

**EASTERN VIRGINIA GROUNDWATER MANAGEMENT
ADVISORY COMMITTEE**

MEETING #8 NOTES – FINAL

MONDAY, MAY 15, 2017

DEQ CENRAL OFFICE – 2ND FLOOR CONFERENCE ROOMS B&C

Meeting Attendees

EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE MEMBERS	
James Baker – City of Chesapeake	Chris Pomeroy – Western Tidewater Water Authority
Nina Butler – WestRock	Dwayne Roadcap – VDH (stepped in for Marissa Levine after Lunch)
Tom Frederick – VA Water and Wastewater Authorities Association	Paul Rogers – Production Agriculture – Farmer
Rhu Harris – Hanover County	Curtis Smith – Eastern Shore Groundwater Committee
Bryan Hill – James City County	Kurt Stephenson – Virginia Tech
Marissa Levine – VDH	Mike Toalson – VA Home Builders Association
Keith Martin – Chamber of Commerce	Dennis Treacy – Smithfield Foundation/Smithfield Foods, Inc.
Randy McFarland – USGS (for George Harlow)	Brett Vassey – Virginia Manufacturers Association
Sandi McNinch – VA Economic Development Partnership	Ellis Walton – VA Farm Bureau
David Paylor – DEQ	Bob Wayland - Citizen

NOTE: Advisory Committee Members NOT in attendance: John Aulbach – Aqua Virginia; George Harlow – USGS; Chip Jones – Northern Neck Soil & Water Conservation District; John O’Dell – VA Well Drillers Association; Travis Quesenberry – King George County; Nikki Rovner – The Nature Conservancy

INTERESTED PARTIES ATTENDING MEETING	
Phil Abraham – VECTRE Corporation	Chris Harbin – City of Norfolk
Elizabeth Andrews – Virginia Coastal Policy Center	Jonathan Harding – Virginia Agribusiness Council
Arielle Brown – Virginia Farm Bureau	David Jurgens – City of Chesapeake
Jeff Corbin – Restoration Systems	Whitney Katchmark - HRPDC
Robert Crockett - ADVANTUS	Wilmer Stoneman – VA Farm Bureau
Jay Dano - HRSD	Shannon Varner – Mission H2O
Jason Early – CARDNO	Matt Wells - WestRock
Chris Gill – Christian & Barton	Andrea Wortzel – Troutman Sanders

SUPPORT STAFF ATTENDING MEETING	
Brandon Bull - DEQ	Bill Norris - DEQ
Drew Hammond - DEQ	Mark Rubin – VA Center for Consensus Building
Scott Kudlas - DEQ	Jutta Schneider - DEQ
Amber Leasure-Earnhardt – VCU/VA Center for Consensus Building	

MEETING HANDOUTS (Materials were also distributed via email and/or posted to DEQ EVGMAC Webpage prior to the meeting.):

- Transmittal Letter to Advisory Committee;
- Draft Agenda;
- Draft Meeting Notes – EVGMAC Meeting #7 – Monday, April 17, 2017;
- Issues Summary for May Meeting;
- Elements of an Effective Water Market Figure;
- Groundwater Banking (ASR) Strawman;
- Australia Water Sharing Policy Model; Illustrative Application for Virginia

In addition the following documents were distributed to EVGMAC Members via email and were also made available at the meeting:

- Eastern Virginia Groundwater Management Advisory Committee Report to the Virginia Department of Environmental Quality and Virginia General Assembly – Working Draft
- 1. Welcome & Introductions (Mark Rubin – Director of the VA Center for Consensus Building at VCU and Meeting Facilitator)**

Mark Rubin welcomed the members of the Advisory Committee and members of the Interested Public to the meeting and asked for introductions.

- 2. Review and Approval of Meeting Notes from the April 17, 2017 meeting of the EVGMAC (Mark Rubin):**

Mark asked whether there were any comments or edits to the draft meeting notes that had been distributed to the group. Noting no changes, the meeting notes will be marked as final and will be posted to Town Hall.

ACTION ITEM: Staff will post the Notes from the April 17th meeting of the EVGMAC to Town Hall as “Final”.

- 3. “Closing-the-Loop” from March Meeting (Mark Rubin):**

Mark Rubin noted that one of the first things that we would be doing during the next few meetings would be to take a moment to “close-the-loop” from the previous meeting. First of all in the materials that you received prior to the meeting there is a revised outline of the Groundwater Committee Report – if you have any further comments about that proposed outline structure please route those comments to Bill Norris for incorporation into the next revisions. The current outline structure reflects the discussions and recommendations made at the last meeting of the Advisory Committee. We will be going over this report in detail during the last two meetings of the Advisory Committee scheduled for June and July. Any comments related to any of these documents should be sent to Bill Norris.

Mark noted that Amber Leasure-Earnhardt will be drafting and revising the report as we progress

through these remaining meetings. A “working draft” of that document was provided to the Advisory Committee prior to today’s meeting. If there are any comments or suggested revisions they need to be routed to Bill Norris for compilation and routing for incorporation into the next revision. He noted that it was important for the members of the Committee to read through the materials that are incorporated into the report structure so that we can discuss them at the next two meetings of the Committee and determine whether we have consensus on the materials contained in the report.

Bill Norris asked if there had been any issues with accessing the documents for the meeting that had been posted to the DEQ EVGMAC Webpage. One member noted that he had been unable to access the documents.

ACTION ITEM: Staff will continue to revise and post the Committee documents on the webpage dedicated to the Eastern Virginia Groundwater Management Advisory Committee:
<http://www.deq.virginia.gov/programs/water/watersupplywaterquantity/easternviriniagroundwatermanagementadvisorycommittee/evgmacmaingroup.aspx>

In addition a separate distribution will be made to address members having difficulty accessing the meeting documents.

4. Trading and Banking Credits (Mark Rubin; Shannon Varner and Stephenson):

Mark Rubin introduced the topic of Trading and Banking Credits and referred the group to three of the handouts that had been made available:

- Elements of an Effective Water Market Figure;
- Groundwater Banking (ASR) Strawman); &
- Australia Water Sharing Policy Model: Illustrative Application for Virginia IT Infrastructure Partnership

The “Elements of an Effective Water Market” document included the following information:

Market Pre-Conditions:

- **Caps – Understand water resources and systems to establish caps**
 - **Definition of the total resource available with established caps on water use, and how it could change over time**
- **Entitlements – Clearly define entitlements and associated reliability**
 - **Clearly defined tradeable entitlements and the characteristics of these water entitlements**

Defining Rules:

- **Participants – Define market operation and trading rules to apply to all participants**
 - **Market rules, understood by market participants that:**

- § **Manage the potential impacts on other water users and the environment;**
- § **Set the boundaries of the market;**
- § **Define acceptable behavior by market participants;**
- § **Consider the potential for market distortion via participants misusing market power;**
- § **Sit within the broader institutional and governance framework for resource managers, policy-makers and regulators with clear roles and responsibilities and no conflicts of interest;**
- § **Include market mechanisms that are familiar to participants, such as contract forms and exchange mechanisms, and ensure that any market reform does not impose a disproportionate share of the cost burden on certain stakeholders;**
- § **Document administrative processes for effecting trade and the enforcement of trade.**

Market Operation and Efficiency:

- **Compliance – Ensure effective compliance including monitoring, metering and accounting**
 - **Ensure administrative processes are simple and transaction costs are low and in proportion to the value of the trade, known in advance and include:**
 - § **Robust registers of water entitlements and accounting mechanisms for water trading and use;**
 - § **Accurate measurement of water resources and use;**
 - § **Monitoring and compliance arrangements**
- **Information - Publicly share reliable and timely information:**
 - **Share reliable and timely information to allow buyers and sellers to make informed decisions and assist in building literacy and capacity of market participants.**

Shannon provided a brief overview of the concept of trading. His presentation included the following:

- To get into the basis of trading, the simple example is you have two permittees – they both have a compliance obligation to reach – perhaps it is to only withdraw 10 mgd, they need to get down to that compliance level – it may cost one permittee \$20 million to get down to that level while it might cost the other permittee, because of their circumstances \$5 million to reduce their withdrawal to that level or even to get below that level with less expense and less problems in a more timely manner. So rather than having one permittee spend \$20 million to get down to that compliance level and the other permittee only spend \$5 million to get down to that level and maybe even get an additional 5 mgd reduction – perhaps those two permittees could trade any excess reduction amount that the one permittee is able to achieve with less cost. That could occur with either the one permittee paying for infrastructure improvements to help reach that reduction or it could be through a system where the one permittee gets a credit that they could

sell to the other party or the permittee could just make those credits available to the other permittee through the goodness of their heart and make them available to the resource.

- In the environmental trading arena there is also a third potential source of credits and reductions and that would be a third-party that isn't one of these permittees but that can provide that benefit to the resource by creating that type of credit that they would sell it on the open market or make it available to a particular permittee.
 - The trading workgroup met numerous times and looked at very broad trading programs and looked at other trading programs in other states and looked at some of the examples of environmental trading programs that we have in Virginia in other environmental programs, in wetlands and streams and in the nutrient banking arenas.
 - The Trading Workgroup came up with a couple of recommendations:
 - One recommendation was to take a piece of the issue that is out there and see if it could be addressed through a banking/trading program – that would be working with someone who is actually returning water to the resource through injection.
 - The second recommendation was to look at a broader idea based on the model that is used in Australia that captures a number of different areas that have been looked at, including trading opportunities on a broader scale.
 - Some of the reasons that we want to do trading is that it can be a much more cost effective mechanism for reaching compliance – it can really encourage innovation – it can reward good behaviors and it can potentially bring private capital into the system.
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Shannon provided a brief overview of the concept of the Groundwater Banking (ASR) Strawman that was included as part of the documents prepared for today's meeting. He noted the following:

- We are talking about returning water to the resource and making sure that the entity that is doing that gets the benefit of that beneficial activity and trying to identify ways in which when we have excess water into the system that might be used as a benefit to others.
- We want to create an incentive for activities that will benefit the resource and help with permit compliance.
- The strawman document sets out some basic parameters:
 - What is a credit? It is that amount of water that is injected into the aquifer less some amount of water that may be lost to the system.
 - How long does a credit last? There are two different scenarios in the strawman but it is essentially water is going to go in and there will be some loss to the system over time and that may impact the length of time that a credit may be available to another permittee or being available for withdrawal.
 - What is the geographic scope? How far out geographically can someone take the benefit of that injection? Is it just at the location of the injection or is it on a much broader scale?

- The ASR Strawman also contains some of the process pieces for implementing and tracking and adjusting as we move through time.
- There are basically two scenarios in the strawman document:
 - One is where there is a single injector – a single user – for short-term storage. It is really set up to be a really simple mechanism. If you are injecting the water for no more than 12 months you can withdraw it on a 1-to-1 basis and get the benefit for your system.
 - The other one is much broader – it is a combination of both banking and trading. If someone is injecting more water than they are going to be using – it has a benefit over a larger area – there would be a mechanism for trading among entities to take the benefits of that “excess” water. This would be addressed through the permitting process – identifying the geographic range on the impact of that recharge – the rate of withdrawal that a particular permittee could use. Outside of that there would be whatever deal those different entities could work out among themselves.
- One of the things that the strawman doesn’t address is what about that permittee out there who has not used all of their allocation? How are we going to encourage people to use innovation and conservation in the development of new resources so that they are not withdrawing or they are reducing their withdrawal from groundwater and then create a credit that for some period of time could be utilized and traded for some period of time for possible some financial benefit and definitely a benefit to the aquifer?

