

Minutes for GWMP Group Meeting #2

April 18, 2019

DHEC convened the second meeting of the Stakeholder Workgroup charged with providing input in developing Groundwater Management Plan (GWMP) for the Western Capacity Use Area. The meeting was held from 9 am to 12 noon at Clemson University's Edisto Research & Education Center (Edisto REC), 64 Research St., Blackville, SC.

Introduction

Jennifer Hughes, the Assistant Bureau Chief for DHEC's Bureau of Water, welcomed everyone and thanked them for their commitment to this process as the meeting convened. She also thanked the Clemson Extension Service for hosting this meeting in a central location, DHEC staff who have prepared information for the meeting and the workgroup members for their contributions.

Kristy Ellenberg, DHEC's Bureau of Water Public Participation Coordinator, reiterated the charge of the workgroup. Introductions were made by attendees, who represented the geographic scope of the Western Capacity Use area, as well as different sectors and expertise. Two members who were unable to attend the first meeting joined the group.

Members in attendance included:

- Becky Ashley, Dominion Energy/SCE&G, Orangeburg County
- Laura Bagwell, Aiken County Soil & Water Conservation District
- Peter DeLorme, Citizen, Aiken County
- Mark Forrester, Gilbert Summit Rural Water District
- Dean Hutto, Hutto Brothers Partnership, Orangeburg County
- Hogan Kaney, Supersod, Orangeburg County
- Hugo Krispyn, Friends of the Edisto, Aiken County
- Jeff Lowe, Breezy Hill Water & Sewer Co., Inc., Aiken County
- Ted Millings, Savannah River Site, Barnwell County
- Jacob Oswald, AIS, LLC & JCO Farms, Allendale County
- Nick Rubin, SC Rural Water Association, Statewide
- Calvin Sawyer, Clemson University, Statewide
- Mike Swearingen, Groundwater Association, Statewide
- Alex Tolbert, Carolina Golf Course Superintendents Association/Orangeburg Country Club
- Richard Tyner, Archroma, Allendale County
- Andy Wachob, SC Department of Natural Resources, Statewide
- Jeremy Walther, Walther Farms, Aiken & Barnwell Counties
- Lawrence L. "Landy" Weathers, Circle W Farms & Weathers Farms, Calhoun County

- Will Martin, Bamberg Board of Public Works, Bamberg County

Goals for this meeting included:

- Staying consistent with statutory intent of protecting the resource, preventing waste and maintaining conditions for development and use;
- Reviewing and seeking feedback on a draft of the first sections of the groundwater management plan which provide essential background information;
- Using the Waccamaw Area Plan and Report as a guide for discussion in identifying the useful information and illustrations for the Western Area Plan; and
- As time allows, considering key strategies that are essential to the Western Capacity Use Area.

Comment: how do we get to the strategies in the plan – individual things that apply to this Capacity Use Area? **For this process and group discussion, we want to start broad and get the general information right first before getting into the specifics of strategies.**

Lance Foxworth, Hydrogeologist for DHEC’s Water Quantity Permitting Section, presented an overview and draft information on Phase 1/Essential Components of the WCUA Groundwater Management Plan. A copy of this presentation will be available as a reference to the Western Capacity Use Area webpage during this process. Future meetings and discussions will focus on Phase 2: Groundwater side including water use and water level trends and Phase 3: Management side including strategies and paths forward.

A draft of Phase 1/Essential Components was shared with the group to seek comment. These sections included:

- Executive Summary
- Introduction
- Definitions
- Geo-Political Structure
- Regional Description

Executive Summary: This section outlined DHEC’s authority through the legislature to develop these Groundwater Management Plans. Goals for the management plan were consistent with the law: to prevent waste, to protect the resource, and to maintain conditions for development and use.

The Department was to ensure there is regional engagement and the present and future needs are met when implementing the resulting plan.

Introduction: This section provided details of the Western Capacity Use Area, management strategies, and direction.

General goals as proposed included:

- Ensuring sustainable development of the groundwater resource by management of groundwater withdrawals;

- Monitoring of groundwater availability to evaluate conditions;
- Noting current groundwater sources utilized with water demand by type and amount used; aquifer storage and recovery and water reuse;
- Providing projected population growth and water demand; opportunities for aquifer storage and recovery, as well as water reuse; groundwater and surface water options
- Promoting water conservation measures;
- Outlining adaptive management and continuous improvement.

