THE COMMONWEALTH OF MASSACHUSETTS

WATER RESOURCES COMMISSION

100 CAMBRIDGE STREET, BOSTON MA 02114

DRAFT Meeting Minutes for September 14, 2023

Meeting conducted remotely via Zoom meeting platform, 1:00 p.m.

Minutes approved December 14, 2023

Members in Attendance:

Vandana Rao	Designee, Executive Office of Energy and Environmental Affairs (EEA)
Chris Kluchman	Designee, Executive Office of Housing and Livable Communities (EOHLC)
Beth McCann	Designee, Department of Environmental Protection (MassDEP)
Anne Carroll	Designee, Department of Conservation and Recreation (DCR)
Todd Richards	Designee, Department of Fish and Game (DFG) (joined at 1:23 pm)
Hotze Wijnja	Designee, Department of Agricultural Resources (DAR)
Tyler Soleau	Designee, Massachusetts Office of Coastal Zone Management (CZM)
Thomas Cambareri	Public Member
Christine Hatch	Public Member (joined at 1:25 pm)
Vincent Ragucci	Public Member
Kenneth Weismantel	Public Member
Samantha Woods	Public Member

Members Absent

Others in Attendance:

Kara Sliwoski	DCR Office of Water Resources
Jason Duff	DCR OWR
Sara Cohen	DCR OWR
Viki Zoltay	DCR OWR
Erin Graham	DCR OWR
Vanessa Curran	DCR OWR
Sarah White	DCR Office of Climate Resilience
Celeste De Palma	DCR Office of Climate Resilience
Nadia Madden	DCR Flood Hazard Management Program
David Boutt	UMass Amherst
Dan Corkran	UMass Amherst
Becca George	EOHLC
Jennifer Pederson	MA Water Works Association
Lexi Dewey	Water Supply Citizens Advisory Committee to the MWRA
Paul Barlow	USGS
Ellen Douglas	AECOM
Lindsay Nystrom	DCR
Sarah Bower	Mass Rivers Alliance
Patty Gambarini	Pioneer Valley Planning Commission
Andreae Downs	Wastewater Advisory Committee to the MWRA
Matt Mostoller	Acton Water
Julie Butler	MassDEP
Jiedine Phanbuh	EEA Intern/Harvard Rappaport Fellow

Rao called the meeting to order at 1:05 p.m.

Agenda Item #1: Welcome and Introductions

Rao welcomed all attendees, announced that the meeting was being recorded and all votes would be taken by roll call. She invited those who wish to speak during the meeting to indicate this in the chat window. Attendance was taken by roll call.

Agenda Item #2: Executive Director's Report

Rao reviewed the meeting packet that was distributed and highlighted MEPA comment letters that were sent on the WRC's behalf. A letter was sent regarding a project in Bourne that involves development in the floodplain. A second letter was sent regarding a project in Littleton that had comments pertaining to floodplain development and also to the Interbasin Transfer Act. Rao asked Curran to give an overview of the Littleton project. Curran explained that Littleton has a municipal water supply and is proposing to install a new well which will tie into a newly completed treatment plant that removes PFAS, iron and manganese from the water supply. Littleton is proposing to run a finished water main to the Town of Boxborough to provide water for some properties served by wells located near Route 495 which are contaminated with salt, and in some cases PFAS as well. Littleton has its sources in the Merrimack Basin. Boxborough is located in two basins, the Merrimack and the SuAsCo River Basins, so it would only be the water that's crossing to the SuAsCo River Basin that would be subject to the Interbasin Transfer Act. WRC staff have received a Request for Determination of Insignificance for this project and are reviewing it. It has already been determined that additional information will be requested, and WRC staff are working with the other agencies to compile all comments into one request to the proponent. Rao thanked Curran for the overview, and next announced that Climate Week is next week, so there are many events and announcements that will be forthcoming from the administration.

Lastly Rao acknowledged Lexi Dewey, Executive Director of the Water Supply Citizens Advisory Committee to the MWRA (WSCAC), who is retiring at the end of September. Rao congratulated her on this next phase in her life, commended her on a great career, and wished her all the best. Dewey thanked Rao and acknowledged the WRC staff's work which supported her own work with WSCAC.