Discussions by the Committee included the following:

- This concept does not deal with the unpermitted users.
- What about the impact of having non-permitted entities involved in the trading program? Are there any examples about how it could inflate or effect trading if it is not just between permitted sources? How would trading be impacted by letting investors buy up the available credits?
- Three markers for later discussion:
 - Just because you inject water into the aquifer it is not necessarily a one-to-one credit – it depends on who the buyer is and the geology where it is located.
 - There is going to have to be a water quality component to the trade that is a requirement of those permittees doing the injection.
 - Folks who have an allocation that is more than their use – right now when DEQ issues permits that allocation is based on historical use and maybe projected demand. That is one of the challenges in the permitting process is being fair in coming up with that allocation number. Of the 14 biggest facilities, 11 of them are giving up potential and not actual allocation amounts in order to reach their compliance levels. There is a little bit of an equity thing about how do we decide what that allocation is and have we permitted excess that was not needed as it turned out? Because as the law is written right now, after your 10 or maybe 15 year permit, if you have not used all of your allocation you loss the amount you didn’t use. In terms of fairness of the market – just a little bit unclear on how you would trade on an unused allocation amount?

- The issue of unused allocations is not addressed in the strawman.
- It should be noted that sometimes the allocation is speculative on the part of DEQ and the applicant's part.
- Was there any consideration of any models that had a "price safety value" consideration? When the price of the trade reaches a certain level that certain things would occur?
 - Not specifically – the need for certainty over the duration of the life of a credit and the geographic extent in which they could be used was discussed. As far as pricing, no discussions took place in the workgroup. It was thought of in a "free-market" scenario. There was some discussion about whether there should be an in-lieu fee fund, where someone could in essence buy credits by payments to DEQ for activities that would have benefit to the resource – but it is not part of the current strawman.
- It was noted that in the Air Market in California that when credit pricing gets above a certain level then the administrating agency takes certain actions – making additional credits available – creating a set-aside – to prevent inflation of the price.
 - That concept would be useful in a comprehensive system – the system being considered for use in Virginia is a simple system that would encourage permittees to add "new" water to the system and store it until needed.
 - With groundwater in Virginia there is a smaller market and fewer players then you would have in an "Air Market" credit trading program. A lot of what is being proposed would require negotiation between the two permittees – you do this and I will do that type of negotiation.
- For the moment, where this would apply potentially would be with the HRSD SWIFT Project if that goes forward and the City of Chesapeake.

5. Identification of the Benefits of a Trading/Banking Program (Mark Rubin):

Mark asked the committee to identify the "pros" and "cons" about having a "trading/banking" program. The following items were identified:

- PRO: It helps with the market.
- PRO: Encourages good behavior and efficiency – by giving people credit for the investment.
- PRO: Net Cost reduction.
- PRO: There are challenges in the eastern end of the area in being able to store water – this approach provides access to a means to store water – storage in the aquifer.
- PRO: Aquifer recharge avoids infrastructure costs. It is less efficient in the water that you are able to reclaim but you don't have to spend a whole lot of money in piping.
- QUESTION: All this water is recycled water – yes or no? No, it could be surface water. It could be river water – it could be treated waste water. The water injected has to be treated to the same chemical composition of the existing groundwater – otherwise it will not rehydrate the aquifer.

The technology exists to achieve the needed level of treatment. What is the public perception of injecting water?

- Some concerns have been raised especially with the possible use of treated wastewater as the injection water. It has been noncontroversial in Chesapeake because they are not using treated wastewater. In terms of the HRSD SWIFT project there have been significant negative impact concerns and reactions from a couple of entities so far. As we get closer to the possible implementation of the project that opposition is likely to grow. We have to have certainty that the water being injected is drinking water quality and that the water has been treated to meet drinking water standards. It should be noted that this approach is not unprecedented – it is taking place in California; Florida; and Phoenix, Arizona. There will be a need for some fairly significant public relations efforts around some of these projects. There are also concerns and questions about possible alternative regulatory structures that might be needed regarding water quality concerns and how you regulate that.
- CON: Public Perception
- CON: Does not address the issue of unpermitted users.
- CON: Risks of contamination
- CON: Questions about the appropriate regulatory structure
- QUESTION: This is more cost effective than desalination – is that correct? With all of the discussions that have taken place the answer is probably yes. This likely to be a question that will be raised by some permittees in the eastern area of the Groundwater Management Area regarding why they couldn't just use “desal” instead of having to use injection? Treating the water is more cost effective than using “desal” – Yes or No?
 - For the HRSD SWIFT project if they had to use reverse osmosis, which is the current “desal” technology, they would not be able to pursue the project – they have a different type of treatment process that is less expensive. Reverse osmosis for “desal” carries with it its own set of challenges – all of a sudden you have highly concentrated brine that you have to put back into the system and the fish don't like it. You have to have something that you can do with the brine and groundwater injection would not be a good option. Also the use of desalination by itself doesn't do anything for the aquifer – it could lessen the use of the aquifer if available in certain areas but it would not recharge it.
- QUESTION: We are not looking to recharge to the point that we are going to gain water. Are we just trying to keep everything status quo? Yes or No?
 - The preliminary modeling shows that if the HRSD SWIFT project is fully implemented at the rates it is being designed for that we would in-fact gain head.
 - The trading approach in and of itself is not going to create an increase in head.
- PRO: We are not dictating the technologies that are acceptable to get to drinking water quality so we are letting the market determine the treatment technology that would be used.
- PRO: We are starting to vocalize that groundwater is a limited resource.
- QUESTION: Does this program enhance/encourage or discourage water conservation?

- It is a complicated answer – because the answer is going to be an economic one. In a recent article it was stated that 12 to 15 % of Americans can't afford their water right now. So as we have to build more and more of this kind of infrastructure to make sure that we have enough water – it costs more in the future. If you are an industry operation you are going to look at whether it is cheaper for me to buy credits or cheaper to put in treatment technology?
- QUESTION: How do you set the baseline for trading? Because if you set the baseline to what we have now and then allow trading then arguable if that is used we will never go below that.
 - If you go to the trouble of putting water into the ground you have created an asset and you should have some legal protection that you can claim that water. You have an asset that is valuable to you. You would have a pretty strong incentive to manage that asset. You have invested a lot to put it there.

6. Groundwater Banking (ASR) Strawman Discussion – Mark Rubin:

Mark noted that right now we are not debating whether or not the HRSD SWIFT project is a good idea but rather looking at the “Banking Strawman” and trying to see if that is something that we want to recommend or not. He noted that this concept would likely require both statutory and regulatory changes and implementation. Mark walked through the “strawman” with the committee.

Discussions by the Committee included the following:

- We are just talking about water that is injected into an aquifer in the Eastern Virginia and Eastern Shore Groundwater Management Areas.
- This whole concept is just about injected water. It was suggested that we include the term “injected” in the title of the strawman document to make it clear that is what we are talking about.
- Regarding “groundwater storage credit” – If you have an excess allocation, we are not talking about trading for permitted volumes. Correct. This would only be dealing with those additional volumes of water that are added/injected.
- When staff was describing how much of a credit there is, there was some discussion about some amount of loss of the injected water to the aquifer that was not available for recovery and use. Is there a technical concept here of in effect taxing the injection so that you assure that there is some small net gain to the aquifer? This is addressed in the definition of “recovery factor” and the Seasonal Storage section where it is a 1:1 and the Long Term Storage section where a recovery factor schedule would be established, in the strawman document.
- The Long Term Storage section also identifies the concept of “annual aquifer losses” that would have to be determined in guidelines that would have to be applied. Is that purely a technical determination on what is recoverable or is there some notion of a factor to benefit the aquifer?
 - That concept is not in the strawman now but that doesn't mean that it couldn't be included.

- The notion would be that a permittee could withdraw 90% of what they inject that is not subject to loss (as a technical consideration) so that there is a net benefit to the aquifer from the whole enterprise. Not so much that it would be an amount that would discourage someone from undertaking the project but something that would make sure that there is a notion of a benefit to the aquifer – to the resource – from authorizing the injection and allowing for the trading of most of what is injected. So technically not just the idea of putting the water in and taking it out – there is a credit – but the notion that there is a little something set aside that is for the aquifer that is not available or subject to trading.
- There is something that already exists related to water quality in the Nutrient Trading/Banking world where there is a 5% set-aside that accounts for growth.
- This is an important question but it is purely a policy call. Folks that are saving for the future are the best actors in the program. It is like going to the bank and putting money on deposit – if your bank did this to you for very long you wouldn't want to bank there.
- When you do long term storage you are producing a benefit in the sense that if you add the water and you withdraw it 5 years later – in those 5 years there has been a net gain to the aquifer. It is a temporary benefit but it is still a benefit until you withdraw it.
- The question of benefits is important but to get into that you have to peel the layers of the “onion” that we are beginning to peel. There is the benefit of temporary storage prior to 100% withdrawal. What this strawman contemplates is that 100% withdrawal of your deposit may never happen and it is just forfeited to the good, because these credits expire on a schedule over time. There are overlapping features of the benefits and withdrawal concepts that will need to be considered.
- Should the concept of “**saving a piece of the injection volume for the benefit of the aquifer**” should be included in the strawman. Is this something that we should add to the proposal?
 - Committee members noted that they had no problem adding the concept. It was noted that it is likely that concept is already built into the process since when DEQ sets the loss rate that they are likely to be conservative because they wouldn't want that factor to be too small even though it could be adjusted periodically.
 - We would want to err on the side of caution.
 - It could be used as a consideration in setting the recovery factor.
- How is the benefit to the aquifer measured or assessed? Would it be in terms of recovery of water levels in the aquifers? Or is it sort of a blind faith perception that we can lose 10%? How do we know what the effect is unless there are some observation data?
 - It could be evaluated based on computer models. It is not straight forward. There are probably several different metrics that could be used.
 - Water level monitoring would be an intrinsic part of this whole operation. As water is injected and as water is withdrawn those records should be examined to see what the long-term effect is.

