

Water Planning Council Implementation Working Group
Drought Sub-Work Group Report
June 4, 2021

COMMITTEE MEMBERSHIP, BACKGROUND, AND CHARGE

The Drought Topical Sub-Work Group (DWG) was formed in September 2019 as a result of recommendations in Connecticut’s State Water Plan, approved by the Connecticut General Assembly in 2019. In order to fulfill the recommendations of the State Water Plan, an Implementation Working Group (IWG) was formed. The IWG created the DWG to recommend improvements to Connecticut's Drought Preparedness and Response Plan (Drought Plan), based on the experience of the 2016-2017 drought.

The following DWG members met regularly from September 2019 through June 2021 and contributed to this report:

Steve Rupar (Chair)	WSP
Alicea Charamut	Rivers Alliance of Connecticut
Peter Galant	Tighe & Bond
Steven Harkey	Connecticut Department of Public Health
Douglas Hoskins	Connecticut Department of Energy and Environmental Protection
Iris Kaminski	Member of the Public
Eric Lindquist	Connecticut Office of Policy and Management
Denise Savageau	Connecticut Association of Conservation Districts
Jeff Ulrich	Aquarion Water Company

This report contains findings and recommendations based on the DWG’s review of the State’s 2016-2017 drought response. The DWG initially considered eight drought-related recommendations from two sources: the State Water Plan, and the 2018 update to the State Drought Plan. In consultation with the IWG, the DWG was asked to address four of the eight recommendations, as noted below:

From Connecticut State Water Plan Section 5.3.2.8:

Charge 1. The WPC, through its committees, could develop a template for interpreting statewide drought indices to local risk levels and response measures for use by utilities at the local level, based on storage, demand levels, type of system, etc.

From the Interagency Drought Workgroup (IDW) September 5, 2018 cover letter submitting the State Drought Plan to the Water Planning for approval:

Charge 2. At present, the Drought Plan and the Interagency Drought Workgroup exist in an ad hoc capacity under the collective executive branch authority of the Water Planning Council, its member agencies, and the Governor. Because the Drought Plan is not authorized in statute, its implementation relies upon existing statutory and regulatory powers of the agencies that comprise the Interagency Drought Workgroup. There have been external efforts, most recently through House Bill 5154 (2018 session), to legislate a state drought plan. The Council

should consider developing legislative recommendations to improve the authority and implementation of the Drought Plan for consideration during a future legislative session, as it offered to do in testimony it submitted regarding HB 5154.

[Charge 3](#). The adoption of water use restriction ordinances by municipalities is considered to be a major element of drought planning and response, but the model water use ordinance featured in Appendix B [of the state Drought Plan] is deemed inadequate or impractical for some communities. There is also a need for better coordination between and among municipalities and public water suppliers on reduction targets. The WPC should consider collaborating with municipalities and public water suppliers to improve and promote the model water use restriction ordinance.

At a March 6, 2020 meeting, the DWG agreed to consider one additional charge per the request of the Water Planning Council through the IWG:

[Charge 4](#). Would the current state drought plan have been effective during the 2016-2017 drought?

The DWG determined that the most effective way to understand and address the charges noted above was to review the work of the state Interagency Drought Workgroup (IDW) during the 2016-2017 drought. The IDW is responsible for actively monitoring drought conditions and recommending drought declarations and mitigation actions to the Office of the Governor and state agency commissioners, under the authority of the WPC in accordance with the State Drought Plan. The IDW consists of representatives of the following state agencies: Department of Public Health (DPH), Department of Energy and Environmental Protection (DEEP), Office of Policy and Management (OPM), Department of Agriculture, and the Department of Emergency Services and Public Protection. Technical assistance is provided by the United States Geological Survey, National Weather Service, and National Oceanic and Atmospheric Administration.

DWG Process

The DWG held a total of 20 meetings between September 6, 2019 and April 29, 2021. Copies of meeting agendas and meeting minutes are included in Appendix A and Appendix B, respectively. Meetings were held in person through March 6, 2020 and transitioned to a virtual format using Microsoft Teams subsequent to that date, due to the impact of the Covid-19 pandemic. The DWG examined the work of the IDW in the 2016-2017 drought for the first 10 meetings by reviewing documentation such as meeting minutes and agendas from the historical drought, and through discussion with members of the IDW who were active during that drought. The work to review the 2016-2017 drought was complicated by the Covid-19 pandemic, and by an ongoing drought in 2020. The DWG took time to review the status of the work of the IDW during the 2020 drought and found this process very helpful in understanding work during the 2016-2017 drought. Work to review the 2016-2017 drought was completed at the DWG July 24, 2020 meeting.

The DWG developed findings and recommendations by first completing an online survey regarding the above-referenced charges, where each DWG member had the opportunity to record their thoughts independent of other members. A copy of the online survey results is included in Appendix C. The DWG collectively grouped the findings and recommendations to the appropriate DWG Charge, and also recorded whether they agreed with the finding and recommendation. Consensus findings and recommendations were defined as those with at least $\frac{2}{3}$ of DWG members agreeing with and supporting the finding and recommendation. The findings and recommendations are discussed in more detail in the following sections of this report.

Overview of 2016-2017 Drought

On June 27, 2016, following recommendations from the IDW, the State declared a Drought Advisory for all counties. Rainfall had been up to six inches below normal over the preceding three months. A press release from the Department of Public Health asked consumers to be conscientious of water use and to comply with any water use restrictions that may be issued by public water suppliers or the State.

Conditions continued to remain drier than normal through the remainder of the summer, with a growing long-term precipitation deficit. On September 14, the Office of Policy and Management issued a press release asking for

10% voluntary water conservation and clarifying that the Drought Advisory issued on June 27 remained in effect statewide.

On October 27, 2016 the Office of the Governor announced a Drought Watch for all counties except New London and Windham, which remained under a Drought Advisory. Precipitation had ranged from 60% to 73% of normal across the state during June through September. Drinking water reservoirs continued to decline and average levels statewide dropped below 80% of normal as of the end of September, with some reservoirs much less than half capacity. Some public water suppliers, particularly in southwestern Connecticut, needed emergency interconnections to ensure that drinking water and other public services such as fire protection remained available. Many public water suppliers issued strict mandatory water use restrictions. Agricultural impacts were thankfully limited, due to an ending growing season, although some farmers were reportedly struggling to obtain water for cows. Residents and businesses in the Drought Watch counties were asked to voluntarily conserve water by 15%, and by 10% in the Drought Advisory counties.

