The Virginia Coastal Plain (VACP) North of Fredericksburg (NoF) is less understood than other parts of the VACP. There is limited hydrogeologic borehole data and groundwater withdrawal information.
    - There are only three (3) active water-level monitoring wells – two (2) if you exclude wells in Alexandria and Arlington which are not in the groundwater management area.
    - No borehole logs exist in a digital format uploaded to GeoLog Locator.
    - There are no known core or cuttings in the study area at the time that this investigation was completed.
    - Sparse data coverage across one of the most geologically complex regions of the Virginia Coastal Plain challenges robust interpretative studies crucial to planning and management.
- An improved understanding of the hydrogeology of the Virginia Coastal Plain (VACP) North of Fredericksburg (NoF) is needed, including the following:
    - Hydrogeologic framework

    - Hydrologic conditions (flows, budgets)
    - Groundwater-levels and trends
    - Groundwater withdrawal locations, rates, and trends
    - Water-quality information
- Reasons for needing more data:
    - Inclusion of Fairfax, Prince William, and Stafford Counties in the 2014 Eastern Virginia Groundwater Management Area – these areas were excluded from previous studies.
    - Adding these areas in a study area would complete coverage of the Coastal Plain of Virginia.
    - There are about 750,000 inhabitants, 10% of which in this area use private wells.
    - Results from this sort of investigation would inform future research focus and would be included in future groundwater models.
- This is essentially, an extension of work by previous Fall Zone studies (e.g. McFarland, 1999).
- There were 4 objectives when the investigation was started. These were to compile and evaluate available: Compile and evaluate available:
    - Hydrogeologic framework data
    - Data on hydrologic conditions
    - Geochemistry and water-quality data, and
    - Withdrawal data

Objective 1: Hydrogeologic framework: Greg Connock presented an overview of the Hydrologic framework with "basement and structural context" for the investigation area. He noted the following:

- The sediments that make up the aquifer system are kind of a representation of a variety of different depositional environments that came to be based on the Paleo Climate and the Paleo geologic configuration of North America throughout the formation of these coastal plains.
- The Virginia Coastal Plain is part of a much larger regional aquifer system that we refer to as the Northern Atlantic Coastal Plain Aquifer System.
- There has been a rapid deepening of the depth to basement or depth to bedrock and the general thickening of the sedimentary bench as you move from the fall zone in the West towards the Chesapeake Bay in the East.
- The depth to basement is probably one of the first things that you want to look at. In the study area the depth to basement is highly variable and is based on a limited number of data points. There are only a handful of "basement/bedrock penetrations for the study area. The data compilation for this area shows that the basement depths are highly variable from west to east as well as north to south. It should be noted that a number of the locations identified on the presentation maps are further south of the study area. The basement depths range from 20 feet to 300 feet.
- The general basement composition has implications when you try to understand the structural history of the area, the fault zones in the area and how that ultimately influences the deposition of the sediments that form the aquifer system today.

- There are a number of different terranes within the study area despite it being a relatively small area. In geologic terms "terrane" actually refers to units with distinct geologic histories to those that are adjacent to them.
- Notable heterogeneity exists in the basement composition underlying the VACP NoF.
    - Goochland terrane
    - Chopwamsic terrane
    - Potomac composite terrane
    - Occoquan Granite
    - Fault zones occur along basement terrane boundaries, with major deflections in the Potomac River coincident with fault zones.
- The major fault system within the study area is the Stafford Fault System – a series of faults and fault zones.
- Proximal fault systems – Stafford Fault System
    - Stafford fault system is a SW-NE trending series of reverse faults that are a defining feature of the VACP NoF.
        - Strike: NE
        - Dip: NW
        - Vertical displacement: 6m to 61m
        - Consistent with regional fault trends
    - Comprises 4 distinct faults/fault zones
        - Dumfries fault zone
        - Fall Hill fault.
        - Hazel Run fault
        - Brooke fault zone
- Stafford Fault System in Outcrop
    - Dumfries fault zone (45 km)
        - Minor right-lateral strike-slip component with profound effects on strata thickness
            - Aquia abruptly truncates on upthrown side.
            - Cretaceous strata doubles on downthrown side
        - Fall Hill fault (18 km) and Hazel Run fault (12 km)
            - Stratigraphically extensive displacement from basement to surface
        - Brooke fault zone (40 km)
            - Truncates Nanjemoy-Marlboro, eroded on upwarped side.
            - Syndepositional movement affected Potomac deposition.
        - All faults have distinct slip rates with relatively consistent temporal patterns in fault movement histories.
- Faults have an influence on where certain hydrologic units are and have an impact on groundwater flow.
- Relevance to framework interpretations:
    - Thornburg scarp – this is interpreted as a Miocene shoreline - as you come out of central Virginia into the study area you can see a deflection within the shoreline that is consistent with the orientation of those terrain boundaries and faults
        - Stratigraphic erosional extent suggests formation during Miocene transgressions (Calvert and older)