- The idea and abstract of getting some aquifer recovery out of this program is a very appealing idea, but how we do it and how we address all of the factors involved is very complicated to assess. If we are just going to tax the people who are investing and putting water back into the aquifer and we are not doing anything with the unpermitted users or the people who have grandfathered allocations then something seems troubling about that approach.
 - We have to look at this concept as a whole not just in the context of a banking/trading program.
- It was noted that there are a number of different ways that “water” is referred to in our discussions of the strawman - we should be very careful to be clear that for this strawman that we are dealing with and talking about “injected” water only in the strawman.
- We are having this discussion in the abstract without looking at and considering HRSD SWIFT. The HRSD project which has the potential of 100 MGD is the “elephant in the room”. Anything that we say here is going to need to apply to that concept as well. If we just had the HRSD project and current usage we would expect in a few decades or so at 100 MGD we would expect to see rebound radiating out eventually maybe in 50 years to most of the aquifer. And any financial things that we say about what you can buy and what you can sell obviously HRSD is going to avail themselves of those.
 - That is one of the challenges that were mentioned earlier. A lot of this in terms of recovery credit really depends on the scale of the injection and the location of the injection. Something as large as the HRSD project shows up in the groundwater modeling and the water level monitoring while something as small as a 1 MGD injection in the thickest part of the aquifer doesn’t show up in either of those in any meaningful way. So is it good or is it not good? But a 1 MGD injection along the Fall-Line is going to show up in both of those. So those are some of the details and complexities that we would need to try to put some bounds around should we pursue this concept.
- Does the size of the injection mean that potentially there would need to be different rules as to how you credit things?
 - That is one of the complexities of the issue that has to be talked about.
 - It is a matter of the size and location of the injection that are the key concepts. You have to model an answer because there are going to be different impacts and different benefits based on those components.
- For these discussions we are talking largely about the Potomac Aquifer but there are 5 aquifers there.
- The aquifers in Virginia extend all the way up into Maryland and goes down into Alabama – how are we going to take that into consideration?
 - We have had discussions with North Carolina and with Maryland regarding the extent of the aquifers in terms of what their regulatory programs are or at least to discuss the potential impacts that you might have in those areas. The thought is that anything that is beyond Southern Maryland and Northern North Carolina has such a geologic time scale to it that it is not really relevant to you and me today or in the foreseeable future. You

are talking in terms of 10,000 or 100,000 years. It has been projected that it would take 200,000 years for groundwater from Virginia to reach Alabama.

- It was reiterated that anytime you add water to a confined system it seems that the benefits that you are providing is that you are helping to preserve that storage space. If you continue to withdraw you are going to lose storage through compaction and you are going to have land subsidence. There are multiple benefits that need to be taken into consideration that are related to land subsidence and preserving storage capacity of the aquifer, preventing salt water intrusion, and encouraging good behavior, etc.
- Why is the term “seasonal storage” being used instead of short-term storage? Does it make a difference? Is it a term of art?
 - The term was used because we found other programs in other states that used the term.
- “Groundwater Credit” – a well injection permit would be required before any water could be injected into Virginia aquifers. We would still need to talk about water quality concerns. EPA currently handles the well injection permits.
- “Seasonal Storage” – the recovery factor would be 1:1 so there would be no there is no accounting for any lose there. The credit duration would be one year. If you don’t use the credit within a year of when it was injected it would be retired.
 - Why is that? Why would it be retired? Why isn’t there consideration given to the option to do longer term credits? It was noted that concept was included under the concept of “Long Term Storage” that is included in the strawman. The reason for this designation was that if a permittee was just going to use or need the water within a year and you were concerned with just temporary storage that there would be an expedited process to address this 1:1 recovery factor for water used within a year of its injection. It is a very limited process where the recovery occurs at the same facility as the injection.
- Is the concept that a permittee has to elect prior to injection whether it is a long-term or a short-term project effort? So when you start you would have to declare whether it is a long-term or a short-term project.
 - If you took advantage of the short-term (one year) then you would have a 1:1 recovery factor if it was for a longer period than one year then you would have to use the established recovery rate factor – reduce then by an established amount.
 - We don’t want to require that people to have to elect as to whether they are going to have withdrawals within a year or not. That was discussed and it certainly could be rewritten to incorporate that. The assumption during the discussions of the strawman in the workgroup was that even for long-term storage that if the withdrawal occurred within the year that it would be on a 1:1 basis. You wouldn’t start the utilization of the recovery factors until the second year. You could blend this into one process instead of two as it is currently drafted.
 - The language related to “retiring of a credit” makes it sounds as if we are dealing with two different types of credits. One would be mutually exclusive to the other.

- The two options were included because these were the two options that are being used in other parts of the country.
- If we are looking at the benefit to the aquifer, we would rather have permittees elect to leave the water in the ground longer and have fewer withdrawal credits in the future. It is in our interest to encourage permittees to leave the water in the ground longer and withdraw a lesser amount in the future and not to have to say, “Your credit has expired – you are out of luck” because you had originally planned to be short-term.
- We could just eliminate the “seasonal storage” language and roll in the 1:1 in the first year concept into the language for “Long-Term Storage”. It could be as simple as noting that if the withdrawal occurs within the first year that you have a 1:1 recovery ratio and if it occurs after that you have a smaller recovery rate based on established recovery ratios. It was agreed that it was confusing to have two different approaches.
- Long-Term Storage: Need to combine the concept of Short-Term and Long-Term Storage concept.
 - Recovery factors would be based on estimated annual aquifer losses using the groundwater model.
 - The recovery shall not be less than some amount – yet to be determined.
 - The recovery factor schedule covering 10 years would be established by DEQ. The certainty factor is that “once established” that the 10-year schedule would not be modified. Reevaluation of the recovery rate schedule would occur at the end of the 10-year period.
 - With trying to encourage infrastructure development is 10 years going to work well with that? 10 years is a relatively short time-frame.
 - Didn’t we agree at our last meeting that we were going to report and recommend that the permit term be extended to 15 years? If so then we need to adjust the strawman accordingly to include that proposal – so that it matches with the recommended 15-year permit term.
 - The recovery factor has a “floor” – it shall not be less than stipulated which should also take into consideration the permit term length and should apply at that time – there would be some expectation that it would never fall below a certain level – it would address the concern over certainty.
- Generally when municipalities build infrastructure it is amortized on a 20-year basis not a 10-year basis. So would a 15-year period help? Sure, but that is still stretching the norm – shrinking the norm. So we are asking someone to build something based on a 20-year amortization schedule and the available credits are not lined up with that.
 - There other states that have 20-year permit terms. If you have a reopener built into the permit why wouldn’t a longer term permit work?
- A concern was noted that of our 14 largest facilities, 11 of them had allocations that were significantly higher than what they have been using. We have to be very careful about our ability to project needs 20 years out in terms of whatever permit that is issued. Would the state

be uncomfortable with using the reopener provision to address a change in the need? No not necessarily. There would be a concern about issuing a permit today based on a projection or speculation of what the permittee would need 20 years from now. If there was a mechanism included that could provide an action point where the need is materializing and so we need to act on it then that might be workable.

- It was recommended that the change of the reference's from a 10-year period to a 15-year period throughout the strawman would be appropriated and coupled with the identification of the "floor" might make 20-year financing workable. It was agreed that a 10-year time period was not very practicable, so a change to 15 would help.
- How soon would we need to start worrying about "salt-water" intrusion?
 - For lateral intrusion of salt water we probably have a fair amount of time before it becomes a concern.
 - Research by the USGS shows that we currently have 42 production facilities have salt water that could "up cone" in a decade or so.
 - Westward movement of salt water is not as fast as pulling it up through the system if you are pumping in the Eastern part of the management area.
- The concept of injected groundwater banking is a concept that the committee will consider moving forward with and including in the report as a recommendation once the final revised version is available.
- Did the cost needs presented at the last meeting include this change? No. Would there be additional costs to DEQ with a change from 10 to 15 years? Don't know if there would be additional costs or what those costs would be. Those needs need to be included in the "List of Needs" document.
- Just for context, would it be helpful to include some reference to the existing Nutrient Credit Trading Program in Virginia as evidence that Virginia has been doing nutrient credit trading for a decade so we have some experience with a trading program.
- It was noted that there was a small two-page document that was developed that documented that all the various places within the country where they did ASR projects and the general rules about spatial recovery limits, the lose factors, etc. It is sort of a listing of states that have done it or are doing it.

ACTION ITEM: The Strawman document for Groundwater Banking (ASR) will be revised to reflect the discussions and recommendations of the Advisory Committee.

ACTION ITEM: If the decision is made to move forward with this concept then the needs related to DEQ to do this needs to be included in the "List of Needs" that were presented at the last meeting.

The Revised “Groundwater Banking (ASR) Strawman:

Injected Groundwater Banking (ASR) Strawman

Definitions

Injected water: water that is injected into an aquifer in the eastern **Eastern** Virginia and Eastern Shore Groundwater Management Areas.

Groundwater storage credit: the total quantity of injected water that is authorized to be recovered from the aquifer. Credit available for use in a given year is equal to the remaining injected water at the end of the previous year multiplied by the recovery factor. Credit is deposited into the permittee’s groundwater storage account at DEQ and retired when authorized water is recovered.

Recovery factor: the annual fraction of the remaining injected water that is available for recovery by a permittee. The recovery factor is calculated as one minus the annual water loss rate.

GW storage account: DEQ will maintain and publish annually a groundwater storage account for any permittee holding groundwater storage credits.

Recovery zone: the area within the spatial boundary from which injected water is authorized to be recovered.

Seasonal storage: injected water that may be recovered within 12 months of the date of injection.

Long term storage: injected water that may be withdrawn across multiple years.

Water loss rate: the rate at which injected water is lost for recovery.

Groundwater Credit

Within existing groundwater management areas, DEQ will grant a *groundwater credit* to any party that injects water into the coastal aquifer for purposes of using the aquifer for water storage and recovery.

A groundwater credit is considered additional to a groundwater allocation granted under a groundwater withdrawal permit. Groundwater allocations shall not be reduced based on injection activity of the permittee.

A well injection permit would be required before any water is injected into the Virginia aquifers.

~~*Seasonal Storage*~~

~~_____ Recovery factor for seasonal storage shall be 1. (1:1 inject to recovery rate)~~

~~_____ Credit duration: 1 year. Credits not used within the year of being injected will be retired.~~

Spatial Recovery: Recovery occurs at the same facility as injection.

Credit transfer between permittees: None

Long-Term Groundwater Storage

Recovery factor: **For the first year the Recovery factor shall be 1. (1:1 injected to recovery rate). In subsequent years the Recovery** Recovery factors will be based on estimated *annual aquifer losses* using the groundwater model. Guidelines for estimating aquifer losses will be published and updated by DEQ. For projects injecting into the Potomac coastal plain aquifer, the recovery factor shall not be less than “to be determined”.

A recovery factor schedule covering ~~10-15~~ years will be established by DEQ. Once established, the ~~10-year~~ **15-year** schedule shall not be modified. At the end of the ~~10-year~~ **15-year** period the schedule will be re-evaluated and the recovery factor may be revised based on new information.

Annual recovery factors contained in the recovery factor schedule may vary across time. For instance, the recovery factor may increase over time if annual loss rates are not constant over time.

DEQ may establish maximum annual limits on the rate of withdrawal from recovery wells.

Spatial Recovery: Recovery can occur **either on-site or** off-site of the injection location. The spatial recovery zone will be delineated during the permitting process. DEQ will develop guidelines for defining the spatial recovery zone. The spatial recovery zone will be defined to the maximum practical extent and subject to reasonable expectations that no adverse impacts will be imposed on the groundwater resource. The “spatial recovery zone” will be re-evaluated every ~~10-15~~ years.

Credit transfer between permittees: Groundwater storage credits may be transferred to another party within the spatial recovery zone.

7. BREAK – 10:50 AM – 11:00 AM

8. Australia Water Sharing Policy Model: Illustrative Application for Virginia (Mark Rubin & Kurt Stephenson):

Mark Rubin introduced the topic of the Australia Water Sharing Policy Model and assured the committee that we would have a full conversation and a discussion on this concept. The workgroup generally liked the idea of a trading system but they essentially ran out of time to construct a trading system model for Virginia and likely this committee won't have time to either. There are some pretty big policy pieces involved with the concept of trading that need to be discussed. We are likely to not be able to construct an entire trading system today, so part of the question at the end of the discussion is

whether we are going to want to recommend something about going forward with looking at a more comprehensive trading system. The workgroup looked at a number of approaches but the Australia model seemed to have the most traction among the members during the course of the discussions, so that is the concept/model that we want to bring to the group today.