On May 8, 2017, following some substantial hydrologic recharge over the preceding winter, the IDW ended the Drought Watch, but maintained the Drought Advisory statewide. Average statewide drinking water reservoir levels were at more than 100% of normal as of the end of April, with three systems at less than 90% of normal.

Following another month of improvement and recovery, the State declared on June 14, 2017 that the Drought Advisory had ended for all counties.

FINDINGS AND RECOMMENDATIONS

The findings and recommendations of the DWG are presented below and categorized by charge.

FINDINGS AND RECOMMENDATIONS THAT PERTAIN TO CHARGE [1]

Charge 1- *The WPC, through its committees, could develop a template for interpreting statewide drought indices to local risk levels and response measures for use by utilities at the local level, based on storage, demand levels, type of system, etc.*

Background

This charge was taken directly from the State Water Plan (Section 5.3.2.8 Statewide Drought Planning). Recognizing that droughts impact water utilities differently based on utility specific factors such as type of supply, storage, and ratio of supply to demand, and that utilities serving more than 1,000 people are required to submit Water Supply Plans to the State that include drought response plans that account for these utility specific conditions, it was unclear to the DWG how the State Water Plan expected a standard template of statewide drought indices would be used by water utilities with such varying characteristics.

The Workgroup therefore reached out to two authors of the State Water Plan (David Murphy of Milone and MacBroom and Kirk Westphal formerly of CDM Smith) for interpretation of the Plan's recommendations. Both authors agreed that it was not the intent of the recommendation to replace or change the individual Water Supply Plan drought triggers or actions, but rather to improve coordination between the individual utility drought plans and the State Drought Preparedness and Response Plan. The Workgroup has adopted this interpretation, with a particular emphasis on communications and the potential confusion when the State Drought Plan and individual utility drought plans in a region are indicating different drought urgency and potentially different drought response actions.

1.01 Finding: While emergency response plans, including drought triggers, are required of water utilities serving 1,000 or more persons, it appears that there is no standard for assessing drought risk and developing drought response plans that are adequately protective of public water supply, particularly in light of a changing climate.

1.01 Recommendation: The Department of Public Health should develop guidance for how utilities should develop their utility specific drought response plans, ensure that they are adequately protective of public water supply, and take into consideration precipitation and temperature changes expected from climate change.

1.01 Discussion: Public water systems serving more than 1,000 people are required to submit Drought Response Plans to the State for review and approval as part of their individual Water Supply Plans. Historically, the drought triggers and actions in these plans have been based on individual utility's operating history. It is recognized that public water systems are impacted differently by drought depending on a number of factors such as whether they are supplied by groundwater vs surface water sources, supply vs demand and reservoir storage vs watershed area ratios. It therefore isn't possible to create a one-size-fits-all template for individual utility drought planning. It would be helpful, however, for DPH to issue guidance for developing drought response plans and testing them to demonstrate that they provide adequate public water supply protection. This guidance could also provide for consistency in drought response and reasonable expectations for demand reductions. Guidance regarding appropriate data sets, how to handle the uncertainty related to climate change, and the relationship between utility and State declared drought stages could also be provided.

1.02 Finding: During both the 2016-2017 and 2020 droughts, conditions varied from region to region. Analysis of IDW discussions and actions indicate that declaring drought by region is advantageous. The current State Drought Plan allows for regional declarations as well as professional judgement. However, it has proven difficult to assess some regions due to inconsistency in the number of stream gages and groundwater monitoring wells in each region.

1.02 Recommendation A: Maintain allowances for regional declarations and professional judgement in the State Drought Plan.

1.02 Recommendation B: Identify areas where additional indicator sites are needed (real-time stream and groundwater gages in each drought region) and maintain the existing stream gages and groundwater stations in order to monitor conditions locally.

1.02 Discussion: Even though Connecticut is a relatively small state, precipitation can vary from one region of the state to the other. During the 2016-2017 drought, the eastern part of the state received enough precipitation to remain at a "Drought Advisory" level while the western counties were elevated to a higher level of "Drought Warning" (2008 Drought Plan levels.) The opposite was true during the drought of 2020. Lower Fairfield County had the highest amount of precipitation in the state. Although water systems in the region reacted differently, the IDW never elevated Fairfield County above Stage 1 drought -- essentially a "head's up" level of drought yet Windham County was at Stage 3 for several months.

Real-time stream and groundwater gages are the most effective means of gathering scientific data related to flooding, drought, river health, recreation, water supply, wastewater management, and setting ecological streamflow targets. The data from our stream and groundwater gages must continue to be collected on a regular basis with no interruptions, and the network expanded, in order to have the most complete scientific data with which to analyze and evaluate in a comparative manner from season to season and year to year to year. Conservation groups, government regulators, and water and power companies all agree we need more, not less, data.

1.03 Finding: The drought indices utilized for determining state and regional level drought status that are the most appropriate should be continually monitored for effectiveness by the IDW.

1.03 Recommendation: Develop a committee through the Water Planning Council to determine the need for a template for interpreting statewide drought indices and, if needed, to engage subject matter experts and stakeholders to develop a template for interpreting statewide drought indices. More localized templates may then be able to be developed but without making the resolution so narrow that it becomes an overwhelming task.

1.03 Discussion: New models and methods for analyzing drought conditions are continually being developed and the IDW identifies areas for improvement with each successive drought. For example, when the IDW was trying to evaluate conditions during the recovery period of the 2020 drought, it concluded that the indices used to declare drought at its onset were not adequate to evaluate recovery at its conclusion.

1.04 Finding: Public water supply data must be made more readily available to DPH/IDW and easily condensed into a report that can be utilized to allow for significant response time to an emerging threat. This will allow DPH to put fewer resources into creating necessary reports and more into analyzing the data.

1.04 Recommendation: DPH, in coordination with Federal partners, should develop an online portal for public water systems to report their various surface water and groundwater capacities as well as the other metrics required by regulation.

1.04 Discussion: The process by which DPH currently receives and compiles water supply data is labor intensive and time consuming. Online submission and more automated report production will mean that DPH can produce timely reports for their own use, for use of the IDW, and for public inspection as well.

