Meeting Summary
Natural Resources and Technical Services Committee
December 5, 2017, 4:30 p.m.

Committee Members:	John Young (Chair), John Morris, Bob Morgan (ex officio)
Other Board Members:	Yinka Ayankoya, Ray DuBose
Staff:	Mary Tiger, Mary Darr, Todd Taylor, Ed Kerwin, Ruth Rouse, John Kiviniemi

The Natural Resources and Technical Services (NRTS) Committee met to review and discuss next steps for a potential biogas-to-energy (B2E) project at the Mason Farm Wastewater Treatment Plant (WWTP) and drought planning. John Young opened the meeting and provided a brief introduction.

Biogas-to-Energy (Attachment 1 in Agenda Package)

Mary Tiger provided a brief history of OWASA's evaluation of B2E options. The OWASA Board of Directors set a goal to beneficially use all wastewater treatment plant biogas by the end of calendar year 2022 provided that the preferred strategy is projected to have a positive payback within the expected useful life of the required equipment (and to consider the social cost of carbon in that analysis).

Staff presented the NRTS Committee with seven options to meet the established goal on September 26, 2017:

1. Status quo – continue to use the biogas as fuel for boilers and flare off unused gas
2. Biogas-fueled combined heat and power system operated continuously – 330 kW
3. Biogas-fueled combined heat and power system optimized to meet peak demands – 950 kW
4. Biogas-fueled combined heat and power system with high strength organic waste – 700 kW
5. Biogas used as renewable compressed natural gas for vehicle fuel
6. Biogas used as renewable compressed natural gas for off-site transport
7. Biogas injected into natural gas pipeline

Since that September NRTS meeting, staff attended a day-long workshop entitled "The Universe of Digester Gas Utilization and How to Select the Best Alternative for your Water Resource Recovery Facility" at the Water Environment Federation's annual conference, WEFTEC in October; in addition, there were several sessions on B2E at the conference.

Based on the information learned at the conference, staff refined 30-year proformas for each option to reuse biogas that included capital costs, operations and maintenance, energy savings, and whether certain incentives such as renewable identification numbers (RIN) would be available. A best and worst case scenario was calculated for each option to capture the financial uncertainty associated with each option. Each proforma was done with and without including a social cost of carbon in alignment with OWASA Board direction provided to staff at their September 8, 2016 work session.

Page 13 of Attachment 1 in the agenda packet includes distinguishing considerations between the options:

- A combined heat and power system (Options 2-3) has the potential to increase the resiliency and reliability of the plant, but it does so at a cost.
- Options that involve regional collaboration (Options 4-5) could provide a direct benefit to our community, but would require us to operate on a longer timeframe that is less in our control.
- At this point, Option 7 has potential to be financially responsible, implementable, and makes beneficial use of our biogas, but it will complicate operations and maintenance at the plant without any direct benefit to our plant or the community.

The table on page 16 of the Attachment 1 in the agenda packet summarizes the pros and cons of each option.

John Young pointed out that the NRTS Committee did not need to develop a final recommendation to the Board on a given option, but to make a recommendation to the Board on whether to do a study to evaluate one or more options further with consulting expertise.

Discussion and observation from the Board members in attendance included:

- The options that include high strength organic waste have uncertainties and risks associated with them including traffic, odor, and fitting the necessary equipment on a tight WWTP site.
- OWASA Board should make a decision about B2E while being mindful of our core mission.
- For some options, could we sell the backup generators and was that included in the cost analyses. Staff did look into this, but it's a small portion of the economics. Staff also would recommend that we maintain the backup generators.
- One Committee member commented that they thought the Duke Energy or the Utilities Commission would be interested in B2E options to reduce peak energy use. Staff has discussed with Duke; at high corporate level, Duke Energy is very interested in combined heat and power, but at much larger scale than what OWASA could provide. Other staff at Duke Energy are interested in energy efficiency, but have not yet built a program that includes small-scale combined heat and power.
- The option to maintain the status quo has the most benefits (green shaded cells) in the summary table in the agenda package. However, it was acknowledged that the driver for this particular initiative was the beneficial use of all the biogas, for which the status quo falls short.
- There was discussion on the finance graph on page 12 of Attachment 1 of the agenda packet. Staff clarified that the diamond on each option was our best estimate; the range shows best and worst case. It was noted that only Options 4 (Combined heat and power with high strength organic waste), 5 (compressed natural gas for vehicle fuel) and 7 (biogas wholesaled to PSNC pipeline) had potential positive payback over life of the equipment and all options have the potential to have negative payback over life of equipment under the worst case scenario.

NRTS Recommendation

The Committee and other Board members present unanimously agreed that we should repair our system to continue our current use of biogas (approximately half of it is not beneficially reused) and continue to stay abreast of this issue. This is essentially the 3rd alternative for next steps included in the agenda packet: "Improve the status quo; engage and assist with complementary analyses by the Town of Carrboro, Orange County Solid Waste, Chapel Hill-Carrboro City Schools, and/or University of North Carolina; and continue to consider opportunities to make beneficial use of all of the biogas generated at the WWTP". The Committee recognized that we would not meet the 2022 goal with this recommendation.

Drought Management (Attachment 2 of Agenda Package)

Ruth Rouse provided information on the trigger tables for declaring water shortages that are included in the Water Shortage Response Plan. The triggers are based on modeled risk of the reservoir storage falling below 20 percent in the next 12 months. Twenty percent storage remaining provides approximately three months of raw water supply, which provides OWASA time to find an alternative temporary supply.