Kurt Stephenson introduced the concept of the Australia Water Sharing Policy Model to the committee. His presentation included the following:

- The workgroup got together in December and talked about the Australia Model and concluded that some of the ideas contained in the model were worth pursuing in more detail but one of the recommendations if we move forward with this concept would be to continue a subgroup to flesh out the details of using such a model in Virginia.
- Previously in this committee we had reviewed some groundwater trading programs that have been implemented in the United States, but what has been introduced in Australia is a more comprehensive program than those that we have discussed. It is comprehensive in the sense that it covers both groundwater and surface water. All sources are included under the management program.
- The Australia Model is not just a trading program. The way the Australia system is conceived is that it is a comprehensive water management system in which trading plays a part. It is a comprehensive water management system because the overriding objective is to achieve the state's goal of protecting and extending the water resources for current and future generations. Its long term goal is source protection. It explicitly addresses what the government would need in terms of achieving and setting overall water quantity objectives. It addresses the ability to achieve those goals under uncertainty – when the uncertainty might come from scientific uncertainty about what the water availability is or from weather related uncertainties, but at the same time achieving stability for the individual users so that they can exercise long term planning to the maximum extent possible and also to facilitate flexibility to adjust to changing conditions – that is where the trading part fit in. This is a comprehensive water management system that looks at all of the player's objectives and tries to achieve those in the most effective way possible.

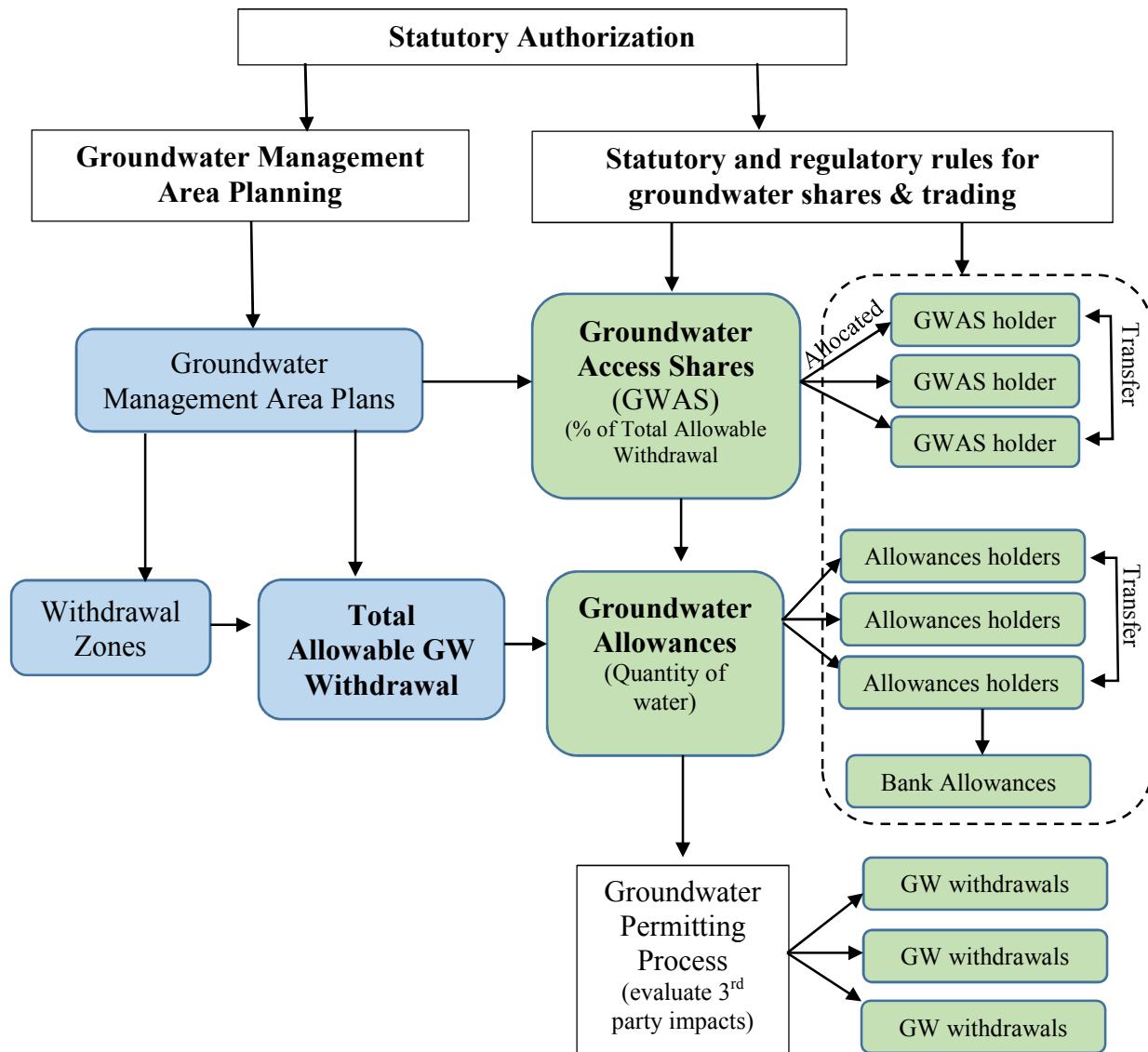
He reviewed the diagram on the last page of the handout (included below) to provide a summary of the details of the Australia Model. He reviewed the main pieces of the Australia system and how those might apply in Virginia.

- The Australian system is based legally on similar grounds that the Commonwealth legal system is based. The water resource is a public resource.
- What the Australian system does (starting from the left side of the diagram) they have a system, depending on the resource, surface or ground, where there is a determination of the total water that is available in the system. That is a state determined decision. If that is transferred over here that the Groundwater Management Areas would have specific goals within those areas.

- Different regions would have specific goals in terms of the total water availability in those regions. Withdrawal zones might be established.
- The state's objective is to protect that resource and to set limits on how much can be withdrawn. That could be set up in a number of different ways in the sense of who is playing; how those goals are set; what information is considered; what is the public process of setting those limits. Once things have been set, what the system does is to allocate "shares" – "Groundwater Access Shares" which is a percentage of the Total Allowable Withdrawal that a Groundwater User Claims for their use of that public water. Those shares are protected at least in Australia in perpetuity. If you own a 3% share of the total allowable water – that is protected in perpetuity – it is written into statute.
- So the groundwater share allows you a certain percentage of the total allowable water. Then when the state makes the determination about how much water is available those shares are converted into allowances or entitlements which gives you a specific quantity of water that you can use. You could think of this in these terms – you might own stock in a corporation and that stock then allows you to receive a dividend – the stock is kind of like the water access shares but you don't know from year to year how much dividends you are going to get because the value of those dividends might change depending on how profitable the corporation is that year. The way it would work in groundwater, conceivably, DEQ, through a set process would determine that we have this much, say 20 million gallons of water that is going to be available per year for the next 10 years in the Southeast region of the aquifer. Of that there will be people who water access shares that could translate that quantity into a percentage that they could then use for over the 10 year period – those shares would be converted into allowances which would be a given quantity of water that you could use every year for 10 years. Until that process is repeated in the next cycle. DEQ then at that time might say that given our current scientific knowledge and advances at that time, the available amount might be adjusted to 19 million or some other amount – gallons per year that could be yielded from this aquifer. Then that amount would be divided up based on the shares to the users. Now the allowances that you get which is the quantity of water that is transferable among users within those zones. So if you have 3% of 19 million gallons and you have allowances for that quantity of water then you can transfer those quantities to another user in the same zone. You can also transfer those shares.
- This is the big picture overview of how the Australian system works and how it achieves those objectives. It gives the state the ability to change but those quantities and shares give people a certain amount of certainty that their share of the water is going to be available for each specific user so that they can plan around having access to that quantity of water into the future. There is an acknowledgement that the actual amount could go up or down but that amount would be shared proportionally based on those shares.
 - Can those shares be sold or transferred? Yes. The access shares as well as the allowances can be sold or transferred to different parties. That provides a flexibility component to the system to provide for growth or a situation where a user might not need as much water as anticipated.

- How are the shares initially determined? That was one of the big challenges when they set up the system in the early to mid-90. They based it off of some historical usage records. The way the Australian system works is different in each of the provinces but is governed by the general concept. In New South Wales they hold a certain small (4 to 5%) percentage that they didn't allocate and reserved it for critical human need – to provide for growth, etc. – to have that certain amount in reserve that they could allocate for critical human needs.
- The other thing that came up in this morning's discussions was how you deal with unpermitted users. In the Australian system, everybody is in the system; agricultural, municipal and industrial – but who is not in the system is the designation of some lower level amount of use for example, if you have an individual house whole well then, at least in New South Wales, you are not in the system. It is a comprehensive program but it doesn't track every drop of water.
- The surface water is completely different, because the water availability can change literally from week to week, but they use the same philosophical system to govern both surface water and groundwater, it is just implemented a little differently.
- What prompted Australia to implement this program?
 - It was an acknowledgement that they had a very limited resource in water – it was those pressures of trying to mitigate and handle potential conflicts about who owned the water and who got access to the available water. That was the mitigating factor that resulted in the development of this approach.
- That is one of the concepts that we want to look at: If the HRSD SWIFT project becomes fully operational and performs as predicted then groundwater would not be as scarce as it is now. This would be a big system change that we would need to take into consideration in future management of the resource.
- The Australian model is a fundamentally different way of going about water allocation.

Figure 1: A Hypothetical Illustration of a Virginia Share-based Groundwater Allocation System



Discussions by the group included the following:

- Regarding economic development: So future business recruitments come into the area – for them to be able to participate and have water allocated to them would they have to purchase those shares/allocations from someone else? Yes. So if there is no one willing to sell then they have no options. In Australia that is the way they have chosen to manage this limited resource – once the system is closed – then people have to buy into the system through the purchase of shares and allocations if they are available and other users are willing to sell them. There are limited amount of stock (shares and allocations) that are available. You have to look at it from the perspective of what is the alternative to this. If you had a system where you had a limited

resource and the demands exceeded the available supply then you are always going to have that decision to make if someone comes in and says I want to withdraw 10 million gallons per day, then DEQ is either going to have to be confronted with the choice of allowing the groundwater depletion rate to accelerate or we are going to have to take that amount out of somebody else's permit.

- What has the result been for the aquifer?
 - For New South Wales, they are achieving their established aquifer goals.
- Are there any large scale ASR projects underway in Australia?
 - That is a good question but we don't know. It does tend to be a surface water dominated system.

ACTION ITEM: Kurt Stephenson said that he would research the Australian model further and bring back to the committee information on any ASR projects being conducted.