Agenda Item #3: Hydrologic Conditions Report

For the month of August, monthly average temperatures were mostly normal to below normal. Precipitation was above normal except for the Connecticut River Valley and Islands Regions where it was normal. The Crop Moisture Index showed slightly dry/favorably moist conditions in the western area of the state, and abnormally moist in remaining areas. The Evaporative Demand Drought Index showed normal to below normal conditions except on Cape Cod and the Islands, where there were areas that were above normal to much above normal. The Keetch Byram Drought Index was elevated on the Islands. Streamflow was mostly high across the state, except for on Cape Cod where it was normal. Flooding was experienced on August 8th and August 18th. Over those two days there were numerous warnings for severe thunderstorms, flooding, and flash flooding. This link (https://www.wbur.org/news/2023/09/12/summer-flooding-rain-massachusetts) gives a nice summary. Individual groundwater wells ranged from below normal to much above normal. Most regions were much above normal. The Cape Cod Region was on the

low end of normal. The Islands were at Index Severity Level 2. Lakes and impoundments were all normal. No drought conditions are currently in place.

Agenda Item #4: Meeting Minutes

Rao invited motions to approve three sets of meeting minutes.

VOTE	A motion was made by Weismantel with a second by Ragucci to approve the meeting minutes for May 11, 2023. The roll call vote to approve was unanimous of those present.

VOTE	A motion was made by Weismantel with a second by Ragucci to approve the meeting minutes for June 8, 2023. The roll call vote to approve was unanimous of those present.

VOTE	A motion was made by Weismantel with a second by Ragucci to approve the meeting minutes for June 21, 2023, with edit as provided by Kluchman. The roll call vote to approve was unanimous of those present.

Agenda Item #5: Mapping Vulnerability to Groundwater Flooding in Massachusetts

Rao noted that the climate is changing and groundwater is rising, which will have a lot of impacts on not just things like basements, people living in basements, and infrastructure that's in basements, but also on roads and other ground level infrastructure. For this research on groundwater flooding conducted by David Boutt, WRC staff received funding through SHMCAP (State Hazard Mitigation and Climate Adaptation Plan) implementation from EEA.

Rao introduced Zoltay as the project manager for this work. Zoltay introduced the project team, which includes Dr. David Boutt, a research professor at UMass Amherst and Daniel Corkran, a PhD student at UMass Amherst. She also introduced the inter-agency team that includes Julie Butler from MassDEP, and Joy Duperault and Nadia Madden from DCR's Flood Hazard Management Program. There is an overall trend of rising groundwater in general, not just seasonally. This has been shown by Boutt's research and USGS to be statistically significant. How will this affect basements, septic systems, and underground utilities? The team has created a statewide hydrogeologic model or groundwater model because not as much information is available about the subsurface, with opportunities for future work on the model in terms of refinement and additional scenarios incorporating climate change. Zoltay welcomed Boutt.

Boutt began his presentation by defining groundwater flooding, which is the movement of the water table toward the surface. Boutt presented evidence for rising water tables. The project objectives are to map the water table depths across the Commonwealth and then make probabilistic predictions of the likelihood of future groundwater rise within the state. Boutt introduced Corkran to walk through some of the data sets that were collected to perform the analysis. Corkran explained that the HUC 12 watersheds were used to define the model extents. Typically groundwater models experience edge issues so to avoid those boundary effects influencing the groundwater model water table predictions, the boundaries were extended out beyond the boundaries of the state to the HUC 12 watershed boundaries. A topographic digital elevation model from USGS was used, as well as a new bedrock elevation model put out by the

MA Geological Survey. Potential evapotranspiration (PET) was obtained from a 1996 study that modeled PET rates for the entirety of southern New England. Boutt added that all these data combined to create a new product, which defines the high yield aquifers throughout the Commonwealth, based on their transmissivity. Transmissivity depends on aquifer thickness and hydraulic conductivity.

Corkran discussed the groundwater model development which involved incorporating the datasets previously discussed and calibrating the model to mean ground water elevations. The results of the calibrated model allowed for the development of a water table elevation and a mean depth of water map for the entire state of Massachusetts. Rao suggested pausing for any questions. Wijnja asked about the potential impacts of other groundwater withdrawals for drinking water and other purposes. Boutt responded that the current model does not have withdrawals built in but could be considered in future versions of the model. Douglas asked if the model is one big model for the whole state or is it discretized by basins, and is it overburden groundwater? Douglas also asked if the research team was assuming that it is one big regional groundwater system? Boutt responded that it is one big model, and overburden and bedrock. The water table divides are really a result of this model, so the groundwater subbasins could be defined and delineated based on the water table elevations. Barlow asked if the model is one layer, or actually two with a bedrock layer? Boutt responded it's a single layer model.

