



ORANGE WATER AND SEWER AUTHORITY

*A public, non-profit agency providing water, sewer and reclaimed water services
to the Carrboro-Chapel Hill community.*

Agenda

Work Session of the OWASA Board of Directors

Thursday, September 13, 2018, 6:00 P.M.

OWASA Community Room

The Board of Directors appreciates and invites the public to attend and observe its meetings. For the Board's Work Session, public comments are invited on only items appearing on this agenda. Speakers are invited to submit more detailed comments via written materials, ideally submitted at least three days in advance of the meeting to the Clerk to the Board via email or US Postal Service (aorbich@owasa.org/400 Jones Ferry Road, Carrboro, NC 27510).

For items on the agenda, public speakers are encouraged to organize their remarks for delivery within a four-minute time frame allowed each speaker, unless otherwise determined by the Board of Directors.

The Board may take action on any item on the agenda.

Announcements

- a. Announcements by the Chair
 - Any Board Member who knows of a conflict of interest or potential conflict of interest with respect to any item on the agenda tonight is asked to disclose the same at this time.
- b. Announcements by Board Members
 - Update on the September 11, 2018 Natural Resources and Technical Services Committee Meeting (John Morris)
- c. Announcements by Staff
 - Introduction of Tiffanie Hawley, OWASA's new Operations Supervisor – Jones Ferry Road Water Treatment Plant (Kenneth Loflin)
 - Introduction of Wil Lawson, OWASA's new Operations Supervisor – Mason Farm Wastewater Treatment Plant (Monica Dodson)
- d. Additional Comments, Suggestions, and Information Items by Board Members (Yinka Ayankoya)

Consent Agenda

Information and Reports

1. Annual Report on Disposal of Surplus Personal Property (Kelly Satterfield)

Action

2. Minutes of the August 23, 2018 Closed Session of the Board of Directors for the Purpose of Discussing Potential Litigation and a Personnel Matter (Robert Morgan)

Regular Agenda

Discussion

3. Review Draft Water Treatment Plant and Wastewater Treatment Plant Reliability and Risk Assessment Action Plan (Mary Darr)
4. Diversity and Inclusion Program Progress Report and Equal Employment Opportunity/Affirmative Action Report for Fiscal Year 2018 (Stephanie Glasgow)

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5. Long-Range Water Supply Plan – Projected Demands and Yield (Ruth Rouse)
6. Review Board Work Schedule (Yinka Ayankoya/Ed Kerwin)
 - a. Request(s) by Board Committees, Board Members and Staff
 - b. September 27, 2018 Annual Meeting of the Board
 - c. October 11, 2018 Work Session
 - d. 12 Month Board Meeting Schedule
 - e. Pending Key Staff Action Items

Summary of Work Session Items

7. Executive Director will summarize the key staff action items from the Work Session

Closed Session

8. The Board of Directors will convene in a Closed Session for the Purpose of Discussing a Personnel Matter (Yinka Ayankoya)

Agenda Item 1:

Annual Report on Disposal of Surplus Personal Property

Purpose:

To update the Board of Directors on OWASA’s disposal of surplus personal property. This report is provided for information only and no action is necessary.

Background:

The OWASA Purchasing and Contracting Policy authorizes the Executive Director to declare as surplus and to sell personal property that is no longer needed or useful in the operation of OWASA’s water and sewer systems. Personal property is broadly defined as fixtures and equipment and excludes land.

The policy authorizes five methods of personal property disposal: trade-in, public auction, advertisement for bid, direct negotiation and sale, and scrap. Items having no residual value that remain unsold after an auction or other sale procedure, or that pose a potential threat to the public health or safety, may be treated as scrap or trash regardless of their original acquisition cost. Items having no apparent market value after being advertised for sale may be donated to charitable organizations.

The policy requires the Executive Director to report to the Board of Directors annually on the disposal of personal property.

Information:

The following surplus personal property was sold or otherwise disposed of during Fiscal Year 2018:

Disposal Method	Items Sold	Proceeds
Web-based public auction	Computer & communication equipment	\$827
Scrap	Metal	7,210
	Total proceeds	\$8,037

Agenda Item 2

Orange Water and Sewer Authority

Closed Session of the Board of Directors

August 23, 2018

The Board of Directors of Orange Water and Sewer Authority met in Closed Session on Thursday, August 23, 2018, following the Board meeting.

Board Members present: Yinka Ayankoya (Chair), Jeff Danner (Vice Chair), Bruce Boehm, Jody Eimers, Robert Morgan, John Morris, Ruchir Vora and John A. Young.
Board Member absent: Ray DuBose (Secretary).

Other present: Ed Kerwin (Executive Director), Robert Epting (General Counsel) and Robin Jacobs.

ITEM ONE

The Board of Directors met in Closed Session with staff to discuss potential litigation.

ITEM TWO

The Board of Directors met in Closed Session without staff to evaluate the General Counsel's annual performance review.

No official action was taken at the meeting.

The meeting was adjourned at 9:50 p.m.

Robert Morgan, Chair
Human Resources Committee

Agenda Item 3:

Review Draft Water Treatment Plant (WTP) and Wastewater Treatment Plant (WWTP) Reliability and Risk Assessment Action Plan

Purpose:

The purpose of this agenda item is to obtain the Board's feedback regarding the Action Plan developed by staff from the findings of the Reliability and Risk Assessment Evaluation.

Background:

The Reliability and Risk Assessment project identified and assessed risks that would prevent OWASA from providing water, wastewater, and reclaimed water services that meet or exceed federal, state, and local quality requirements.

A cross-functional team of OWASA staff worked with experts from the consulting firm CH2M to perform the evaluation using a risk assessment methodology based on the International Organization for Standardization (ISO) 31000 framework. The four main components of the process were risk identification, analysis, evaluation, and treatment. The eight most critical systems at the WTP and ten most critical systems at the WWTP were evaluated.

A project overview and update, followed by a discussion between the Board, staff and our consultant, was provided at the Board's [January 11, 2018 Work Session](#). The Draft Reliability and Risk Assessment Evaluation Report was presented and discussed at the at the Board's [July 13, 2018 Work Session](#).

Action Plan:

The attached action plan prepared by staff assigns responsibilities for recommendations from the Reliability and Risk Assessment Evaluation Report. Tasks have been assigned to a variety of staff including managers, treatment plant operations, maintenance, engineering, and safety and risk management. Target completion dates are identified for each item.

Several of the activities are included in the Fiscal Year (FY) 2019-2023 Capital Improvements Program (CIP). Since CIP projects can take several years to design, permit, bid and construct, staff will monitor these systems until they are replaced or upgraded. Projects identified in the Action Plan that are not currently in the CIP will be included in the upcoming CIP development process that is part of the FY 2020 budget process. Other activities, such as new or increased preventive maintenance activities and installing level sensors will be incorporated into departmental annual operating budgets.

Many of the action plan items involve activities that are focused on employee development and training, maintaining standard operating procedures, communication, and evaluation of risk

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during the design process. As the Board noted at the July 13th Work Session, a robust and continuous employee training program is essential to identifying and mitigating risks.

We believe current staffing levels can manage and complete the activities identified in the Action Plan. However, it is important that key vacancies including the Maintenance Coordinator, Safety and Risk Manager, and Asset Management and Facilities Engineer are filled and the new staff trained on risk management. The need for additional resources may be identified as we work through the Action Plan.

As we work through the action plan, we will evaluate its impact and assess the need to conduct additional risk analysis workshops for the next prioritized group of water and wastewater systems.

Other Related Activities:

There are two CIP projects starting in FY 2019 that are focused on improving the reliability and reducing the risk of the water distribution system.

- Distribution System Water Main Replacement Prioritization Model (CIP 275-89) will use a risk framework to identify and prioritize water mains for rehabilitation and replacement.
- Barbee Chapel Road Pump Station Study (CIP 273-09) will evaluate construction of a new drinking water pump station along the NC Highway 54 corridor near the service area boundary with the City of Durham.

We will evaluate installing additional pressure monitors in the water distribution system that could alert staff to leaks and help locate leaks when the Agua Vista advanced metering infrastructure project is complete.

Next Steps:

Staff throughout the organization are eager to continue to use the risk assessment process to evaluate other facilities and identify additional opportunities to reduce risk. Staff will update the Action Plan as the status of tasks change.

Action Requested:

Review and provide feedback on the attached WTP and WWTP Reliability and Risk Assessment Action Plan.

Information:

- Draft Reliability and Risk Assessment Acton Plan

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Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Abbreviations

CIP	Capital Improvements Program	PM	Preventive Maintenance
FMEA	Failure Modes and Effects Analysis	SCADA	Supervisory Control and Data Acquisition
FY	Fiscal Year	SOP	Standard Operating Procedure
IT	Information Technology	UV	Ultraviolet
KF	Key Findings	VFD	Variable Frequency Drive
MCPS	Morgan Creek Pump Station	W	Water
O&M	Operation and Maintenance	WTP	Jones Ferry Road Water Treatment Plant
OT	Operations Technology	WW	Wastewater
PLC	Programmable Logic Controller	WWTP	Mason Farm Wastewater Treatment Plant

Jones Ferry Road Water Treatment Plant

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
W-R1	Clearwell	WTP Clearwell – Condition of the canvas curtain, which ensures adequate disinfectant contact time required by regulations, is unknown. Failure of drain line valve could drain the Clearwell. Failure of overflow standpipe could significantly reduce storage capacity of Clearwell.	Perform Clearwell inspection by diver to assess the condition of the following: joints between the clear well’s concrete walls and floors, surface of concrete walls, expansion joints in the Clearwell floor, areas of sediment buildup, concrete roof support columns, stainless steel influent baffle plate, canvas curtain, mechanism supporting curtain, 12-inch overflow pipe, 12-inch drain line located under Clearwell and the associated valve, 30-inch effluent pipe to old Clearwell, and 60-inch influent pipe under generator (including valve and surrounding grout). Consider also including old Clearwell located in main building and two suction pipes associated with the old Clearwell. Address deficiencies identified by the condition assessments. Evaluate abandoning (filling) or replacing drain line and valve; relocating the overflow standpipe to outside of the Clearwell; and Clearwell redundancy.	Timing will be determined as part of FY 2020-2024 CIP development process.	Gangadharan	A project to assess and inspect the Clearwell will be added to the CIP.
W-R2	Post Filter Mix Tank and piping located between Filters and Clearwell	WTP Post-filter pipeline - This system is a single point of failure. Procedures for temporarily bypassing this system are not well known by staff nor formally documented.	Formally document bypass procedure used during prior construction project using archived as-builts. Also, prepare contact time calculations for bypass.	November 2018	Loflin	

Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
W-R3	Electrical Distribution System	WTP electrical system - Configuration of the electrical power distribution system is complex due to the existence of both 2300 and 480 voltage systems.	Phased capital project to eliminate 2300 voltage system, which would involve converting finished water pump no.5 to 480 voltage.	FY 2020	Gangadharan	A. The conversion of finished water pump no.5 to 480 voltage is being completed as part of CIP 272-42. B. A project to convert the remaining 2300 voltage distribution system at WTP will be evaluated as part of the FY 2020-2024 CIP development process.
W-R4	Electrical Distribution System	WTP electrical system - Various single-points of failure	Conduct component level PM identified in FMEA (gas in oil testing, thermographic survey, insulation test, turns ratio test, etc.)	June 2019	J. Dodson	
W-R5	Finished Water Flow Meter	WTP finished water meter-Finished water flow meter is single point of failure. There is no finished water flow meter downstream of alternate chemical application vault, which is activated if primary chemical application vault fails.	Evaluate options for meter redundancy. Develop mitigation plan for failure of meter.	December 2018	Loflin	Review with our SCADA systems integrator. Temporary metering may be a possible option to mitigate risk.
W-R6	Hypochlorite, Caustic, and Ammonia Chemical Feed Pumps	WTP chemical feed pumps - Chemical feed pumps were identified as a high risk due to condition and criticality. Difficult to maintain a wide variety of pumps (manufacturer, type, and capacity). Ancillary pumping equipment (check valves, pressure relief valve, etc.) and piping configuration may be inadequate.	CIP and O&M projects to replace hypochlorite, caustic, and ammonia chemical feed pumps. Undergo standardization process for chemical feed pumps.	FY 2020	Gangadharan	Caustic, hypochlorite, and ammonia chemical feed system improvements are part of CIP 272-46.
W-R7	Various Locations	WTP VFD - Difficult to repair and replace VFDs due to equipment obsolescence and no bypass.	Upgrade VFDs as parts become obsolete. Evaluate VFD redundancy on critical equipment.	Ongoing Ongoing	J. Dodson Gangadharan	Critical system VFDs will be evaluated for redundancy/bypass as systems are assessed for replacement.

Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
W-R8	SCADA	SCADA miscellaneous improvements and SOP Development - Inadequate feedback loops for pump on/off and remote/local signals, equipment obsolescence, inadequate historical backup, various single points of failure, and other miscellaneous issues.	Prepare SCADA Master Plan for both WTP and WWTP.	FY 2020	Gangadharan	Water Facilities SCADA Master Plan is part of CIP 272-49. Wastewater Facilities SCADA Master Plan (WW-R11) will be added to this scope.
W-R9	SCADA	Firewall for SCADA system may be inadequate. Overlap and coordination between Information Technology (IT) and Operations Technology (OT).	Initiate Homeland Security Network Cybersecurity Audit	FY 2020	Taylor	Coordinate Audit with WWTP WW-R12.
W-R10	Various Locations	Reliance on services conducted by key third-party vendors/contractors.	Prioritize and review key contracts (CITI, Electric Motor Shop, etc.) using information from Comprehensive Emergency Management Plan	October 2018	Loflin M. Dodson	
W-R11	Various Locations	Training and Standard Operating Procedures need to be improved.	Chemical unloading SOP for Bulk Delivery Drivers; flushing of chemicals annually, valve exercise to avoid overtightening, etc.	November 2018	Loflin	
W-R12	Various Locations	Critical Spare & Job Safety Analysis	Perform Critical Spare Analysis (Identified in FMEA) Perform Job Safety Analysis on critical tasks.	December 2019 Determine timing when Safety & Risk Manager is hired.	Maintenance Coordinator Safety & Risk Manager	

Mason Farm Wastewater Treatment Plant

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
WW-R1	Rogerson Drive Pump Station	WWTP Rogerson Drive pump station- Various single points of failure. Single electrical feed. Generator fuel storage is inadequate. Bypass is difficult.	Diesel fuel storage assessment. Upgrade pump station so that it can easily be bypassed if there is a catastrophic equipment failure. Install a generator access point, bare connection for a temporary electrical connection, and bypass connection point.	December 2018 June 2019	Gangadharan	Diesel fuel assessment will be completed in advance of FY 2020-2024 CIP development. Bypass improvements are expected to be completed as part of CIP 277-31.

Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
WW-R2	Morgan Creek Pump Station	WWTP MCPS Wet Well Stairs - Stair fasteners located in wet well may deteriorate rapidly due to corrosive environment and incompatible material.	Proactively replace wet well stair fasteners. Modify air intakes and dampers for better air turnover.	October 2018 FY 2021	Johnson Gangadharan	Modifications will be assessed and implemented as part of CIP 278-82
WW-R3	Morgan Creek Pump Station	WWTP MCPS Influent Pump - No backup level control for Precision Digital level instrument	Install backup capacitance probe level sensor.	December 2018	Johnson	
WW-R4	Morgan Creek Pump Station	WWTP MCPS Influent Sluice Gates - Influent sluice gate could accidentally close due to human error or equipment failure	Remove sluice gate.	Complete	Johnson	
WW-R5	Headworks	WWTP Headworks - Concrete located near the effluent of structure is in poor condition	Build bypass structure, rehabilitate concrete, and improve odor control system.	TBD	Gangadharan	This scope for CIP 278-82 will address this treatment plan. A target completion date will be established at the start of detailed design this fall.
WW-R6	Electrical Distribution	WWTP Electrical System - Transformer A is single point of failure for electrical power to plant. Main Breaker A and B are single points of failure. Components of backup power system are located in same building as main power.	Conduct component level PM identified in FMEA (gas in oil testing, thermographic survey, insulation test, turns ratio test, etc.) Redesign of backup power system or installation of generator access point for critical systems.	December 2019 Ongoing	Johnson Gangadharan	Critical system generator access points will be evaluated as systems are assessed for upgrade/replacement.
WW-R7	Electrical Distribution	WWTP Electrical System - Penetration where electrical cables exit building and enter conduit tray.	Seal penetration in building and install screen below bus bar.	TBD	Gangadharan	A project will be added to the CIP to assess this risk in more detail and to develop and implement the appropriate treatment plan. Target completion date will be established prior to detailed design.
WW-R8	Various Locations	WWTP VFD - Difficult to repair and replace VFDs due to equipment obsolesces and no bypass.	Upgrade VFDs as parts become obsolete Evaluate VFD redundancy on critical equipment.	Ongoing Ongoing	Johnson Gangadharan	Critical system VFDs will be evaluated for redundancy/bypass as systems are assessed for replacement.

Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
WW-R9	Chemical Tank Farm	WWTP Chemical Tank Farm - Incompatible chemicals could mix inside of the sodium hydroxide tank's secondary containment if there was a failure of both a sodium hydroxide tank/piping and acetic acid piping that passes through this containment area.	Address this issue as part of WWTP Chemical Building and Bulk Tank Piping Rehab.	FY 2020	Gangadharan	Piping is being replaced as part of CIP 278-80.
WW-R10	Ultraviolet (UV) Disinfection	WWTP UV Disinfection – The breaker serving the UV disinfection system is a single point of failure. This breaker has not been tested because the UV disinfection system is continuously operated. The programmable logic controller (PLC) that controls the UV disinfection system is a single point of failure and proprietary technology.	Coordinate temporarily stopping discharge of effluent, shutting off UV disinfection system, and testing breaker. Consider installing a generator access point. Sign a service contract with PLC manufacturer. Either develop a mitigation plan for failure of PLC or purchase a spare PLC.	December 2019 October 2018	Johnson M. Dodson	
WW-R11	SCADA	SCADA miscellaneous improvements and SOP Development - Inadequate feedback loops for pump on/off and remote/local signals, equipment obsolescence, inadequate historical backup, various single points of failure, and other miscellaneous issues.	Prepare SCADA Master Plan for both WTP and WWTP.	FY 2020	Gangadharan	Water Facilities SCADA Master Plan is part of CIP 272-49. Wastewater Facilities SCADA Master Plan will be added to this scope.
WW-R12	SCADA	SCADA - Firewall for SCADA system may be inadequate. Overlap and coordination between Information Technology (IT) and Operations Technology (OT).	Initiate Homeland Security Network Cybersecurity Audit	FY 2020	Taylor	Coordinate Audit with WTP W-R9.
WW-R13	Various Locations	Reliance on services conducted by key third-party vendors/contractors	Prioritize and review key contracts (CITI, Electric Motor Shop, etc.) using information from Comprehensive Emergency Management Plan.	October 2018	Loflin M. Dodson	
WW-R14	Various Locations	Training and Standard Operating Procedures need to be improved	Combine SOP & Process Control Procedures into single document; prepare a chemical unloading SOP for bulk delivery drivers; biosolids driver procedure; etc.	December 2019	M. Dodson	

Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Risk No.	System	Risk Description	Treatment Plan	Target Completion Date	Responsible Person	Notes/Status
WW-R15	Various Locations	Critical Spare & Job Safety Analysis	Perform Critical Spare Analysis (identified in FMEA) Perform Job Safety Analysis on critical tasks.	December 2019 Determine timing when Safety & Risk Manager is hired.	Maintenance Coordinator Safety & Risk Manager	

Additional Key Findings

Risk No.	Group	Other Findings	Target Completion Date	Responsible Person	Notes/Status
KF-1	Engineering	Perform cross-disciplinary reviews during the design phase of projects.	Ongoing	Gangadharan	Cross-disciplinary reviews are already utilized on most projects; this process will be extended to the scoping and pre-design phases for appropriate projects.
KF-2	Engineering	While standardizing equipment provides value, continue to evaluate the entire system before applying a “one size fits all” approach—a pump that is appropriate in one operating context may not be appropriate in another.	Ongoing	Gangadharan	
KF-3	Engineering	Consider the system of systems, as some processes impact others and should be reviewed holistically.	Ongoing	Gangadharan	
KF-4	Engineering	Avoid relying solely on O&M to manage risk and instead consider how operators interact with the system and the ongoing maintenance in the design phase to minimize or ideally eliminate risk.	Ongoing	Gangadharan	
KF-5	Operations & Maintenance	Communicate maintenance and operability concerns to the engineering staff so risk can be designed out of the systems.	Ongoing	Loflin M. Dodson	
KF-6	Operations & Maintenance	Communicate between plants so that lessons learned at one can be applied to the other.	Ongoing	Loflin M. Dodson	
KF-7	Operations & Maintenance	Maintain updated SOPs and Process Control Protocols.	Ongoing	Loflin M. Dodson	
KF-8	Operations & Maintenance	Formalize relationships with third-party vendors and contractors to establish clearly defined roles and responsibilities.		Loflin M. Dodson	See W-R10 and WW-R13
KF-9	Senior Leadership	Conduct risk analysis workshops of the remaining plant subsystems not included as part of this assessment. This will support detailed reviews of the current subsystems and designs.	TBD	Asset Management and Facilities Engineer	Evaluate impact of current action plan to inform need and timing for additional evaluations.
KF-10	Senior Leadership	Teach all staff members about risk and facilitate greater participation in risk analysis workshops.	Ongoing	Asset Management and Facilities Engineer	

Draft WTP and WWTP Reliability and Risk Assessment Action Plan - September 13, 2018

Risk No.	Group	Other Findings	Target Completion Date	Responsible Person	Notes/Status
KF-11	Senior Leadership	Encourage cross-departmental communication because it takes an entire team to understand the OWASA subsystems in enough detail to evaluate risk.	Ongoing	Taylor Darr	
KF-12	Senior Leadership	Provide specialized training in electrical and SCADA systems.	Ongoing	Loflin M. Dodson	
KF-13	Senior Leadership	Support knowledge transfer between employees and in succession planning.	Ongoing	Loflin M. Dodson	
KF-14	Senior Leadership	Emphasize risk reduction across all departments.	Ongoing	Taylor	
KF-15	Industry Best Practice	Review risk and reliability assessment evaluation every 5-years and/or whenever a change in operating context occurs.	FY 2024	Asset Management and Facilities Engineer	

Agenda Item 4:

Diversity and Inclusion (D&I) Program Progress Report and Equal Employment Opportunity/Affirmative Action Report for Fiscal Year 2018

Purpose:

To provide 1) Progress Report on the D&I Program; and 2) Annual EEO Report for Fiscal Year 2018; and to receive feedback from the Board of Directors.