1.05 Finding: Regional droughts, variability of supply conditions across utilities, and a significant portion of residents that rely on wells makes developing blanket statements about drought conditions impossible and sometimes unhelpful.

1.05 Recommendation: Instead of a template, which may be too prescriptive, develop a checklist for press releases, messaging, and public outreach materials that will be issued by the IDW or lead agency, including:

- Clear messaging about the status of regions affected (or not) by dry conditions or drought.
- Language differentiating between IDW declared regional droughts and individual public water supply droughts and encouraging those on public water supply to pay close attention to their providers as conditions and restrictions will vary depending on the source.
- Information about the status of groundwater supplies and instructions for residents on private wells.

1.05 Discussion: Statements released by the state about drought conditions can be confusing due to the many variables that determine a drought's severity for a region or a single household, and the difference between drought stages declared by the IDW and individual public water suppliers. Having either templates, sample language, or a checklist to utilize when writing public statements and press releases will assist in creating clear consistent messaging.

1.06 Finding: Indicators were not well documented in the IDW notes from the 2016-2017 drought. Those who were not in the meeting but looking at the meeting minutes would not know what data the IDW used in their decisions.

1.06 Recommendation: Conclusions of each IDW meeting should be consistently reported and clear. Data upon which conclusions were based should be included in official meeting materials.

1.06 Discussion: In 2020 the IDW did an excellent job of including the data submitted to the IDW for consideration along with meeting agendas and notes. The charts and data from 2020 should be used as a standard and best practice going forward.

FINDING AND RECOMMENDATIONS THAT PERTAIN TO CHARGE [2]

Charge 2- *At present, the Drought Plan and the Interagency Drought Workgroup exist in an ad hoc capacity under the collective executive branch authority of the Water Planning Council, its member agencies, and the Governor. Because the Drought Plan is not authorized in statute, its implementation relies upon existing statutory and regulatory powers of the agencies that comprise the Interagency Drought Workgroup. There have been external efforts, most recently through House Bill 5154 (2018 session), to legislate a state drought plan. The Council should consider developing legislative recommendations to improve the authority and implementation of the Drought Plan for consideration during a future legislative session, as it offered to do in testimony it submitted regarding HB 5154.*

Background

In reviewing the work of the IDW during the 2016-2017 drought, the DWG confirmed that the IDW generally operated in accordance with the 2003 Connecticut Drought Preparedness and Response Plan (Drought Plan),

which was in effect at the time prior to its 2018 update. However, the DWG has determined that the function, authority and procedures in the Drought Plan contributed to inefficiencies in the work of the IDW and the response to the 2016-2017 drought. The Drought Plan and IDW have been implemented under the authority of the CT Water Planning Council, but neither the Plan nor the IDW are defined separately under statute or regulation.

This DWG generally agrees that the Drought Plan and IDW would benefit from strengthened policy and procedures, however, it also determined that changing the statute or regulation would not be the best approach. Potential disadvantages of incorporating changes by statute or regulation are that they take significant time to implement, may provide less flexibility to adapt to changing conditions, and include the possibility of the addition of non-agency members into the decision making process which could weaken decisions and allow political influence; and the possibility of statute or regulation not accurately reflecting each IDW member agency's mandate and add to agency conflicts, possibly leading to additional disfunction.

As an alternative to statutory or regulatory enhancements, the DWG suggests that the Drought Plan and IDW function, authority, and procedures be strengthened by incorporating changes into the text of the Drought Plan. This will preserve the positive features of the existing IDW and foster the existing functionality and cooperation between agencies, while continuing to allow for an appropriate level of professional judgement in determining actions under the Drought Plan.

Several members of the IDW actively participated in the work of the DWG, and during the 2020 drought the IDW worked to implement several of the recommendations noted below to improve IDW functionality. The DWG recognizes and commends the IDW for its proactive work to improve drought response. The DWG encourages the WPC to incorporate the proposed recommendations into an updated Drought Plan as soon as possible, while work in this area is fresh, and before the inevitable change in IDW personnel and collective memory through promotions, retirements, changes of position, etc.

Appendix D includes suggested changes to the Drought Plan that would address some of the above listed Charge 2 recommendations.

2.01 Finding: Meetings of the IDW were irregular during the 2016-2017 drought.

2.01 Recommendations: The IDW should establish a regular schedule of meetings.

2.01 Discussion: No regular meeting schedule for the IDW existed prior to and during the 2016-17 drought. This resulted in irregular attendance at meetings. The lack of regular meetings also did not allow for planning and preparedness of the IDW operations. The IDW has recently made efforts to schedule meetings more regularly even during non-drought periods.

2.02 Finding: IDW representation and attendance at meetings were inconsistent during the 2016-2017 drought.

2.02 Recommendation A : OPM should remain the lead agency for the IDW and serve as Chair. The IDW should also have a designated staff coordinator located within OPM.

2.02 Discussion A: OPM staff have assumed the coordination of the IDW including leadership as chair, but it is unclear how this is formalized in the department. Is the IDW functioning because individual staff members are stepping up, or is it part of their formal job responsibilities? Efforts have more recently been made to formalize representation at IDW and attendance was markedly improved with video conferencing as a readily available option.

2.02 Recommendation B: A lead and backup member should be designated on each agency on the IDW.

2.02 Discussion B: The inconsistency of membership and meeting attendance appeared to impact meeting discussions, availability of important data, meeting outcomes, and decision making. A clear consistent leader is critical to ensure consistent implementation of the state drought plan. When agency representation is not consistent, it impairs information dissemination, requires more time to bring members up to the current drought situation, and hinders impactful and timely decision making. If the drought plan has clear language requiring that

each participant agency have a main IDW member and alternate, much of these shortfalls and concerns can be mitigated.

2.03 Finding: Communication between the IDW and municipalities during the 2016-2017 drought may not have been effective.

2.03 Recommendation: All towns should be required through State statute or regulation to have an official Municipal Drought Liaison (MDL).

2.03 Discussion: Communication with municipalities is important during drought emergencies and for drought preparedness. During the 2016-17 not all towns had identified a main contact person. DEMHS is recently making good progress in getting a Municipal Water Liaison established for each town working through DEMHS. To formalize the importance of drought preparedness and response and the role of municipalities, requiring a MDL in State statute or regulation should be considered. This could be within the civil preparedness Statute 28.7 of the CGS.