        - Deflection near Fredericksburg to parallel Stafford Fault system underlines tectonic influence.
    - Effects of Dumfries fault zone on Aquia
        - Ongoing flexure and fault movement prior to Calvert deposition has resulted in the highly variable Aquia isopach shown.
    - Syndepositional erosion of Nanjemoy Marlboro
        - Result of accelerated fault movement during Eocene, signaling Tertiary deformation in study area
- Representative geologic cross-sections slide:
    - Detailed cross sections across the study area are limited and are typically unconstrained due to a lack of borehole data.
    - Western portion of cross sections "A-A" (Quantico, VA – Prince Frederick, MD) and "B B" (Stafford, VA – King George, VA) from Powars and others, 2015 (modified from Mixon and others, 2000) represent the best, published representation of how the stratigraphic distribution and occurrence of hydrogeologic units vary laterally.
    - Note, both cross sections are reliant on interpolation from limited control points in the VACP NoF. • Contradictions do exist with both Meng and Harsh, 1988 and McFarland, 200

Objective 2: Hydrologic conditions: The presenters then provided the group with an overview of the Hydrologic conditions in the study area. It was noted that the first step in understanding any hydrogeologic system is to understand the geology, because that water is inside those sediments and rocks. Understanding geology is always the first step towards understanding hydrogeology.

- What data was found related to hydrologic conditions?
- Surface water resources in the study area – USGS National Water Information System site.
    - There are six USGS operated stream gauges in the study area. However, if you exclude Arlington and Alexandria, as they are not in the groundwater management area, you are down to four. There is information from those gauges that can help inform us at least in the northern portion of the study area about surface water dynamics, which is important when trying to get an idea of recharge into an aquifer.
    - There are also two USGS operated tide gauges in the area (these are also in the northern parts of the study area which are outside of the groundwater management area).
    - There are 135 inactive sites – there is still data available on the USGS website for these gauges but they are no longer in service.
- Groundwater resources in the study area – groundwater levels: wells and records:
    - There are 167 sites with groundwater level data – only 12 have these have more than 5 groundwater measurements.
    - The periods of record range from zero (no data) to 71 years.
    - Longest active record is 65 years.
    - There are three wells with active measurements – these are periodic wells - these wells are measured four times a year (once a quarter) – this results in limited ability to understand the shorter term dynamics in groundwater.

    - There is a lack of groundwater level data across the study area and what is available is almost all centralized in the northern or central part of the study area.
    - In the groundwater management area in the study area there are only two active wells – this limits insight on vertical and horizontal movement of groundwater in the study area, especially considering how complex the geology in the area is and offers very little, if any, insight on potential recharge to the Potomac Aquifer.
    - It is important to keep in mind that this close to the fall line is one of the few places where you have the aquifer close enough to the surface for outcropping for recharge.
- A slide of the Groundwater resources in the study area showing wells classified by aquifer was presented. It was noted that our poor understanding of the geology of the area makes it pretty much impossible to double check to see if these aquifer codes are correct. Of the 167 wells, there are 131 that have no geologic unit code assigned, which means that we do not know which hydrogeologic unit they are screened in. There are 24 sites in Potomac aquifer sediments – the depths range from eight feet to 620 feet.

Objective 3: Geochemistry and Water-Quality (WQ) including groundwater age-dating: The findings from work conducted by Jason Pope was presented related to geochemistry, water-quality and groundwater age-dating.