Background:

On March 9, 2017 the Board approved the Initial Implementation Plan (Plan) for our D&I Program and included a directive that a consultant be hired to assist with the work.

The Plan's goals are:

- 1) The diversity of OWASA's workforce reflects the communities we serve.
- 2) Inclusive work environment for everyone that encourages and supports each Team member to contribute to their full ability towards OWASA's mission.

Progress reports were provided to the Board on June 8 and September 14, 2017, February 8 and April 12, 2018.

Three groups were formed and received 16 hours of training each to help guide the D&I work. The ***Diversity Resource Group*** with employee volunteers from throughout the organization helped shape Focus Groups for the Organizational Assessment and continue to help guide and promote the D&I work. The ***Diversity Recruitment Group*** is made up of hiring managers and Human Resource staff. This group is working on improvements to the recruitment, selection and retention processes. The ***Diversity Leadership Group*** includes the five Department Directors and Executive Director to provide the leadership and support to make sure the OWASA Team delivers excellent service to our customers while providing a diverse workforce and an inclusive work environment for all.

While there are many tasks from the Plan, there are two (combined) which are specific to the Organizational Assessment:

- Task 2.1e and 2.3d – “Develop, administer and evaluate Focus Group Assessment and recommend options for improvement”.

Focus Group meetings took place with employees and the Board in late 2017. There were fifteen (15) work group meetings attended by seventy-four (74) employees and nine (9) demographic and cultural group meetings attended by forty-seven (47) employees.

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As a result of the Assessment, employees provided forty (40) general recommendations in seven (7) categories. VISIONS (consultant) provided additional recommendations in four (4) categories. Employees also provided twenty-six (26) recommendations in four (4) categories for recruitment and retention.

At the progress report to the Board on April 12, 2018 the Board reviewed a Draft Action Plan for Improvements Identified by the Organizational Assessment. The Board agreed with Staff moving forward with the two step Action Plan.

Progress Report:

Diversity and Inclusion Plan

With considerable guidance from VISIONS, and the participation of our staff, we have made important progress on the Plan as summarized in Attachment #1.

Key activities include:

- Staff continues to engage with agencies and organizations to seek assistance in recruitment.
- We continue to solicit OWASA employees for employment referrals.
- NeoGov software has been implemented to include the job interest feature.
- Recruitment Plans are prepared for each recruitment to include using local census data to develop applicant targets for under-represented groups.
- Additional employees have been trained on the newly developed standard processes for interview panels and making employment decisions.
- A Welcome Team has been developed and trained to improve the onboarding process.
- The Diversity Resource, Recruitment and Leadership groups were formed to help guide the initiative. Each group has been provided 16 hours of training by VISIONS.
- Mandatory training for Supervisors took place in August and September 2018.
- Voluntary Employee training took place in August and September 2018.
- Various core trainings have been offered to all employees.
- The Board reviewed the compensation of employees and adopted a resolution in December 2017 where they provided 3 of the 4 rating categories a pay increase. Merit Increases for "Successful" ratings are to be no less than 2.9% above the Cost of Labor Adjustment (COLA).
- The Board of Directors has had four training sessions with VISIONS. Additional training is forthcoming.

Action Plan for Improvements

Staff along with VISIONS has been working diligently on the Action Plan for Improvements Identified by the Organizational Assessment included as Attachment #2.

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Key activities include:

- The Diversity Leadership, Resource and Recruitment Groups along with VISIONS prioritized and delegated the general recommendations from the Organizational Assessment.
- Employee information and feedback sessions were held in June 2018 regarding the general recommendations from the Organizational Assessment.
- The Diversity Leadership, Resource and Recruitment Groups along with VISIONS prioritized and delegated the recruitment/selection recommendations from the Organizational Assessment.
- Employee information and feedback sessions were held in July 2018 for the recruitment/selection recommendations from the Organizational Assessment.
- In July 2018, VISIONS along with the Diversity Recruitment and Leadership Groups completed a comprehensive review of recruitment processes, career development programs, the mentoring program and promotional opportunities.
- On July 23, 2018 all three diversity Groups met to place a timeline and assignment to all the recommendations. See Attachment #2, Exhibit A: the Organizational Assessment General and Recruitment/Selection Recommendations by Year and Responsible Group.

EEO Report:

Each year OWASA provides the Board the recruiting practices along with the race and gender make-up of our workforce. This report is a summary of our findings for Fiscal Year (FY) 2018.

Recruiting Efforts

When a vacancy becomes available within OWASA, the position is posted internally as well as externally using the following methods:

- NC Department of Commerce, Division of Employment Security – NC Works
- OWASA Website and Twitter
- Newspapers and other Print Publications
- Online Advertising
- Minority Organizations and Groups
- Colleges and Universities
- Churches
- Other Organizations

Diversity in our Workforce

Ending FY2018, OWASA was made up of 23.2% Women and 76.8% Men. Our workforce was 74.4% White, 12.8% Black, 6.4% Two or More Races, 3.2% Hispanic, 2.4% Asian and 0.8% American Indian or Alaska Native.

Details of the race and gender distribution of the OWASA workforce by EEO job classification as of June 30, 2018 is provided in Attachment #3. Attachment #3, Exhibit A details the EEO job classification for each position within our team. Race and gender data is captured each year on

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June 30th to provide the Board with the EEO report and Attachment 3, Exhibit B provides a look at the last ten (10) years of race and gender data on that date.

Applicant Diversity

Filling vacancies with the best candidates, based on the skills and qualifications needed for the position remains the focus of our hiring practices. In fulfilling this goal, we seek to encourage and promote diversity within the organization. We will continue to advertise in a wide variety of venues to attract a diverse candidate base. We will pursue opportunities to recruit employees at all levels by participating in outreach efforts to make more potential applicants aware that OWASA is a good place to work.

The race and gender distribution of OWASA's applicants for the period of July 1, 2017 through June 30, 2018 is detailed in Attachment #4. OWASA recruited for 15 positions during FY2018 and received a total of 727 applications.

Board of Directors

The nine-member Board of Directors govern OWASA. The Chapel Hill Town Council appoints five, the Carrboro Board of Alderman appoints two and the Orange County Board of Commissioners appoints two Board members. Attachment #5 details the race and gender distribution of the OWASA Board of Directors as of June 30, 2018.

Key Take-Aways

Key takeaways include:

- We have the opportunity to improve diversity at all levels of the organization.
- It is critical that leadership take a focused review of the EEO report.
- Workforce gender distribution has increased from last year.
- Workforce race distribution is similar to last year.
- The number of applications received is comparable to 2017.
- The number of Hispanic applicants increased.
- More applicants voluntarily provided race and gender information.
- We starting reporting separate categories for Hispanic, Asian or Pacific Islander, American Indian or Alaska Native, and Two or more races in 2017.

Staff Comments:

We are optimistic about tackling key areas of disparity and focusing on the need for more diverse applicants and employees. By increasing the applicant pool, training the Staff on standard processes and reducing and eliminating bias we are confident this initiative will be a success.

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Information:

- Attachment 1 - OWASA's D&I Plan, September 13, 2018 Progress Report
- Attachment 2 - Action Plan for Improvements Identified by the Organizational Assessment
 - Exhibit A - Organizational Assessment General and Recruitment/Selection Recommendations by Year and Responsible Group
- Attachment 3 - Workforce Race and Gender Distribution
 - Exhibit A - EEO Job Classification for each Position
 - Exhibit B - OWASA Workforce Race and Gender Distribution 10-year History
- Attachment 4 - Applicant Race and Gender Distribution
- Attachment 5 - Board of Directors Race and Gender Distribution

September 13, 2018 Progress Report

OWASA's Diversity and Inclusion Program

Initial Implementation Plan – adopted March 9, 2017

Goal 1. The diversity of OWASA's workforce reflects the communities we serve.

Objective 1.1 Attract diverse pool of applicants for open positions.						
Strategies	Task #	Tasks	Resources to Complete Task	Target Completion Date	Outcomes & Measures of Success	Status as of September 13, 2018
Increase the diversity of applicants for employment and establish OWASA as an employer that values diversity and inclusion.	1.1a	Develop a list of agencies/ organizations that can assist OWASA with ways to attract a more diverse group of applicants for employment.	Human Resources and Safety Director (HR Director)	March 2017 Ongoing to keep current	Comprehensive list developed	Complete and ongoing. <i>The Recruitment Efforts and Strategies form is maintained and routinely updated. Individuals and agencies on this list are provided recruitment notifications.</i>
	1.1b	Engage with agencies/ organizations to seek assistance in recruitment and to communicate OWASA's commitment as an employer that values diversity and inclusion.	HR Director (May be a collaborative effort with local governments)	August 2017 Ongoing to keep current	Number of agencies/ organizations participating Diversity of applicants increases	Since March 2017 OWASA staff attended <i>thirteen (13)</i> career fairs. <i>Approximately 96 outreach letters went to area agencies describing our interest and commitment to strengthening our diversity. As a result, we met with three agencies to discuss possible employment programs. With one additional group, we advertised in their brochure that</i>

						<i>OWASA seeks a diverse workforce.</i>
	1.1c	<p>Solicit assistance from OWASA employees for employment referrals and suggestions to improve diversity recruitment.</p> <p>Consider adding this scope to existing Employee Human Resources Team or creating new Employee Diversity and Inclusion Team.</p>	Department Directors	Ongoing	<p>Number of employee referrals</p> <p>Diversity of applicants reflects the diversity of the labor market for that position</p>	<p><i>Since July 1, 2016 there have been seven (7) candidate referrals submitted by employees. Two (2) of the referred candidates were offered a position and accepted, one was offered a position and declined.</i></p> <p><i>When recruitments open, an e-mail is sent to all employees reminding them of the program.</i></p> <p><i>The Diversity Resource Group has been established.</i></p>
	1.1d	Evaluate the job application process for implicit and explicit biases.	Consultant	December 2018	<p>Use industry best practices</p> <p>Increase yield of a diverse applicant pool at each stage of the application/ selection process</p>	<i>The Diversity Recruitment, Resource and Leadership groups met in July 2018 to review, prioritize and assign tasks related to the recommendations.</i>

	1.1e	Implement NeoGov (on-demand HR software for the public sector) for applicant tracking and management reporting to provide greater functionality for applicants and provide statistical data for Team evaluation.	HR Director	May 2017	Software implemented Staff trained	<i>Software implemented, and training has taken place with hiring supervisors and managers.</i> <i>An overview/ training session was provided at the June 8, 2017 Managers meeting.</i>
Prepare a recruitment plan for each job vacancy to ensure continuing efforts to build a diverse workforce.	1.1f	Develop process for preparing recruitment plans for each job vacancy.	Consultant	December 2017	Standard process for preparing recruitment plans completed Staff trained Applicant pools are diverse	<i>A recruitment plan is created with each vacancy. Visions has reviewed the process.</i>
	1.1g	Using local census data, develop applicant targets for under-represented groups for each job category.	HR Director	August 2017	Targets for each job category established and incorporated into recruitment plans	<i>Orange County census data is compared with departmental data to assist in determining under-represented groups to be targeted during advertising.</i>
Objective 1.2 Employment decisions are made based on merit and job-related ability.						

Strategies	Task #	Tasks	Resources to Complete Task	Target Completion Date	Outcomes & Measures of Success	Status as of September 13, 2018
Conduct training for supervisors on recognizing and understanding explicit and implicit bias and how to effectively conduct screening and selection interviews.	1.2a	Provide mandatory training program for all supervisors. (Offer voluntary training to non-supervisors.)	Consultant	September 2018	Training program developed All supervisors successfully complete training and demonstrate competency Employment decisions based on an established and creditable merit system	<i>All supervisors attended fourteen (14) hours of training in August and September 2018.</i>
	1.2b	Evaluate “train-the-trainer” to sustain the training program moving forward.	Consultant Department Directors	TBD	TBD	<i>We expect to learn more about this task after the supervisory training has been completed.</i>
Use an inclusive process to objectively evaluate candidates for vacant positions to inform employment decisions.	1.2c	Develop standard process for use by an employee interview panel for vacant positions.	Executive Director	March 2017	Standardized process for use of employee evaluation panel completed Staff trained	<i>Complete.</i> <i>One hundred and twenty-four (124) employees have been trained.</i>
	1.2d	Develop standard process for making employment decisions.	Executive Director	March 2017	Standard process completed Staff trained Workforce diversity	<i>Complete.</i> <i>One hundred and twenty-four (124) employees have been trained.</i>

Goal 2. Inclusive work environment for everyone that encourages and supports each Team member to contribute to their full ability towards OWASA's mission

Objective 2.1 Employees are aware of the importance and value of diversity and inclusion

Strategies	Task #	Tasks	Resources to Complete Task	Target Completion Date	Outcomes & Measures of Success	Status as of September 13, 2018
Provide training for all employees on the importance and value of diversity and inclusion and how they contribute to a successful, diverse and dynamic work environment.	2.1a	Provide voluntary training program for all employees.	Consultant	September 2018	Training program developed Number of employees trained Employee feedback	Three groups have been formed and provided 16 hours of training. 1) Diversity Resource Group 2) Diversity Recruitment Group 3) Leadership Group <i>Employee training was offered in August and September 2018 with thirty-two (32) attendees.</i>
	2.1b	Evaluate “train-the-trainer” to sustain the training moving forward.	Consultant Department Directors	TBD	TBD	We expect to learn more about this task after the supervisory training has been completed.
Provide training and coaching for all supervisors on how to lead and manage their area of	2.1c	Provide mandatory training for supervisors.	Consultant	September 2018	Training program developed All supervisors successfully complete training and	All supervisors attended 14 hours of training in August and September 2018.

Revision made edits reflect changes from the September 14, 2017 Progress Report

Strategies	Task #	Tasks	Resources to Complete Task	Target Completion Date	Outcomes & Measures of Success	Status as of September 13, 2018
responsibility in a manner that promotes and values the positive aspects of a more diverse workplace.		(Offer voluntary training to non-supervisors.)			demonstrate competency Employee feedback	
	2.1d	Evaluate “train-the-trainer” to sustain the training moving forward.	Consultant Department Directors	TBD	TBD	<i>We expect to learn more about this task after the supervisory training has been completed.</i>
Assess the work culture to determine level of success for diversity and inclusion.	2.1e	Develop, administer and evaluate Focus Group Assessment employee survey and recommend options for improvement (combined with 2.3d).	Consultant Executive Director	August October November 2017	Assessment Survey participation rate Recommendations for continuous improvement	<i>Organizational Assessment complete.</i> <i>In June and July 2018 all employees were invited to attend meetings with VISIONS to review the findings and recommendations and to provide their feedback.</i> <i>All Diversity groups met in July 2018 to review, prioritize and assign tasks related to the recommendations.</i>

<i>Strategies</i>	<i>Task #</i>	<i>Tasks</i>	<i>Resources to Complete Task</i>	<i>Target Completion Date</i>	<i>Outcomes & Measures of Success</i>	<i>Status as of September 13, 2018</i>
Establish a “welcome team” to help acclimate new employees	2.1f	Develop and train “welcome team.”	HR Director	April 2017	Onboarding process improved	<i>There are fifteen (15) employees currently on the Welcome Team assisting with new employee onboarding.</i>

Objective 2.2 Provide employees with opportunities to enhance their knowledge and skills to improve their performance and advance their career.

<i>Strategies</i>	<i>Task #</i>	<i>Tasks</i>	<i>Resources to Complete Task</i>	<i>Target Completion Date</i>	<i>Outcomes & Measures of Success</i>	<i>Status as of September 13, 2018</i>
Provide job skills training.	2.2a	Develop training program(s) for core job skills that benefit all employees and the organization (teamwork, communication, problem-solving, dispute resolution, multi-cultural appreciation, etc.).	Department Directors	TBD (longer-term task)	Training program developed	<i>Ongoing. See 2.2b for training provided.</i>
	2.2b	Make core job skills training available for all employees.	Consultant Staff Intergovernmental cooperation (?)	TBD	Employee feedback Employees demonstrate core job competency	<i>On July 13, 2017 training on How to Reduce Stress and Diffuse Controversy was provided by BHS. The voluntary session was attended by seventeen (17) individuals.</i>

<i>Strategies</i>	<i>Task #</i>	<i>Tasks</i>	<i>Resources to Complete Task</i>	<i>Target Completion Date</i>	<i>Outcomes & Measures of Success</i>	<i>Status as of September 13, 2018</i>
						<p><i>Communicating with Impact training was offered to all employees on December 7, 2017. There were eighteen (18) staff members in attendance.</i></p> <p><i>Reaching for Stellar Service training was offered to all employees on January 22, 2018. There were eleven (11) attendees.</i></p>
	2.2c	Provide interested employees a coaching and mentoring program.	Department Directors	Ongoing	<p>Number of mentors and mentees participating</p> <p>Number of employees advancing career</p>	<p><i>Complete and ongoing. There are currently five (5) formal mentor/mentee relationships through the program.</i></p>

Objective 2.3 Retain successful employees.						
Strategies	Task #	Tasks	Resources to Complete Task	Target Completion Date	Outcomes & Measures of Success	Status as of September 13, 2018
Provide competitive total compensation (pay and benefits) and reward employees for high performance.	2.3a	Evaluate options to allow employees to advance more quickly through their pay range based on performance.	Board of Directors Executive Director Department Directors	April 2017	TBD	Complete. The Board adopted a resolution on December 14, 2017.
	2.3b	Routine evaluation of total compensation.	Board of Directors Executive Director	Ongoing	Voluntary turnover rate	Complete. The Board adopted a resolution on December 14, 2017.
Routinely assess the diversity and inclusive work culture to identify opportunities to improve.	2.3c	Evaluate process to timely and effectively address employee concerns.	HR Director	May 2017	Number of employee concerns successfully resolved	The Grievance Procedures and Performance Review Appeal process were reviewed. Since July 1, 2016 there have been <i>five (5)</i> grievances successfully resolved. There were no Performance Review appeals.
	2.3d	Develop, administer and evaluate Organizational	Consultant	TBD	Assessment participation rate	In June and July 2018 all employees were invited to attend meetings with

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<i>Strategies</i>	<i>Task #</i>	<i>Tasks</i>	<i>Resources to Complete Task</i>	<i>Target Completion Date</i>	<i>Outcomes & Measures of Success</i>	<i>Status as of September 13, 2018</i>
		Assessment and recommend options for improvement (combined with 2.1e).			Recommendations for continuous improvement	<p><i>VISIONS to review the findings and recommendations.</i></p> <p><i>All Diversity groups met in July 2018 to review, prioritize and assign tasks related to the recommendations.</i></p>

Action Plan for Improvements Identified by the Organizational Assessment

Goals/Objectives: Service Excellence; Diverse Workforce; Inclusive Environment

Item 1: Prioritize and Delegate Organizational Recommendations

Action Steps	Ref #	Recommendations	Assignment	Target Date	Outcome/Measure
Prioritize and delegate recommended actions using the Diversity Leadership, Diversity Resource and Diversity Recruitment Groups.	1a	Prioritize the OWASA and VISIONS recommendations from the organizational assessment as low, medium and high priority. There were forty (40) OWASA recommendations from employees in seven (7) categories and thirteen (13) additional VISIONS recommendations in four (4) categories.	Diversity Leadership; Diversity Resource; Diversity Recruitment Groups; VISIONS (inviting all employees to participate)	September 2018	Prioritized action plan with assignments and timetable; ensure tie in to OWASA's Diversity and Inclusion Plan <i>Complete and ongoing. See Exhibit A, Organizational Assessment General and Recruitment/Selection Recommendations by Year and Responsible Group</i>

Item 2: Conduct the Recruitment/Hiring Process Assessment and Implement Recommendations

Action Steps	Ref. #	Recommendations	Assignment	Target Date	Outcome/Measure
Conduct work sessions with Human Resources and the Diversity Recruitment Group to thoroughly review every step of the recruitment process and internal career development while incorporating recommendations from organizational assessment.	2a	Guided by tasks identified in OWASA’s Diversity and Inclusion Plan	Human Resources; VISIONS; Diversity Leadership; Diversity Recruitment Group	September 2018	Report with recommended changes and timetable <i>Complete and ongoing. See Exhibit A, Organizational Assessment General and Recruitment/Selection Recommendations by Year and Responsible Group</i>
	2b	Review and prioritize the recruitment/retention recommendations from the organizational assessment. There were twenty-six (26) recommendations from employees in four (4) categories.	Human Resources; Diversity Recruitment Group; VISIONS	September 2018	Prioritized action plan document with assignments and timetable <i>Complete and ongoing. See Exhibit A, Organizational Assessment General and</i>

					<i>Recruitment/Selection Recommendations by Year and Responsible Group</i>
	2c	Diversity Recruitment Group to review hiring, mentoring, career development and promotion opportunities for fairness and accessibility	Human Resources; Diversity Recruitment Group; VISIONS	September 2018	Report with recommended changes and timetable <i>Complete and ongoing. See Exhibit A, Organizational Assessment General and Recruitment/Selection Recommendations by Year and Responsible Group</i>

**Organizational Assessment
General and Recruitment/Selection Recommendations
by Year and Responsible Group
August 2018**