- This was described as a comprehensive system. What is the interface between surface water and groundwater in Australia?
 - It depends on the system – for New South Wales it depends on the groundwater system and the amount of surface water and groundwater that is available. Their allocation system covers both hydrologically connected and confined systems.
- Our discussions have revolved around credits for groundwater but obviously if surface water were to supplant the groundwater need then a situation is created where someone gets a bunch of credits for groundwater that they no longer need and don't use – is that productive to have those traded to somebody else as opposed to being available for growth? You would have to buy into the system if you need groundwater.
 - One possibility would be to have a system that was not so comprehensive.
- It might be helpful to think of the Australian program as having two major pieces. The allocation piece that we have been talking about is a different model than the permitting program that we already have in place in the Commonwealth. DEQ has just taken all of the major permits through an allocation process – through those permits. That is part one. So do you like the current permit program we have or do you like this percentage system that Australia has? That is one question. Part Two is do you like the idea of trading off of whatever the allocations or permit limits are? The trading component that Australia has or some variation of that could be bolted onto the DEQ permit program if that was the desire just as it is attached to the Australian concept that we have been discussing. So there are really two pieces that we need to consider. The Australian model brings up both: our permitting program and the possible trading program.
- Does the Australian model include permitting for everyone?
 - Domestic wells are not permitted and are not included as part of the overall Australian model.
 - There is a lower usage – a lower withdrawal amount cutoff number. Probably lower than our minimum.

- So we are talking about an allocation system with the notion of defining what the resource is at the beginning of the process and then allocating it out. Do we take the same sort of approach if we had a trading program without the allocation system?
 - You can. We have an allocation system already; it is called our permitting program. The trading with whatever detailed rules we want to include could be added to the existing permitting program, just as it was included in Australia with the type of allocation system that they picked for themselves.
 - The way the Australian system works is that if you bolt a trading program onto a permitting system, the things that you are trading are only for the duration/length of the permitting cycle. So everything is tied to the permit. There is probably less certainty in planning beyond the permit term, because with an allocation system you don't know how those allocations are going to change for the next permit cycle. That is why the Australian system has been developed the way it has so there can be more certainty in setting your expectations about water availability in the future.
 - Is there a life span for the allocations in Australia? Not for the shares. But the base value, the percentages applied changes every so often based on availability. On the resources in question those values can change based on availability. For surface water it can change monthly or even weekly, but on groundwater it may be years before those values change.
 - So for the short-fall situations that we have been addressing through the permit actions, in the Australian model there would have been equal percent reductions because everyone owns a fractional share. Everyone takes their share of the pain. On the groundwater resource the amount available might not change for years – it would depend on how often we want to reassess the total amount available – the status of the resource. It might be on a 5 or 10 year cycle for groundwater. It might be weekly for surface water.

§ Different groundwater zones might have different time frames. Possibly.

- When we went through this current round of permit reductions, it was customized to the needs of the individual permittees, either in quantity or in schedule. That approach goes away with use of the Australian model. It is just a straight percentage approach.
 - Yes, but it gives flexibility and it takes the burden off the state to have to figure out between the 14 permittees or however many permitted users how much someone actually needs something and gives it to the users themselves – they would determine that maybe they didn't use as much in this 10 year period than anticipated so they have a certain amount of extra that they can trade (sell or lease) to someone else who needs a greater allocation.
- The big advantage in terms of the allocation side is the certainty – it gives stability to the market place – the trading system becomes very stable if we are using the Australian model, while still preserving the state's ability to change and manage the resource and to meet whatever the groundwater objectives are.

- The state would still have to say “here is the amount of water that is available”. For any trading program you would have to define the market – define what is available. That amount would be capped.
- The Groundwater Management Act that we have now says that if water is scarce and we are depleting the aquifer we are giving DEQ authority to manage that scarce resource. DEQ has permitting authority but there is nothing in the Act that says or sets how much – what quantity we are shooting for to achieve those objectives. That would be potential useful information to have at least from a user’s standpoint – what are we talking about – how limited is this resource? And it goes to a comprehensive planning process so we can to how much is available in this time period – in this region.
 - That was a big deal when the workgroup was discussing this concept – setting a cap and how do we do it.
 - As has been noted, the perception of the state is that the water belongs to the state and now we are trading something that belongs to the state and you have set a cap on what it is and then you have the further philosophical and practical question of right now everybody pays to get the water out of the ground but they are not paying for the water itself and now there is a market based on the state’s resource.
 - § Not everybody agrees that it is the state’s water – that is the reality of public perception that we need to understand.

Mark asked the committee whether anyone else had any ideas or experience about trading that we ought to put on the table for further discussion. He noted that we wanted to put the Australian model out and on the table as a vehicle for discussion. Are there other notions that people have about trading in general? Is there any interest in a different allocation system – something like the Australian System versus the permitting system that we have? He noted that all of the workgroups generally think that the current permitting system worked well as long as there was enough water. The general notion is that when we were talking about trading we would be thinking about a permitting system not the Australian type of allocation system.

Further discussions included the following:

- A concern was noted that we really don’t have that level of an agreement that the water is a state resource and we don’t have any agreement unless you are personally impacted that there is a scarcity issue – this is all in terms of the general public’s perception. We do not have the overall perception like Australia that is driving the program and the understanding that it is a scarce and limited resource.
- We don’t have the baseline historical data to establish the baseline values and to establish what the shares are that would be available that everybody is going to get. We also have a number of varied players around the table in terms of public/private – how would this all work with this number of different stakeholders. How would we deal with it? Is it strictly a question of buy-in to the program? It is not just new businesses that come in – but also new subdivisions with new homes – how do we address those new users if we are totally allocated – do they have to buy

in? Who are they buying from? Without having a lot more structure that we could see to determine that it would be better than permitting it is going to be real hard to make the decision to go with an allocation/share system like the Australian model.

- From a perspective of thinking about two different futures – we are sitting here 8 years from now, the state could have a very large and very successful aquifer storage/recharge program or we could be sitting here in the next 8 years and for some reason the plans for HRSD do not get off the ground or do not product the planned results and then all of these permits that have been negotiated in the last year or two are going to up for renewal and then the question is going to be do you want to have to go through this current process every ten years – every permit cycle? If the answer is yes, because everything works fine then there is no incentive to change. But if you think that should be an alternative - what is the alternative that could be implemented? The Australian model is just one alternative that could be used.
- It is a logical alternative to consider, but one of the things – the elephant in the room – that we have all been talking about previously is that with so many unpermitted users and that use is growing. Don't see how you could put an allocation/share system like the Australian system in place over our existing system with the existing high percentage of unpermitted use. Don't see how trading could work in the current environment.
- A trading system is going to be almost impossible to work unless you have a better handle on that unpermitted use, because you would be trading with less than 50% of the shares allocated – an unknown amount.
 - Doesn't the same concern apply to the existing permit system? Yes. Trading then is just a way to help the existing permittees. One of the thing that the workgroup did talk about was rather than a huge wide open trading program maybe we could develop one that was more narrowly defined to include those that were more likely to use it – the larger permitted users or new permitted users of 1 million gallons or more. This would limit the trading program to just those with the larger allocations.
 - This is a usable concept and should not be discarded just because we don't have a handle on the unpermitted users.
- What is the share between permitted and unpermitted users in the Eastern Virginia Groundwater Management Area for current use?
 - The current estimate of the share between permitted and unpermitted use is 60/40 or 70/30 – somewhere in that range.
- Does the concept of limiting a trading program to only the big users make any difference in the group's thoughts in terms of trading? It was suggested that it probably doesn't make a difference. There is no problem with pursuing it further, but it is likely that at the end of the day that you are not going to get something that is very productive if you don't have a handle on that 30% or 40% of the use.
 - The projections that have been mentioned are that 10 years from now that the split between permitted and unpermitted use will be closer to 50/50 if the trends are consistent.

- Part of the trading concept is that you are really not looking to be lowering the usage; you are looking to preserve the usage. So how are you going to preserve the usage when what is 60% today will be 50% 10 years from now? What good does it do to have those people traded off when there actually is not going to be that much left if we don't do something to impact the unpermitted use?
 - It is not an either or scenario, “unpermitted use” is an issue that will have to be addressed no matter what we do.
 - The question is how someone allocates what they can trade if the total volume may be going down especially if the HRSD SWIFT project doesn't work. There are a lot of variables that may make it very difficult for trading to be a viable solution.
- When DEQ is going through the permitting process, the resource as a whole is being considered and they are projecting unpermitted use as well.
 - There is a placeholder for unpermitted users in the permitting process. But there is no projection of that use forward to grow – the unpermitted use number is held static.
- The real issue is that the trading program has to be, at least initially, time limited to something close to the permit term. The reason for that is that by being flexible in the negotiations with the largest permit holders and trying to take into consideration the individual permittee's needs that we didn't get all the way to where we needed to go. So starting with the trading program it is going to have to start at a lower number than you think it is right now – it is something lower than what the current allocations are. We don't know what that amount would be but this is something that would have to be dealt with.
- The concept of having a planning process that would occur at the beginning of every 10-year permit cycle, not a planning process for the permittees but it would be a planning process for everyone in the Groundwater Management Area that would identify the current use, this is what people are using and this is what we think we have. Then you could have a discussion about setting limits and plans to achieve a certain level of use 10 years into the future. Is this type of planning process worth having to set these overall goals and to set overall quantity limits so that people can see how much or how little is available? We need to consider both permitted and unpermitted use as well as the rate of depletion in the planning process to be able to set overall goals for the resource every 10 years. Is that process worth having?
 - That is the missing piece – that makes the issue for existing permittees that much more unpredictable because they find out at the end of a permit term when they reapply rather than having some advance notice of what the situation will look like. That is what the Australian approach accounts for.
 - This type of planning process would also provide for an ongoing dialogue with the localities about how to address the unpermitted users – it would be a planning process for the groundwater management areas.
- In the Australian model did anyone provide an allocation for localities/local governments for domestic use?

- No, but conceivably you could. How the state or the group decides to allocate their shares is completely open-ended – it is just a question about how you would enforce it.
- It was noted as a clarification that for this type of allocation system to work that we would have to have a realistic baseline – we probably can't use what is currently permitted or necessarily what was permitted before this round because that really doesn't accurately represents what we would do if we did a trading program. With what we have on the table today – not against the concept of trading – but we need to look closely at how the shares – the amount of water available – would be allocated. Do we say that a jurisdiction would have a certain allocation and what does that include? Does it include domestic users? Does it also include the commercial users, some or all? Is there a threshold level? If we had that level of structure to it, it might make trading a much more viable option, but looking at it right now it is too nebulous a concept.
 - The Australian model is really not a trading program; it is a groundwater allocation system. You need to figure out who gets what initially.
- From the notion of planning and setting some goals as we are always trying to get new businesses in, how do we accommodate new growth in a system like this? Do we need to set aside an amount/an allocation for new growth?
 - Would a 5% set-aside be sufficient? How much water would that be?
 - The amount of allocations available might prevent some businesses from expanding in Virginia, because they are not getting the allocation that they need or those additional allocations are just not available.
 - How would water from smaller commercial water facilities fall into an allocation scenario – how would that water be allocated?
 - The reality is that in this region industrial businesses just don't look at this (water availability) alone, they look at the cumulative environmental and regulatory impacts to building in this region. So if you are a water intensive business, your first look is the TMDLs, can I even get a permit if I have an outfall? Then what happens with “air”, are we in a “non-attainment” area? This is just one more thing that has to be taken into consideration. It is just something else that it is going to make it that much more difficult for this region to attract someone who is water intensive. In general manufacturers aren't afraid of that but they have to have clarity and certainty to move forward with a project - It can't be, we will let you know every few years.
 - Clarity and certainty is needed – it is more a consideration of what do we do with the companies that are already here in the region.
- There are a lot of parallels to what we have been learning as a state in the Nutrient Management world.
 - There needs to be a cap and allocations.
 - How will it be allocated? Current permitting program or some variations
 - Time horizons are critical – it needs to be in the neighborhood of 20 years not every 5 or 10 years to allow for time to do whatever planning we are going to do and investment.