2.04 Finding: The authority of the IDW exists but the procedures of the IDW need to be updated, clarified and strengthened.

2.04 Recommendation A: The operations of the IDW should be updated in the Drought Plan. Recommended language is included in Appendix D.

2.04 Discussion: The charge asked the DWG to look at possible legislative changes needed to ensure that the IDW had authority to act. It was the consensus of the DWG that the IDW already has the necessary authority to act and no legislative changes are proposed. However, the DWG did find that from an operational perspective, changes were needed to make the IDW more effective. From the accountability standpoint, one of the findings of the workgroup's review of the 2016-2017 drought was that the group went months without meeting even as conditions deteriorated. In addition, decisions were made during an IDW meeting but were not carried out when decisions were overridden by the Governor's office. From the standpoint of the public tracking actions of the IDW, there is no easily understood explanation or reason for not following the IDW recommendation. Procedures should be in place to track all actions of the IDW including recommendations to the Governor's office.

FINDING AND RECOMMENDATIONS THAT PERTAIN TO CHARGE [3]

Charge 3 - *The adoption of water use restriction ordinances by municipalities is considered to be a major element of drought planning and response, but the model water use ordinance featured in Appendix B is deemed inadequate or impractical for some communities. There is also a need for better coordination between and among municipalities and public water suppliers on reduction targets. The WPC should consider collaborating with municipalities and public water suppliers to improve and promote the model water use restriction ordinance.*

Background

The original Drought Preparedness Plan identified a need for enforcement of drought restrictions. A model ordinance was developed for adoption by municipalities based on previous drought planning in southwest CT. Water utilities have different policies on drought enforcement. Generally, private utilities do not believe that they have explicit legal authority to enforce restrictions and need municipalities to do the enforcement of water restrictions. Utilities overseen by PURA believe that enforcement authority may be provided by PURA approval of a utility's individual rules and regulations.

3.01 Finding: The model ordinance has not been widely adopted by municipalities.

3.01 Discussion: Only a handful of municipalities have any type of drought or water restriction ordinance. Those municipalities that have not adopted an ordinance rely on the water utilities to manage drought mitigation, enforce drought restrictions and drought preparedness. The lack of adoption of a water restriction ordinance may leave

municipalities vulnerable and without proper authority to implement some drought mitigation and/or conservation actions.

3.02 Finding: The model ordinance does not include private wells.

3.02 Discussion: Including private wells in water planning was identified as a need in the State Water Plan. Since the model ordinance focuses on public supply, town residents served by private wells may not understand the need for a drought or water supply ordinance in their town. Generally, the public does not understand groundwater and the potential relationship between private wells in a given area. This lack of understanding contributes to the town's reluctance to regulate private wells. Private wells are seen as a privately-owned resource rather than as part of a public trust resource. Revising the model drought ordinance to include private wells/groundwater resources is critical for adoption by municipalities statewide.

3.03 Finding: It has not been determined how a drought ordinance may fit into Hazard Mitigation Planning as a path towards adoption.

3.03 Discussion: Every town is required to adopt a Hazard Mitigation Plan (HMP) that is updated every five years. This plan identifies potential natural hazards that may impact the town, including drought. The HMP brings together numerous town departments and has implementable action items. Many of the HMPs are done collaboratively for towns working with their Council of Government (COG). The HMP planning process may be a way to identify actions that can be included in the ordinance and advance the adoption of drought/water supply ordinances by municipalities.

3.04 Finding: The current State Drought Preparedness Plan (SDPP) calls for each municipality to identify a Municipal Drought Liaison (MDL) and this task needs to be completed.

3.04 Discussion: The interagency drought workgroup is charged with implementing the SDPP. When the plan was updated, it recognized the need for better communications especially with two key partners: 1) municipalities and 2) water utilities. The IDW is working with DEMHS using the Regional network for emergency response to identify a drought coordinator in each town. As a default, they are using the emergency response coordinator until someone else is named. The use of the emergency response network is appropriate but may also be supported by coordinating with local land use agencies possibly through COGs to identify the best person. The drought coordinator could also be someone from public health, conservation, inland wetlands, or another town agency focused on water resources. Source water protection, water conservation, and drought preparedness are all related and are part of watershed planning, often carried out in the land use department. The Greenwich model has the Conservation Director as the lead for water supply and a water supply team that includes the Director of Health, Fire Chief, Emergency Operations Center Director, and the First Selectman.

The WPC/IDW are currently finalizing the initial list of water coordinators. Each town will have a water coordinator to help facilitate communications between each of the responsible entities to aid in the messaging for water restrictions among other drought coordination efforts.

3.05 Finding: Based on our review, water utilities are concerned that having to get approval from one or more municipalities before implementing drought restrictions may cause delay and inconsistent response.

3.05 Discussion: Some water utility members of this group have expressed concerns about having to coordinate and get approval from municipalities on implementing drought restrictions. Municipalities mostly rely on water utilities to respond to emergencies. On the other hand, some members expressed concerns that utilities may not implement drought recommendations early enough and that municipalities have a role as they are charged with public health and safety. Because water utilities' fundamental responsibility is to maintain and protect public health, it is important that individual drought response plans be adequately protective and implemented accordingly (see discussion under 1.01).

3.06 Finding: Given the variety of municipalities and types of water use within municipalities, while many utilities rely upon municipal enforcement of the utility drought plan, these plans are not generally designed to fully protect town and local water supplies.

3.06 Discussion: Non-utility members of the workgroup felt that there was a need for municipal ordinance for several reasons including: 1) private wells are not covered by utilities, 2) municipalities are charged with ensuring the health and safety of their communities and that includes making sure that all utility providers are doing what is needed during a natural disaster such as drought, 3) there is concern that smaller utilities may not have the capability to do enforcement, and 4) municipalities could support utilities in enforcement actions if needed. The consensus was any new model ordinance should reflect the need to coordinate with the water utility.

3.07 Finding: The 2016 drought saw a change in policy where it was determined that private water utilities could enforce drought restrictions.