Priorities for 2018

Recommendation	Responsible Group
1. Maintain the Diversity and Inclusion Plan	Diversity Leadership Group; Diversity Recruitment Group and Diversity Resource Group; support from Human Resources
2. Look for opportunities to acknowledge the unique Diversity and Inclusion role and contributions of all demographic groups at OWASA including those groups that dominate as well as those groups that are less present	Diversity Leadership Group; Diversity Recruitment Group; Diversity Resource Group
3. Review recommendations and propose priorities and timetables	Diversity Leadership Group; Diversity Recruitment Group; Diversity Resource Group
4. Close organizational divides via joint activities	Diversity Leadership Group; Diversity Recruitment Group; Diversity Resource Group
5. Monitor hiring and promotion for fairness	Diversity Leadership Group; Human Resources; Diversity Recruitment Group
6. Review performance review system for fairness	Diversity Leadership Group; Human Resources; with feedback from all employees
7. Leadership training for managers/supervisors	Diversity Leadership Group; Human Resources; Managers/Supervisors
8. Diversity and Inclusion training for managers, supervisors and employees	Diversity Leadership Group; Human Resources; Managers/Supervisors
9. Review OWASA's bullying policy and increase accountability	Diversity Leadership Group; Human Resources; Managers/Supervisors
10. Instill priority for managers and supervisors to role model Diversity and Inclusion	Diversity Leadership Group; Human Resources
11. Support board development to implement the Diversity and Inclusion plan	Diversity Leadership Group; Board of Directors
12. Routinely review and discuss Diversity and Inclusion indicators with the board	Executive Director; Human Resources
13. (1) Replace the two existing administrative guides, "Guidelines for Use of an Interview Panel" and "Process for Hiring Decisions" with a single comprehensive administrative guide possibly titled: " <i>Guidelines to Fairly and Objectively Evaluate and Select Candidates to Fill Vacant Positions</i> ". This new administrative guide will provide guidance on all	Executive Director

aspects of our evaluation and selection process for new hires (and promotions) to ensure it is fair, objective, job related, and without bias. The new guide will include specific checks and balances for the hiring process, with oversight by the Human Resources Department and Executive Director. (2) The Director of Human Resources and Safety and the Executive Director will seek feedback from the Diversity Recruitment Group and the Diversity Resources Group before finalizing the new administrative guide. (3) Training will be routinely provided.	
14. Share and solicit feedback; routinely affirm employees	Managers/Supervisors; support from Diversity Leadership Group
15. Open and inclusive communication and transparency from upper levels	Managers/Supervisors; support from Diversity Leadership Group
16. Create supervisory development and support group	Managers/Supervisors
17. (1) Discussions - Ensure that the supervisor discusses with each employee the need for employee initiative and self-assessment in order to create the potential for filling a vacancy or moving up. Ensure the recommended agenda and/or checklist for the performance review includes a discussion of the employee self-assessment and opportunities for mentoring and career development and that these discussions happen. (2) Self-Assessment Form - Add Employee "Additional Skills and Experience" Question to Self-Assessment Form to help managers and supervisors know about additional skills and experience that employees have that could help with career advancement. (This item has been completed.)	Hiring Supervisors; support from Diversity Recruitment Group
18. (1) Ensure that all employees know about the opportunity to volunteer to participate in the interview process. The Human Resources Department will periodically encourage employees throughout the organization to volunteer and will maintain a list of OWASA employees who are willing to participate. (2) When assembling an Initial Screening Team and Interview Panel, the Hiring Supervisor will recruit as diverse a group of participants as possible across the organization, considering both cultural and work groups.	Hiring Supervisors; support from Diversity Leadership Group, Diversity Recruitment Group and Human Resources
19. (1) Review rules/regulations/legal requirements; (2) Review job position and posting information; (3) Review the standard interview process and decide on interview questions that are related to the job description and qualifications in the job posting; (4) Discuss the diversity implications, challenges, opportunities and any legal and other factors.; (5) Include interview questions on diversity and inclusion for all interviews: e.g. <ul style="list-style-type: none"> • OWASA places great importance on having a diverse workforce and providing an inclusive environment. What does diversity mean to you? What does inclusion mean to you? • Describe one challenge or difficult situation you experienced with diversity and inclusion at work. What would have made the situation better? 	Hiring Supervisors; support from Human Resources
20. (1) Discuss agenda and protocol for interview; (2) Review rating scale; (3) Discuss potential for bias, best practices for fairness, any diversity concerns and the importance, agreement and willingness of each member to speak up on issues of fairness. (4) Interview Panel Meetings #1 and #2 can be combined if the hiring supervisor and Human Resources agree that the goals can be accomplished in one meeting.	Hiring Supervisors; support from Human Resources

<p>21. (1) OWASA will implement a process that is as fair and objective as possible to evaluate and rate the candidates for the position. The expectation is that the candidates who score among the highest on all aspects of the hiring process (qualifications, screening, interviewing, assessment exercise(s), reference checks and background checks) will be considered for selection for the position. The hiring supervisor, with the approval of the Executive Director, has the authority to make a selection from among those to be considered that is informed by the cumulative scoring and ranking from all aspects of the hiring process. (2) HR will update the Recruitment Checklist, Administrative Guides on the Use of Interview Panels and the Process for Hiring Decisions and other applicable procedures. (3) Staff will be trained, supported and reviewed for compliance. It is the obligation of the interview panel and the hiring supervisor, with the support of Human Resources, to discuss and resolve any aspects of fairness that may emerge in balancing the criteria and the scoring from all aspects of the hiring process resulting in the final selection. (4) The hiring supervisor will prepare a hiring justification memorandum through the Department Director, to the Executive Director, which includes the rationale for the hiring recommendation. In addition, the hiring supervisor will hold a debriefing session with the interview and screening panels to review the hiring decision and discuss what worked well and could be improved and any concerns.</p>	<p>Diversity Recruitment Group; support from Human Resources and Hiring Supervisors</p>
<p>22. (1) Increase the diversity of employees (e.g. race, gender, level, and department) who participate in the referral fee program. (2) Continue to communicate to all employees about every vacancy and include info about the referral program in every announcement. (3) Track the diversity of the users of the referral fee program, the positions involved and the success rate. Take action to increase the effective involvement across the organization.</p>	<p>Diversity Resource Group</p>
<p>23. (1) Provide convenient access to computers, electronic devices and the relevant OWASA share drives and software for all employees to access job, training and career development information; (2) Annually review by Information Technology staff of the permissions for access to the various computer drives and software and any changes and updates that can ease access for all employees; Report by Information Technology to the Leadership Team and Human Resources on any related fairness issues including discussion and problem-solving as needed.</p>	<p>Information Technology: Identify what needs to be improved?</p>
<p>24. (1) The Executive Director, when authorizing a hire or filling of vacancy, will determine the time frame for the posting that will provide for sufficient knowledge of the vacancy to the organization and the public and sufficient time for the recruitment to be a fair and inclusive process. (2) The Job Posting Policy will set out a minimum time frame for job posting. (3) The Job Posting Policy will provide a guide for where and how positions will be posted. Graphics and photos will be included with diversity and critical outreach factors in consideration, e.g. race and gender diversity and cleanliness and safety of the jobs, outstanding benefits, etc.</p>	<p>Human Resources; support from Executive Director and Diversity Recruitment Group</p>
<p>25. (1) Job postings will list the diversity and inclusion requirement, e.g. – <i>“OWASA places great importance on having a diverse workforce and providing an inclusive environment. The position requires the willingness</i></p>	<p>Human Resources; support from Hiring Supervisors and Diversity</p>

<p><i>and ability to work in and support a diverse and inclusive environment". (2)</i> All applications will include the question. e.g. —"<i>Describe your willingness and ability to work in and support a diverse and inclusive environment."</i> (3) The teams screening and rating the applications will be provided instructions and training on how to rate and use this question for screening – e.g. Is this a minimum or preferred criteria and what types of responses meet the criteria?</p>	Leadership, Diversity Recruitment and Diversity Resource Groups
26. Improve communications between field and office	All Employees

Priorities for 2019

Recommendation	Responsible Group
1. Maintain the Diversity and Inclusion Plan	Diversity Leadership Group; Human Resources; support from the Diversity Recruitment Group and Diversity Resource Group
2. Close organizational divides via joint activities	Diversity Leadership Group; Diversity Recruitment Group; Diversity Resource Group; All employees
3. Talk openly about diversity	Diversity Leadership Group; Human Resources; Diversity Recruitment Group; Diversity Resource Group
4. Consider "skill based" opportunities for all	Diversity Leadership Group
5. Supervisors develop aptitude with Diversity and Inclusion	Diversity Leadership Group; Human Resources; Managers/Supervisors
6. Monitor performance review system for fairness	Diversity Leadership Group; Human Resources; with feedback from all employees
7. Leadership training for managers/supervisors	Diversity Leadership Group; Human Resources; Managers/Supervisors
8. Department and cross-department meetings to improve leadership and inclusion	Diversity Leadership Group; Managers/Supervisors
9. Monitor OWASA's bullying policy and increase accountability	Diversity Leadership Group; Human Resources; Managers/Supervisors
10. Supervision policy/procedures should provide support	Diversity Leadership Group
11. Instill priority for managers and supervisors to role model Diversity and Inclusion	Diversity Leadership Group; Human Resources
12. Consider flexible policies where feasible to meet the unique needs of work groups, e.g. work from home	Diversity Leadership Group; Human Resources
13. At a regular interval, the Leadership Team will review managers and supervisors for their involvement in career and leadership development with employees; Document any patterns and disparities in involvement that affect diversity and inclusion and implement any corrective actions needed; provide training for managers and supervisors on career development discussions and involvement, especially new managers/supervisors.	Diversity Leadership Group

14. More people of color at the Director Level	Executive Director
15. Routinely review and discuss Diversity and Inclusion indicators with the board	Executive Director; Human Resources
16. (1) OWASA will implement a process that is as fair and objective as possible to evaluate and rate the candidates for the position. The expectation is that the candidates who score among the highest on all aspects of the hiring process (qualifications, screening, interviewing, assessment exercise(s), reference checks and background checks) will be considered for selection for the position. The hiring supervisor, with the approval of the Executive Director, has the authority to make a selection from among those to be considered that is informed by the cumulative scoring and ranking from all aspects of the hiring process. (2) HR will update the Recruitment Checklist, Administrative Guides on the Use of Interview Panels and the Process for Hiring Decisions and other applicable procedures. (3) Staff will be trained, supported and reviewed for compliance. It is the obligation of the interview panel and the hiring supervisor, with the support of Human Resources, to discuss and resolve any aspects of fairness that may emerge in balancing the criteria and the scoring from all aspects of the hiring process resulting in the final selection. (4) The hiring supervisor will prepare a hiring justification memorandum through the Department Director, to the Executive Director, which includes the rationale for the hiring recommendation. In addition, the hiring supervisor will hold a debriefing session with the interview and screening panels to review the hiring decision and discuss what worked well and could be improved and any concerns.	Diversity Recruitment Group; support from Human Resources and Hiring Supervisors
17. Additions to Recruitment Strategies: Make the following additions to the Recruitment Strategies form: a) Identify network of community leaders/local and state government officials from the area b) Identify individual contacts and/or positions at each community college c) Identify Minority Contractors' organizations d) Identify local and regional community members who can support recruitment- e.g. former employees or board members, concerned citizens or professionals e) Increase use of formal and informal industry networks for excluded groups, e.g. American Water Works Association, young professionals groups, etc.	Diversity Recruitment Group
18. Create a standard agenda format and protocol for the interview process from opening to closing and indicate where variations needed can occur.	Diversity Recruitment Group; support from Human Resources
19. Update mentoring program and processes and monitor utilization.	Diversity Resources Group; Human Resources
20. On an annual basis, educate and inform employees on the priorities for workforce diversity and inclusion: Review with employees the workforce diversity and inclusion snapshot of the organization; Discuss any needed improvements, the good reasons to improve and sustain workforce	Diversity Resource Group and Human Resources (plan in conjunction with annual D&I report to the board); support from

diversity and inclusion and the positive impact for all employees; Discuss and acknowledge any questions, concerns or different points of view.	Diversity Leadership and Diversity Recruitment Group
21. Consider need for pay equity study	Human Resources
22. Use orientation process for cross departmental learning	Human Resources; Managers/Supervisors
23. Human Resources will (1) Align, reconcile and date the version of all forms, administrative guides, policies and program descriptions for hiring, selection, recruitment training and career development processes. (2) Ensure that the forms and guides are consistent with the current practices along with the changes adopted from this report. (3) Develop a standard format and framework for the written Recruitment, Selection and Hiring Plan for each position and for similar categories of positions that would usually include the same content.	Human Resources; support from Diversity Recruitment Group
24. (1) Evaluate for clear cut minimal requirements and preferred requirements that can be determined by specific demonstrable aspects of the applicant's education, training, experience, ability or answers to interview, reference or background check questions. (2) Include questions in the application to address all requirements listed in the description/advertisement to ensure that the initial screening is fair and based on the job description/advertisement. (3) Discuss impact of subjective criteria on bias and fair assessment and test for and discuss any bias for included and excluded groups involved in the requirements. (4) Screening and Interview team members will be trained and encouraged to speak up about any concerns of bias or unfairness. (5) The hiring supervisor will provide the standard minimum and preferred job requirements and rating scales for the position and help tailor the process for the initial screening, interview selections, interview, references and background check questions within the policies and guidelines.	Human Resources; support from Diversity Leadership Group and Hiring Supervisors
25. Clarify consistency of the posting and implementation of all licensing and certification requirements in job descriptions and career development information. Indicate if the license or certification is required prior to hiring or promotion or within a certain time frame thereafter. Add passing physical exam to this list of uniform requirements.	Hiring Supervisors; support from Human Resources
26. Clarify the reference check process, the responsible person(s), the timing in the process; Use a standard set of questions and rating scale; Consider adding a diversity question, e.g. <i>"How would you rate this candidate's ability to work effectively in, and support, a diverse and inclusive work environment?"</i>	Human Resources; support from Hiring Supervisors
27. Clarify and standardize the background check process. The timing, the responsible person(s), the forms and format and the rating scale, if any. When? Determine and clarify how background check information can be used. No credit checks are used for employee hires. Note: Currently, the background check process is initiated once the top one or two candidates are identified. The candidate would get an email from CAI requesting authorization to perform the background screenings and to provide information needed (date of birth, driver's license number, former addresses, etc.). If the candidate authorizes the screenings then CAI will then run criminal, driving and social security checks on the candidate(s). We also will request verification on education based on the position	Human Resources

requirements. If the position requires a high school diploma or bachelor's degree, then we will request confirmation of completion from the educational institution provided by the candidate. Again, the background checks are initiated by OWASA but administered by CAI.	
<p>28. Additional Recruitment and Selection Recommendations from the Organizational Assessment</p> <ul style="list-style-type: none"> a) Increase High School Networking b) Add Career Development component to H20 c) Increase Networking with women in labor fields and Latinx organizations d) Increase Networking with NCOPS and the Rural Water Organization e) Increase networking with Community Colleges and Historically Black Colleges and Universities and Women's Colleges f) Maximize use of Summer Empowerment Internship Program for hiring outreach and pipeline g) Evaluate need for additional Human Resources staff to implement these recommendations 	Human Resources; support from Diversity Recruitment Group
29. Share and solicit feedback; routinely affirm employees	Managers/Supervisors; support from Diversity Leadership Group
30. Clear, written communications, work processes	Managers/Supervisors
31. Establish "points of contact" between departments for key work processes	Managers/Supervisors
32. Improve cross-training with the input of those involved	Managers/Supervisors
33. Brainstorm and problem-solve across departments	Managers/Supervisors
34. Operations Levels input into the CIP	Managers/Supervisors
35. Create supervisory development and support group	Managers/Supervisors
36. Discuss mentoring opportunities with employees during the performance review along with skill advancement, career and leadership development.	Hiring Managers
37. Ensure that employees know about and use all opportunities for career development, advancement and referral of each other for development and advancement; Ensure that the career paths are transparent through easily available information. (2) Develop a tool using the organizational chart and job descriptions and classifications that can be used in the mentoring and performance review/self-assessment/skill advancement/career development process and to encourage and inform employee referrals.	Hiring Supervisors; support from Diversity Recruitment Group and Human Resources
38. Provide training and coaching to use the electronic devices and programs. Consider cultural and status differences that may impact computer training, e.g. comfort level, willingness, exposure, hours and convenience of access, type of device, etc.	Hiring Supervisors
39. Clarify consistency of the posting and implementation of all licensing and certification requirements in job descriptions and career development information. Indicate if the license or certification is required prior to hiring or promotion or within a certain time frame thereafter. Add passing physical exam to this list of uniform requirements.	HR and Hiring Supervisors

40. Maximize usefulness and attractiveness of website for job info and outreach for a diverse audience, including those less familiar with the water utility industry.	Communications and Community Relations Officer
41. Help build board diversity with their appointing authority	Board of Directors
42. Support board development to implement the Diversity and Inclusion plan	Board Chair; Executive Director

Priorities for 2020

Recommendation	Responsible Group
1. Maintain the Diversity and Inclusion Plan	Diversity Leadership Group; Human Resources; support from the Diversity Recruitment Group and Diversity Resource Group
2. Employees expected to pay attention to “in” group and “out” group dynamics and act to create fairness and inclusion	Diversity Leadership Group; Human Resources; support from the Diversity Recruitment Group and Diversity Resource Group; All employees
3. Consider “skill based” opportunities for all	Diversity Leadership Group
4. Talk openly about diversity	Diversity Leadership Group; Human Resources; Diversity Recruitment Group; Diversity Resource Group
5. Increase diversity in management	Diversity Leadership Group; Human Resources; Diversity Recruitment Group
6. Supervisors develop aptitude with Diversity and Inclusion	Diversity Leadership; Human Resources; Managers/Supervisors
7. Instill priority for managers and supervisors to role model Diversity and Inclusion	Diversity Leadership Group; Human Resources
8. More people of color at the Director Level	Executive Director
9. Implement annual review and assessment of board role	Executive Director
10. Clarify policy on providing relocation benefits for new hires. Discuss with selectee when the offer is made. Review for fairness across job status/levels and the impact on any training requirements.	Executive Director; support from Human Resources
11. Improve cross-training with the input of those involved	Managers/Supervisors
12. Create supervisory development and support group	Managers/Supervisors
13. Document the Process for Training and Certification <ul style="list-style-type: none"> a. Clarify the processes and time frame for training, certification and development for advancement in all departments. b. Clarify how employees get the chance to go to training – on request, rotation system, supervisor recommendation, other. c. Clarify/review Education and Training Benefits and bonuses for fairness and inclusion. 	Managers/Supervisors

<p>d. Annual Review of training and development by Human Resources and Leadership Team: Document what is working? Who is benefitting? Any exclusions? Improvements needed?</p>	
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Diversity Group Members

Diversity Leadership Group	Diversity Recruitment Group	Diversity Resource Group
Ed Kerwin Stephen Winters Stephanie Glasgow Mary Darr Todd Taylor Dan Przybyl	Kelly Belcher Monica Dodson Kenneth Loflin Randy Horton Nick Rogers Kelly Satterfield Denise Battle Vishnu Gangadharan	Sandra Bradshaw Alicia Grey Jose DuRant Glorija Gladney Johnny Riley Rosa Valdez Joshua Dury Addison McDonough Marcus Fuller Ruth Rouse Millie Zeno-Chapman Emily Currier Linda Low Greg Monschein

OWASA Workforce Race and Gender Distribution

OWASA Workforce Race and Gender Distribution									
By EEO Classification on June 30, 2018									
Classification	Gender		Race						
	Male	Female	Two or More Races	White	Black/ African American	Hispanic	Asian	American Indian or Alaska Native	Native Hawaiian or Other Pacific Islander
Officials and Administrators	9	6	2	12	0	0	1	0	0
Professionals	6	6	0	11	0	0	1	0	0
Technicians	10	3	1	12	0	0	0	0	0
Protective Service Workers	2	0	0	2	0	0	0	0	0
Paraprofessionals	3	2	1	1	2	0	1	0	0
Administrative Support	0	9	0	2	6	1	0	0	0
Skilled Craft Workers	39	2	4	30	3	3	0	1	0
Service-Maintenance	27	1	0	23	5	0	0	0	0
Total (125)	96	29	8	93	16	4	3	1	0
Percentage	76.8%	23.2%	6.4%	74.4%	12.8%	3.2%	2.4%	0.8%	0

Officials and Administrators

Assistant Distribution and Collection Systems Manager
Customer Service Manager
Director of Engineering and Planning
Director of Finance and Customer Service
Director of Human Resources and Safety
Director of Information Technology
Distribution and Collections Systems Manager
Engineering Manager (Capital Projects)
Engineering Manager (Systems Development)
Executive Director
Finance and Procurement Manager
General Manager of Operations
Planning and Development Manager
Wastewater Treatment & Biosolids Recycling Manager
Water Supply and Treatment Manager

Professionals

Asset Management and Facilities Engineer
Business Systems Analyst
Communications and Community Relations Officer
Financial Analyst
Laboratory Supervisor
Maintenance Coordinator
Maintenance Supervisor
Operations Supervisor
Safety and Risk Manager
Sustainability Manager
Utilities Engineer - Non-Registered
Utilities Engineer - Registered

Technicians

Construction Inspector
Database Administrator
Engineering Associate
Engineering Technician
GIS Coordinator
Laboratory Analyst
Network Administrator

Protective Service Workers

Lake Warden
Senior Lake Warden

Paraprofessionals

Accounting Technician I
Accounting Technician II
Billing Supervisor
Human Resources Generalist
Information Services Technical Specialist
Solids Handling Supervisor

Administrative Support

Administrative Assistant
Customer Service Representative
Clerk/Cashier
Executive Assistant
Senior Customer Service Representative