- We need to tack on a trading component to enable participants to find more efficiency.
- The hard policy questions still remain: Who gets an allocation; for how much; and for how long? Whatever those answers are – trading can help.

Mark asked the group what we would want to include in the report about the concept of trading. Is there something that the committee would like to say in the report to David Paylor and to the General Assembly about trading? Is this something that ought to be pursued in the future?

- It was suggested that we should consider the comments that were made regarding the Nutrient Management program and the parallels that could be drawn between the trading concept and the nutrient management program and the things that needed to be considered and included in any future discussions about trading.
- The concept is an important one to continue to look at in the future. It could have some real value to consider further.
- A process question was raised regarding what goes into the final report: If the report says that we need enabling legislation to start the process with the State Water Control Board or the DEQ staff – it looks like you would need to have zones designated because of the different values, a schedule, and pricing – you are talking at least 3 years just to get through that process. Time is of the essence. If this concept is included in the report as a recommendation then it should have some sense of priority because the back-end of this takes so long to operationalize it - it has to be modeled and it has to be priced. We would be at year 5 in the process before we know it.
- The recommendation would then be to yes, let's explore it but let's not take forever – let's establish a time frame and get some resources to do it.
 - Enabling legislation needs to be sufficiently clear about the outline of the concepts – you don't want to write the regulation in code but you do need to have the concepts clearly identified so that we head in the right direction.
 - Need to have clear direction from the legislature as to what is acceptable and what isn't.
 - This is a concept that needs further thought and further discussion by the committee.
 - From our discussions to date it is apparent that there is going to have to be a lot of modeling and work behind the scenes to make this workable. DEQ would have to have the authority and the resources needed to do this work.

ACTION ITEM: The concept of a trading/allocation system will be revisited at the June or July meeting of the Advisory Committee.

9. Water Quality Concerns (Mark Rubin/Marissa Levine):

Mark raised an issue related to HRSD and alternative regulatory structures. The issue is how we address water quality issues/concerns in regard to a project like HRSD and what the concerns are about how you would regulate it.

Marissa Levine noted that the EPA UIC program is the regulator for groundwater well injection. The concern is that we do not know what EPA is going to look like in a year. With that uncertainty, she

asked the Advisory Committee to discuss what recommendations should occur in the report that moves Virginia to be evaluating an appropriate regulatory framework to address the HRSD SWIFT project or similar projects. We don't have a preconceived notion of what that should be but we have to consider the possibility that the EPA regulatory framework might change and even if it doesn't to ensure that we have a discussion of what needs to be in place for this scale and type of project from a regulatory point of view.

- This is a Department of Health issue and concern; it is a DEQ issue and concern and it is an EPA issue and concern. We are going to need to talk about what is currently in place and what, if anything needs to be tweaked. We need to have this discussion.
- This builds on one of the questions raised this morning related to public perception. We really need to deal with this as transparently as possible with these issues, because there are perceptions and preconceived notions related to the HRSD SWIFT project. As that project gets closer to operationalizing there may be additional concerns raised by the public as more people realize what they are proposing and as they get closer to implementing the project.
- The point is that we need to make sure that we are identifying and addressing the concerns and that they are being managed in whatever regulatory framework is set up.
- The EPA UIC program is a program that can be delegated to the state. For 20 years the state has refused to take on the program because it comes without resources.
 - How much is the EPA UIC program used in Virginia?
 - § It depends on the class of the UIC well. For the small injection facilities there is about 12 thousand; when you start to get into oil and gas facilities there are far fewer than that; and then you get into the types of injections that we are talking about now related to groundwater injection, there is really only one.
 - § The issue is that you have to take the whole program if it the state were to assume the program. That is why the state has not assumed the program.
 - § There may be some options related to the water quality concerns for the HRSD SWIFT project because DEQ already has a permitting program that applies to HRSD that we might be able to modify to address those specific concerns.
- The issue is: What is the vehicle, especially in an ASR project that is aimed at recharging the aquifer to some extent that creates the certainty – that assures the public that we have the vigilance in dealing with and addressing water quality?

ACTION ITEM: Mark asked the Advisory Committee members to think about this issue about having a vehicle the creates this certainty and that assures the public that we can be and are being vigilant in dealing with and addressing water quality in a project such as HRSD SWIFT. This will be a topic for discussion at either the June or July meeting of the Advisory Committee.

10. LUCH – 12:00 Noon – 1:15 PM

11. Alternative Management Structures (Andrea Wortzel):

Mark Rubin introduced the topic of Alternative Management Structures to the group. He informed the group that Andrea Wortzel, who is a lawyer at Troutman Sanders and is Counsel to Mission H2O. She has been involved with this all through the process of the meetings of the committee as well as the workgroups, which we are greatly appreciative of. She is going to talk about what the Alternative Management Structures Workgroup has been working on. Andrea distributed a handout on “Alternative Management Structures” and briefed the Advisory Group on the work of the workgroup. Her presentation included the following:

- The Alternative Management Structures Workgroup meet 6 to 8 times independently and several times with the Alternative Sources Workgroup.
- GWAC Problem Statement – Presented at the March Meeting:
 - The Eastern Virginia Groundwater Management Advisory Committee (Committee) will develop a consensus strategy, including legislation for the implementation of the strategy, for the management of groundwater and other alternative sources in the Eastern Virginia Groundwater Management Area (EVGMA). The goal is to create a clear, consistent and understandable **framework for the management** of the water resource so that local and state regulators, those whose activities are regulated by the law, and consumers, both human and industrial, can guide their actions in accordance with a strategy to sustain the water resource. The intent is to **manage** the resource so that it is productive and available to meet the human, industrial and environmental needs of the EVGMA.
- Problem to be addressed may include (Presented at the March Meeting – also included in the draft report distributed for today’s meeting):
 - Reduce remaining critical cells;
 - Minimize the potential for the return of, or increase in, the number of critical cells;
 - Improvement in land subsidence and restoration of elastic storage;
 - Minimize the potential for upconing or lateral saltwater intrusion resulting from groundwater pumping;
 - Maintain groundwater availability to permitted and unpermitted users for future growth to the greatest extent practicable
- Questions to Consider (New Material):
 - Short Term = Permit Reductions

	Permitted (mgd)	Unpermitted (mgd)	Total (mgd)
Allocated	114	30-40 (estimated)	144-154
Actual Use	60-70	30-40	90-110
Target	40-50	30-40	70-90

- Does this solve the problem?
 - § DEQ says NO
 - § Stabilizes the Aquifer – But Does Not Improve It

- § More will be needed
 - § No New Withdrawal Permits Going Forward if we maintain the Status Quo.
- Does SWIFT solve the problem?
 - § DEQ originally proposed reducing large groundwater permits from 112 MGD to 44 MGD. This is a loss of 68 MGD of capacity.
 - § SWIFT expected to generate 100 MGD in new capacity (gain of 32 MGD).
 - § 2-3 New Industrial projects (or One Data Center) could consume this amount.
 - § NOTE: The Workgroup did discuss potential regulatory changes needed to enable SWIFT to occur.
 - § DEQ and VDH working directly with HRSD SWIFT to develop appropriate regulatory structure and water quality targets.
 - § Broader stakeholder group including DEQ and VDH engaged directly with SWIFT to address possible oversight framework, similar to the Occoquan Watershed Monitoring Lab.
- Are the permit reductions plus SWIFT enough to solve the problem?
- Is so, should report say so?
 - § May need permit reductions + SWIFT + more.
- If not, what other changes are needed?
- Alternative Management Structures Workgroup discussions focused on potential changes to management structure that could help solve the problem and create more incentives and opportunities for alternative sources.
- Key recognition/conclusion from the workgroup = stakeholder involvement going forward is critical.
- Alternative Management Structures – Options Considered (New Material):
 - Status Quo – what is lacking?
 - § DEQ does not have authority to require regional partnerships, cooperation, or even planning (NOTE: JLARC report discussed this issue.)
 - § DEQ permit review process does not focus on alternative options (the focus is on protection of the groundwater resource) – there is not a robust study or review of options/alternatives.
 - § DEQ permit review process does not consider relationships among water resources (groundwater, surface water, stormwater, water quality) – “One Water Concept”.
 - § Permits serve as allocation mechanism (for withdrawals greater than 300,000 gallons per month).
 - § Permits sole groundwater management vehicle.
 - Voluntary Allocation Agreements:
 - § Similar to provision in Surface Water Management Act – there is nothing like it in the Groundwater Management Act.
 - § Rejected by Workgroup – there is nothing that precludes this from happening now.

- Formation of Water Management District or Other Regional Governing Body:
 - § Could be similar to ICPRB, HRSD, Rappahannock River Basin Commission, or Florida Water Management District.
 - § Concerns voiced: local infrastructure and dependence on revenue from water sales.
 - § Discussed potential role:
 - Forum with no authority;
 - Review and provide recommendations to DEQ on proposed permits/projects;
 - Management of Water Systems and Planning;
 - Management of Water Systems, Planning and Permitting – like Florida Water Management District.
 - § No Consensus reached.
- Regional Commission – Many Details to Consider (“The Devil is in the Details”):
 - § Appointed representatives? Who would appoint them? (40 Localities in EVGMA – Representative for each?).
 - § Could establish more detailed and frequent reporting requirements.
 - § Establish uniform methodology to project demand.
 - § Set criteria to address unpermitted withdrawals.
 - § Assessment if proposed projects/permits and alternatives.
 - § Timeline for merging ownership/management of water supplies.
 - § No Consensus Reached.
- Formation of 501(c)(3) to create framework for ongoing stakeholder input – Do need some way to integrate public concerns and input – there is a need for stakeholder input moving forward.
 - § Reviewed Alabama Clean Water Partnership.
 - § Similar groups already exist (HRPDC, Mission H2O).
 - § Would not have permitting authority.
- Extension of EVGMAC (in some form – current or different form)
- DEQ host “state of the aquifer” meetings every 6 months or so – who would be invited to these meetings? Open to the public – public meetings set around the Eastern Virginia Groundwater Management Area.
- How to Capture This in the Report (New Material):
 - What is the problem?
 - Has it been solved?
 - If not, how will it be solved?
 - Recommendations on specific alternative management structure?
 - Recommendations to continue to study one or more of the options?
 - Recommendations on how to continue the dialogue?
 - Recommendations to continue with the current system – status quo?