Other topics to consider:

- Current groundwater sources utilized, water demand by type
- Definitions: noted that sustainable use is a specific definition in the plan
- Groundwater withdrawer vs user: a withdrawer is defined as one who uses over the threshold of 3 million gallons in any one month (mgm), while a user can use groundwater for anything in any quantity
- Geopolitical Structure: the WCUA is served by two Councils of Government (COG); the Lower Savannah COG which serves six of the seven counties in the WCUA and the Central Midlands COG which serves Lexington County.
- Goal:
 - Uniform geographical framework within which the planning programming and delivery of services by state federal and local government might be undertaken with maximum efficiency and effectiveness

Regional Description: 7 counties, regional border features: Savannah River, Fall Line, Lake Murray, Congaree River, Lake Marion, county lines between Allendale, Bamberg, and Orangeburg with Hampton, Colleton, and Dorchester counties

Five of the state's eight river basins drain the region, mostly in Aiken Plateau. As previously noted, the region has lots of groundwater/surface water interaction (Savannah, Edisto, Salkehatchie, Saluda, Santee).

Climate: Data has been included in this draft through 2010, but the Department is coordinating with SC DNR to get more updated climate data (from 2016).

The mountain area and ocean along the coast drives climate. The hottest area is in the center of the state.

Land Use: This proposed section would be new to the WCUA draft plan, as it has not been included in other capacity use area plans but could incorporate useful information into the framework. The WCUA is mostly rural, scattered with urban areas in parts of Lexington, Aiken and Orangeburg. The rural areas are comprised mostly of farmland, forest, and wetlands. Data from the Department of Agriculture shows most counties have seen an increase of irrigated acres.

This section was included as a good way to start the plan with regional descriptions and a better understanding of what makes up this region. This section can be expanded to include more information on non-agricultural land and water use.

Workgroup members reviewed the draft of Phase 1 of the plan in small groups and then expanded discussions to the full group.

Group discussion:

- Under sustainable use definition, “unacceptable... consequences” has not been defined. Clarification may help.
- Reasonable use needs to be more specifically defined, the definition in the report is vague
 - Reasonable use changes as technology improves and industrial processes are more efficient; DHEC currently uses Clemson’s crop irrigation numbers, but there are disadvantages to consider in adopting strict numbers as technology and practices may change over time and future updates may be difficult to maintain.
- Definition for *person* is from the regulations
- Include a section that has the SOP (standard operating procedure) for how reasonable use is calculated so users can understand this better—referencing standards preferred
- Do we have numbers for industry or water supply? Yes, for water supply, but industry is usually required to supply what their particular industry standard is at the time of application.
- Including current and projected water use is helpful.
- Land use description: does not exist in other plans, is specific to western
- Definition of land use: includes all land including land growing forestry and farm use storage; only reported if making more than \$1,000 of product, so some may not be included in water use reporting/capacity use program
- Look at increase of water use. Water use reporting was required since approximately 2000, so increased use is a function of more reporters that have been pumping and new irrigation systems were also installed.
- Increase of farmland technology (drop pivots, subsurface drip, GMO, etc.) means less water even with increase in irrigated acreage
- Can we incentivize water conservation methods? DHEC will do what we can and recognizes that agricultural businesses have higher expenses and lose money when not using effective irrigation methods. May encourage BMPs and use of better technologies within strategies.
- Please include this language as part of the land use section: increase of irrigated acreage does not mean increase in water use. Note the relationships of increased reporting and efficiencies.
- Home builders are installing more low flow plumbing
- Include land use sections that deal with expansive urban areas, list types of industries and industrial growth – adjust so we are encompassing all users and not just agricultural use
- No data showing use by type – this data is the next phase and will be included in other meetings/discussions.

- Did the math: rainfall over WCUA vs groundwater use (2017) across the whole state, only using ~2% of the average rainfall in groundwater
 - Policy can't affect rainfall, just use. The rainfall in this region supplies the groundwater to the rest of the coastal plain, so it's important to allow it to get down to the coastal areas; may be helpful to **include a water budget**.
 - Need to understand that we cannot control how much rain we get. Timing of rainfall is also critical. There are drier years vs wetter years and the rain doesn't always come when it's helpful.
- Irrigation in SC is nothing compared to GA – if agriculture stopped pumping in Southwest Georgia, the water table would take 50 years to replenish, but it was able to come back in 2013 in 3.5 months due to rain.
 - Impacts of pumping in the localized areas: if we continue to pump in one area, it can cause a problem for that region; management practices can help.
 - Interconnectedness of regions by aquifer: What happens up in the WCUA affects the coast. This plan is not only about needs in the Western Area, but ensuring that aquifers are set for the rest of the coastal plain as well.
- Water budget section to include next time from DNR data

Cal Sawyer, Ph.D. of Clemson Extension presented Agricultural Water Use in SC: *Preliminary Results of the SC Agricultural Water Use and Irrigation Survey*. This presentation will be made available as a resource on the WCUA webpage during this process.