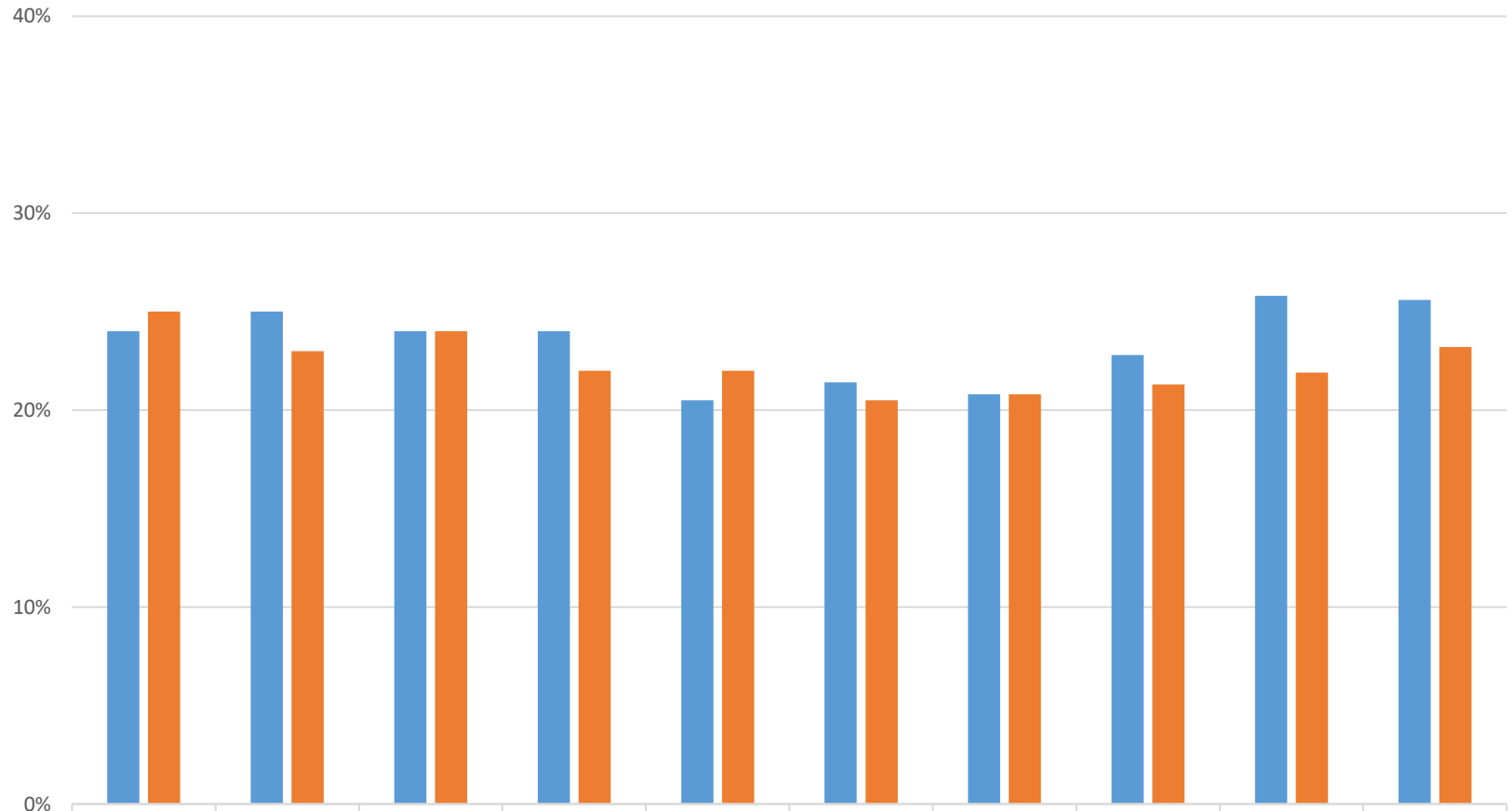
Skilled Craft Worker

Crew Leader
Senior Maintenance Mechanic
Treatment Plant Operator
Vehicle and Equipment Maintenance Mechanic
Warehouse-Cross Connection Coordinator
Utility Mechanic II
Utility Mechanic III

Service Maintenance

Assistant Lake Warden
Maintenance Mechanic
Solids Handler
Utility Mechanic I

OWASA
Workforce Race and Gender Distribution
10-year History
(data collected on June 30th each year)



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
■ Minority	24.0%	25.0%	24.0%	24.0%	20.5%	21.4%	20.8%	22.8%	25.8%	25.6%
■ Female	25.0%	23.0%	24.0%	22.0%	22.0%	20.5%	20.8%	21.3%	21.9%	23.2%

OWASA Applicant Race and Gender Distribution											
By EEO Classification											
July 1, 2017 through June 30, 2018											
Classification	Gender			Race							
	Male	Female	Not Provided	Two or More Races	White	Black/ African American	Hispanic	Asian	American Indian or Alaska Native	Native Hawaiian or Other Pacific Islander	Not Provided
Officials and Administrators	38	4	2	1	32	5	1	3	0	0	2
Professionals	342	179	25	23	307	119	24	38	3	0	32
Technicians	0	0	0	0	0	0	0	0	0	0	0
Protective Service Workers	28	3	0	1	23	4	1	0	1	1	0
Paraprofessionals	39	1	0	0	27	10	2	1	0	0	0
Administrative Support	0	0	0	0	0	0	0	0	0	0	0
Skilled Craft Workers	0	0	0	0	0	0	0	0	0	0	0
Service-Maintenance	61	3	2	25	21	16	2	1	0	0	1
Total (727)	508	190	29	50	410	154	30	43	4	1	35
Percentage	70%	26%	4%	6.9%	56.3%	21.3%	4.1%	6%	0.5%	0.1%	4.8%

OWASA Board of Directors Race and Gender Distribution

OWASA Board of Directors Race and Gender Distribution on June 30, 2018									
Appointment	Gender		Race						
	Male	Female	Two or More Races	White	Black/ African American	Hispanic	Asian	American Indian or Alaska Native	Native Hawaiian or Other Pacific Islander
Chapel Hill	4	1	0	4	0	0	1	0	0
Orange County	1	1	0	1	1	0	0	0	0
Carrboro	1	1	0	1	1	0	0	0	0
Total (9)	6	3	0	6	2	0	1	0	0
Percentage	66.7%	33.3%	0	66.7%	22.2%	0	11.1%	0	0

Agenda Item 5:

Long-Range Water Supply Plan – Projected Demands and Yield

Purpose:

To receive the OWASA Board of Directors' questions, comments, and feedback to staff regarding draft water supply projections for use in the update of the Long-Range Water Supply Plan (LRWSP).

Background:

Preparation of a long-term water demand projection is an essential task for OWASA, and it is the first step in the update of our LRWSP. It is required to evaluate how much water we expect to need to provide to our customers in the future, the ability (reliable yield) of our existing water supply sources to meet future needs, and the need for and cost-effectiveness of additional supply-side and/or demand-side strategies (including the expansion of our reclaimed water system).

The long-term demand projection is also essential for other purposes, such as:

- evaluating the need for capacity improvements to our drinking water treatment plant, pumping and storage facilities, and distribution system; and
- developing our long-range wastewater flow projection, which in turn will be used to inform our plans and decisions regarding the need for and timing of future investments in capacity expansions in our wastewater collection, treatment, and recycling systems.

Since there is a high level of uncertainty in developing water demands over the next fifty years, it is important to evaluate our potential demands periodically and the assumptions upon which they are based. If our projections are too low, we could face greater risks during drought, more frequent and severe water use restrictions, and potential limitations on new development and connections to our water, wastewater, and reclaimed water systems. On the other hand, if our projections are too high, we risk making costly, unneeded expansions in our infrastructure systems.

OWASA does not project growth within our service area. The Towns of Carrboro and Chapel Hill and the University of North Carolina at Chapel Hill provide information regarding future population and employment.

Key Steps to Develop the Draft Water Demand Projections

After considering the data requirements, complexities, and uncertainties involved in different water demand projection methods, staff proposes that we use a simple and understandable water demand projection approach that includes water use input variables which we can readily obtain,

September 13, 2018

track, and use. We applied unit demands based on OWASA data (gallons per day per dwelling unit for residential development and gallons per square foot per day for nonresidential development) to the growth projections for our service area that were recently estimated for the regional Metropolitan Transportation Plan using the CommunityViz model. This planning effort was spearheaded by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization and the Capital Area Metropolitan Planning Organization to create a more efficient regional transportation system covering portions of ten counties. As part of this process, the Triangle J Council of Governments used the CommunityViz tool to estimate where residential population and employment growth would occur. Those growth projections included data for 2045 and for build-out conditions, which staff assumed would occur in 2070. If build-out occurs sooner, the demands presented in this report would occur earlier, and if it occurred later, the demands presented would occur later.

The key steps in our approach for the draft baseline projection presented in this report are:

1. Determine the annual demands for the “Base Year” (calendar year 2017).
2. Determine the water use factors or unit demands based on 2014–2017 billed use data that will be applied to single family residential, master-metered multi-family residential, University of North Carolina (UNC) and UNC Health Care, and other types of commercial development. These most recent four years of data were used to reflect the most recent customer behaviors and fixture updates.
3. Use the CommunityViz model to obtain the number of new dwelling units for single family and multi-family development and employment square footage for both the “2045 Scenario” and “Build-Out Scenario”. Assume that growth is linear and that build-out occurs in 2070.
4. Apply the water use factors from step 2 to the growth projections.
5. Adjust demands from existing and new development to reflect conservation assumptions.
6. Factor in water treatment and distribution system losses to derive the total projected demand on our water supply reservoirs.
7. Evaluate the sensitivity of the results to changes in key assumptions.

Key Assumptions to Develop the Water Demand Projections

Key assumptions made to develop the draft baseline projection through 2070 are:

1. OWASA’s retail service area as defined in the *Water and Sewer Management, Planning and Boundary Agreement* will remain unchanged, and we will not provide wholesale or retail water service beyond the existing Urban Service Area boundary of Carrboro and Chapel Hill.
2. Federal and state regulations will allow us to continue with our reclaimed water (RCW) program and our water treatment plant process water recycling system.
3. Dwelling unit and economic growth projections (employment and non-residential development) through 2045 are assumed to be consistent with the projections from the CommunityViz 2045 Scenario. As noted above, we assume the growth projected to occur by 2045 occurs at a uniform rate between now and then, and that the

CommunityViz Build-Out scenario growth projections for our service area will be realized at a linear rate from 2046 to 2070.

4. Water use factors for the various types of projected development are based on recent unit demands determined from our water use analysis, as summarized in the attached draft report. The key water use assumptions for new development are:
 - a. new individually-metered single-family residences will use 4,200 gallons/unit/month;
 - b. new master-metered multi-family dwelling units will use 3,300 gallons/unit/month; and
 - c. new non-residential development will use 75 gallons/day/1,000 square feet

The above factors are similar to recent findings from the Town of Cary’s detailed analysis of billed water use among its major customer classes.
5. Non-revenue water (such as water used for line flushing, water used for firefighting, and system leaks) will continue to be approximately 10% of our raw water demands.
6. There will not be any major expansion of our RCW system, and our annual RCW demands will remain constant through the 50-year planning horizon.

Draft Water Demand Projections

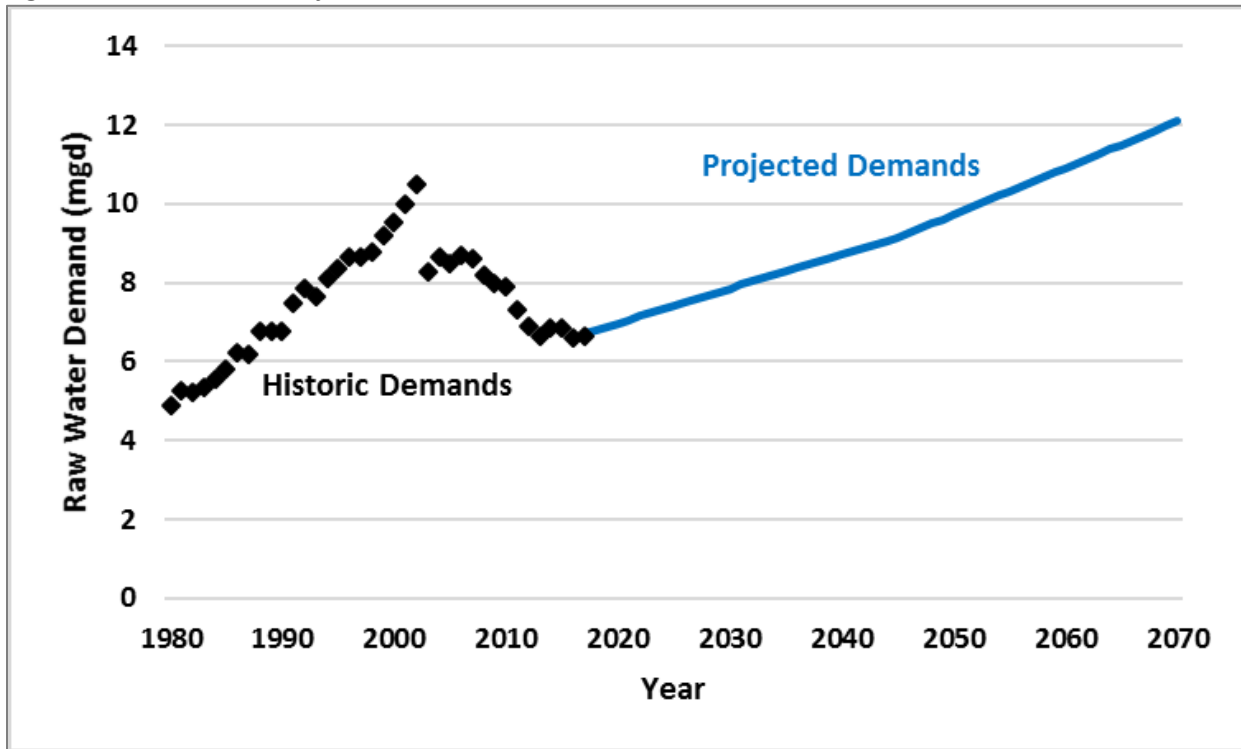
The approach and assumptions outlined above resulted in the demands summarized in Table 1 as compared to the demands included in the 2010 LRWSP; Figure 1 shows the projected demands along with our historic raw water demands.

Table 1: Draft Raw Water Demand Projections Compared to Projections in 2010 LRWSP

Year	Draft 2018 Total Raw Water Demands*	2010 LRWSP Projected Raw Water Requirements	Percent Change from 2010 Projection
2025	7.42	9.03	-17.9%
2030	7.86	9.68	-18.8%
2035	8.29	10.24	-19.1%
2040	8.71	10.79	-19.3%
2045	9.14	11.33	-19.3%
2050	9.73	11.86	-18.0%
2055	10.32	12.39	-16.7%
2060	10.91	12.91	-15.5%
2065	11.50	N/A	N/A
2070	12.09	N/A	N/A

** Includes 10% adjustment to account for non-revenue water (fire-fighting, flushing, leaks, etc.)*

Figure 1: Historic and Projected Raw Water Withdrawals



“What If” Scenarios for our Water Demand Projections

Our long-term demand projection is based on the key assumptions described above, all of which have some degree of uncertainty. We have evaluated how sensitive the projection is to changes in several of the key assumptions.

Table 2 summarizes how certain changes in key assumptions affect the long-term demand projection.

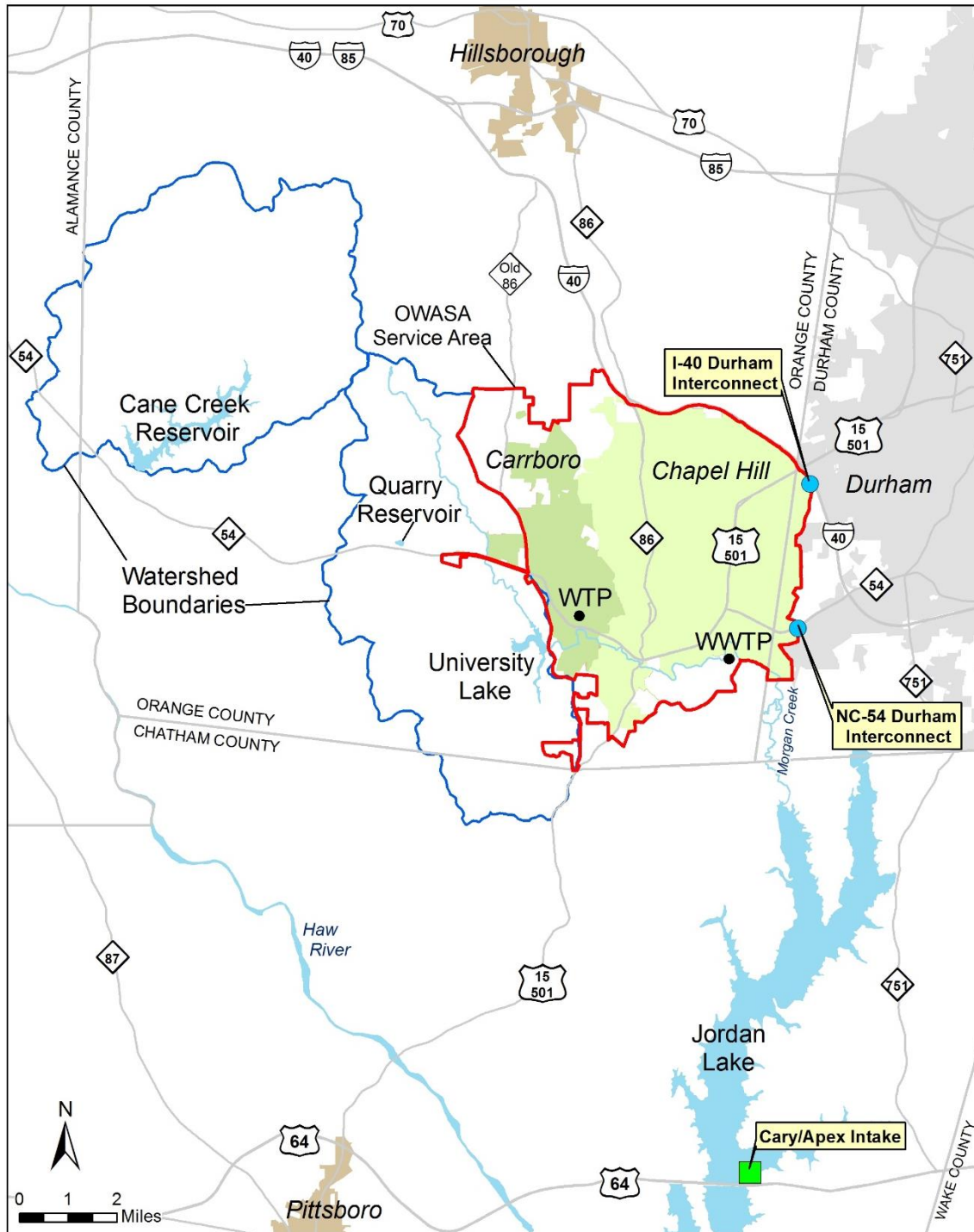
Table 2: Sensitivity of Projection to Changes in Single Assumptions

Change in Key Assumption	Projected Effect on Drinking Water Demands	Projected Effect on Raw Water Demands
Projected number of dwelling units or water use factor for residential use is 10% greater than the baseline	Increase by 0.14 mgd by 2045 0.26 mgd by 2070	Increase by 0.16 mgd by 2045 0.29 mgd by 2070
Projected growth in non-residential square footage is 15% greater than assumed in the baseline	Increase by 0.17 mgd by 2045 0.39 mgd by 2070	Increase by 0.19 mgd by 2045 0.43 mgd by 2070
RCW service is extended to meet cooling tower water demands at UNC’s Cogeneration Plant	Annual billed drinking water demands would be about 0.09 mgd lower, but overall total billed sales would remain the same.	Annual raw water withdrawals would be about 0.10 mgd lower than the baseline projection.
Urban service area is extended and water service is provided to a Meadowmont or Southern Village type development intensity over a 908 acre area	Increase by 0.53 mgd at project build-out	Increase by 0.58 mgd at project build-out
Water plant process water recycling system is no longer in service	N/A	0.56 mgd by 2045 0.75 mgd by 2070
Reclaimed water system is no longer in service	0.77 mgd This increase would mostly occur during the peak demand summer months.	0.85 mgd This increase would mostly occur during the peak demand summer months.

Yield of OWASA’s Water Supply Reservoirs

OWASA’s existing locally managed water supply sources include University Lake, Cane Creek Reservoir, and the Quarry Reservoir. In addition, OWASA has an allocation of five percent of Jordan Lake’s water supply pool which we can access through the Cary-Apex water intake and their treatment plant; Cary-Apex would then wheel drinking water through the City of Durham and our interconnections. Figure 2 illustrates the location of these sources.

Figure 2: OWASA's Water Supply Reservoirs



Hydrologic modeling completed for the 2010 LRWSP estimated the combined yield of our three locally managed reservoirs (not including Jordan Lake allocation) as approximately 10.5 million gallons per day (mgd). This estimate is based on a recurrence of the 2001-02 drought of record and that we reserve 20 percent of our storage to provide us with some time to develop or obtain an emergency supplemental supply of water, such as a temporary intake on the Haw River should

supply from Jordan Lake not be accessible. It also assumes that we can optimally operate our reservoirs for water supply; water quality conditions in one reservoir sometimes keep us from operating our reservoirs optimally. We have not experienced a new drought of record since the 2010 LRWSP was prepared; therefore, there has been no change in the estimated yield of our locally managed reservoir system.