Corkran continued on by explaining that there are groundwater rise risk zones. The risk zone definitions including flooding, emergence, and shoaling. Nineteen percent of the state's land area is at risk for groundwater flooding, 21% at risk for emergence, and 38% at risk for shoaling. Boutt noted that when predicting future changes, both under a 10^{th} percentile groundwater rise projection and a 90^{th} percentile scenario, western MA communities are at the highest risk. The relative risk in the eastern part of the state, specifically on Cape Cod is much lower. To wrap up, we're in a region where the water table is already naturally high. One of the things that's really interesting about these results is that even as we have increases in precipitation, the extents of those risk zones don't change a lot. Some of the areas are already wet and are going to get wetter. But the expansion of those zones is not that large. The project team is thinking about next steps in terms of improving this model. One important area, especially in the coastal part of Massachusetts, is looking at the compounding effect of sea level rise. Also this is a steady state model but should transient effects be assessed to understand if there are additional compounding factors that will cause the water table to reach the land surface.

Rao asked how this will fit in with sea level rise, for example on Cape Cod sea level rise is pushing the groundwater lens to the surface. Boutt said this will be looked at in a second phase. There is also an MVP (Municipal Vulnerability Preparedness) project looking at this phenomenon in the Plymouth Carver aquifer system. Richards asked if some small reaches of small streams that might go dry for longer periods of time during drought periods, would higher groundwater levels slightly buffer that effect, especially as mentioned in the western area, so that groundwater might sustain some of these streams a little bit longer than we expect under other conditions? Boutt agreed and said he is trying to understand, even with droughts and wet periods, why is groundwater storage increasing? Part of that has to do with the timing of the precipitation as well as our changing forest cover.

Douglas asked if the model assumed the same PET (potential evapotranspiration) into the future? Boutt answered yes, that is correct. Carroll asked if groundwater withdrawals could ease the impacts? Boutt responded that MA has small aquifer systems that are not subject to intense agricultural or industrial pumping. The average trend is not decreasing, it is increasing. Hatch thanked Boutt and Corkran for the presentation and asked if there are any concrete products that can be used to communicate the vulnerability of water resources. What would it take to create a model to predict areas for future nuisance flooding? Boutt responded that an integrated hydrologic model would be required which does a good job of capturing the partially saturated zone and the physics by which water moves through.

Rao and Gambarini asked Boutt what products for practical applications does he see coming out of this Phase 1 study? Corkran responded that the maps that have been developed can be very useful to people planning infrastructure projects or planning to drill new wells. The risk zones are a good way to identify areas within the state where efforts should be focused on addressing potential issues from groundwater rise. Kluchman asked if recharging groundwater with stormwater could be problematic in areas experiencing groundwater rise? Boutt responded that he and Zoltay have been talking about a project to map out high- and low- potential areas for enhanced aquifer recharge. Rao asked Zoltay to talk about the rollout plan for this work. Zoltay said that the base data sets that were compiled will be made available on MassGIS, and the climate change products will be made available on the Resilient MA website which is the main source of all climate-related information for the state. Once all the information is posted and available, there will be a webinar scheduled to explain the project.

Boutt added that the team is also working with MassDEP to bundle some of these products into a hydrogeologic atlas, to be combined with a new MA well driller database. Hatch pointed out that the flip flopping between wet and dry years highlights how little groundwater storage we have in the state. MA doesn't have the geology to store huge amounts of water, so if we have these long droughts and still need to provide the Commonwealth with water resources, we are going to have to come up with other ways of and other locations for storing water. Rao thanked Boutt and Corkran for the excellent presentation.

The full presentation is available at: https://www.mass.gov/doc/september-14-2023-wrc-presentation-massachusetts-groundwater-flooding-study/download.