Agriculture is the state's largest industry providing approximately 98,000 jobs and a \$41.7B economic impact.

- Rainfall doesn't always occur at critical times during growing season
- Most water use is surface water
- Lots of agriculture, irrigation use has increase from 30% to 43% of GW use in the state
- Total acreage in farms and irrigated acreage in farms
- Survey done to look at agricultural water use
 - Utilized to inform ag-related management decisions about SC's water resources
 - Refine future research priorities and extension programming
- Data categories:
 - Surface water vs Groundwater
 - Irrigation system (center pivot, surface drip, lateral move, etc.)
 - Acres irrigated
 - Crops irrigated
 - Power source and capacity
 - Scheduling methods
 - Future irrigation plans
- Clemson did not set a volume threshold, if a user was part of production agriculture, they were surveyed

- Data from all production agriculture through extension agents, *in person, on-farm* preferred, and some digital distribution (errors in collection), so responses were not uniform unless in person
- Elements from 167 surveys, data on 473 individual water sources, crop scheduling for 75,000 acres
- Evaluation on two levels:
 - Statewide
 - Regional analysis
 - Clustered by cap use areas
 - Remaining counties clustered into Piedmont-Central coastal plain
- Most users use wells: 141 users (next: lake or pond, 29 users), will be lumping surface water sources together (some users pump GW into ponds and use it from there, this will be described in the next iteration)
- If less than 15 responses, did not do regional analysis for that area
- Mean farm size, crop acreage, and irrigated acres described (no numbers if fewer than 15 responses)
- Information says only 167 respondents, but more sources than respondents because using multiple sources (encourage conjunctive use)
- 68% row crops, 4% small grains, 6% orchard, 5% fruits and veg, 1% ornamentals, 17% turf/hay, 4% other (green beans, and such...needs to be moved to appropriate categories)
- Want to show trends over time of the irrigation technologies: most are in center pivot – fixed rate, there are variable rate center pivots put in, decent amount of surface drip
- Scheduling methods: can put in as many responses, did instinct and crop observation, hand feel, want to see how the technology-based scheduling changes over time (still not as prevalent)
- 43% says no changed to current irrigated acres, 53% says plans to increase irrigated acreage, 4% said they were decreasing or stopping their irrigated acreage
- Next steps
 - Fill data gaps in several critical counties (Waccamaw and pee dee)
 - Refine survey instrument to optimize response continuity (ex: understanding that some ponds are filled by gw, and separating out the “other” category)
 - Develop dynamic models to more robustly quantify irrigation costs
 - Evaluate agricultural water uses other than irrigation
 - Determine frequency of future surveys maybe 3-4 years between surveys (this is a rollout, so this “doesn’t count”)
- Future holds greater limitations on water availability and quality
- In SC increasingly important to water as efficiently as possible
- Climate uncertainty will affect distribution of SW and GW resources
- Advancing a robust water resources research agenda is crucial to answering current and future questions
- Continuing cooperation and shared responsibility among agencies, universities, and water users is paramount

Questions:

- Considering how often to do survey, noting that there is a 5 yr permit cycle. Will survey results be used to determine permit renewal info and could these be used in conjunction? Withdrawers already reporting water use to DHEC. It would be interested to use some of this information in the survey. Department will use most up-to-date information, rely on Clemson extension numbers, and will still collect water use data every year. DHEC will have final report in May for 2018. In year prior to permit renewals, Department prepares a written report based on what we know, to help inform permit renewals. The report is used as a means to look at ways to help farmers or water suppliers to look at newer conservation techniques.
- If everybody is using good BMPs, will this affect permits?
 - If conservation efforts reduce that pressure, then permit renewals can be affected because we can have more flexibility to increase permits, if needed; if we see declines, we can't always permit at the same levels except where withdrawers are using those conservation techniques to help with those. We see broad increase in conservation when we bring it to light and people see the benefits.
 - Clemson will not get site specific data as surveys are conducted with total anonymity. DHEC does not get that information. Other surveys like this of agricultural water use, have been conducted in other states, and to Dr. Sawyer's knowledge, have NOT been used to make regulatory decisions in those states. We do no plan to do that either. Survey will shed light on positive aspects of agriculture and what they are doing to conserve water, economic benefits to not using as much water. Gives information/data to be able to mount a position/provide information/clarity to lower the potential for misunderstanding of the data.
- Talked about growth and usage and types of technology. Talk about strategies, communication on conservation. Where most growth and use is? Municipals in certain counties vs. growth of agriculture in other counties with regards to what we want to do for communication on conservation? From agricultural perspective, one of the goals/objectives is to help build a set of needs for educating and doing more research (primarily for ag uses), still do some work in industrial areas. Our educational target is agricultural. If on municipal water source, this is the high end of conservation.

****BREAK****

Alex Butler provided a brief review of the Waccamaw Area as a case study to determine what would be helpful for WCUA.

When considering groundwater management plans in SC, there are different phases: Phase 1 as discussed today includes the essential components; Phase 2 looks at groundwater level trends, current groundwater demand, groundwater demand trends; and Phase 3 looks at strategies.

Within the groundwater level trends, groundwater demand, and demand trends, some additional graphics and topics are fleshed out:

- **Hydrogeologic framework.** Looking at how the aquifers thicken as you move down the coast, and how the confining units pinch out in the western, close to the Aiken/Barnwell border. New graphics should be coming from DNR soon.

New well in Windsor: data support that there are confining layers in this area, but the data are over such a short period of time, we need to keep watching the data.

Part of hydrogeologic framework, looking at 3rd dimension, have a **section that discusses available surface water sources available in this area.** This should be added to the phase 1 section.

- Knowing the distinction between hydrogeologic vs physiologic.
- **Groundwater demand.** In the Waccamaw report, as it would be done for Western, a breakdown is included by water use category and how many users in the region. Information can be broken out by their use by each county and type. Data ONLY includes those that report to us (only includes groundwater, but we can also include surface water if preferred, which may be **useful if we are recommending conjunctive use as a strategy.**
- Include use based on aquifer;
- The permit amount as compared to the amount that is used can be different especially when irrigators need more/less based on rainfall.
 - We include an allowance in permits so there will not typically be an exceedance for normal operations. We also use numbers that tend to overestimate on permits and look at historical use during renewals. The Department can change the permitted amount based on their actual use.
- **Graphical representation.** Department can show wells based on aquifer (color based on aquifer) and how much total demand is carried by each available aquifer. The Department tries to avoid new permits that are screened across multiple aquifers because it becomes harder to manage resource.
- Look at water level trends – map with monitoring wells and their water levels in the DNR well clusters
- Potentiometric maps and current water use mapped together; can see if we have high water use where there are depressions in the potentiometric map. A function of the aquifer properties or a high user that is not being captured, can be helpful. Don't expect to have cones of depressions in the upper reaches of the western.
- Historic water use, how it has changed over time by county and population by county
- Historic use by type in each county (bar graphs, pie charts, whatever you'd like; please send your recommendations in the next few days)
- Where is water coming from by county and type of use by aquifer
- Can break down by seasonal demand (monthly breakdown) because of high seasonal irrigation use in region
- What hasn't been included is climate – water levels don't just change due to pumping, also driven by climate. We can include a section on groundwater recharge which occurs in this region; pertinent for this region in particular.

Used to be able to stand in the river and it was very high, and now it's running much lower. **This is mostly due to climate because we had so much more rain in certain years.** Want a chart that shows water levels throughout the years – groundwater and surface water are so interconnected here that it's important to show these things. We can work on an overlay of climate pattern over water level graphs.

If we like these, we will move forward with this version (similar to Waccamaw Plan)

Comments or other information we would like to add to the plan:

- Chart that says where you would hit aquifers at certain depths, but we can give general areas where aquifers are; what the well core would look like at certain points we can include that. Include maybe one point in each county, where would the aquifers be reached (how far down); using cores that exist currently – work with DNR for that. This is a best estimation, it varies.
- Waterways incise aquifers in this particular region, this is not described. It is localized, and one of the distinguishing things of the area. The aquifer is not continuous. Some users are incised on both sides, so groundwater is harder to capture. It is important because the connections to the surface water – more gaining streams from aquifers. *Also important for education point, make sure that people know that these systems are connected.* The upper part of this region is different once you get off the plateau and reach the lower swampy areas. We can work up a generalized graphic for this.
- Do we have anything that can tell us that there are places where the aquifer is draining into the river as opposed where the river is coming into the aquifer and where does this affect the wells?
 - **We have no losing streams, where streams are losing into the aquifer, but for the most part this is not the case. The normal is the groundwater to feed the streams.**

If you want it in the draft, please have it to us by next week!