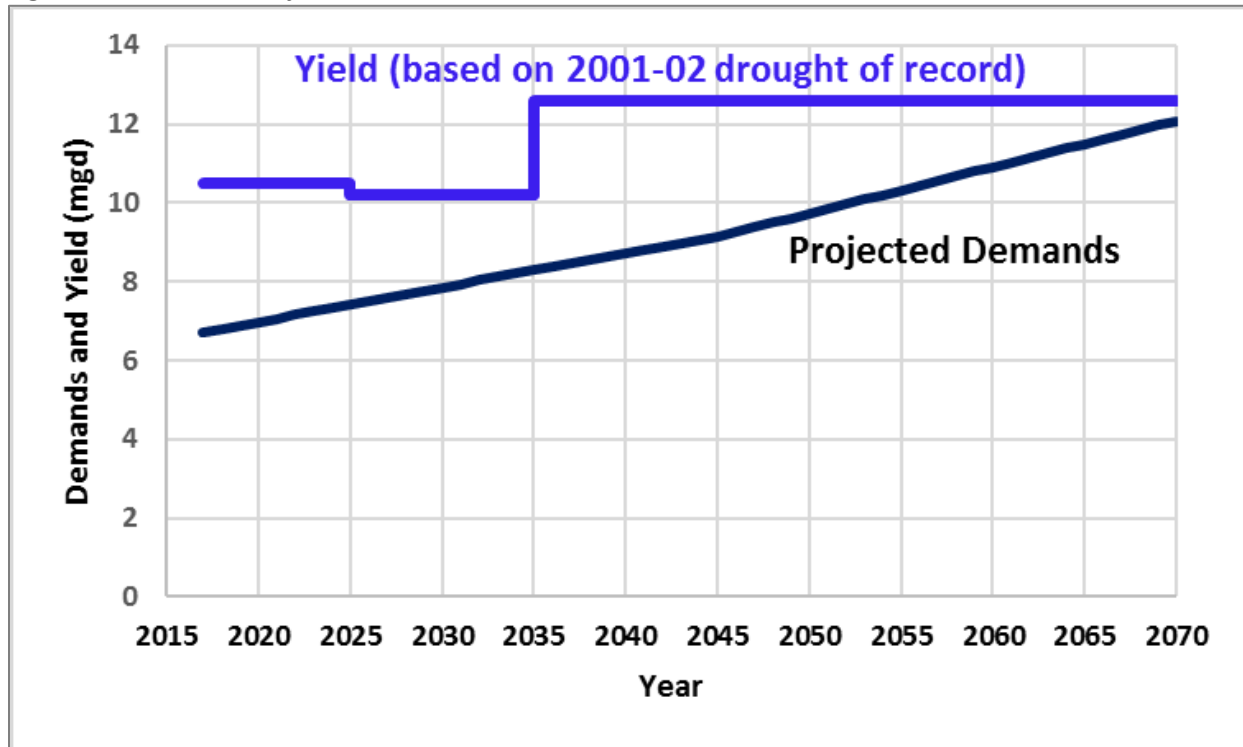
As noted above, OWASA also has an allocation of 5 percent of the water supply storage in Jordan Lake. Modeling completed by the North Carolina Division of Water Resources (DWR) indicates that this is an approximate yield of 5 mgd. Simply adding that 5 mgd to the yield of our local reservoirs results in an available supply of 15.5 mgd. This number is likely conservative since we can time withdrawals from several reservoirs to maximize the yield. An analysis completed as part of the 2010 LRWSP to evaluate the impact of including our Jordan Lake allocation on our supply estimated that our yield would actually increase between 4.8 mgd and 6.5 mgd depending on the pumping rate and period of time that water was withdrawn.

Currently OWASA does not have guaranteed access to this allocation. OWASA has mutual aid agreements with both the Town of Cary and City of Durham, but these agreements do not guarantee supply. Options to provide OWASA greater control to access its Jordan Lake allocation will be evaluated as part of the LRWSP.

The 2010 LRWSP identified the expansion of the Quarry Reservoir (shallow option – with pumping access down to 385 feet MSL, which is the limit of our existing Quarry Reservoir raw water pump station) as the most cost-effective option for a supplemental water supply source. Martin Marietta has a permit to mine the land adjacent to our existing Quarry through December 2030. OWASA plans to drain the Quarry Reservoir in approximately 2025 to enable Martin Marietta to connect it with the pit they are currently mining, thereby creating one large reservoir. We would then fill the expanded Quarry Reservoir with water from Cane Creek Reservoir (the Quarry Reservoir has a very small drainage area and would not fill without supplemental water); we estimate that it will take approximately five years to fill the expanded Quarry Reservoir. The 2010 LRWSP estimated that this option will provide approximately 2.1 mgd of additional yield, for a total system yield of 12.6 mgd (excluding our Jordan Lake allocation).

Figure 3 illustrates our draft projected demands with our local reservoir yield, including the changes in the Quarry Reservoir described above; it does not include our allocation from Jordan Lake. It should be noted that the projected demands included on the graph do not account for the uncertainty associated with our assumptions and methods. Staff could include uncertainty shading based on the individual “what if” scenarios summarized above; alternatively if the Board thinks it would be beneficial to complete a Monte Carlo analysis to better quantify the uncertainty in the projection analysis, staff can pursue that option.

Figure 3: OWASA’s Projected Water Demands and Estimated Yield



The yield in this figure does not include OWASA’s allocation from Jordan Lake of 5 percent of the water supply pool. Estimates from DWR indicate this would increase yield approximately 5 mgd. Modeling completed as part of the 2010 LRWSP estimate that access to our Jordan Lake allocation would increase our yield by 4.8-6.5 mgd depending on the pumping rate.

Researchers at Carolinas Integrated Sciences and Assessments (CISA) at the University of South Carolina are collaborating with OWASA and Hazen and Sawyer to understand the water supply yield implications of climate change for OWASA. The goal is to assess potential climate-driven changes in the dependability of OWASA’s raw water supply over the next 50-year planning horizon.

The researchers are using a two-step approach where the initial focus is on identifying specific climate conditions that threaten the reliability of OWASA’s water supply (vulnerability analysis), and then this information is used to develop plausible and credible future projections of these unfavorable climate conditions from the climate models (climate change analysis).

The researchers first evaluated the OWASA system (with the shallow option to expand the Quarry Reservoir), using hydrologic models provided by Hazen and Sawyer which were used to estimate the yield of OWASA’s reservoir system for the 2010 LRWSP and other follow-on work to that Plan. They will evaluate the system assuming a large number ($n = 5000$) of ‘synthetic’ hydroclimate inputs¹ (i.e., rainfall, streamflow, and reservoir evaporation). These simulations will enable us to isolate and characterize climate conditions that would likely compromise

¹ Synthetic hydrologic and/or meteorological data are commonly used in water resource studies to supplement observational records, which give us a limited view of natural variability in climate and especially of extreme conditions like droughts.

OWASA's goals; in this case the initial goal was to meet a water demand of approximately 13 mgd based on the demand projections included in the 2010 LRWSP.

Exploratory analysis reveals that the combined effect of the length of a drought and its severity can tell us when reservoir levels are likely to drop below a Stage 3 water shortage advisory as defined in our [Water Shortage Response Plan](#) while meeting a demand of 13 mgd. In most cases, only intense droughts lasting approximately 24 months or longer seem to reduce the reservoir storage to these critical levels. The researchers also noted that there are a sizeable number of simulations that result in lower yields even when rainfall is higher during the 24 months. The researchers are currently investigating these anomalous cases.

The next step will be to assess the plausibility of the critical drought conditions (i.e., how likely is low rainfall over 24 months to occur) using publicly-available climate change models. This will also require some evaluation of how well these climate models can simulate the multi-year extreme dry conditions (the 24 months noted above).

Proposed Next Steps:

Staff proposes the following next steps to complete the water demand projections task of the LRWSP update:

- Incorporate the Board's comments and feedback into a revised draft projection and report.
- Have Hazen and Sawyer, our engineering consultant for the LRWSP update, prepare a statistical analysis of the effects of weather on overall system demands, and incorporate the results into the revised draft report.
- Share the revised draft report with Hazen and Sawyer to provide a technical review of the results.
- If the Board desires, retain a consultant to complete a Monte Carlo simulation and incorporate the results of that analysis into the revised draft report.
- Share the revised draft report with the Towns, County, University, UNC Health Care, and others to receive their technical review and corrections, questions, comments, and suggestions.
- Share the revised draft report with nearby water utilities, and continue to exchange information and analyses regarding demand projections and water use analyses.
- Present a final draft baseline projection and report for further review and guidance by the Board. No formal resolution is needed; however, it would be important to have the Board's acceptance of the projections as the starting point for future analyses in the LRWSP.
- Once the projection is finalized, use it as a basis for identifying projected long-term shortfalls in supply and evaluating the need for and cost-effectiveness of additional supply-side and/or demand-side strategies.

Staff Recommendation:

Staff recommends that the Board provide feedback concerning the draft water demand projections. The following questions may help guide the Board’s discussion:

- Does the Board agree that our relatively simple demand projection approach (including use of the regional transportation modeling growth projections as the basis for our preliminary demand projection) is a reasonable approach given the available data, the lack of local, long-term population and development projections, and the uncertainties?
- Are the water use factors and other assumptions we have made a reasonable basis for developing the draft projection?
- Are the “What if…” scenarios presented in this draft report adequate to convey the sensitivity of the baseline projection to changes in key assumptions, or are additional analyses needed to inform the Board’s discussions?
- Does the Board desire a more rigorous statistical analysis of scenarios and an associated probabilistic-based range of projections, using a method such as a Monte Carlo simulation?
- Does the Board concur with the proposed next steps, including the proposed approach to seek public review and comment on the draft projections?

Given the uncertainty in long-term water demand projections, staff also recommends that we review the assumptions surrounding the demand projections every five years or so. No formal Board action is requested or needed at this time.

Information:

- Attachment 1: Draft Report: Preliminary Long-Range Water Demand Projections Through 2070

Long-Range Water Supply Plan Update

Draft Report:

Preliminary Long-Range Water Demand Projections Through 2070

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September 2018

Long-Range Water Supply Plan Update

Draft Report:

Preliminary Long-Range Water Demand Projections Through 2070

WHAT'S THE PURPOSE OF THIS REPORT?

This draft report presents a preliminary “baseline” long-term water demand projection for the Orange Water and Sewer Authority (OWASA) service area through the year 2070. It provides an overview of the supporting information, analyses, and methods used to develop the projection, and it highlights some of the key uncertainties and sensitivities that surround the draft demand projection. This draft projection and report have been prepared by OWASA staff.

Discussion and refinement of the assumptions, draft baseline projection, uncertainties, and sensitivity analysis is the Board of Directors’ and staff’s initial work task relating to the planned update of OWASA’s 2010 Long-Range Water Supply Plan (LRWSP). The 2010 LRWSP had a 50-year planning horizon, but conditions and assumptions have changed since that was prepared. As part of OWASA’s [Strategic Plan](#), the Board of Directors identified the need to update the LRWSP to incorporate the best available information on projected long-term water demands, adequacy of existing supplies, anticipated capacities and costs of supply-side and demand-side strategies, and other key factors.

HAS THIS DRAFT PROJECTION AND REPORT BEEN REVIEWED BY ANY OTHER PARTIES?

No. Staff has not yet sought external review and comment on the preliminary baseline projection and this draft report. We want to incorporate the Board’s comments and revisions before we seek external review and comment on the draft baseline projection and report.

WHAT ARE SOME KEY HIGHLIGHTS OF THIS DRAFT REPORT?

Some of the key points are:

- The draft baseline long-term water demand projection through the year 2070 is based on the most up-to-date housing unit and economic growth (non-residential space and employment) projections and water use trends analyses available for the OWASA service area. The development projections include a 2045 development scenario, and a “build-out” scenario that does not correspond to any specific time horizon beyond 2045. The development scenarios were originally developed as part of a collaborative regional modeling (CommunityViz model) and planning project for preparation of the 2045 Metropolitan Transportation Plan. OWASA does not project growth in our service area. The Town of Chapel Hill and Carrboro and the University of North Carolina at Chapel Hill (UNC) provide information regarding future population and employment.
- We believe our water demand modeling approach is appropriate given the available data, lack of more specific local development and population growth projections for our service area, and uncertainty surrounding many of the variables and assumptions upon which our draft baseline projection has been based.
- The draft baseline demand projection presented in this report is lower than the corresponding demand projection for the “Expected Scenario” included in OWASA’s 2010 LRWSP. Table 1

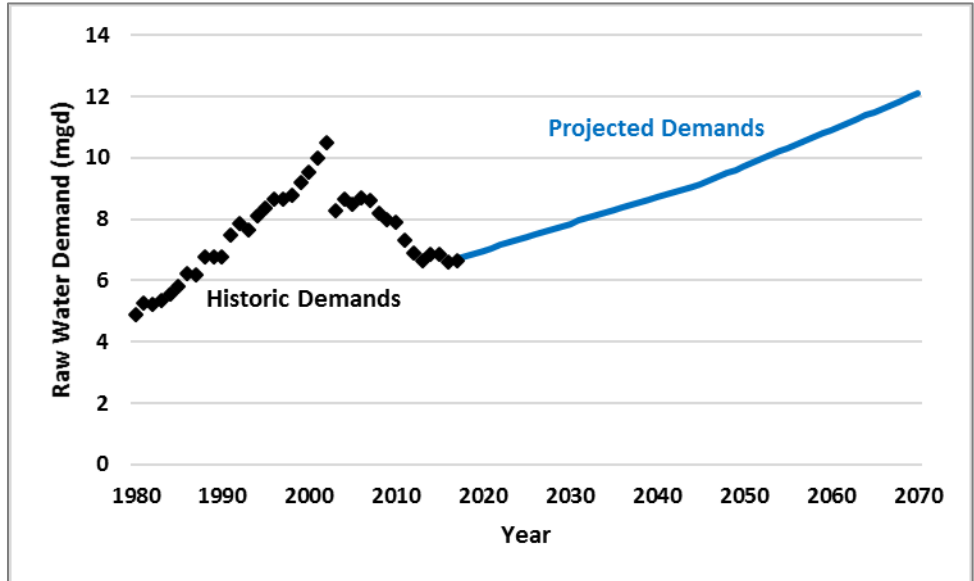
provides a summary comparison of the two projections. Figure 1 illustrates these latest projections along with historic raw water demands.

Table 1.
Comparison of Raw Water Demand Projections from 2010 LRWSP
and September 2018 Draft Report

Year	Draft 2018 Total Raw Water Demands*	2010 LRWSP Projected Raw Water Requirements	Percent Change from 2010 Projection
2025	7.42	9.03	-17.9%
2030	7.86	9.68	-18.8%
2035	8.29	10.24	-19.1%
2040	8.71	10.79	-19.3%
2045	9.14	11.33	-19.3%
2050	9.73	11.86	-18.0%
2055	10.32	12.39	-16.7%
2060	10.91	12.91	-15.5%
2065	11.50	N/A	N/A
2070	12.09	N/A	N/A

* Includes 10% adjustment to account for non-revenue water (fire-fighting, flushing, leaks, etc.)

Figure 1.
Historic and Projected Raw Water Withdrawals



- Past projections by OWASA and other agencies have typically over-projected long-term water demands for the OWASA service area. Various long-term water demand forecasts prepared during the period from 1969 to 2008 for the Chapel Hill-Carrboro area exceeded our 2017 actual demands

by about 5% to 120%. Some key contributing factors are that the projections: (a) under-estimated the extent to which our customers would reduce their use of water through water use efficiency and conservation measures; (b) under-estimated the effects that seasonal rates, increasing block rates, and increasing price of water and wastewater services would have on our customers; and (c) over-estimated the rate of population and economic growth for our service area.

Our “Expected Scenario” demand projection from the 2010 LRWSP is within about 15% of our actual raw water demands for 2017.

- The Carrboro, Chapel Hill, and Orange County planning departments participated in the regional transportation plan modeling effort to develop growth projections and allocations for the respective planning jurisdictions in the region; however, the towns have not recently prepared any official long-term population and economic growth forecasts. Chapel Hill just commenced a 2049 Land Use Plan update project that will focus on key growth areas throughout the town. Staff from The University of North Carolina at Chapel Hill (UNC-CH) and UNC Health Care also provided information incorporated into the CommunityViz model. UNC-CH is updating its Master Plan, but specific growth projections for UNC-CH are not yet available. The North Carolina Office of State Budget and Management (OSBM) has prepared a 20-year (2037) population growth projection for the State and each of its 100 counties; however, OSBM does not prepare any population projections for municipalities within the state.
- Although long-term planning is important, it is extremely difficult if not impossible to foresee all the technological, legal, socio-economic, climatological, and other changes and events that will occur in the future – especially for the 50-year planning horizon we are using. The accuracy of population, economic growth, and associated water demand projections will likely decline the farther into the future we project.
- There is uncertainty surrounding many of the key factors that will shape the future water demands of our service area, such as:
 - the rate of population and employment growth that is projected to occur;
 - the types of residential and non-residential growth projected to occur (as compared to the development projections from the regional transportation model);
 - the extent to which low impact development (green infrastructure to capture stormwater, water-smart landscaping, etc.), high performance building, and other development trends and applicable regulatory requirements will affect future demands;
 - the extent to which water use efficiency and water use habits will change over time and affect water demands by our existing and future customers;
 - how future water use will be affected by changes in price, household size and income, etc.;
 - and
 - the effect that a warming climate may have on long-term water demands (irrigation demands, cooling water requirements, etc.).

The installation of advanced metering infrastructure (AMI) will help us address some the uncertainty, but projections into the future are always inherently uncertain. AMI may also result in additional demand reductions as customers become more aware of their water use and leaks are identified more quickly.

WHY IS THE LONG-TERM WATER DEMAND PROJECTION ESSENTIAL TO OWASA?

Preparation of a long-term water demand projection is an essential task for OWASA, and is the first step in the update of our LRWSP. It is required to evaluate how much water we expect to need to provide to our customers in the future, the ability (reliable yield) of our existing water sources to meet future needs, and the need for and cost-effectiveness of additional supply-side and/or demand-side strategies (including the expansion of our reclaimed water system).

The long-term demand projection is also essential for other purposes, such as:

- evaluating the need for capacity improvements to our drinking water treatment plant, pumping and storage facilities, and distribution system; and
- developing our long-range wastewater flow projection, which in turn will be used to inform our plans and decisions regarding the need for and timing of future investments in capacity expansions in our wastewater collection and treatment system.

The long-term demand projections have important implications for OWASA, our customers, and the environment. If our projections are overly conservative (much higher than actually occurs in the future), we face the risk of making costly, unneeded investments to expand the capacity of our water, wastewater, and reclaimed water (RCW) system infrastructure. If our projections are too low, we could face greater risks during drought, more frequent and severe water use restrictions, and potential limitations on new development and connections to our water, wastewater, and reclaimed water systems.

Either outcome could have a number of negative effects, such as higher charges and greater inconvenience and hardship for our customers; loss of public confidence, and greater impacts on the environment and the local economy.

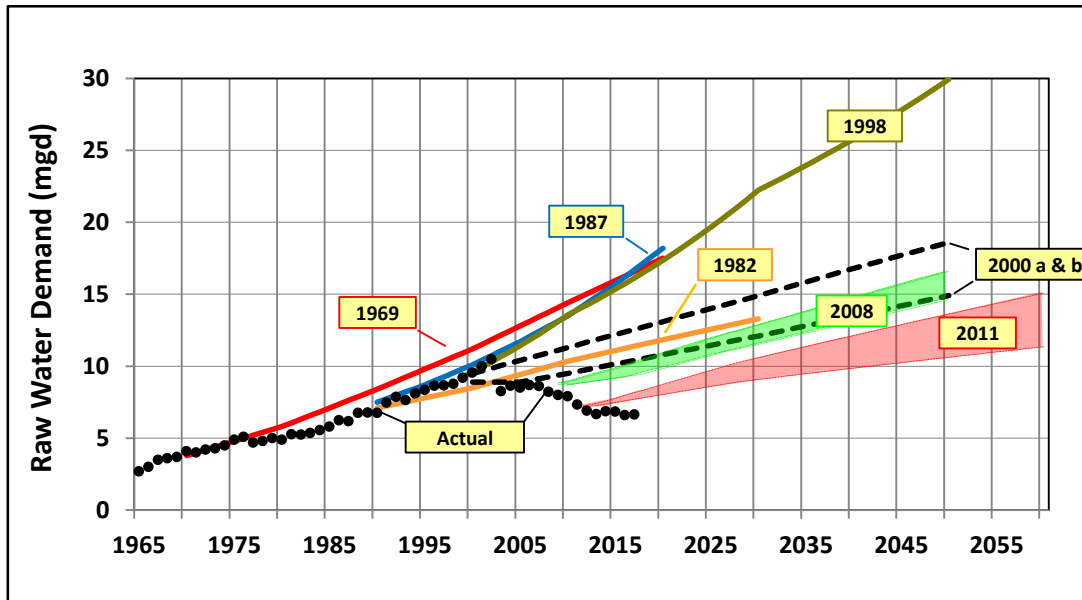
In light of the long lead times involved in water supply planning, design, permitting, and development, our approach is to use a 50-year planning horizon. We acknowledge that the level of uncertainty increases the farther into the future our projections go, but we believe preparation of a 50-year projection enables us to proactively and strategically evaluate and consider alternative strategies for meeting the long-term water, wastewater, and reclaimed water needs of the Chapel Hill-Carrboro community in a more sustainable manner.

In light of the importance of our long-range demand forecast on infrastructure planning and investments, staff recommends that we review our long-range projections every five years or when major changes in key trends and assumptions are identified, and that we revise the projections (and associated long-term plans) as needed to reflect the changed conditions.

WHAT HAS BEEN THE GENERAL ACCURACY OF OUR PAST DEMAND PROJECTIONS?

OWASA and other agencies have issued several long-term water demand projections for the Chapel Hill-Carrboro community. The oldest projection we have reviewed was from 1969, and the most recent was prepared for the 2010 LRWSP, as revised in 2011. Figure 1 shows how those projections compared to our historical annual raw water demands.

Figure 2.
Past Long-Range Water Demand Projections Compared to Actual Water Withdrawals



A key observation shown in Figure 2 is that starting around 2000, our community’s actual water demands have been considerably lower than what was previously projected to occur in our service area over the long-term. The projections prepared during the period from 1969 to 2008 for the Chapel Hill-Carrboro community have exceeded our 2017 actual demands by about 30% to 120%. At projection year 10 and 20 (10 and 20 years from the date the projection was completed), the projections for years 10 and 20 were off by a range of -3% to 43% and -13% to 143%, respectively.

In hindsight, these older projections did not anticipate the demand reduction effects of water conservation and efficiency, nor the effects of seasonal rates, increasing block rates, and increasing price of water and wastewater services. They also over-estimated the future rate of population growth for the Chapel Hill-Carrboro community. The shift from single-family to multi-family residential development in our service area may also have played a role. Projections made prior to 2006 did not anticipate the substantial reductions in raw water demands that resulted from implementation of the drinking water treatment plant process recycling system in 2002, or the reclaimed water (RCW) system in 2009.

Another key observation is that the very stable period of linear growth in water demands came to an end around the time of the record drought of 2001-2002.