- On the slides presented and the color coding of the information that as you move from green areas to red that you are dealing with younger to older water, so that is zero to 10 and 11 to 100. You are basically moving up a magnitude in terms of years with each color.
- There is a lot of green along the fall line area for what is considered "modern" water – zero to 70 years. This should be taken with a grain of salt especially in the study area since this is all modeled from very few data points (only one in the study area).
- "Young" or modern groundwater (< 70 years) is found only in unconfined areas of the Potomac aquifer.
- Groundwater residence time increases with depth and distance from the unconfined area, or with length of groundwater flow path.
- There is groundwater in excess of 25,000 years old very close to the fall line where we think that the Potomac Aquifer might be outcropping.
- Note that the age numbers for groundwater aging are 1,000's of years not normal years.
- The water quality data in the USGS data base are even more sparse than the groundwater level for the study area.
    - There are only 10 sampling events across 19 sites, which means there is only one sampling event per site – the sampling dates range from 1949 to 1998. There has been no new USGS water sampling data in this area since 1998.

Objective 4: Groundwater withdrawals: Available information regarding the groundwater withdrawals in the study area was presented through a series of power-point slides for the periods of 1982-1989; 1990-1999; 2000-2009; 2010-2019; and 2020-2021. Note that the size of the withdrawal "dots" are not the same scale between the figures.

- VA NoF reported groundwater withdrawals:
    - Figures show total annual reported withdrawals, in millions of gallons (MGal), for the time interval listed in each figure.
    - Reported withdrawals within the study area, both for total annual withdrawal and individual annual withdrawal, have decreased over time.

    - High of 368.769 MGal in total reported withdrawals for the study area in 1995
    - Low of 35.1593 MGal in total reported withdrawals for the study area in 2015
    - 79.6062 MGal in total reported withdrawals for the study area in 2021 (most recent year with data)
    - Withdrawal values of zero for about half of reported users raises questions about completeness of reporting.

Question: Are those withdrawals just those that are permitted or do they include estimates of unpermitted as well? *These are just permitted figures.*

- Population and private well data for Virginia localities in the Coastal Plain North of Fredericksburg was presented:
    - Most of the self-supplied (private well) population in this region is in Stafford and Prince William counties, which are less densely populated.
    - Over the last two decades, the portion of the population with private wells has remained steady, but the number of wells may have increased because of growing populations (pop. growth of 14% from 2010 to 2020).
    - Most private wells in the study area appear to be screened in either the Potomac aquifer (subdivided) or the surficial aquifer, reflecting the relative thickness of these units, and perhaps the absence of other units. Bedrock wells are likely located in areas where sedimentary units are thin, as for elsewhere in the Fall Zone.
    - Groundwater withdrawals in the study area for private domestic supply are at least 75% of the groundwater withdrawal total, because most municipal withdrawals are from the Potomac River.

Key Takeaways:

- Faulting leads to abrupt thickening of the Potomac and abrupt termination of other units across fault planes
- 143 wells in the study area but few groundwater-level records of meaningful length
- 13 water quality samples in the study area. No well has repeat measurements
- VA reported withdrawals have decreased over time, the number of permits in the area have also declined • It is estimated that most (over 90%) of current groundwater withdrawals in the study area come from private household wells
- ***Maryland reported withdrawals were 67x higher than withdrawals in Virginia in the counties directly across the Potomac River from the study area (Prince George's and Charles) in 2020
- While hydrogeologic data within that last 20 years is sparse, there are ample opportunities within the study area to fill current gaps in data:
    - Groundwater-level and quality
    - hydrogeologic unit depths and extents
    - local geology and structure
    - age dating of groundwater.