3.07 Discussion: Prior to the drought of 2016, public and private utilities looked at the role of municipalities within their service area differently. Public utilities believed that they had legal authority to enforce drought restrictions without a municipal ordinance. Private utilities believed that a local ordinance was needed for enforcement and relied on municipalities for enforcement. PURA reviewed the role of water utilities and water supply plans during the 2016 drought and determined that Aquarion, as a private utility, did have the authority to enforce water restrictions. This determination also supports the need for a new ordinance that recognizes the shared responsibility with the water utility.

3.08 Finding: 2016-2017 saw the adoption of drought mitigation restrictions/strategies put in place in southwest CT that were not only in response to the current drought but to prevent future droughts.

3.08 Discussion: The 2016 drought in southwest CT resulted in Aquarion and the municipalities adopting outdoor water restrictions. These restrictions were kept in place through 2017 and eventually became permanent restrictions as part of Aquarion's ongoing water supply management program. The model ordinance, and indeed much of the discussion on drought management, deals with responding to a drought and not with mitigation actions, such as water conservation, to prevent or minimize the impact of a drought. Further discussion is needed as to whether a model drought ordinance should be expanded to include water conservation as part of the water supply and drought ordinance.

Recommendations:

3.01 A new set of model ordinances should be developed to better fit local municipal needs. There are many different scenarios regarding water supplies at the local level and model ordinances should be developed to meet the different set of conditions. For example, some towns may be serviced solely by public water supplies and other towns may be a combination of private wells and public supply. A task force should be convened to develop model ordinances for the different town/water supply configurations. These should include how municipalities will coordinate with local water utilities.

3.02 The Water Planning Council should confirm that public water suppliers have the authority to implement and enforce water use restrictions on their customers in accordance with their approved drought response plans without the need for enacting ordinances in each municipality served, similar to the authority assumed by Aquarion during the 2016 drought.

3.03 Each town should have a Municipal Drought Liaison (MDL) which should be required by state regulation or statute.

FINDING AND RECOMMENDATIONS THAT PERTAIN TO CHARGE [4]

Charge 4 - *Would the current state drought plan have been effective during the 2016-2017 drought?*

Background

The current *Connecticut Drought Preparedness and Response Plan* was adopted by the Connecticut Water Planning Council on November 6, 2018. Although it was nearing completion, it was not officially in place during the 2016-2017 drought. The Drought plan subcommittee has reviewed all of the minutes of the Interagency Drought Workgroup (IDW) available during the 2016-2017 drought. Additionally, it heard from utility and

municipal staff actively involved in the state's southwest region and from various agency members involved in the IDW. This in-depth review took place during the 2020 drought resulting in some recommendations already being implemented, at least temporarily, by the IDW. The following findings reflect not only the discoveries about the 2016-17 drought but reflect operational improvements applied by the IDW during the 2020 drought.

4A – Regional Droughts

4A.01 Finding: The regionality of 2016-17 drought was considered by the IDW in its decision making and communications, whereas previously there was more focus on statewide drought. IDW is currently reviewing and declaring droughts on a regional (i.e. county) basis.

4.01 Discussion: Although the current Drought Preparedness and Response Plan had not been formally adopted, members of the IDW were aware that a key recommendation in the plan was to look at droughts regionally. Just as with other extreme weather events, it was unlikely that the entire state would experience the same level of severe drought conditions. It was also understood that public water supply systems have different vulnerability to different levels of drought, as do private wells. The IDW took this into consideration during the 2016-17 drought.

4.02 Finding: Although the current plan allows IDW to make recommendations on a regional/local level, there have been no attempts to define regions and to specify which data should be analyzed.

4.02 Discussion: The current drought plan allows for IDW to make decisions about drought response on a regional level, but does not define regions. Since NOAA uses counties to define areas for extreme weather events, this has been suggested as a possibility. These are familiar to the public and used to communicate weather alerts. It has also been noted that data used for making decisions is not necessarily available across all regions (e.g. stream gages) and that we need better data to make more informed decisions on the regional/local level. Another factor for consideration is water utilities' operational areas and water supply plans

Recommendations:

- 4.01 IDW should continue to review and evaluate drought on a regional scale.
- 4.02 Identify/demarcate drought regions to be used by IDW and whose boundaries can be easily communicated to the public.
- 4.03 Identify gaps in data needed to adequately assess drought conditions on a regional scale and determine pathways for obtaining better data.

4B – IDW Record of meetings and data review

4.03 Finding: Meeting minutes did not include sufficient condition information or metrics to determine the conditions at the time of the meeting.

4.03 Discussion: The review of the 2016 Drought IDW meeting minutes indicated several areas of concern. Findings 4.03-4.06 are a result of this review of the meeting minutes. The meeting minutes at times did not fully document the drought conditions at the time of the meeting. This may indicate a lack of critical information needed by the IDW or a lack of records being kept. Record keeping of conditions information is critical and allows for the evaluation of actions taken and need for changes in procedures or the drought plan itself. Currently, the IDW is producing a condition summary report for their meetings.

4.04 Finding: Meeting minutes lacked sufficient details to document the IDW's rationale for the decisions reached and actions taken.

4.04 Discussion: Each meeting's minutes should contain sufficient information so that those reading the minutes can determine what decisions were made and why the decisions were made. This is also critical for an after-action report to evaluate the decisions made and what actions should be taken in future droughts or what improvements are needed in the drought plan.

4.05 Finding: Meeting minutes, actions, and drought criteria were not taken or provided for all meetings. Records were not kept of decisions that were made via emails instead of actual meetings.

4.05 Discussion: Decisions and actions were being made using email exchanges between IDW members and these decisions or actions were not being fully recorded. It is critical to document the decisions being made if they were done via emails. It is understandable that busy schedules do not allow for all IDW members to all meet. However, decisions should be made in a meeting instead of via emails. This will allow for the proper documentation of actions and decisions. If decisions are made via emails, the IDW should document these decisions in some way.

4.06 Finding: The IDW may not have all of the necessary information it needs to make informed decisions on a regional or local level.

4.06 Discussion: The lack of important data is a hindrance to proper decision making. The meeting minutes appeared to indicate that the IDW did not have all of the available information at the time of decision making at a regional or local level. The IDW needs all of the available information to make critical decisions regarding drought actions and declarations on a regional and local level.