Kristy Ellenberg revisited the goals for the planning process and strategies from other plans. She noted consistencies and common themes between today's discussions and strategies in existing plans. From group discussions, we have heard sustainability as a whole needs to be a key element. Also, we have had lots of discussion on education and educating users and public, on groundwater and surface water relationships, on advocating for conjunctive use and understanding how that works. There has been discussion on reasonable use, data and models and monitoring, how to relay information from planning stage and moving forward. The group noted effective policy that describes what we would like to do, should be what this plan is.

- What exactly is the point of this plan? What is the end goal? Publish and then nothing ever happens?
 - **The plan will be used to guide the Department in permitting decisions. It gives goals to look at changes that are happening and ahead of game so that if we see changes that are detrimental to aquifer we can find alternatives to work on those and promote public awareness to those that are also stakeholders and the general public. The work that we do on permitting and include everyone and don't think that we are being selective and we have a holistic view of what we are doing. If we have issues, there are things we can**

do and catch issues before they get too large. When you start using water in conservative way, allow for other growth in other areas and keep the aquifer from long-term degradation. Manage the resource proactively and be ahead of the game and allow the resource to be used. We want to be proactive because we are usually a reactive state. We want to guide public information and education.

- With a 5 year review of permits, does this mean the plan may be reviewed every 5 years?
 - The reporting is done every 5 years, and the plan is always open to consider further review. The plan is guiding principles on permitting decisions and changes to the plan require board approval by statute. Reporting and permitting address important issues, and the review is what reflects more change as issues arise.
- Sustainable use can't be too specific because it is an everchanging process. Is there a set of guidelines that we can reference that can change but keep the plan relevant?
 - Sustainability is relevant. There are levels of drawdowns that do not cause concern; yet can't say that no one can go below a specific level because they would change based on area. We want to look at general trends, what effects does your new well have on existing people, how to prevent negative impacts on your neighbor, and then from large standpoint, look at regional cones of depression. May need to have other sources of use and management strategies to mitigate that issue.
- Are we acknowledging that we can be as proactive as possible, but if it doesn't rain we will have issues? Will plan acknowledge that?
 - As we get further into the process, climate will be in there, and is further in the discussion. What we call long-term viability of aquifers can't put actual depths but want to look at trigger points. We can look at 10 year trends and timing of rainfall. In 2013 water use was way down because it rained at the right time, temps were lower, and conditions were great. Some years we had more rain in the beginning of the year and it was so hot in the summer with no rain, there was much more use.
 - At some point the drought response act (under the authority of DNR) is triggered.
- Do we want to reinvent wheel or use template and mold them for the area? Talked to conservation groups and they were pretty generic, the strategies are not specific enough. Want it to be flexible so we can operate within range of possibilities; think we need some more specificity in the goals and strategies. Maybe some possible trigger points in the strategies for actions.
 - Look at Waccamaw plan, then look at Evaluation which is more specific and addresses hard numbers for the implementation of strategies, and see how Waccamaw Plan informed Waccamaw Evaluation. Can see which aquifers are stressed.
- Strategies from Waccamaw Plan were briefly reviewed:
 - Identify areas where leveling or reduced pumping is appropriate
 - Review applications for demonstrated reasonable use
 - Establish comprehensive GW monitoring
 - Establish conservation education plan
 - Reporting and planning

We had a lot of information presented, we need to continue to guide discussion, and continue to have the dialogue.

Ellenberg and DHEC staff thanked all for participating and committing to the process. At the next meeting, DHEC will present next set of information specific for Western and the group will focus on big strategies this area needs moving towards more specific after that.

Please let us know in a week if you want to see included at the next meeting.

The WCUA website has the minutes and presentations from first meeting. Staff will continue to add information as we develop the resources. There is a link for public comments, and we can include those in a packet. Please share with everyone you know.

The next meeting is here in Blackville on Thursday, May 16 in May at 9AM.

The meeting was adjourned.