Agenda Item #6: Alliance for Water Efficiency Inaugural Symposium Overview and Next Steps

Rao welcomed Carroll and Duff, who both recently attended the inaugural Alliance for Water Efficiency (AWE) symposium. Carroll began the presentation by reminding attendees that AWE is a nonprofit dedicated to efficient and sustainable water use across North America. Some highlights of the recent conference included sessions on water affordability, outdoor water use efficiency, and EPA's WaterSense programs. Duff presented on a panel, along with representatives from Arizona and Wisconsin, that focused on different state perspectives on drought and water conservation. Carroll received a lot of positive feedback on Duff's presentation, and also everything that MA is doing.

Duff continued by sharing some takeaways and action items for each of these topic areas. For water affordability, the key takeaway is to learn more about what's available in MA at the state level. Staff participated in meetings to learn more about Low-Income Household Water

Assistance Program (LIHWAP) and ways the state can help with issues around affordability. Related to that is continuing to explore water conservation and drought resilient rate strategies, which is directly related to affordability of water during times of drought. The next major topic was outdoor water use efficiency and water efficient landscaping. The takeaway here was to look at states that are at the forefront of promoting native drought-tolerant landscaping as a best practice.

Staff will also continue an ongoing effort which is a multi-partner collaboration to develop some drought tolerant native plant resources. Staff are also exploring the possibility of conducting some outdoor water use assessments at state facilities. For EPA WaterSense, the main takeaway was that OWR and EEA should continue to find ways to partner with them as they are a great resource. Lastly, the Water Research Foundation will be conducting a study on the residential end uses of water so the takeaway there is to spread the word about the opportunity to participate in this study. The more representation Massachusetts can have in this type of work, the better staff will be able to understand how water is used in our state, and will be better able to promote water efficient practices.

Kluchman noted that LIHWAP is part of EOHLC, within the Division of Community Services, and not all water service providers participate in the program. Rao noted that there is lots of effort on outdoor water conservation. Although New England has a growing season that is relatively short compared to other parts of the country, a lot of water is used then. Summer/winter ratios are quite stark in many communities. A ratio of summer use at 1.2 times the winter use indicates a conservative community, in terms of outdoor water use. And in some cases it is more than double that ratio. So a lot of water is used for outdoor landscapes. Pederson asked if there is a database for summer/winter ratios? Carroll answered yes and that MassDEP maintains it. Pederson said she would follow up with MassDEP.

The full presentation is available at: https://www.mass.gov/doc/alliance-for-water-efficiency-symposium-overview/download.

Rao invited any Commissioner updates. Hatch noted that she has been getting a lot of inquiries about dam safety. Carroll suggested that Bill Salomaa from DCR's Office of Dam Safety could be invited to present at a future Commission meeting. Another suggestion was that the Division of Ecological Restoration at the Department of Fish and Game could give a dam removal presentation. Rao described a project funded by SHMCAP for flooding vulnerability across the state. This is a first statewide effort, based on previous events and looking at impacts to environmental justice (EJ) populations.

VOTE	A motion was made by Weismantel with a second by Hatch to adjourn the meeting. The roll-call vote to approve was unanimous of those present.

Meeting adjourned, 3:10 pm.

Documents or Exhibits Used at Meeting:

1. WRC Meeting Minutes:
   a. May 11, 2023

   b. June 8, 2023
   c. June 21, 2023
2. Notice from the Massachusetts Water Resources Commission: Receipt of a Request for Determination of Insignificance under the Interbasin Transfer Act, MGL Chapter 21 Sections 8b-8d
3. Correspondence on behalf of the WRC to the MEPA Office regarding the following projects:
   a. Letter dated August 24, 2023 on the Expanded Environmental Notification Form for the Littleton Electric Light & Water Department's proposed Water Supply Connection
   b. Letter dated August 23, 2023 on the Expanded Environmental Notification Form for the Massachusetts Maritime Academy Patriot State II Dock Upgrade in Bourne
4. Interbasin Transfer Act project status report, August 24, 2023
5. Hydrologic Conditions in Massachusetts, August 2023 (available at https://www.mass.gov/info-details/monthly-hydrologic-conditions)

Compiled by: (VC)

Agendas, minutes, and other documents are available on the web site of the Water Resources Commission at https://www.mass.gov/water-resources-commission-meetings. *All other meeting documents are available by request to WRC staff at 10 Park Plaza, Suite 6620, Boston, MA 02116.*