Data Limitations:

- Objective 1:
    - Structural complexities, depositional processes, and erosional effects require extensive geologic data, which are not currently available, to confidently map hydrogeologic units and depth to basement in the study area.
- Objective 2:

    - Comprehensive determination of hydrologic conditions is not possible across the study area, with no active stream gage data available or actively being collected in the middle and southern reaches of the VACP NoF.
- Objective 3:
    - Challenging to accurately interpret groundwater flow due to a lack of continuous groundwater level data, with only 3 active periodic sites that are not able to properly constrain how structural fabrics affect vertical and horizontal flow.
    - Data gaps from Objective 1 prevents the verification of geologic unit codes of old wells, or assigning codes to existing wells that are currently without a geologic unit code.
    - Very little water quality data or age-dating data from VA wells

Implications:

- Suboptimal characterization of the hydrogeologic framework has far-reaching effects.
    - Data collection efforts (e.g. exploratory boreholes, water quality)
    - Interpretive studies (e.g. groundwater modeling)
        - Predominantly a consequence of unpredictable depth to basement and unknowns surrounding the lateral extent and stratigraphic occurrence of specific hydrogeologic units.
- Sparse groundwater-level data is insufficient to determine flow patterns, trends, or recharge in the study area.
    - Potential recharge to Potomac aquifer is poorly understood both in area and quantity.
    - Effects of faults and fractures on groundwater flow are poorly understood (e.g. are faults a confining feature or a conduit for flow?)

Potential resolutions to address data gaps:

- Drilling and installation of groundwater observation monitoring wells
    - In short, this resolution has the capacity to address major data limitations identified by this work.
- Passive seismic (HVSR) and gravity data collection
    - Provides mechanism to quantify depth to basement across the NoF study area and indirectly infer effects of major fault systems on aquifer-system thickness.
- Geophysical log examination and collection
    - Improves hydrogeologic framework interpretation of the VACP NoF
- Catalogue existing core/cuttings in area, collect new core/cuttings if needed.
    - Provides needed confidence and control on geophysical log analysis.
- Continuous monitoring of pre-existing wells
    - Informs characterization of the groundwater system (e.g. groundwater flow paths)
- Water-quality analysis
    - Age-dating: inform groundwater flow paths and vulnerability to contamination.
    - Water chemistry Back to TOC

Acknowledgements

USGS acknowledged the efforts of VADEQ colleagues which have collected or provided much of the data and information presented here as well as thanked VADEQ for providing the funding necessary to compile and prepare this presentation.

ACTION ITEM: The department will post the USGS Presentation on the DEQ Website.

Questions:

What percentage of the wells in the study area are in the fault zone? *The Stafford Fault System covers almost the entire study area, so while it is unlikely that you would have a well that is directly on a fault plain, they would likely between faults for sure.*

Why was Alexandria and Arlington not included in the study area? *The USGS study included Arlington and Alexandria in the study area, but they are not included in the Eastern Virginia Groundwater Management Area, that ends in Fairfax County. DEQ noted that was a legislative decision to exclude localities North of 95 from the Eastern Virginia Groundwater Management Area.*

Have there been any collaborative efforts between Maryland and Virginia related to groundwater management and management of the aquifer? *Not aware of any collaborative efforts related to groundwater management. Collaboration in this area could be tricky from a geologic perspective because of differences in nomenclature and regulations and requirements.*

In the Key Takeaways slide there was a notation that it is estimated that over 90% of the current groundwater withdrawals in the study area come from private household wells. Does that mean that industry, agriculture, etc. aren't using groundwater withdrawals but rather are using surface water withdrawals? *It is not that they are not using groundwater but it is just a smaller percentage compared to the rest of the coastal plain and surface water is more readily available.*

Information from a recent meeting indicated that over 70% of the water intakes in Virginia are unpermitted, how would that impact if all this study? *Since this study did not require conducting a water budget it would not have impacted the study. As noted previously, this area was explicitly excluded from other studies (1988 Regional Aquifer System Assessment Study and the 2006 Geologic Framework). This area was included in 2014 so this study was undertaken to identify what information and data was available and what data gaps existed.*

How do private homebuilders fit into this process? *Residential wells are regulated by the Virginia Department of Health. They would get a permit from VDH to make sure that the well was properly installed. Every well that is drilled requires the submittal of documentation to VDH and to DEQ.*

Is the VDH database the source of the information in the study report that said that 75% of the wells are private wells? *The analysis was conducted from the perspective of knowing where the municipal water supplies are located and the areas they serve and the population that they*

serve and comparing that with the most recent census data. The calculations were done using the population that is on municipal supply and that population that is not.