A concerted effort was made to incorporate these factors in our most recent projections done for the 2010 LRWSP; explicit calculations were included for estimated conservation by existing customers, new connections, and the RCW system. The 2010 projection for 2017 is within about 15% of our actual adjusted raw water demands for 2017. However, some of the assumptions made for that projection are not expected to hold up over time. For example, development of Carolina North, the University’s planned major satellite campus, was expected to be underway by now, but those plans are now on indefinite hold.

WHAT DEMAND PROJECTION APPROACH HAVE WE TAKEN FOR OUR 2018 PROJECTION AND WHY?

After considering the data requirements, complexities, and uncertainties involved in different water demand projection methods, staff proposes that we use a simple and understandable water demand projection approach that includes water use input variables which we can readily obtain, track, and use. In the absence of long-term population and development projections from Carrboro and Chapel Hill, we apply those water use input factors to the residential dwelling unit and non-residential (employment and non-residential square footage) growth projections for our service area that were recently developed for the regional CommunityViz model.

The key steps in our approach for the draft baseline projection presented in this report are:

1. Determine the annual demands for the “Base Year” (calendar year 2017).
2. Determine the water use factors (i.e, gallons per day per dwelling unit for residential demand and gallons per day per square foot for nonresidential demand) based on 2014-2017 billed use data that will be applied to the various types of development included in the population and economic growth projections from the CommunityViz model.
3. Use the “2045 Scenario” growth projections to determine the 2045 water demand projection. Assume that additional growth will occur at a constant linear rate between now and 2045.
4. Assume that the “Build-Out Scenario” growth projections in the CommunityViz model correspond to 2070 (regional communities involved in that effort did not define a build out year), and that the additional growth will occur at a constant linear rate from 2046 to 2070.
5. Apply the water use factors to the growth projections.
6. Adjust demands from existing development to reflect the assumed rate at which those demands will decline as our existing customers implement additional permanent water conservation measures.
7. Adjust the water use factors for future development to reflect assumed reductions resulting from continued improvements in water use efficiency in new development.
8. Add the projected water demands for the new development to the projected demand from existing customers to obtain the projected total demands by our customers.
9. Factor in water treatment and distribution system losses to derive the total projected demand on our water supply reservoirs.
10. Evaluate the sensitivity of the results to changes in key assumptions.

WHAT KEY ASSUMPTIONS HAVE WE MADE FOR OUR DRAFT BASELINE WATER DEMAND PROJECTION?

Key assumptions we have made for developing our draft baseline projection through 2070 are:

1. OWASA’s service area as defined in the *Water and Sewer Management, Planning and Boundary Agreement* will remain unchanged, and we will not provide wholesale or retail water service beyond the existing Urban Service Area boundary of Carrboro and Chapel Hill.

2. Federal and state regulations will allow us to continue with our reclaimed water (RCW) program and our water treatment plant process water recycling system.
3. Dwelling unit and economic growth projections (employment and non-residential development) through 2045 are assumed to be consistent with the projections from the CommunityViz 2045 Scenario. As noted above, we assume the growth projected to occur by 2045 occurs at a uniform rate between now and then, and that the CommunityViz Build-Out scenario growth projections for our service area will be realized at a linear rate from 2046 to 2070.
4. Water use factors for the various types of projected development are based on recent unit demands determined from our water use analysis, as summarized in a later section of this report. The key water use assumptions for new development are:
 - a. new individually-metered single-family residences will use 4,200 gallons/unit/month;
 - b. new master-metered multi-family dwelling units will use 3,300 gallons/unit/month; and
 - c. new non-residential development will use 75 gallons/day/1,000 square feet.

The Town of Cary recently completed a detailed analysis of billed water use among its major customer classes. As a check, OWASA staff compared the above factors based on our billing data, and they are similar to those that Cary developed.

5. Non-revenue water (such as water used for line flushing, water used for firefighting, and system leaks) will continue to be approximately 10% of our raw water demands.
6. There will not be any major expansion of our RCW system, and our annual RCW demands will remain constant through the 50-year planning horizon.

Our projections also reflect the assumption that water use will continue to decline over time as a result of the effects of the U.S. Environmental Protection Agency's WaterSense program, the U.S. Department of Energy's Energy Star program, early leak detection provided by our investment in automatic metering infrastructure, and the nation-wide water efficiency requirements specified in the Energy Policy Act of 1992.

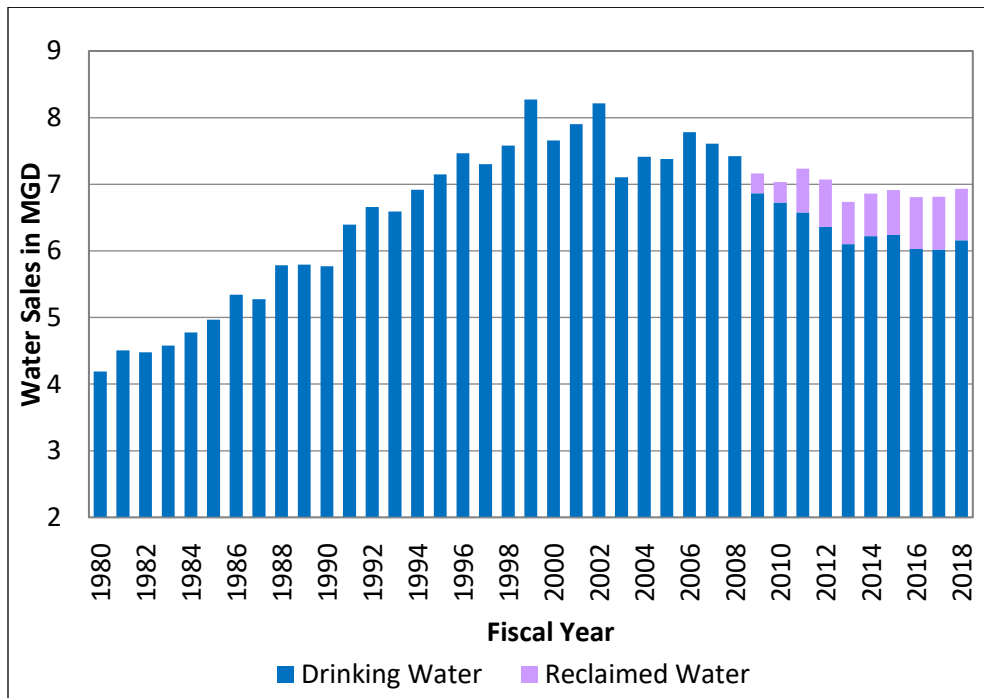
WHAT ARE SOME KEY TRENDS AND WATER USE FACTORS IN OUR SERVICE AREA?

The water use metrics incorporated in the draft baseline projection have been derived from staff's recent analysis of billed water use data for OWASA's major customer classes, as summarized below.

Overall Water Use by Our Customers

Figure 3 shows the annual average-day billed water use, in millions of gallons per day (MGD), for our drinking water and RCW systems for Fiscal Years (FY) 1980 to 2018. Like Figure 2, this graph shows a remarkably linear rate of growth in billed use from 1980 through about 2002, followed by a steady decline which appears to have bottomed out around 2013.

Figure 3.
Average-Day Billed Water Use by OWASA Customers (Drinking Water and Reclaimed Water)
Fiscal Years 1980 - 2018

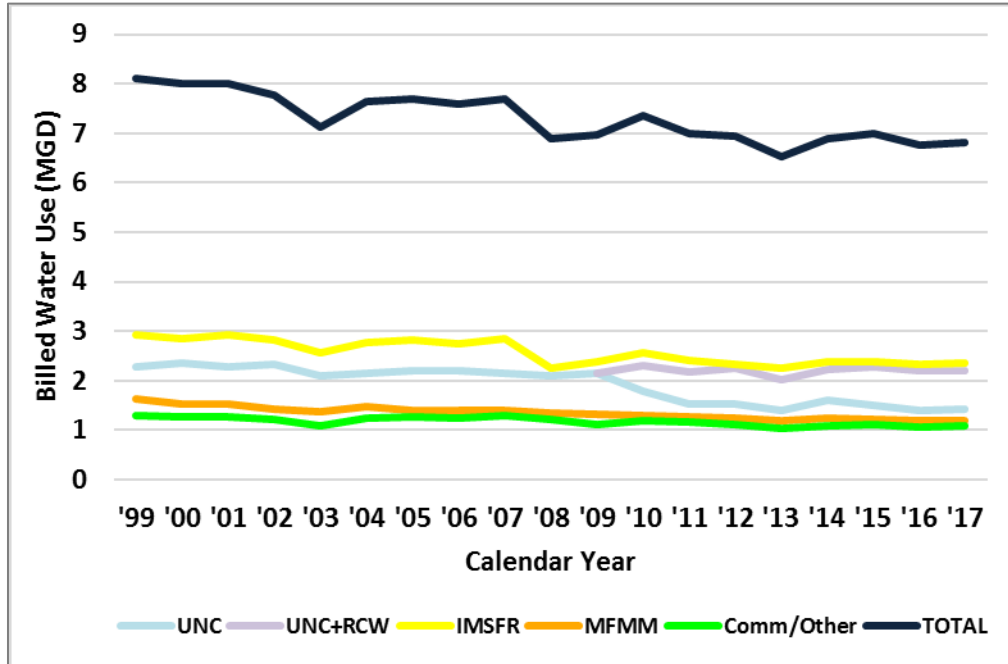


This figure also shows that RCW billed water use has remained relatively stable over the past few years. No major new RCW customers were added to the system during that time.

Figure 4 shows the historical annual average-day billed water demands for OWASA’s four major customer groups for Calendar Years (CY) 1999 to 2017. The four groups are:

- Individually-Metered Single Family Residential (IMSFR);
- Master-Metered Multi-Family Residential (MFMM);
- Commercial/Retail/Other (Comm/Other); and
- UNC/UNC Health Care.

Figure 4.
Average Annual Billed Water Use By Major Customer Group, CY 1999 – 2017 (in MGD)

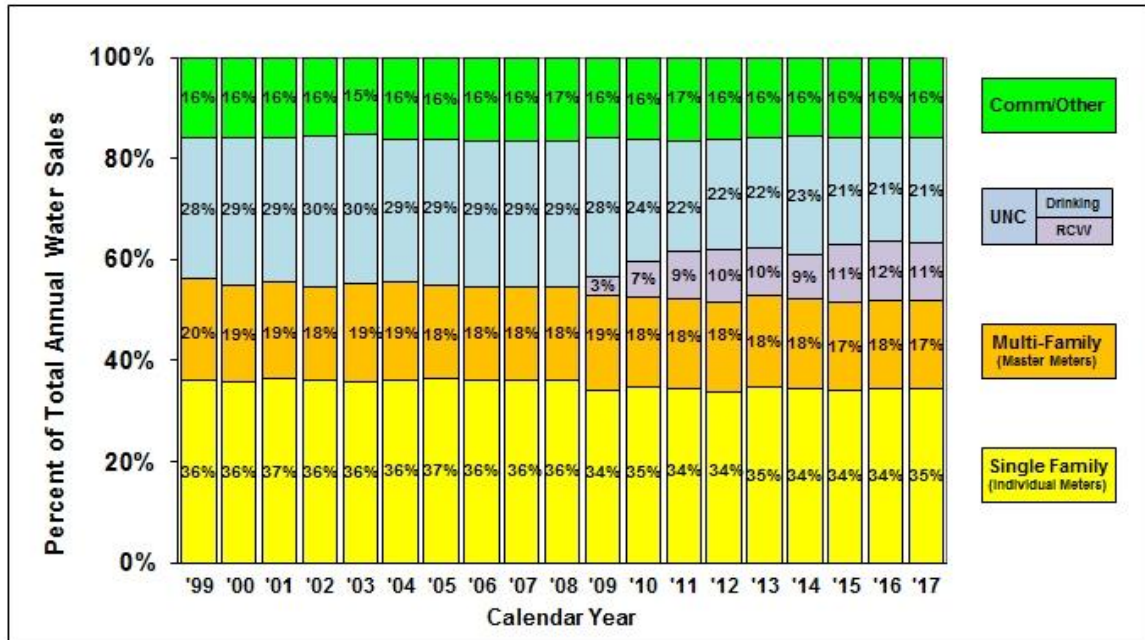


The key take-away from this graph is that the demand for water across each of these major sectors generally declined through 2013-2014, and has remained relatively stable for past few years. Some key factors contributing to declines shown above include:

- implementation of seasonal water conservation rates for all customers in 2002 and of increasing block water rates for our individually-metered single family residential customers in 2007;
- the 2001-2002 record drought and near-record drought of 2007-2008, both of which involved extensive water conservation education and outreach efforts (as well as the implementation of drought surcharges in the 07-08 drought) across the region and required mandatory water use restrictions to reduce demands and extend the local supply;
- implementation of private submetering and rebilling systems in many of the master-metered multi-family complexes in our service area;
- implementation of many major water use efficiency improvements by UNC-CH and UNC Health Care; and
- the State’s enactment of Session Law 2007-546 (Senate Bill 668) in 2007, which required that water use in all existing buildings owned by the State and The University of North Carolina be reduced by at least 20% compared to FY 2002-2003 water use. The reductions were required to be achieved by December 31, 2009. The law also requires that all new State buildings, including those built by UNC-CH, be a minimum of 20% more water-efficient than previously required under the State Plumbing Code.

Figure 5 shows the relative *portion* of total annual billed sales for our four major customer groups for CY 1999 – 2017. The key take-away from this graph is that the relative demand for water across these major sectors has remained relatively constant for nearly the past twenty years.

Figure 5.
Percent of Total Annual Billed Water Sales, By Major Customer Group, CY 1999 – 2017

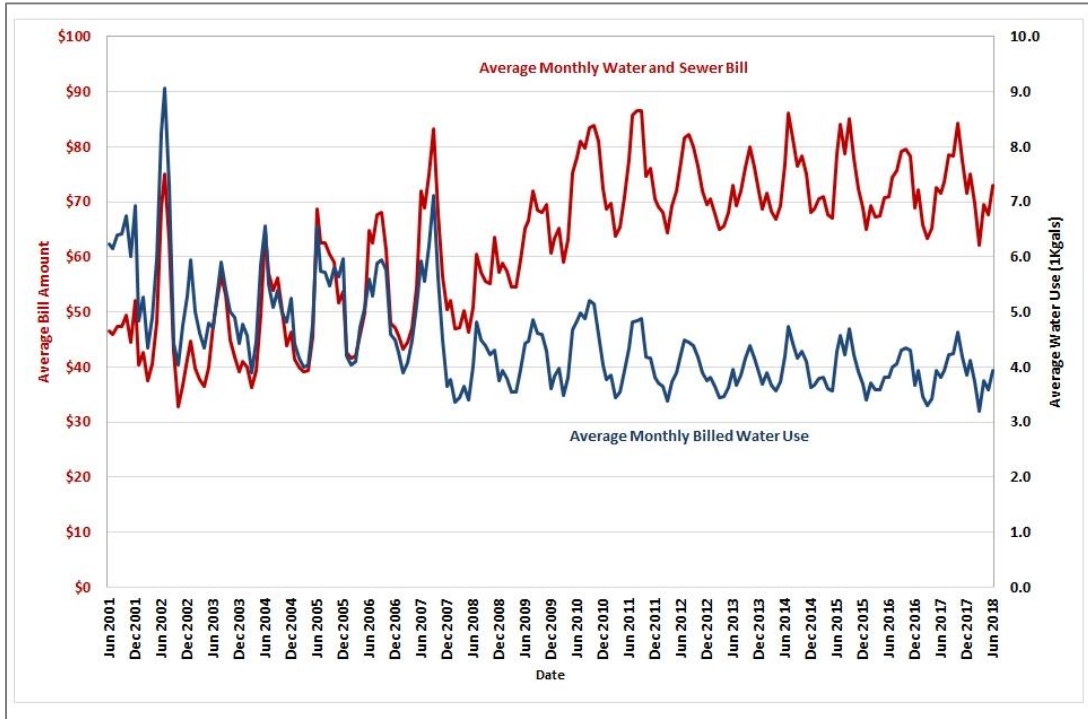


While the proportionate amount of billed use across our major customer classes has been relatively stable for many years, it is uncertain whether this trend will continue.

Water Use by Individually-Metered Single-Family Residential (IMSFR) Customers

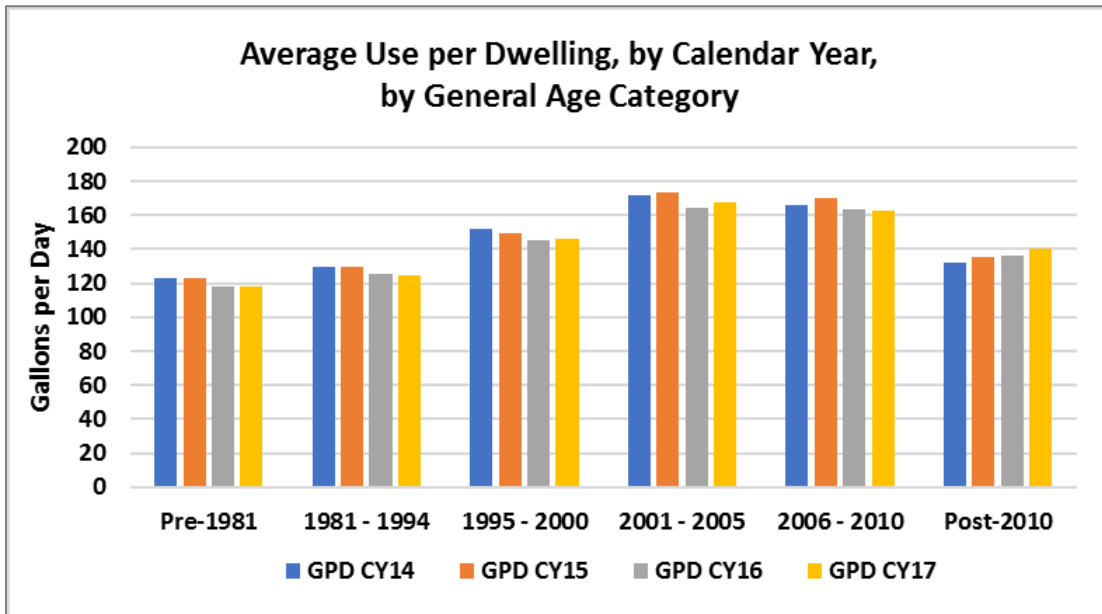
Figure 6 shows the average monthly billed water use for our IMSFR customers for the period 2001 to 2017. The 12-month running average declined substantially from 2001 through about 2013, and has remained relatively constant at 4,000 gallons/month since that time. Two major step reductions occurred around the times when OWASA adopted stronger conservation rate structures. Coincidentally, those rate structures changes were made about the same time as two extreme droughts (record drought of 2001-2002 and extreme drought of 2007-2008). In recent years, annual average monthly billed use among this major customer class has remained relatively stable at about 4,000 gallons/month/account.

Figure 6.
Average Monthly Billed Water Use and Billed Charges for OWASA's
Individually-Metered Single Family Residential Customer Class - 2001 to 2017



We have used IMSFR billing data and County tax parcel data to analyze average daily water use by general age range of IMSFR dwelling units in our service area. The age ranges selected are intended to reflect the times when major changes occurred in national water efficiency requirements. Figure 7 shows how average daily billed water use during CY 2014 – 2017 has varied, by general age range of dwelling units. One general observation from this graph is that homes built from 2010 to present appear to be using less water than homes built between 2001 and 2010. That could reflect the installation and use of more water-efficient fixtures and appliances in newer homes; however, it could also be a function of household size, house and/or lot size, and other factors.

Figure 7.
Average Daily Billed Use for Individually-Metered Single Family Residences,
by General Age of Residence, for Calendar Years 2014 - 2017



Based on the above analyses, staff recommends using an average water use factor of 140 gallons/day (4,200 gallons/month) for new IMSFR dwelling units built in the OWASA service area.

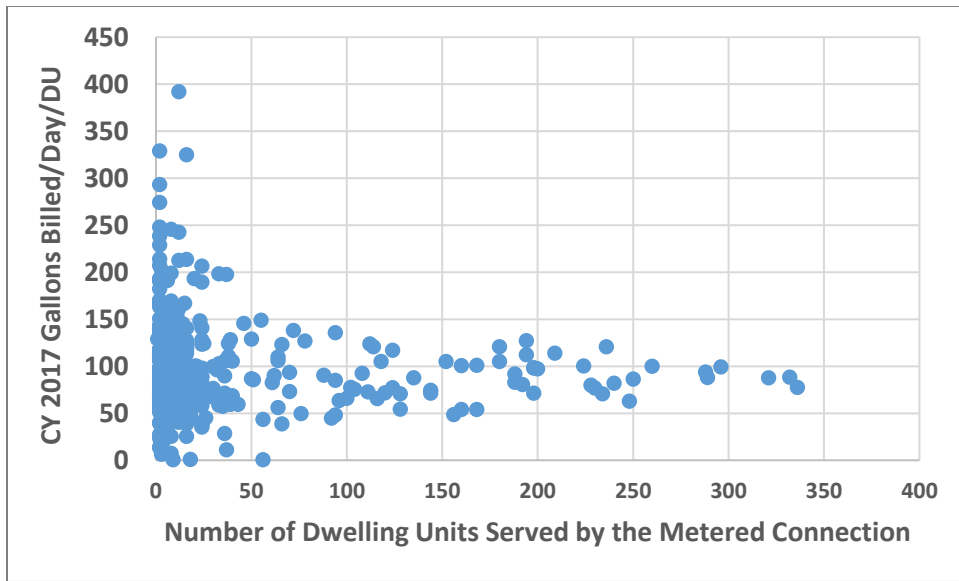
Water Use by Master-Metered Multi-Family Residential Customers

As shown above in Figure 5, water use by OWASA’s Multi-Family Master-Metered Residential (MFMM) customer class has historically accounted for about 17 to 20% of average-day water sales. As shown in Figure 4, overall water use in this class steadily declined from CY 1999 to around CY 2013, but has been relatively stable for the past few years.