Discussions by the group included the following:

- A suggestion was made that the group should consider the way that the Eastern Shore Groundwater Committee is set up and structured as an option/template for a “regional group”.
 - This group has been doing a number of these steps since the 1990’s. They essentially function as a water management district on the Eastern Shore. It is run through the Planning District Commission and has provided a mechanism for public and stakeholder involvement since the 1990’s. There are two counties and one town involved in the process that created the Eastern Shore Groundwater Committee through Joint Resolution – there are 11 members of the Committee – about ½ of which are elected officials with the others are appointed citizen members (Appointed by the Counties and the Town). They contract with an Environmental Consultant who helps the committee review every groundwater permit that comes up within the Eastern Shore Groundwater Management Area. The Committee provides comments on those permits during their development and provides that input to DEQ. All of this is coordinated through the PDC.
 - What is the purpose of the Eastern Shore Groundwater Committee? Their purpose is to work with DEQ on how groundwater withdrawals are allocated throughout the region. There are two users who constitute 51 or 52% of all of the groundwater use on the Eastern Shore. They work closely with these two users. They maintain a Regional Groundwater Management Plan. They try to leverage research to address data needs. They do a lot of public outreach and public engagement and educational efforts. The Committee gives them a unified voice to work with groups and committees like this one.
 - Is Industry represented on the Eastern Shore Groundwater Committee? No, they are not represented directly but the Committee works very closely with them. The meetings are all open to the public. They work closely with all the major users on the Eastern Shore.
 - How does the committee make decisions? The Committee operates by vote. How are conflicts resolved? There are rarely any areas of conflict that would constitute a tough decision.
 - The Eastern Shore Groundwater Area is the only sole source aquifer area in the Commonwealth. They may be experiencing some regional level saltwater intrusion that will need to be taken into consideration.
 - Does the Committee discuss things like alternative water planning? Yes, but being primarily agriculture a lot of the Committee’s work is working with the farmers locally to encourage them to use the shallow, unconfined aquifer (Columbia) to reserve the confined Yorktown Aquifer for the public supply. Working with farmers to encourage them to use irrigation ponds anything that they can do to preserve the Columbia for agricultural use.
 - The recommendation was made that the Eastern Shore Groundwater Committee should be included in the report as a possible framework moving forward in this process.

ACTION ITEM: Staff will include reference to and information on the existing Eastern Shore Groundwater Committee as an example of a framework for management of the groundwater resource in the Report.

- A friendly amendment was suggested on the information included in the presentation regarding “Status Quo” identified in the presentation. Right now we are not required to make an explicit determination within the Groundwater Management Area about how the broad goals of reducing remaining critical cells; minimizing the potential for the return of, or increase in, the number of critical cells; improvement in land subsidence and restoration of elastic storage; minimize the potential for upconing or lateral saltwater intrusion resulting from groundwater pumping and maintain groundwater availability to permitted and unpermitted users for future growth to the greatest extent practicable translate overall into broad water withdrawal targets. Not user by user but for the overall Groundwater Management Area, how do those broad goals translate into an overall withdrawal limit within the zone of the Groundwater Management Area? In regard to the “short term permit reductions” that have been identified – an explicit part of a planning process could be a requirement to come up with these numbers (Allocated; Actual Use; Target Withdrawal Limits for Permitted and Unpermitted) every 10 years so that people in the basin will know how those broad goals translate into overall withdrawal limits. Right now we do not have any explicit determination about how groundwater management goals translate into overall withdrawals. It might be useful to have this type of information included in the planning process.
- How would these figures – permit reduction goals – withdrawal limits/goals etc. be set? Would this be a result of DEQ discussions and negotiations with permittees?
 - DEQ probably has some idea of the needed limits and reductions in mind now.
 - The Groundwater Management Act doesn’t require bringing this concept forward and identifying upfront “How much can this aquifer give us overall?”
- Should the state set, as part of the planning process, an explicit number that everybody knows on an “every 10 years” cycle or on the basis of every permit cycle?
 - This would be without getting into the allocation issue of who gets how much but it would be more of a discussion and a periodic look at “what are we trying to achieve?”
 - Who is “everybody”? Everybody in the Groundwater Management Area.
 - The problem is that there is not “one number” – “one amount” that is available for the entire aquifer – it matters where you are. To set “a number”, even for a broad area could potentially short-change some uses that might be available. You would likely artificially set it too low.
 - § It wouldn’t have to be a single number for the entire basin. It could be a range that would apply depending on where you are in the management area. It would be useful as part of the “planning process”.
 - § It would also have to be multi-varied because it not only matters where you are laterally and where you are vertically.
 - § Don’t know how you would do this?

- The “everybody” question still raises the question of “regulated” versus “unregulated”?
- This concept is underlying everything that has been discussed for the last year and a half in the Committee and the Workgroup meetings. Is it worth including this concept as part of the planning process moving forward – to identify: Who is taking what amount? How much is available in what areas or regions of the Management Area? It would be a planning process to inform DEQ setting of the permit limits and the withdrawal targets.
- The idea of having a “State of the State Report” on the Aquifer is a really good idea. Everyone could have a better idea as a result of these periodic reports – thru informational meetings – as to the actual “state of the aquifer” and the goals and limits and rationale behind the setting of those goals and limits. This could inform all stakeholders as to the current understanding of the aquifer.
 - Maybe a “state of the aquifer” makes sense – maybe a “state of water resources” concept makes more sense – maybe we enlarge it and include all water resources in the Commonwealth – in the area. The point of the State Water Supply Plans was to look at all of the potential resources available and to identify options and alternatives going forward. DEQ does not have the authority to assign regions but a lot of regions self-selected in one form or another for purposes of the State Water Supply Plans. That did give us a look into the future about where “pinch points” are likely to occur in other parts of the state that are not confined just to the Coastal Aquifer.
 - A “state of the aquifer” or a “state of water resources” report – informational meeting – could also be used to bring people up to date on the status of the modeling efforts and any tweaks; new inputs and modifications to the model.
- We do need to manage the resource; catch up and keep ahead of the curve without having to identify a single number that might be seen as being restrictive. There is probably not just “one number” that is the right number because it is so location/space specific.
- Is there a way to get to the benefits without identifying a published restrictive number that might cause problems? It appears that DEQ’s concern over the level of groundwater withdrawals was such that it surprised some people that we needed to make these types of reductions. There is a range of numbers for withdrawal amounts that were considered in order to stabilize the aquifer – to reduce the risk of critical cells popping up everywhere. It was not a number, but a range of numbers. Is there a way to avoid those types of surprises in the future? Can we get ahead of the curve and inform people that this is what we are learning about the resource and this is what has to happen in order to manage it going forward? Or are we going to continue to have these types of permit reductions every permit renewal cycle? How do you avoid those surprises and allow everyone to plan for the future?
 - We need a mechanism for communication and dialogue such as the proposed “state of the aquifer” – “state of the water resources” report – forum.
- Today everybody is being managed on an individual basis. What we have been discussing is identifying some way for this process to occur on a collective basis. What’s wrong with that?

- In terms of how you keep people informed/involved - we need to have better communication piece/process.
- Around 1990, we found out that a meteorite had hit the Chesapeake Bay and created an impact crater that meant that our model was all wrong. It took some time to figure all of that out. We are hoping that there are fewer surprises of that nature in the future.
- DEQ also stopped doing as much empirical stuff because of budget cuts.
- When DEQ came up with the proposed permit reductions – that was done collectively and not permit by permit. If DEQ had done it permit-by-permit the way the model would have reacted it would have called for greater reductions. So there was a collectively look taken at that time. That is a concept that has made sense to use in this process – though there may be different ways to apply it.
- The sense is that DEQ has something in their minds as to a range that they are using. There is some resistance to making that an explicit number or even an explicit range. But the concept of sharing your views from what you see is not a problem. In order to prevent potential surprises in the future that having frequent forums for discussions and updates would be useful.
 - It is hard to argue against doing this on a collectively basis rather than on a permit-by-permit basis – on an individual basis. The question becomes who is going to do that collective piece? Who is responsible for that process? What authority would they have? Who is involved? How do we become involved? If we start talking about an explicit goal it kind of begs the problem if we don't ask what does that mean? What does the number mean? Does it mean that all users have to dial back their usage? If we all have to dial back then who is going to enforce that? How is the amount going to be determined? Are we including perspective use or just current use? Once you put out an explicit number you have identified that we have an issue but we don't know how we are going to address it. It makes sense to look at it collectively. The reason that the workgroup didn't come up with any specific recommendations or consensus was that a lot of people had issues and concerns. That is understandable given everyone's different perspectives and how the water resources are being managed differently by the individual users based on the assets they have. A individual perspective was noted that having a Regional Entity take over a Water Utility might not be a bad thing – because there are some that think that water utilities are always liabilities they are never assets – willing to give the utility to anyone willing to take it – don't see a lot of people taking this approach or agreeing with this perspective.
- The sense is that stakeholder involvement is something that everyone would like to have. Now we are talking about a collective view of the system as opposed to an individual permit by permit perspective.
 - Stakeholder involvement in what? Is it stakeholder involvement in setting the allocation amount decisions or is it stakeholder involvement in setting broad goals for the aquifer? What is the stakeholder involvement for?
 - § From the discussions of the workgroup, probably it would be stakeholder involvement in all of the above. There was a sense that having this kind of

dialogue would be really helpful to get an appreciation of the constraints that all the water users were facing and what happens if you reduce this user by this much and that user by this much and how that affects each user – each permittee and how it affects those around them. It was both about having a dialogue and being informed about what the model is showing, what is the current thinking, what is the current state of the resource but also having a collective dialogue about where do we go from here.

- § Effectively this stakeholder involvement process would be to inform the permitting process through a collective dialogue and discussions.
- § It is more than just informing the permit process – there are other stakeholders involved in the community – this dialogue could be used to inform all stakeholders, not just the permittees. All of the stakeholders would be informed through this type of process about what is going on with water resources in their area through a “collective view”.
- § This would help to avoid those “surprises”.

ACTION ITEM: Curtis Smith with the Eastern Shore Groundwater Committee offered to share what the committee does annually for the Eastern Shore localities with the Advisory Committee. He will contact Amber Leasure-Earnhardt so that they can discuss their process. He will also route that information to Bill Norris so that it can be distributed.

- The group discussed the Eastern Shore Groundwater Committee process.
- Since we seem to be settling on a concept of a “state of the water” report/meeting, how often would such a report or meeting need to take place? How often would there be new information to report or discuss?
 - Annually you would have something to talk about.
 - One of the things that DEQ has done and that nobody has talked about or they might not be aware of is that DEQ does try to put out annually what is known as the “total permitted scenario” which is a model report that gives the tensiometric surface of the aquifers based on current use and total permitted use – that was always thought to be DEQ’s way of informing people of where the aquifer was at a consistent point in time. Obviously there are things that can be done to make that report more accessible to a broader constituency. Right now it is a technical document.
 - DEQ also has a report that they give to the General Assembly on the Status of Water Resources in the Commonwealth on an annual basis that also may be an underutilized vehicle that could be enhanced and more people could have access to share this type of information. That type of information could form the basis for a meeting.
 - There is another source of information that might also be useful and that is the Council on Virginia’s Future’s Natural Resources Scorecard for Virginia. It could be expanded to include more information to supplement the water resources section of the scorecard. Starting July 1st, DPB takes over the compilation and distribution of that report, since the Council is being discontinued.

§ DEQ has started to move forward with that concept. A “dashboard” has been developed that has groundwater as one of those indicators.