4.07 Finding: The current drought plan indicators may not be appropriate for decision making during a winter drought.

4.07 Discussion: In recent years, new information regarding the impacts of snow drought has been reviewed, evaluated, and adopted. Slow melting mountain snowpack of the western US replenishes reservoirs over the spring and early summer in CA. The snow acts as water storage that releases over time. The role of snow and snowpack in CT has yet to be fully investigated as it relates to drought. Further research and analysis need to be completed to better understand how the lack of snow and snowpack in the winter impacts drought, groundwater recharge, and drinking water. Such information can be used to determine if winter related criteria need to be developed.

Recommendations:

- 4.04 The IDW should maintain detailed records of data, data analysis, and drought status for each IDW meeting, in order to provide a record and context for the meeting minutes and any decisions that were made.
- 4.05 The IDW should include copies of all indicators and records reviewed with their meeting minutes.
- 4.06 The IDW should strive to make all significant decisions at an IDW meeting and not use emails.
- 4.07 If decisions are being made using emails then the IDW should draft minutes to reflect the information in the emails and any decisions made.
- 4.08 Drought criteria and condition summaries should be provided and evaluated on a regular basis.
- 4.09 The IDW should evaluate the data and information currently available to them to determine where there are any deficiencies.
- 4.10 If in the IDW's evaluation of drought data deficiencies are identified, the IDW should endeavor to address the deficiencies.
- 4.11 If the deficiencies are found to be at a regional or local level, the IDW should develop a process to gather more local level drought conditions and impacts.
- 4.12 The IDW should conduct a research review to determine if snow drought impacts CT and develop winter criteria and triggers if it does.

4C – Private Wells

4.08 Finding: Private wells are not given proper consideration in the Drought Preparedness and Response Plan.

4.08 Discussion: In Connecticut, most water supply planning is accomplished by water utilities and the Water Utility Coordinating Committees and does not include private groundwater wells. Groundwater and surface water are impacted differently by periods of drought and extreme precipitation events and therefore need to be considered differently. Private wells need to be included and given proper consideration in all water supply planning, including in drought planning and response.

4.09 Finding: Recent droughts have impacted private wells in CT and our region but there remains a lack of data and lack of direction on how to include private wells in their decision making.

4.09 Discussion: IDW members are aware of unofficial reports of yield problems for private wells during the most recent droughts (2016-17 & 2020). The IDW is also aware of problems in other states including Maine where extended drought has impact residential wells. There are few USGS real-time groundwater monitoring wells to inform decision making. Although the IDW recognizes these problems and has concerns about the impacts of climate change on private wells, they acknowledge that they do not have the tools in place to gather data on private wells. There also seems to be no defined role for supporting local municipalities regarding private wells. In 2020, the IDW did obtain new well data from local health districts on an irregular, anecdotal basis. Unless state or local government steps up, no one is looking at private wells.

Recommendations:

- 4.13 Update drought plan to better define how private wells will be considered by the IDW, what data should be considered in their evaluation, and what actions will be implemented during drought emergencies.
- 4.14 Expand network of USGS real-time groundwater monitoring stations to better anticipate and corroborate private well impacts.
- 4.15 Develop procedure for reporting of private well yield problems caused by drought and how IDW should coordinate with local government.

4D – State IDW vs Water Supply Plans

4.10 Finding: Drought response in CT is driven by the state-adopted Drought Preparedness and Response Plan implemented by IDW and individual Public Water System (PWS) Water Supply Plans that must include drought response as part of the plans. There remains confusion as to the role and relationship of IDW and PWS Plans.

4.10 Discussion: There was consensus that IDW, with OPM as the lead agency, is the appropriate group to manage the State’s drought preparedness and response, and that water utilities, under the direction of DPH and as part of their water supply plans, are the lead at the local level. The current drought plan better defines this role than the previous plan but messaging and communications continues to be problematic. The IDW is looking at all water supplies, including private wells and small utilities. Water utilities, on the other hand, are looking specifically at their supply and may disagree with the IDW decisions on when to put drought restrictions in place and on public messaging. Water utilities who are functionally more dependent on water sales may be more reluctant to put mandatory restrictions in place.

4.11 Finding: No comprehensive after-action review of the drought plan was conducted by IDW that included water utilities and it is unclear if individual PWS Water Supply Plans were effective or need to be updated.

4.11 Discussion: Although some adjustments have been made to the overall operation of the IDW, no comprehensive after-action review of the drought was taken that looked at both the state and the utility response. Utilities feel that public water supply drought planning needs to better consider system-specific risks and is best managed through the State’s Water Supply Plan process which includes review and approval by the Department of Public Health. There was also discussion about setting trigger levels and updating water supply plans to reflect changes in precipitation rates and distribution resulting from climate change, however, it was the consensus that this should be handled elsewhere and not as part of the drought plan.

Recommendations:

- 4.16 The state drought plan should be updated to better define the relationship between State IDW and public water supply drought preparedness and response and its role in both. This should include goals for response to each drought phase.
- 4.17 IDW should conduct after-action assessments following each drought event and should include water utilities in that assessment.
- 4.18 DPH should require public water supply plans to include analysis of the impact of triggers and use reductions under historic drought conditions to demonstrate the effectiveness of their drought response plans.

4E – Communications

4.12 Finding: The Interagency Drought Workgroup procedures for public communication of drought stages are inconsistent.

4.12 Discussion: The communications regarding the declaration of drought stages during the 2016 drought did not seem to follow any set procedure or protocol. The lack of procedures and templates hindered the timely release of communications due to the need for communications to be reviewed by each agency prior to its release. The development of procedures and standard templates should allow for shorter review times. The development of templates can include various agencies and communications staff or offices which would allow for better communications materials.

During the 2016 drought response review, concerns were raised by the lack of a procedure to officially document communications with the Governor’s office specifically if the Governor’s office decision is contrary to the IDW’s recommended actions.

4.13 Finding: The communications of the IDW were perceived to be in one direction. During emergencies, communications go between the state, municipalities, and utilities. The communication relationship between the IDW, utilities, and the municipalities was unclear.

4.13 Discussion: During the 2016 drought response review, it appeared that there was little communication between the IDW, towns, and water utilities. The only apparent communication was the release of drought declarations issued as a press release. The impacted towns or water utilities did not appear to have any input or to coordinate messaging for the declaration or the conservation measures requested by the state. The current drought plan includes two-way communications with the establishment of the Municipal Drought Liaison (MDL). Had the Water Coordinator been present in the 2016 drought, communication between the various stakeholders would most likely have been better.