One key factor that has substantially affected water use within our MFMM customer class is the installation of private submetering and rebilling systems in both old and new apartment complexes. A prior analysis by OWASA concluded that a number of existing apartment complexes in our service area reduced their overall average water use by around 15 to 20% after installing private submetering and rebilling systems. That is consistent with the findings of the *National Multiple Family Submetering and Allocation Billing Program Study* which reported that submetering and rebilling achieved an average water savings of more than 15% (21.8 gallons/day/unit).

For those MFMM customer accounts for which we have dwelling unit counts (covers about 16,000 dwelling units), we have analyzed average-day water use per dwelling unit, assuming full occupancy (which results in an under-estimate of the actual water use/occupied unit). Figure 8 shows distribution of CY 2017 average-day use per unit by MFMM service connection for which we have data on the number of units. The overall average was about 100 gallons per day/unit; however, we again emphasize that the actual use per *occupied* unit would be higher.

Figure 8.
Average-Day Billed Water Use/Dwelling Unit by Number of Units Served for
Master-Metered Multi-Family Residential Connection, CY 2017



Some key factors affecting water use in the MFMM customer class are: the age and size of the dwelling units; the number of occupants per unit; the occupancy (vacancy) rates of the various complexes; the presence of swimming pools, laundry facilities, and other features; the extent to which water use efficiency measures have been installed; and the extent to which private submetering and rebilling systems have been implemented, as discussed above.

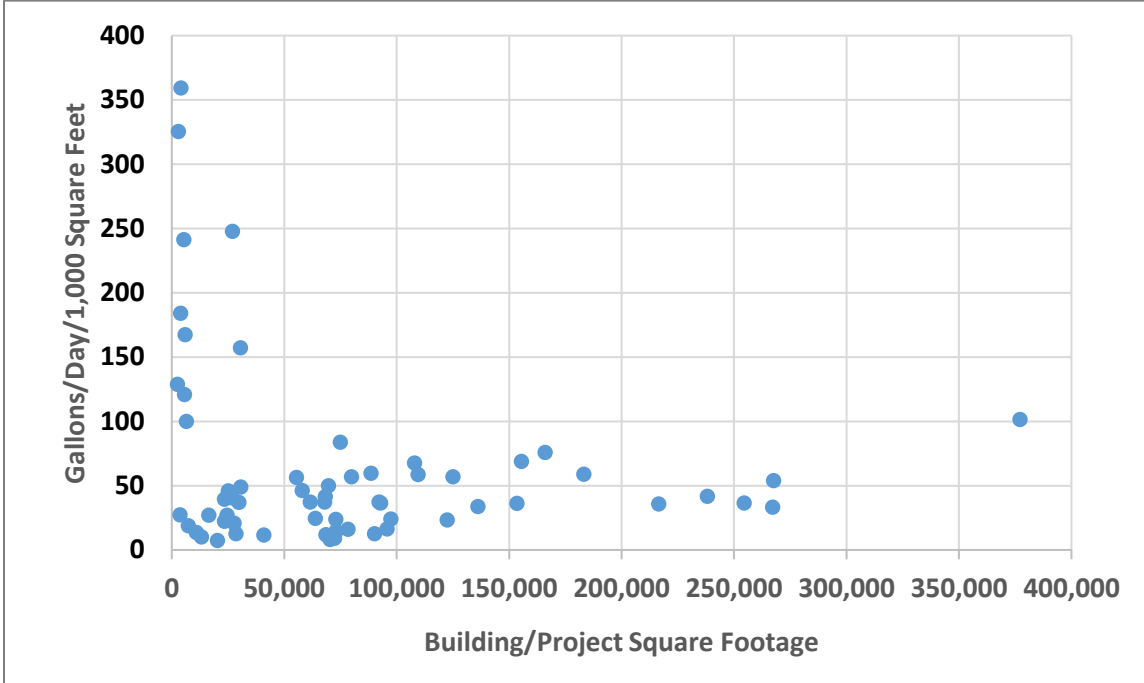
Based on our analyses, staff recommends using an average water use factor of 110 gallons/day for new MFMM dwelling units built in the OWASA service area. This factor includes a modest adjustment for general water use for offices, laundry areas, swimming pools, and other common facilities that are oftentimes metered separately from the residential buildings.

Water Use by Non-Residential, Non-UNC/UNC Health Care Customers

Figure 4 summarizes average annual billed water use for our Non-Residential, Non-UNC/UNC Health Care customers, also referred to as our Commercial/Other customer group. This broad group includes commercial, office, retail, and institutional customers, as well as some major mixed use development projects, such as East 54, 140 West, and Greenbridge.

Figure 9 shows CY 2017 average-day water use/1,000 square feet for a subset of about 100 Non-Residential, Non-UNC/UNC Health Care buildings of various types. Together, those buildings represent about 5 million square feet of building area.

Figure 9.
CY 2017 Average-Day Water Use/1,000 Square Feet for Subset of Non-Residential Buildings



Water Use by UNC and UNC Health Care

Figure 4 shows average annual billed water use for our UNC and UNC Health Care customers from CY 1999 - 2017. The use of water by UNC-CH and UNC Health Care declined during the early to mid-2000s, after which water use associated with new growth of the main campus and hospital generally offset major gains UNC-CH and UNC Health Care achieved in water use efficiency in their existing buildings. RCW use began in April 2009 and has been stable for about last three years. UNC-CH and UNC Health Care do not have any current plans to connect any major facilities to the RCW system in the foreseeable future, but is continuing to look for cost-effective opportunities for RCW.

Figure 10 shows CY 2017 average-day water use/1,000 square for about 180 UNC buildings of various types that together have nearly 13 million square feet of space. The average-day water use for those buildings was about 56 gpd/1,000 square feet and the median was 28 gpd/1,000 square feet. This analysis under-estimates the actual requirements of these buildings, as it excludes the associated water requirements for UNC-CH’s central heating and cooling facilities and operations that serve many of the buildings included in the above analysis.

Figure 10.

CY 2017 Average-Day Water Use/1,000 Square Feet for Subset of UNC Buildings

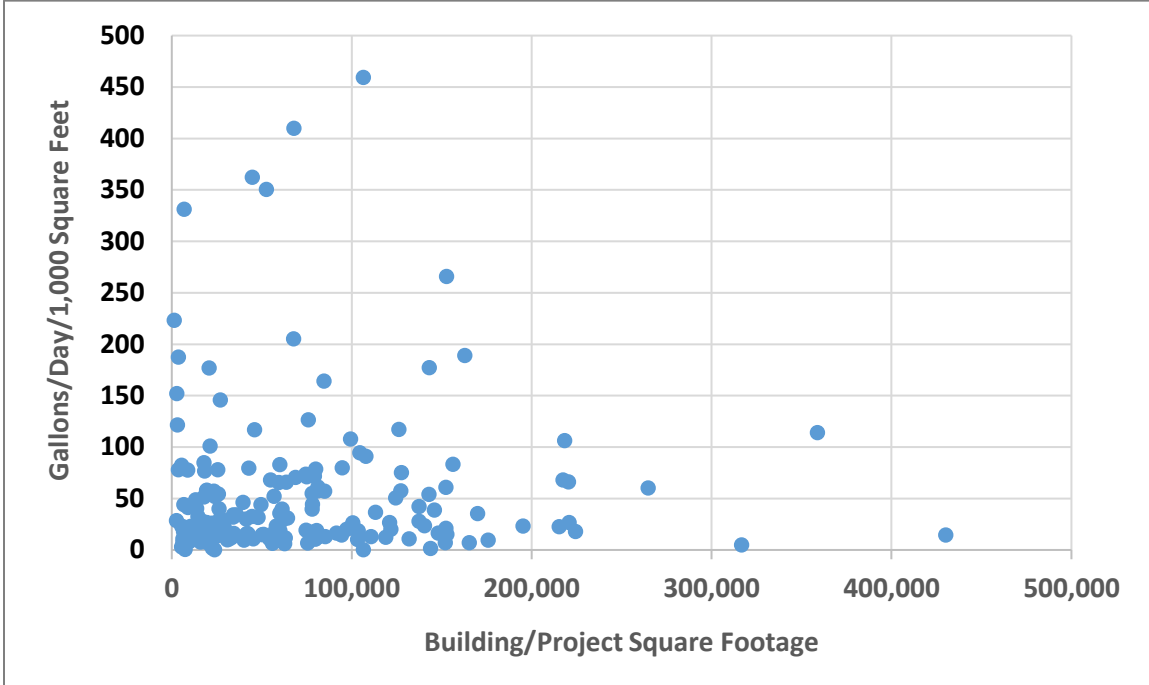
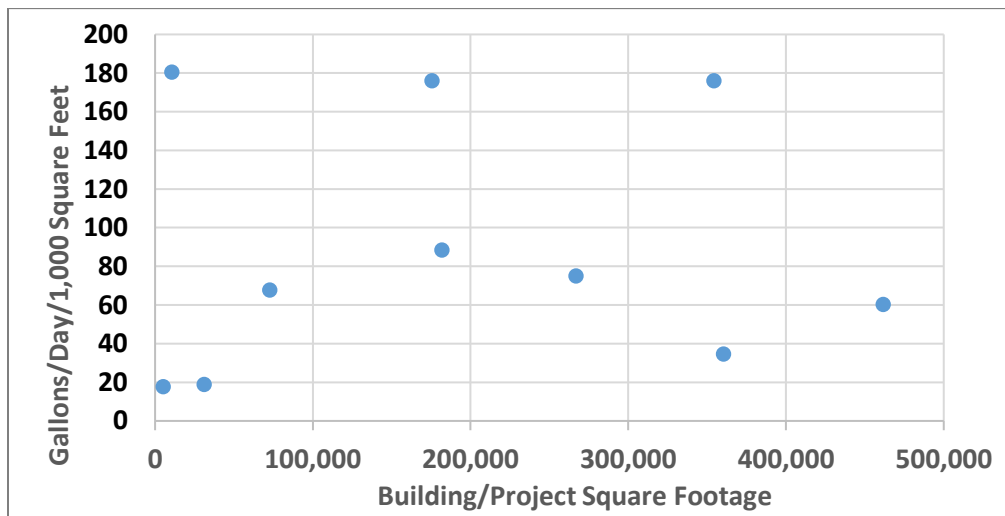


Figure 11 shows average-day water use during CY 2017 for 10 major UNC Health Care buildings on or in close proximity to the main campus. These buildings total about 2 million square feet of building area, and had an average use of 92 gpd/1,000 square feet and a median of about 71 gpd/1,000 square feet. This analysis under-estimates the actual requirements of these buildings, as it excludes the associated water requirements for UNC Health Care’s central cooling facilities and operations that serve most of the buildings included in the above analysis.

Figure 11.

CY 2017 Average-Day Water Use/1,000 Square Feet for Subset of UNC Health Care Buildings



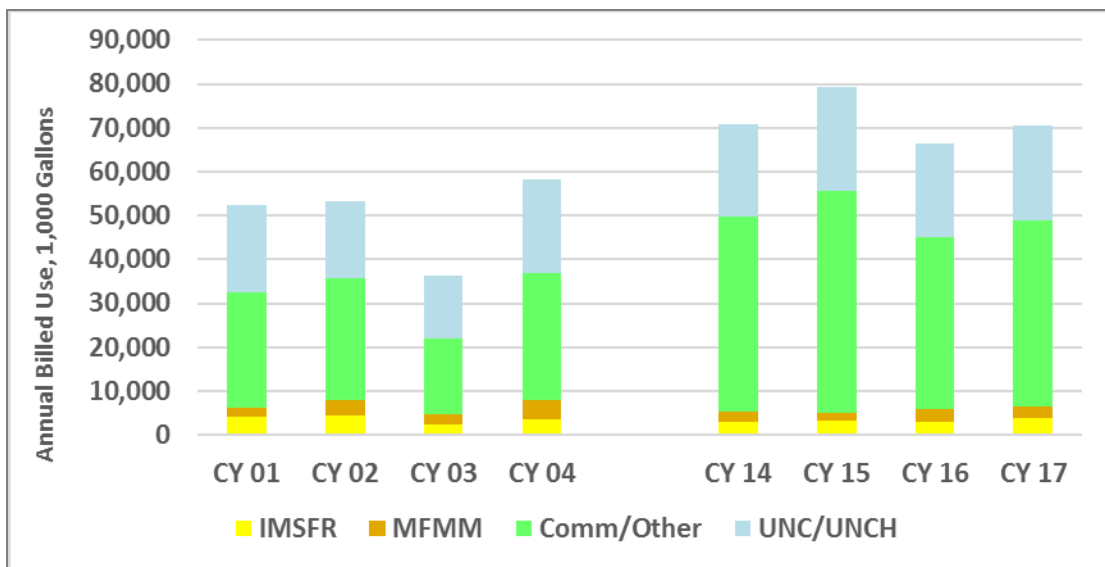
The combined analysis of four years (CY 2014 – 2017) of billed water use for nearly 300 non-residential buildings and commercial centers totaling nearly 20 million square feet of building area indicated an overall average water use factor of about 60 gpd/1,000 square feet. However, this is considered an underestimate of actual use, as it excludes UNC-CH’s and UNC Health Care’s use of water and reclaimed water for central heating and cooling operations that serve many of the buildings included in the above analysis. It also does not consider other non-residential water uses, such as public pools and car washes. To account for this, we have added a 25% adjustment factor for a total use of 75 gpd/1,000 square feet.

Water Use Through Irrigation Meters

The above analyses and graphs include billed drinking water use through irrigation meters serving customers within the four major customer groups. Billed drinking water use through irrigation meters has averaged slightly less than 0.2 mgd for the last four calendar years, accounting for only slightly more than 3% of the total billed drinking water use by our customers.

However, as shown in Figure 12, a comparison of the four-year period from CY 2014 – 2017 with four-year period from CY 2001 – 2004 indicates that billed drinking water use through separate irrigation meters has increased more than 40% compared to the CY 2001 – 2004 period. The number of separate irrigation meters has increased by more than 30% since 2004; however, the overall average use per meter was 8% lower in CY 2017 than in CY 2004. Some irrigation demands are now being met by the reclaimed water system and harvested rainwater, thereby offsetting the need to use our essential drinking water supply sources for irrigation.

Figure 12.
Comparison of Average-Day Billed Drinking Water Use for Irrigation-Only Meters
For the Periods CY 2001 – 2004 and CY 2014 - 2017



Our draft baseline projection does not assume any proportionate increase in irrigation demands in our service area.

WHAT IS THE BASIS FOR THE RESIDENTIAL AND NON-RESIDENTIAL GROWTH PROJECTIONS?

As discussed above, our draft baseline water demand projection is largely driven by the residential and non-residential growth projections prepared for the Carrboro-Chapel Hill area as part of the 2045 Metropolitan Transportation Plan. Those growth projections were developed by local governments in portions of ten counties in the Triangle region with assistance from Triangle J Council of Governments (TJCOG). Using information provided by those local governments, including expected land use and development constraints for 2045, TJCOG used the Triangle CommunityViz 2.0 Model to project where future growth would occur in the region. The OSBM’s 20-year, county-level population projections for 2037 were extended to 2045 then used in the model to determine the amount of residential growth allocated at the county level. The CommunityViz model was used to spatially allocate the projected growth based on land suitability, the type of place each parcel is today and what the applicable local planning department expects it to be in the future, development constraints, and other factors.

TJCOG provided OWASA a parcel-level dwelling unit and economic (employment and non-residential square footage) growth projection database which was incorporated into OWASA’s Geographic Information System (GIS). The database included the growth allocation data for the OWASA service area for the 2045 Scenario and the “Build-Out” scenario (which has an unspecified timetable). The allocations are the additional growth the regional model projects to occur within the OWASA service area, based on the input of the local planning departments and other factors as summarized above.

Table 2 summarizes the 2045 and Build-Out allocations from the CommunityViz model.

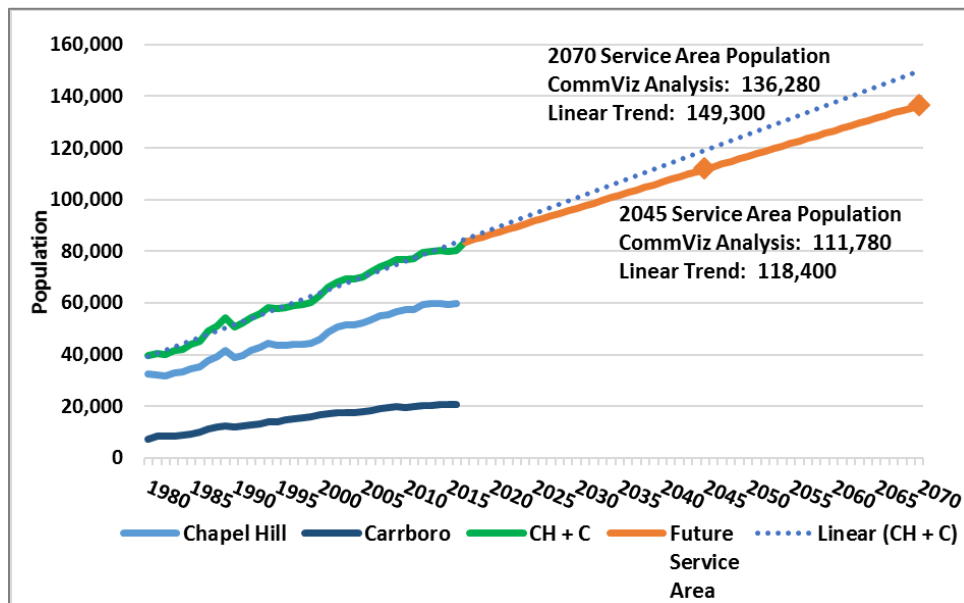
Table 2.
Residential Dwelling Unit and Non-Residential Building Space
Growth Allocations from CommunityViz 2045 and Buildout Scenario

Development Type	Units	# People per DU ^(a)	New Residential Growth (Dwelling Units)		Projected # of New Residents Added		Annualized Rates # New DUs/Year	
			2045	Build-Out	2045	Buildout	2018 - 2045	2046 - 2070
Single-Family Residential	# DUs	2.6	3,639	3,639	9,461	9,461	130	0
Multi-Family Residential	# DUs	2.1	9,001	20,712	18,902	43,495	321	468
RESIDENTIAL SUBTOTAL:			12,640	24,351	28,364	52,957	451	468
Development Type	Units	# Emp. /1,000 SF	Growth (Square Feet)		Projected # of New Employees Added		Annualized Rates # New Non-Res SqFt/Year	
			2045	Build-Out	2045	Buildout	2018 - 2045	2046 - 2070
Industrial	Sq. Ft.	1.8	514,444	519,444	926	935	18,373	200
Office	Sq. Ft.	3.3	5,203,030	10,186,061	17,170	33,614	185,823	199,321
Service-Low	Sq. Ft.	2.9	6,774,483	11,863,793	19,646	34,405	241,946	203,572
Service-High	Sq. Ft.	3.2	775,938	6,221,563	2,483	19,909	27,712	217,825
Retail	Sq. Ft.	2.9	2,877,931	9,142,069	8,346	26,512	102,783	250,566
NON-RESIDENTIAL SUBTOTAL:			16,145,826	37,932,930	48,571	115,375	576,637	871,484

(a) Number of residents per household was from CommunityViz modeling assumptions.

We then used the household population density factors from the CommunityViz model to determine the additional number of residents projected for our service area for each of the two scenarios. That population increase was added to our 2017 baseline year population estimate for our service area (approximately 83,500 people), and then compared to the Year 2045 and Year 2070 population estimates we derived by extending the historical trend line for population growth in the OWASA service area, which is assumed to be the same as the trend line for the combined population of Carrboro and Chapel Hill. Figure 13 shows the results of that comparison.

Figure 13.
Linear Trend Projection for Future Combined Population of Chapel Hill and Carrboro
as Compared to Projected Population of OWASA Service Area Based on CommunityViz Model



These two different methods provide reasonably similar results, as the projected total service area population indicated from the CommunityViz 2045 and Build-Out (2070) scenarios is about 6,600 (5.6%) and 13,000 (8.7%) less, respectively, than the total service area population projected simply by extending the historical linear growth trend line for our service area. Staff also compared the projections to those provided in the recent State of the Community Report; that report showed 2050 projections for the towns (which varies a little from our service area) of 128,755 based on a linear projection from 1990-2010 data. This is about 12,270 (9.4%) more than predicted from the orange line in Figure 13. The 2050 projection for the towns was 102,310 based on a recent, short-term linear trend projection from 2010-2017 data. This is about 12.3% lower than the projection derived using the CommunityViz growth projections, since recent growth has been slower than the longer-term historical rate shown in Figure 13.

WHAT IS THE DRAFT LONG-TERM WATER DEMAND PROJECTION FOR OUR SERVICE AREA?

Following the methods and assumptions summarized above, we have developed a preliminary draft baseline water demand projection for our service area. Table 3 summarizes the projected water demands for five-year increments through 2070.

Table 3.
Raw Water and Customer Demand Projections from Draft 2018 Projection Model
(Figures shown are in MGD)

Year	Projected Customer Demands		Draft 2018 Total Raw Water Demands*
	Drinking Water Demands	Reclaimed Water Demands	
2025	6.74	0.77	7.42
2030	7.14	0.77	7.86
2035	7.53	0.77	8.29
2040	7.92	0.77	8.71
2045	8.31	0.77	9.14
2050	8.85	0.77	9.73
2055	9.38	0.77	10.32
2060	9.92	0.77	10.91
2065	10.45	0.77	11.50
2070	10.99	0.77	12.09

** Includes 10% adjustment to account for non-revenue water (fire-fighting, flushing, leaks, etc.)*

Based on the growth and development projections and water use assumptions summarized in this draft report and incorporated in the demand projection, growth in our non-residential water demands is expected to increase at a faster rate than our residential sector water demands.

WHAT DATA LIMITATIONS AND UNCERTAINTY DO WE FACE AS WE DEVELOP OUR PROJECTION?