How is the availability of groundwater calculated? Data centers use a lot of water. How is the calculation made that they have enough available supply? *Large data centers don't typically rely on groundwater for their supplies, they are usually tied into a municipal supply. If there were to be a large industry, data center or warehouse, or something else that would require a large source of groundwater, then that would require a permitting process and evaluation. Residential wells are usually much shallower wells. Large withdrawals that require a permit require a technical evaluation to ensure that there is adequate groundwater available.*

Were well drillers logs included as part of the study database? *Unless the well drillers furnished that information and USGS made an effort to include that well in their database, then they were not included. Private wells are not normally included as part of the USGS database. The DEQ Groundwater Characterization Staff have been present for the drilling and logging of permitted wells, not private household wells. DEQ does have logs based on high quality cuttings information at about four of the locations in the study area.*

What is the background on the concentration of sampling wells in certain areas? *Primarily the study wells used and included in the study and the data analysis process are based on historical studies and historic data collected.*

What are some of the water quality information used to determine the age of the water in the aquifer? *A half-life calculation is used to determine the age.*

Our water supply is at risk, and we are interested in groundwater monitoring and the location of monitoring wells and stream gauges and trying to understand the process and the locations of those monitoring wells and gauges. *The USGS representatives reviewed the data that was presented in their presentations related to the location of wells and the databases used for the study. The active groundwater monitoring sites are located on the northern tip of Arlington and two in the northeastern corner of Prince William. Currently there are no groundwater monitoring wells in Fairfax County. The three groundwater monitoring wells in the study area are all periodic groundwater level wells, which have only four measurements per year. We don't have the resolution of data to understand the dynamics at play in the system, i.e.., tidal or pumping events. These are manually monitored wells. Surface water is more concentrated. The stream gauges and the tide gauges are funded through agreements with the localities where they are located. There are five stream gauges located in Fairfax County. The stream gauge measures the discharge of the local stream, and the tide gauge measures the continuous elevation data of the Potomac River.*

Is the tidal Potomac saline? *Generally, you have a surface water freshwater wedge which fluctuates with time. Saltwater is more dense than freshwater so the freshwater will generally sit of the saltwater. When the level of the Potomac River is lower, there is less freshwater to push that saltwater out. So, when the river level is lower, the saltwater wedge from the Bay or ocean moves further upstream and when the river level is higher, there is more fresh water to push back that to legislation to*

What does DEQ and the USGS plan to do to address the lack of data? *USGS can't really do anything unless we are funded to do it. So, that funding would have to come either from a local partner or federally appropriated funds. The latter is probably not likely for an investigation like this so we would ha.ve to rely on a collaborative study with DEQ or other concerned stakeholders within the area to collect data. From DEQ's perspective the next step is to take the available funds and see what we can do to better further the understanding of the resource. Long term efforts and projects would require a long-term sustainable funding mechanism.*

Comments from the committee: When this committee was first formed, it went through a lot of analyses and made recommendations that went forward to legislation or actions towards funding to be provided. The committee has devolved into a receiving body for information. Their request is for DEQ to use this committee and its members as that body that can help provide stakeholder support in racking and stacking those things that need additional funding. This group could lobby as a stakeholder group to the legislature to help make a positive change in this business.

There is a current proposal, a Senate Joint Resolution (SJR 25), to study groundwater, it currently lists the technical support effort coming from the State Water Control Board instead of from this committee. Maybe the language could be amended to include input from this committee.

Many of the members of this group have lobbyists that we work with. Maybe this group can be helpful moving forward to help lobby for the needed funding. Please use us and our expertise and contacts.

Public Comment Forum: All public comments were made as part of the Question-and-Answer period. There were no additional public comments during this period.

Next Committee Meeting:

Weedon Cloe noted that the next meeting of the advisory committee will be the last week in April. DEQ will send out a reminder/save-the-date notice in the near future to confirm the date and topics for the meeting.

Adjournment:

Weedon Cloe thanked all of the members of the committee and the interested public and the USGS representatives for their presentation and closed the meeting. The meeting was adjourned at 11:30 AM.