4.14 Finding: Improved communications and coordination are needed between the IDW, municipalities, and utilities.

4.14 Discussion: Would non-voting advisory membership expansion of the IDW to include representatives of the towns or regions and utilities or water suppliers allow for improved communication between these stakeholders? In the current drought plan, towns and water companies/utilities have a defined role at each stage starting with stage 2. Yet, these stakeholders are not represented in the meetings of the IDW. Inclusion of these stakeholders would allow for further gathering of regional drought information and impacts and also include the best measures for mitigation actions for that region. The concerns for such a large group are that it may hinder the group’s decision-making ability. However, decision making and recommendations to the Governor’s Office would remain with the agency representatives.

Does the current drought plan’s water coordinator position meet the need for communications between the state and local officials and utilities or water suppliers? The Water Coordinator has yet to be fully implemented including during the 2020 drought response. The Water Coordinator responsibilities need to be well developed along with a communications plan and mechanism in order to determine if the Water Coordinator can be an effective mechanism for communications between the various stakeholders.

Recommendations:

- 4.19 IDW should determine a consistent set of procedures for communications that should define timing and responsibilities.
- 4.20 Templates for various stages and drought conditions should be drafted and finalized using agency staff and communication's offices staff. These templates should be approved prior to the next drought event and include areas where additional situational information can be added during the drought event.
- 4.21 IDW should develop a mechanism to document any decisions made by the Governor's Office when a recommendation is made regarding drought declarations and conservation requests.
- 4.22 IDW should develop a plan to fully implement the use of the MDL that includes defining the role and responsibilities of the position.
- 4.23 The IDW should develop and establish simple and efficient mechanisms that ensure two-way impactful communications between the state and the Water Coordinator.
- 4.24 IDW should determine, after the full implementation of the MDL, if the MDL has fulfilled the role of two-way communication. If the MDL has not completely fulfilled the role, then the IDW should determine a mechanism that expands their membership to include local or regional stakeholders as advisory members.

4F – Membership/Operations

4.15 Finding: IDW meetings were not being held regularly even during times of drought.

4.15 Discussion: After reviewing the meeting minutes from the 2016 drought response, it was determined that the IDW did not meet on a consistent basis. There were times during the height of the drought in which the IDW did not meet for months. It is critical to meet regularly during drought conditions to assess conditions and recommend actions. It is also critical to meet during normal conditions to assess the previous drought response, make corrections or additions, and prepare for future droughts. These efforts were hindered by the lack of regularly scheduled meetings.

4.16 Finding: Without a lead IDW member to coordinate meetings, drought preparation, and drought plan implementation, these actions are not going to be carried out in a timely and impactful fashion.

4.16 Discussion: Having a lead IDW member in charge of the IDW is critical to the successful implementation of the drought plan and coordination of drought impact mitigation. Currently the lead state agency for the IDW is the Office of Policy and Management. With their role in coordinating and management of other agencies and their established lines of communication with the Governor's Office, OPM is the correct agency to lead the IDW. A clear driving force type of leadership was not apparent during the 2016 drought response review.

4.17 Finding: The IDW membership appeared to be inconsistent and unstable.

Discussion: The IDW meeting minutes of the 2016 drought made clear the lack of consistent membership. Each meeting seemed to have varying agency staff members present. It is imperative to have consistent member attendance to the IDW meetings to ensure attendees are up to date with all of the actions and discussions regarding the drought plan implementation and actions. When members are inconsistent, then the IDW meeting time must be spent updating new attendees in order to further their efforts. Voting members should be present at each meeting or an alternate be selected that can vote in their place. Without the presence of sufficient number of voting members, no decisions can be made.

Recommendations:

- 4.25 IDW should establish monthly meetings during non-drought conditions.
- 4.26 IDW should establish a schedule of meetings during drought conditions whose frequency is sufficient to relay conditions and make timely decisions.

- 4.27 OPM should identify a staff position with sufficient authority to be the lead of the IDW and add the duties to the position's description to ensure the leader role is established.
- 4.28 Members and alternates should be determined by each agency who have the authority to make decision for their agency or branch and can attend meetings regularly.
- 4.29 IDW members and alternates should be updated periodically.

4G – Drought Response vs Drought Mitigation Planning

4.18 Finding: Section IV of the current drought plan on Long Term Planning and Preparedness was not in place during the 2016-17 and there is still the perception that the drought plan does not address mitigation/resiliency and only addresses preparedness in terms of having the tools/protocols in place to respond to a drought emergency.

4.18 Discussion: During the 2016-17, Aquarion successfully implemented water use restrictions for outdoor water use. This was recognized as a necessary step during the drought emergency. In order to mitigate future droughts, they have instituted a permanent water conservation program. Although it was agreed that water conservation is something that should be considered in state water planning, there was not a consensus on whether or not the drought plan or IDW was the proper place for mitigation. Often there is a distinction made between the terms water restrictions (used during emergency) and water conservation. It was noted that Hazard Mitigation Plans include both mitigation and response but no consensus of how the drought plan fits into the state HMP. In addition to water conservation, evaluating the requirement for a larger margin of safety as a mitigation measure was suggested. Consensus to bring the issue to the WPC for consideration.

4.19 Finding: The Governor's Council on Climate Change (GC3) has identified drought and impacts to water supplies as threats posed by a changing climate that need to be addressed through adaptive and resilient planning. This work is continuing, and they have specifically called out the SWP for coordination.

4.19 Discussion: There was consensus that the SWP and GC3 planning efforts should be coordinated. It was not determined how this fits into the drought plan. Obviously, the GC3 was not in place during the 2016-17 drought and not considered. It was also agreed that this was a bigger effort for the entire SWP and not just the drought plan.

Recommendations:

- 4.30 The Water Planning Council needs to provide guidance as to the role of water conservation in mitigating for drought and determine if water conservation should be part of the Drought Preparedness and Response Plan. Further it needs to look at other planning documents including the State Hazard Mitigation Plan and the GC3 reports.
- 4.31 The Water Planning Council needs to determine and advise the SWP-IWG and WPCAG as how best to coordinate with the GC3 planning efforts.

APPENDIX A
MEETING AGENDAS

See attached file

APPENDIX B
MEETING MINUTES

See attached file.

APPENDIX C
SURVEY RESULTS

See attached file.