The information and understanding and the techniques we have used to develop the draft baseline projection are imperfect; therefore, our projection contains uncertainty. Some key sources of uncertainty are:

- the rate of population growth that is projected to occur;
- the rates and types of residential and non-residential growth projected to occur (as compared to the development projections from the regional transportation model);
- the potential for local governments to agree to expand the urban service area boundary, thereby opening up additional land for growth and development that will require water and sewer services from OWASA;
- the extent to which low impact development, high performance building, and other development trends will affect future demands;
- the extent to which water use efficiency and water use habits will change over time and affect water demands in both existing developments and new developments;
- the effect that a warming climate will have on long-term water demands, such as irrigation and cooling water requirements; and
- how future water use will be affected by changes in price, household income, etc.

HOW SENSITIVE IS THE PROJECTION TO CHANGES IN KEY ASSUMPTIONS?

Our long-term demand projection is based on the key assumptions described above, all of which have some degree of uncertainty. We have evaluated how sensitive the projection is to changes in several of the key assumptions,

Table 4 summarizes how certain changes in key assumptions affect the long-term demand projection.

Table 4.
Sensitivity of Projections to Changes in Single Assumptions

Change in Key Assumption	Projected Effect on Drinking Water Demands	Projected Effect on Raw Water Demands
Projected number of dwelling units or water use factor for residential use is 10% greater than the baseline	Increase by 0.14 mgd by 2045 0.26 mgd by 2070	Increase by 0.16 mgd by 2045 0.29 mgd by 2070
Projected growth in non-residential square footage is 15% greater than assumed in the baseline	Increase by 0.17 mgd by 2045 0.39 mgd by 2070	Increase by 0.19 mgd by 2045 0.43 mgd by 2070
RCW service is extended to meet cooling tower water demands at UNC's Cogeneration Plant	Annual billed drinking water demands would be about 0.09 mgd lower, but overall total billed sales would remain the same.	Annual raw water withdrawals would be about 0.10 mgd lower than the baseline projection.
Urban service area is extended and water service is provided to a Meadowmont or Southern Village type development intensity over a 908 acre area (acreage based on Town of Chapel Hill ETJ outside our service area and drainage area on 15-501 near Smith Level Road inside Orange County)	Increase by 0.53 mgd at project build-out	Increase by 0.58 mgd at project build-out
Water plant process water recycling system is no longer in service	N/A	0.56 mgd by 2045 0.75 mgd by 2070
Reclaimed water system is no longer in service	0.77 mgd This increase would mostly occur during the peak demand summer months.	0.85 mgd This increase would mostly occur during the peak demand summer months.

We do not have any specific analyses upon which to make meaningful assumptions regarding how a warming climate may affect our customers' future demands for water. We plan to have Hazen and Sawyer complete a statistical analysis of how our overall water demands have historically been affected by

changes in temperature and precipitation, and we will provide the conclusions of that evaluation to the Board.

HAVE WE ATTEMPTED TO STATISTICALLY QUANTIFY THE UNCERTAINTY IN OUR PROJECTION?

No, but that could be very helpful in better understanding and explaining the uncertainty in our projection. It could also help us to estimate the probability (likelihood) that our demands will be below or above certain thresholds at key points in the future.

If the Board desires, we can engage a consultant to do such an analysis, using a method like Monte Carlo simulation (MCS). MCS is a tool for doing “What if...” analyses and for systematically modeling a range of possible outcomes by substituting different values for any combination of the important input variables included in the water demand projection model. The values modeled by MCS are randomly selected from a specified probability distribution of possible values. The end result is a large set of demand simulations, the results of which can be statistically analyzed and used to convey the probability of certain outcomes. For example, the results could be used to present outcomes such as “Based on our simulation model, we estimate that there is a 90% chance that water demand will be less than 12 mgd in the next 25 years.”

WHAT DOES STAFF SEE AS THE KEY CONCLUSIONS FROM THIS NEW DRAFT PROJECTION?

When compared to the prior demand projection from the 2010 LRWSP, the draft long-term demand projection presented in this report indicates that demands may be even lower than those previously projected for the 2010 “Expected” growth scenario. Table 5 provides a summary comparison of the two projections.

Table 5.
Comparison of Raw Water Demand Projections from 2010 LRWSP
and September 2018 Draft Report

Year	Draft 2018 Total Raw Water Demands*	2010 LRWSP Projected Raw Water Requirements	Percent Change from 2010 Projection
2025	7.42	9.03	-17.9%
2030	7.86	9.68	-18.8%
2035	8.29	10.24	-19.1%
2040	8.71	10.79	-19.3%
2045	9.14	11.33	-19.3%
2050	9.73	11.86	-18.0%
2055	10.32	12.39	-16.7%
2060	10.91	12.91	-15.5%
2065	11.50	N/A	N/A
2070	12.09	N/A	N/A

** Includes 10% adjustment to account for non-revenue water (fire-fighting, flushing, leaks, etc.)*

WHAT ARE THE PROPOSED NEXT STEPS?

Key next steps for our water demand projection task are:

- Incorporate the Board's comments and guidance into a revised draft projection and report.
- Have Hazen and Sawyer prepare a statistical analysis of the effects of weather on overall system demands, and incorporate the results into the revised draft report.
- Share the revised draft report with Hazen and Sawyer to provide a technical review of the results.
- If the Board desires, retain a consultant to complete a Monte Carlo simulation and incorporate the results of that analysis into the revised draft report.
- Share the revised draft report with the Towns, County, University, UNC Health Care, and others to receive their technical review and corrections, questions, comments, and suggestions.
- Share the revised draft report with nearby water utilities, and continue to exchange information and analyses regarding demand projections, water use analyses, etc.
- Present a final draft baseline projection and report for further review and guidance by the Board. No formal resolution is needed; however, it would be important to have the Board's acceptance of the projections as the starting point for future analyses in the LRWSP.
- Share final projections with community as described in the Community Engagement Plan
- Once the projection is finalized, use it as a basis for identifying projected long-term shortfalls in supply, evaluating the need for and cost-effectiveness of additional supply-side and/or demand-side strategies, etc.

Agenda Item 6:

Review Board Work Schedule

Purpose:

- a) Request(s) by Board Committees, Board Members and Staff
- b) September 27, 2018 Board Meeting
- c) October 11, 2018 Work Session
- d) Review and update the 12 Month Board Meeting Schedule
- e) Review Pending Key Staff Action Items

Information:

- Draft agenda for the September 27, 2018 meeting
- Draft agenda for the October 11, 2018 meeting
- 12 Month Board Meeting Schedule
- Pending Key Staff Action Items from Board Meetings

September 13, 2018

Agenda
Annual Meeting of the OWASA Board of Directors
Thursday, September 27, 2018, 7:00 P.M.
Chapel Hill Town Hall

In compliance with the "Americans with Disabilities Act," interpreter services are available with five days prior notice. If you need this assistance, please contact the Clerk to the Board at 919-537-4217 or aorbich@owasa.org.

The Board of Directors appreciates and invites the public to attend and observe its meetings. Public comment is invited either by petition upon topics not on the Board's agenda, or by comments upon items appearing on the Board's agenda. Speakers are invited to submit more detailed comments via written materials, ideally submitted at least three days in advance of the meeting to the Clerk to the Board via email or US Postal Service (aorbich@owasa.org/400 Jones Ferry Road, Carrboro, NC 27510).

Public speakers are encouraged to organize their remarks for delivery within a four-minute time frame allowed each speaker, unless otherwise determined by the Board of Directors.

Announcements

1. Announcements by the Chair
 - A. Any Board Member who knows of a conflict of interest or potential conflict of interest with respect to any item on the agenda tonight is asked to disclose the same at this time.
2. Announcements by Board Members
 - A. Chatham-Orange Joint Planning Task Force Meeting on Thursday, October 4, 2018 (John Young)
 - B. Natural Resources and Technical Services Committee Meeting on Wednesday, November 14, 2018 at 5:00 p.m. to discuss Overall Approach for Managing Forested Watershed Lands (John Young)
3. Announcements by Staff
 - A. Carrboro Citizen's Academy – OWASA Session on Wednesday, October 10, 2018 (Ed Kerwin)

Presentation of Annual Report

1.
 - A. Executive Director's Comments (Ed Kerwin)
 - B. Finance and Customer Service Director's Comments (Stephen Winters)
 - C. Martin Starnes & Associates, CPAs, P.A.'s Comments (Meg Blue)

Petitions and Requests

2.
 - A. Public
 - B. Board
 - C. Staff

Consent Agenda

Information and Reports

3. 12 Month Board Meeting Schedule (Yinka Ayankoya/Ed Kerwin)

Action

4. Position Reclassification for Distribution and Collection Department (Todd Taylor)
5. Minutes of the August 23, 2018 Meeting of the Board of Directors (Andrea Orbich)
5. Minutes of the September 14, 2018 Work Session of the Board of Directors (Andrea Orbich)
6. Minutes of the September 14, 2018 Closed Session of the Board of Directors for the Purpose of Discussing a Personnel Matter (Robert Morgan)

Regular Agenda

Discussion and Action

7. Resolution Awarding a Contract for the Water Treatment Plant Sedimentation Basin Rehabilitation Construction Project (Simon Lobdell)
8. Resolution Reappointing the Firm of Epting and Hackney as General Counsel to the Orange Water and Sewer Authority (Yinka Ayankoya)

Information and Reports

9. Administration of Strategic Plan
 - A. Annual Review and Update of Strategic Trends and Utility Planning Issues (Ruth Rouse)
 - B. Strategic Plan Progress Report (Ed Kerwin)

Summary of Board Meeting Action Items

10. Executive Director will summarize the key action items from the Board meeting and note significant items for discussion and/or action expected at the next meeting

Closed Session

11. The Board of Directors will convene in a Closed Session for the Purpose of Discussing a Personnel Matter (Robert Morgan)

Agenda
Work Session of the OWASA Board of Directors
Thursday, October 11, 2018, 6:00 P.M.
OWASA Community Room

The Board of Directors appreciates and invites the public to attend and observe its meetings. For the Board's Work Session, public comments are invited on only items appearing on this agenda. Speakers are invited to submit more detailed comments via written materials, ideally submitted at least three days in advance of the meeting to the Clerk to the Board via email or US Postal Service (aorbich@owasa.org/400 Jones Ferry Road, Carrboro, NC 27510).

For items on the agenda, public speakers are encouraged to organize their remarks for delivery within a four-minute time frame allowed each speaker, unless otherwise determined by the Board of Directors.

The Board may take action on any item on the agenda.

Announcements

- a. Announcements by the Chair
 - Any Board Member who knows of a conflict of interest or potential conflict of interest with respect to any item on the agenda tonight is asked to disclose the same at this time.
- b. Announcements by Board Members
 - Natural Resources and Technical Services Committee Meeting on Wednesday, November 14, 2018 at 5:00 p.m. to discuss Overall Approach for Managing Forested Watershed Lands (John Young)
- c. Announcements by Staff
 - Update on the October 10, 2018 Carrboro Citizen's Academy – OWASA Session (Ed Kerwin)
 - Chapel Hill Peoples Academy – OWASA Session on Saturday, October 20, 2018 (Ed Kerwin)
- d. Additional Comments, Suggestions, and Information Items by Board Members (Yinka Ayankoya)

Consent Agenda

Information and Reports

1. Quarterly Report on Attendance at Board and Committee Meetings (Andrea Orbich)

Regular Agenda

Discussion

2. Discuss Communications and Community Engagement (Linda Low)
3. Discuss Key Performance Indicator Deep Dive on Water Loss and Non-Revenue Water (Mary Tiger)
4. Discuss Draft OWASA Action Items Recurring Every 3 to 5+ Years (Ed Kerwin)
5. Review Board Work Schedule (Yinka Ayankoya/Ed Kerwin)
 - a. Request(s) by Board Committees, Board Members and Staff
 - b. October 25, 2018 Board Meeting
 - c. November 8, 2018 Work Session
 - d. 12 Month Board Meeting Schedule

- e. Pending Key Staff Action Items

Summary of Work Session Items

- 6. Executive Director will summarize the key staff action items from the Work Session

Closed Session

- 7. The Board of Directors will convene in a Closed Session for the Purpose of Discussing a Personnel Matter (Robert Morgan)

DRAFT

OWASA Board of Directors – 12 Month Board Meeting Schedule (September 7, 2018)

Month	Board Meetings		Committee & Other Meetings
	Work Session	Business Meeting	
September 2018	Annual Report on Disposal of Surplus Personal Property (C) Diversity and Inclusion Program Progress Report and Equal Employment Opportunity/Affirmative Action Report for Fiscal Year 2018 (C) Discuss Action Plan from WTP & WWTP Reliability and Risk Assessment Project Discuss LRWSP – Demands & Yield CS – General Counsel Review (C)	Annual Report and Financial Audit (C) Approve General Counsel Engagement (C) Strategic Trends Report and Strategic Plan Update (C) Award the WTP Sedimentation Basin Rehabilitation Construction Contract Position Reclassification for Distribution and Collection Department CS – Prepare for ED Review (C)	<i>NRTS Committee Meeting to continue discussion of source water protection (9/11/2018)</i> <i>Finance Committee Meeting to discuss longer-term approach/strategy for operating cost management (TBD)</i> <i>HR Committee Meeting to discuss retiree health and 457 deferred compensation (TBD)</i>
	9/13/2018	9/27/2018	
October 2018	Discuss KPI Deep Dive on Water Loss and Non-Revenue Water Discuss Communications and Community Engagement Discuss Draft OWASA Action Items Recurring Every 3 to 5+ Years CS – ED Review (C)	Q1 Financial Report (C) Award the WWTP Solids Thickening Improvements Construction Contract Approve AMI Policies Discuss Recreational Fees for Out-of-County Visitors	<i>Chatham-Orange Joint Planning Task Force Meeting (10/4/2018)</i> <i>Carrboro Citizen’s Academy – OWASA Session (10/10/2018)</i> <i>Chapel Hill Peoples Academy – OWASA Session (10/20/2018)</i>
	10/11/2018	10/25/2018	
November 2018	Discuss Strategic Plan Update Approve ED Key Focus Areas	<i>Holiday - no meeting</i>	<i>NRTS Committee Meeting to discuss overall approach for managing forested watershed lands (11/14/2018)</i>
	11/8/2018		
December 2018	Award the Gravity Sewer Rehabilitation Package #3 Contract 12/13/2018	<i>Holiday - no meeting</i>	<i>NRTS Committee Meeting (TBD – If needed)</i>
January 2019	Employee Health and Dental Insurance Update (C) Appoint Audit Firm (C) Affordability Outreach Program Plan Update (Tentative) Authorize Applying for SRF Loans	Annual Lakes Recreation Report (C) CIP Semiannual Report (C) Q2 Financial Report (C) FY 20 Budget Calendar and Assumptions (C)	
	1/10/2019	1/24/2019	
February 2019	CS – Prepare for General Counsel Interim Review (C)	CS - General Counsel Interim Review (C)	
	2/14/2019	2/28/2019	
March 2019	FY 20 Draft Budget & Rates (C) Review AMI Manual Read (C) CS - Prepare for ED Interim Review (C)	Annual Update of the Energy Management Plan (C) FY 20 Draft Budget & Rates and Proposed Staff Rate Adjustment Recommendation (C) Set date for Public Hearings – FY 20 Budget & Rates (C)	

OWASA Board of Directors – 12 Month Board Meeting Schedule (September 7, 2018)

Month	Board Meetings		Committee & Other Meetings
	Work Session	Business Meeting	
	3/14/2019	CS – ED Interim Review (C) 3/28/2019	
April 2019	Review Employee Health and Dental Insurance Renewals (C) FY 20 Draft Budget and Rate Adjustment Information (C) Appointment of the Nominating Committee (C) 4/11/2019	Q3 Financial Report (C) FY 20 Budget and Rates Discussion and Authorize Staff to Publish Proposed Rates 4/25/2019	
May 2019	Approve Employee Health and Dental Insurance Renewals (C) Discuss Employee Merit Pay for FY 2020 (C) 5/10/2019	Public Hearings – FY 20 Budget and Rates (Tentative) Approve New Banking Services Provider (C) 5/23/2019	
June 2019	Approve FY 20 Budget and Rates, including merit pay decision (C) Election of Officers (C) 6/13/2019	TBD 6/27/2019	
July 2019	TBD 7/11/2019	TBD 7/25/2019	
August 2018	TBD 8/8/2019	Preliminary 12 Month Financial Report (C) CIP Semiannual Report (C) CS – Prepare for General Counsel Review (C) 8/22/2019	

The 12 Month Board Meeting Schedule shows Strategic Plan initiatives and other priority efforts that the Board and staff plan to give greatest consideration to during the next twelve months. The schedule also shows major recurring agenda items that require Board action, or items that have been scheduled in response to the Board's prior standing request. This schedule does not show all the items the Board may consider in a work session or business meeting. It also does not reflect meetings at which the Board will discuss and act on the update of the Strategic Plan.

The 12 Month Board Meeting Schedule will be reviewed and updated at each monthly work session and may also be discussed and updated at the Board's business meetings.

In addition to the initiatives shown in this schedule, staff will be working on other Strategic Plan and organizational priorities that are not expected to require major additional discussion with the Board except as part of budget deliberations.

The schedule implies that the following Strategic Plan initiatives would be addressed beyond the 12-month period. The Board may conclude that one or more of the following initiatives are higher priority. The schedule will be revised as needed to reflect the Board's priorities, and any additional initiatives that the Board may decide to address.

- Development of a plan and policy framework for OWASA lands is considered a longer-term priority. The NRTS Committee discussed this issue in September 2017 and determined it was lower priority than Forestry Management. Staff presented an overall approach for Forestry Management to the Board in May 2018, and this was referred to the NRTS Committee for further discussion; NRTS is scheduled to discuss on November 14, 2018.
- Improve effectiveness as a learning organization is considered a longer-term priority.
- Water Conservation Plan will be prepared concurrent with update of the Long-Range Water Supply Plan.

The OWASA Board determines which topics it wants to explore as a full Board (potentially in a work session format) and which topics it wants to assign to Board committees or committee chairs for further analysis and

OWASA Board of Directors – 12 Month Board Meeting Schedule (September 7, 2018)

development of recommendations. Board also determines priorities and desired timeframes for addressing topics. Committee meetings will be updated on the schedule routinely.

Abbreviations Used in Draft Schedule:

☺	Recurring agenda item (generally these are “required” items)	KPI	Key Performance Indicator
AMI	Advanced Metering Infrastructure	LRWSP	Long-Range Water Supply Plan
CE	Community Engagement	MOA	Memorandum of Agreement
CEP	Community Engagement Plan	MST	Mountains-to-Sea Trail
CIP	Capital Improvements Program	MFMM	Multi-Family Master Meter
COLA	Cost of Labor Adjustment	NCDOT	North Carolina Department of Transportation
CS	Closed Session of the Board	NRTS	Natural Resources and Technical Services
CY	Calendar Year	Q	Quarter
D&I	Diversity and Inclusion	RFP	Request for Proposals
ED	Executive Director	SRF	State Revolving Fund
EEO	Equal Employment Opportunity	SOW	Scope of Work
FY	Fiscal Year	TBD	To Be Determined
HR	Human Resources	WTP	Water Treatment Plant
JLP	Jordan Lake Partnership	WWTP	Wastewater Treatment Plant

Pending Key Staff Action Items from Board Meetings

No.	Date	Action Item	Target Board Meeting Date	Person(s) Responsible	Status
1.	7-12-2018	Provide the Board by email staff's draft questions on Social Responsibility and Environmental Sustainability to be included in staff's RFP for banking services. Staff will consider feedback from individual Board members and issue RFP. Staff will review and rank banking proposals on all criteria except Social Responsibility and Environmental Sustainability, which will be discussed by the Board.	TBD	Winters	Complete – e-mail sent on 8-23-2018
2.	7-12-2018	Address the Board's feedback on the action plan on communications during OWASA-related emergencies.	NA	Low	
3.	7-12-2018	Address the Board's feedback in preparing the consultant's final report on the WTP and WWTP Reliability and Risk Assessment Evaluation. Provide the Board staff's action plan to address the report's recommendations.	9-13-2018	Darr Taylor Loflin M. Dodson	Complete
4.	5-10-2018	Provide the Board information for discussion at a future meeting regarding the timing of the next review of the Employee Pay Administration Guidelines.	10-11-2018	Glasgow	Complete – e-mail sent on 9-6-2018
5.	5-10-2018	Provide the Board a list of key tasks/actions for recurring Board attention over the next five years.	10-11-2018	Kerwin	Complete - e-mail sent on 7-19-2018
6.	5-10-2018	Schedule a NRTS Committee meeting to continue discussing source water protection.	NA	Rouse	Complete - NRTS Meeting scheduled for 9-11-2018 at 5 p.m.
7.	5-10-2018	Schedule a NRTS Committee meeting to discuss overall approach for managing OWASA's forested watershed lands.	NA	Rouse	Complete - NRTS Meeting scheduled for 11-14-2018
8.	5-10-2018	Schedule a Finance Committee meeting in the fall of 2018 to discuss longer-term approach/strategy for cost management.	NA	Winters	To be scheduled in September

Pending Key Staff Action Items from Board Meetings

No.	Date	Action Item	Target Board Meeting Date	Person(s) Responsible	Status
9.	4-26-2018	Provide Board via email information about renewal and replacement reserves for the reclaimed water system to include an outlook for future capital investment.	NA	Winters Taylor M. Dodson Gangadharan	Staff has updated the reserve calculation and will schedule a meeting with UNC to discuss before providing to the Board.
10.	4-26-2018	Discuss out-of-County fees for lake use for the next recreation season.	10-25-2018	Taylor Loflin	Complete - on 12-Month Board Meeting Schedule
11.	1-25-2018	Incorporate Board Members suggestions in the next CIP report.	8-23-2018	Gangadharan	Complete
12.	1-25-2018	Consider an Open House and other opportunities to attract greater MWBE participation in bidding construction projects.	NA	Gangadharan	Complete – Staff provided an update with the August 23, 2018 CIP Semiannual Report and noted that ongoing MWBE outreach efforts and results will continue to be reported in future CIP semiannual reports.
13.	11-9-2017	Address Board member feedback on Strategic Trends Report for next year.	9-27-2018	Rouse	
14.	10-12-2017	Schedule future Board discussion about low-flow benchmarks to be used once AMI is implemented.	TBD	Winters Taylor	