Ruth also provided background information on the Drought Response Operating Protocol (DROP) which was adopted by the Board of Directors in January 2013. The DROP adds an advisory stage that is 10 percent above the water supply storage levels for a Stage 1 water shortage (Figure 1). This advisory stage provides our customers and the community with timely notice of potential water shortages and provides an opportunity to reduce demands on a voluntary basis before mandatory conservation measures are initiated. The DROP also prohibits OWASA from accessing our Jordan Lake allocation before the water in storage reaches a Stage 1 water shortage.

Ruth summarized work that has been done by Dr. Greg Characklis and was presented to the NRTS Committee in May 2014 which demonstrates that the highest reliability of our water supply system occurs when there is a combination of water transfers from neighboring utilities, water conservation measures, and financial reserves in place. Thus, the DROP as written limits our water supply reliability.

NRTS Recommendation

The NRTS Committee and other Board members unanimously agreed to continue to work with staff to develop a specific recommendation to the Board regarding the DROP.

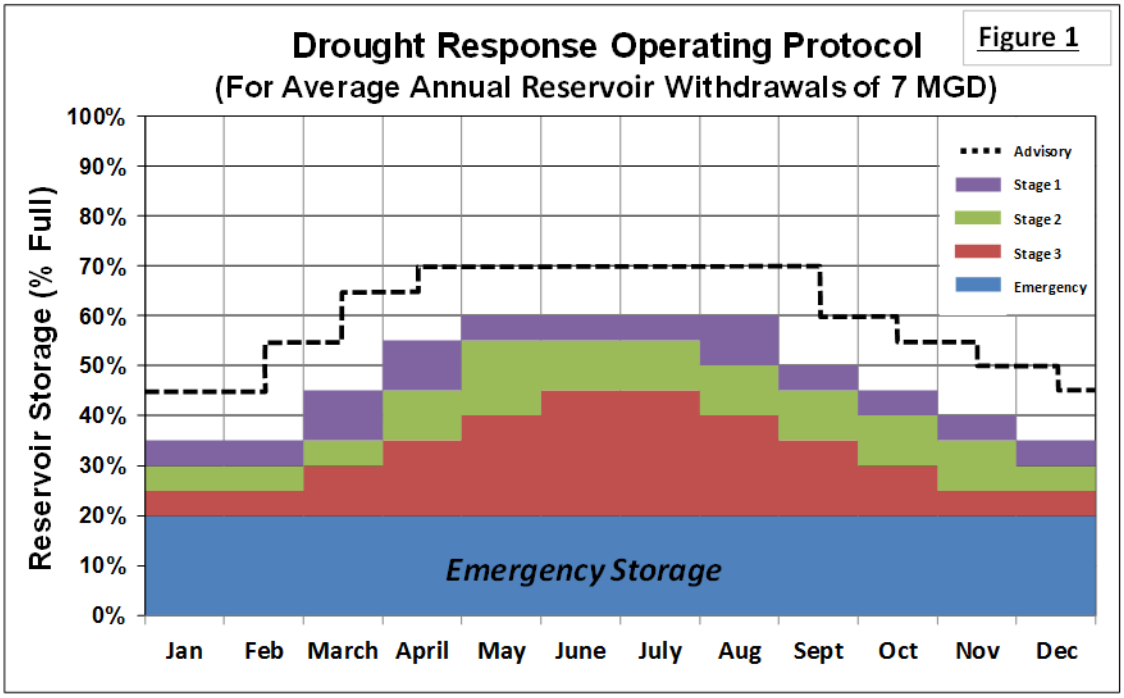
The meeting was adjourned at approximately 5:45 PM.

Prepared by:

Ruth C. Rouse

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Ruth Rouse, AICP
Planning and Development Manager



These responses are based on the risk of depleting OWASA's existing Cane Creek/ University Lake/Quarry Reservoir system to the Emergency Storage level and are consistent with the Response Triggers of OWASA's State-approved Water Shortage Response Plan. Those risks do not consider Jordan Lake to be part of OWASA's existing or primary water supply (University Lake, Cane Creek, and Quarry Reservoirs), but only as an "insurance policy" for use during extended drought or emergency conditions.

Water Shortage Advisory: Aggressive public awareness/education effort, including direct communication with the Carrboro, Chapel Hill, and Orange County elected boards and the University of North Carolina at Chapel Hill. A Water Shortage Advisory may be initiated earlier at OWASA's discretion.

Stage 1 Shortage: Mandatory use restrictions -- with or without rate surcharges -- may be initiated earlier at OWASA's discretion, but not later. The OWASA Board may authorize purchases of water from other utilities and/or obtain water through its Jordan Lake allocation only when total water storage in University Lake, Cane Creek Reservoir, and the Quarry Reservoir is below this Mandatory Stage 1 trigger, but not sooner. Board approval for such a declaration or purchase decision shall not be required, however, during an operational emergency as determined by the Executive Director per OWASA's *Water Shortage Response Plan.*

Stage 2 Shortage: May be initiated earlier at OWASA's discretion, but not later.

Stage 3 Shortage: May be initiated earlier at OWASA's discretion, but not later.

Water Supply Emergency: Emergency actions will be taken to obtain supplemental water to ensure the protection of public health, safety and welfare. If Cane Creek/University Lake/Quarry Reservoir storage declines to this level, such actions would likely include the installation of temporary facilities to pump water from the Haw River to the Cane Creek Reservoir.