APPENDIX D
RECOMMENDED CHANGES TO DROUGHT PLAN

Appendix D: Draft Amendments to the Drought Plan to Define Administrative Roles and Responsibilities

The following language was developed by the DWG to address some of the recommendations contained under Charge 2.

[DRAFT] New Section: Resource Organization & Management

[DRAFT] New Subsection: Meeting Schedule and Format

The IDW shall schedule monthly regular meetings each calendar year. A public notice listing the times, dates, and locations of each meeting shall be posted on the Drought Information Portal website. Meetings may be conducted virtually.

OPM has the authority to cancel regular meetings and schedule special meetings of the IDW. Regular meetings may be cancelled when drought conditions are not present and there is no new or old business to resolve. Meeting cancellation notices shall be posted on the Drought Information Portal website and OPM shall keep documentation of the reasons for such cancellations.

The IDW must meet a minimum of once per year, regardless of drought conditions, to review long-term drought preparedness activities, establish or re-affirm staff assignments/responsibilities, maintain professional relationships, and/or engage in professional development opportunities (presentations, etc.).

[DRAFT] New Subsection: IDW Membership and Staff Assignments

Each agency represented on the Interagency Drought Workgroup shall:

- Designate one employee as the primary agency representative on the IDW, with authority to speak and act on behalf of the agency. A second employee shall be designated as an alternate representative when the primary representative is unavailable.

- Designate one employee, who may also be the primary or alternate IDW representative, to serve as “Agency Drought Coordinator.” The agency drought coordinator shall be responsible for providing necessary agency staff support in preparing for and responding to drought. Such responsibilities include, but are not limited to:
 - Point-of contact for all interagency coordination and response efforts.
 - Collecting, analyzing, and disseminating drought-related data in a timely manner to inform decision-making.
 - Regular participation in all interagency meetings and working groups concerning drought planning and response.
 - Undertaking agency drought responsibilities and action items, as required by the Drought Plan and as directed by the Interagency Drought Workgroup.

[DRAFT] New Subsection: Leadership

The Office of Policy and Management, as the lead agency on the IDW, shall designate one employee to serve as “State Drought Coordinator.” The State Drought Coordinator shall be responsible for coordinating the work of Agency Drought Coordinators and oversee efforts to produce deliverables related to drought preparedness and response. The State Drought Coordinator shall produce meeting documentation (agenda, minutes, reports, and other materials), facilitate IDW meetings, administer the

Drought Information Portal website, and oversee the implementation of the Drought Plan, including additional duties and responsibilities as may be assigned by the IDW.

[DRAFT] New Subsection: Reporting and Documentation

A drought is a significant historical event. As such, it is critical that the event is recorded and well-documented. All IDW meeting materials, including agendas, minutes, data and conditions reports, communications, maps, and any other relevant materials shall be posted and archived on the Drought Information Portal website. Whenever practical, news articles and external press releases or guidance from public water suppliers, etc. should be saved and archived. A timeline of events should be created, beginning with the first declaration of drought by the IDW and ending when the drought declaration is terminated. The lead drought coordinator shall have chief responsibility for appropriate drought documentation.

3.2 Application of the Drought Plan

The IDW is the entity responsible, under the authority of the WPC, for actively monitoring water conditions and, as guided by the Drought Plan, recommending drought declarations and mitigation actions to the Office of the Governor and state agency commissioners. Whenever any member agency of the IDW becomes aware of considerably dry conditions via routine monitoring of internal or external sources, the following sequence of events shall take place:

1. The alerting agency shall contact OPM, which, as the lead agency, shall convene a meeting of the IDW. A public meeting notice and agenda shall be circulated.
2. The IDW shall assess and discuss the drought criteria and any other appropriate data to determine whether dry conditions warrant a declaration(s) of drought conditions for any portion(s) of the state, consistent with the thresholds specified in Section V of this plan. The IDW may cite professional judgement in its determination, if not consistent with the thresholds specified in Section V. A determination to recommend such declaration(s) shall be supported unanimously by all member agencies on the IDW.
3. In the event that the IDW cannot reach unanimous agreement to recommend a drought declaration(s), as guided by the Drought Plan, the IDW shall take no action. A follow-up meeting of the IDW shall be scheduled within 14 business days to re-evaluate conditions. At such follow-up meeting, any determination made by the IDW to recommend a drought declaration(s) shall be by simple majority of the member agencies.
4. Any such recommendations of the IDW shall be transmitted by OPM to the Office of the Governor. The Office of the Governor may accept, reject, or modify the recommendations of the IDW. The Office of the Governor may defer to the secretary of OPM or the commissioner of any IDW member agency to accept, reject, or modify the recommendations of the IDW. State agencies shall commit the resources necessary to undertake mitigation actions outlined in Section V.
5. Whenever a drought declaration is active for any portion of the state, OPM shall schedule regular meetings of the IDW as deemed necessary to re-evaluate conditions and implement mitigation actions associated with each drought stage, as guided by Section V. Responsibilities that are not already clearly assigned shall be delegated to appropriate member agencies based on resource availability, subject matter expertise, and statutory and regulatory authorities. The lead agency of the IDW shall oversee such delegation of responsibilities.
6. The IDW shall determine whether to recommend changes to any active drought declarations (scaling up or scaling back), following the same decision-making protocols in 2-4 above.

Under the National Incident Management System (NIMS) Emergency Support Function System, the Office of Policy and Management is designated the primary state agency in a drought event. When conditions reach Stage

3 (Moderate Drought), the Governor may consider convening his/her Unified Command in accordance with the State Response Framework (SRF) prepared by the Department of Emergency Services and Public Protection, Division of Emergency Management and Homeland Security. The Governor's Unified Command is comprised of the key state agencies and public sector partners relevant to a particular potential or actual emergency. If conditions reach Stage 5 (Extreme Drought), many necessary response functions may be coordinated under the SRF, including activation of the State Emergency Operations Center to centralize planning and response operations.

During times of no drought, the IDW shall meet not less than biennially for the purpose of reviewing and implementing long-term drought preparedness activities in Section IV, and to review any changes in agency staffing or resource demands that affect the IDW. The IDW may, at any time, create and oversee one or more independent working groups consisting of staff from state, local, and/or private entities for the purpose of conducting drought preparedness exercises or activities, or for other drought preparedness needs as the IDW may determine.