- The concept is that there would be an annual meeting. It would be a public meeting, open to anybody. It would have the resources that we already have, maybe beefed up a little bit to be part of the information that would be available to everybody.
 - This would need to look at the entire system not just focus on the permitted users/uses.
 - This would be a forum to acknowledge that yield of the resource is finite and that there are currently a lot of “straws” drawing from the system and that the number of “straws” is continuing to grow over time. This would be a forum for a dialogue about what to do about it.
 - It would be a challenge to structure that type of dialogue.
 - When the workgroup discussed the Alabama approach, there was an element of a dispute resolution component – a mediation process in their program. Does anyone have any thoughts about including such a mechanism in what we have been discussing for Virginia? Not sure that this type of service is needed in Virginia.

Mark asked the group how this concept should be addressed in the report. Should it be included as a recommendation in the report? Does it need to be statutory? Does it need to be required in anyway?

- It was noted that for this type of process on the Eastern Shore (the Eastern Shore Groundwater Committee) is was voluntary. The localities took action because it was a critical need for the region.
- It was suggested that this should be voluntary.

Mark noted that we would draft up something for review by the Advisory Committee that includes an Annual State of the Water Conference that would be open to the public – we would talk about the water resources there; it would create a forum for dialogue among stakeholders and citizens. The goal would be to have a collective view and to encourage stakeholder involvement.

- Is the goal to raise the profile of the problem? Yes.
 - It would help everybody with their planning efforts. If everybody has a sense of what everybody else is doing or thinking about doing then you create a broader more inclusive planning and thought process moving forward.
 - It does assume that you are going to have the same permitting process. There does not appear to be any stomach for making changes to that process at the moment.
 - You would have the same process but you would be elevating the problem and creating a forum for communication and enhanced dialogue among the stakeholders and the regulators.

12. BREAK: 2:05 – 2:15 PM

13. QUESTION:

Following the break, a question was raised by one of the Advisory Committee members:

The purpose of this group was to try to keep the underground water where it is, in the ground, where it is today. Is it right that the current available groundwater supply is at 70% of where it was? It depends on where you are in the system. Forgetting the number, we want to keep the available groundwater level (the capacity) at the present levels. The Advisory Committee was told “how can we grow and keep the water at the present level?” Can the groundwater stay at the present level with no growth? If everything is kept at the status quo? Can it stay there? If the answer is “no”, what do we have to do to keep it there? If we want to grow at say 3% (pick a number) a year for 10 years what do we have to do reach that number? There appear to be only 3 ways that you can do it: 1) you have to inject the water; 2) you have to have technology; or 3) you have to conserve – conserve could mean cut-backs. What else can we do?

- It was suggested that you could also include alternative supplies in this list of options. This would mean the use of surface water supplies.
 - § Where are we going to get this additional surface water from?
- An additional future option might also include desalination.

How can we simplify what we need to do? We seem to just be going around and around in our discussions.

- In regard to the current available groundwater supply: DEQ noted that they have just finished a permitting process that involves reductions for the top 14 permittees that over the period of those permits should get us to where we are not losing head anymore. We already have something in place that is moving us toward stopping the head lose. That is with no growth.
- If you are going to have to account for growth then you have to identify other options.
- In the meeting last month the Advisory Committee talked about possible alternative supplies to account for growth and created a list that is going to be included in the “report”.
- It was noted that a lot of the hurdles/barriers regarding the use or creation of additional impoundments were Federal, primarily dealing with impacts on wetlands.
- The need to address and reduce regulatory barriers at both the state and federal level regarding the creation and use of impoundments was raised.

14. Permitting and Planning Processes (Scott Kudlas):

Mark noted that we have talked a lot about the planning and the permitting process and we actually have covered a piece of that topic here today.

Scott Kudlas provided an overview of the “permitting and planning process”. He provided the following information to the committee:

- We have spent a lot of time today in both the context of the Australian Model and the context of Alternative Management Structures about this tension between the permitting process that works on a case-by-case/individual basis and the feeling that opportunities might get missed, perhaps to be more efficient in the use of the resource; get a bigger bang for their buck perhaps; channel that resource to someone who has a better need or a more immediate need.
- The Permitting Workgroup and the Alternative Management Workgroup both spent a lot of time talking about the merits of (what’s wrong with) looking at some of these things collectively. There are some real potential merits of considering a broader conversation and look at these things before issuing permits. That led to a lot of conversations about “well okay that might be a reasonable thing to do”. The question then is how would this fit into the permit review process? The comment was made, rightly so, that the permit review process already takes a long time and if we have to stop at some point in the process to consult with a broad range of regional stakeholders or a different body that represents those stakeholders wouldn’t that add a lot of time to the permit process? So there was not consensus reached about this concept.
- Not really sure where we go with the conversation about an individual or collective process other than to say that yes there probably are some benefits that might be unrealized if some of that planning or that opportunity to have some horse-trading or some conversation about sharing the resource don’t happen.
- There is a mechanism that the General Assembly did create a couple of years ago through legislation introduced by Delegate Bulova that came out of the State Water Commission – one of the things that they were concerned about was that the permit process have some sort of mechanism in it so that the State; Local; and Regional Water Supply Planning Process could inform the permitting process. In both the Groundwater and Surface Water Programs we have a step that is in our standard operating procedure where the staff consult those plans and consult with the planners who worked with those jurisdictions on the development of those plans just to see how the proposal for the withdrawal fits in or is consistent with that planning. To date, that is the only thing that has been done in that regard.
- If you look closely at the JLARC Report and we reference in the summary of issues that was prepared for this meeting, they tried to get at this in two of their recommendations. These included a recommendation that DEQ should consider having additional funds allocated to it to provide in essence, Regional Planning assistance to try to actively go out and facilitate some of that activity perhaps. The other thing that they were possible alluding to was that when we started the Water Supply Planning Process, we did have 7 staff (one for each DEQ Region)

dedicated to Water Supply Planning – we are now down to one and change – so effective a little less than two. In addition, there were grants that were available that seemed to provide some incentive for a broader conversation. In JLARC’s second recommendation, one of the things that they pointed out was that DEQ already has some fairly significant enabling authority to do regional planning in Chapter 3.2 and to do targeted regional planning. So the suggestion came up in the workgroup that perhaps either the zones that we have been talking about or the Groundwater Management Area as a whole could serve as a focal point for some broader effort on DEQ’s part to have some of those conversations with all of the stakeholders by doing regional area plans.

- Neither of the JLARC recommendations was endorsed by the workgroup.

Discussions by the Advisory Committee included the following:

- Couldn’t the planning effort be done in a way that it wouldn’t extent the permit in the sense that as you are reaching major permit cycles, sometime within the current permit cycle (10 years) having a detailed planning effort to look at some of these regional plans leading into that cycle – not necessarily incorporated into every permit?
 - Yes, it probably could be done that way, but the difference is that the initial concept that was reported on was within the context of the permitting program.
 - Certainly you could address some of those same issues on an independent path that would help inform that process when those permits expire.
- There doesn’t seem to be any appetite for anything that would be mandatory or would dictate to people on what they could do. It would seem that the concept of regional planning effort, whether it is undertaken by DEQ or somebody else is critically important.
- Some regional determination of where the resources are and where the needs are and matching them up could be critically important to this process going forward trying to make the best use of the available resources. There are a number of existing surface water resources that we are currently not making use of.
 - That was an example that was brought up in the workgroup and talked through a little bit. The issue is “what does it look like” – “how would you structure this process of identifying and matching resources and needs”?
- In our earlier discussions, the notion of potentially could you, as a trading region, include the non-permitted users within the allocation. This is an interesting concept. There is some notion of the need to get a handle on the unpermitted user – that volume of non-permitted use. In some jurisdictions there is a significant potential for taking some of those well water users and moving them to the public water. Currently the fee structures for that are likely to discourage them from doing that. It would also be difficult for a utility to justify it cost-effectively. Maybe if we are talking about a limited amount of capacity and there is value to the utilities in terms of having the ability to expand for a commercial users, maybe it makes sense to lower those fees and subsidize those fees so that they could control and promote that. It is kind of a planning notion of is this something that we should be looking at within the region? Is this a way to

manage the resources when there are public water supplies available – surface water supplies available?

- What would be needed to help folks move in this direction – to consider this approach?
 - § It would help to see that there is a broader consensus rather than just one entity promoting or looking at this concept/approach as an alternative.
 - § One of the things, that may be in the report, that is worth mentioning is that if to a certain extent a locality has the ability to get credit for the groundwater that it would taking off the table by moving people from well water to public surface water then that would be an encouragement too to pursue this option.
 - § Just the notion that this is identified as a viable strategy to help deal with the crisis in the aquifer would promote this concept and would make others consider it as an option would be valuable.
- The notion of regional planning could be important to see this evolve down the road. One of the notions is that if trends are not going the way we need them to go or not going as fast that puts more impediments to say that maybe we need to do more.
- How would you think about doing that? Would it need to be done through a PDC? One of the issues that we had in the Alternative Management Structures Workgroup was sort of what would the mechanism be to do this?
 - It could be done within the PDC. The more we have a consensus opinion that this is a viable option from DEQ, from the PDCs, from this group, etc. – all of those layers would help promote this concept.
 - Regional planning is important.
 - Two years down the road, whatever the legislature doesn't enact is going to be forgotten. So if there is some ongoing planning effort that is reinforcing this on an annual basis or whatever – that is still important.
 - How many Planning Districts are in the Eastern Virginia Groundwater Management Area? 4 or 5

ACTION ITEM: Mark noted that this concept of getting some kind of credit for groundwater use that is taken off the table and moved to public surface water would be included in the “report”.

Mark suggested that one of the recommendations for the “report” might be to encourage this kind of regional planning through the PDCs. There was agreement around the room that this should be included as a recommendation with the suggestions that were included in the discussions.

Scott Kudlas asked the group whether this should also be an approach that should be explicitly addressed in some form in the State Water Resources Plan that is issued. It was agreed that it would be helpful.

15. Plans for the Next Meeting of the Advisory Committee (Mark Rubin):

Mark reviewed a number of items that would be discussed at the next meeting of the Advisory Committee:

- Unpermitted Users including the notion of User Fees;
- Material related to the amount of the Fees and how much you would collect – provided by Whitney Katchmark;
- Definition of Human Consumption – Draft Proposal;
- Mike and Dave talked a little bit about stepping off to the side and discussing an issue which we hope to discuss at the June meeting;
- Need to look back at the Trading and Banking information – draft to review.

Mark noted that our schedule moving forward is that we have a meeting on **Monday, June 12th** and one on **Friday, July 7th** then we are done.

He asked for members of the Advisory Committee to route any thoughts on any other items that need to be on the agenda for the next meeting to Bill Norris for incorporation into the next meeting agenda.

Amber noted that when she has been drafting the “report” she has been putting things in brackets when it is something that we have not reached consensus on and that we still need to work on. She asked for the Advisory Committee members to really look at those areas as they review the “report” so that we can discuss those items further and nail down the narrative for the “report”.

Mark noted that these last two meetings are where we will be deciding whether we reach consensus or not so it is important to be here.

Mark noted that we will also need to include a discussion of “regulatory structure” that was raised by VDH earlier in the meeting at the June meeting.

16. Public Comment: No public comment was offered.

17. Meeting Adjournment: Mark Rubin thanked everyone for their attendance and participation in today's meeting. The meeting was adjourned at approximately 2:45 P.M.