

DATE: February 3, 2020
TO: Matt Jordan, General Manager
FROM: Kenneth R. Herd, Chief Science and Technical Officer *KRH*
SUBJECT: Science and Technical Division Activity Report for December 2019 and January 2020

SUMMARY

The Science and Technical Division Activity Report summarizes the key activities of the Planning, Decision Support, Environmental Management and Regulatory Compliance, and Water Quality Services Departments during the months of December 2019 and January 2020.

RECOMMENDATION

Receive and File.

DISCUSSION

The major activities and work effort of the departments which comprise the Science and Technical Division for the months of December 2019 and January 2020 are discussed below.

Planning & Systems Decision Support

The Planning & Systems Decision Support Group is responsible for short and long-term planning support such as master water supply planning, operational planning, seasonal source allocation, demand and supply planning, and is also responsible for the design, implementation, and maintenance of water resources optimizations tools, hydrological models, decision support systems, and water demand forecasting systems. The group also supports the agency in conducting research on the impact of climate variability/climate change and sea level rise.

Planning Department

The Planning Department is responsible for creating, updating and implementing the agency's Long-term Master Water Plan and other related agency programs and initiatives.

December 2019 and January 2020 Activities Include:

- Continued working on Decision Framework for Infrastructure Sequencing (DFIS) project to refine the timing of new supply infrastructures and establish key indicators for monitoring and trigger action for implementation.
- Completed initial source water allocation for FY 2020 plus five-year planning horizon.
- Continue working on 2019-2023 Long-term Master Water Plan update component projects.

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- Initiated a University of Florida research project on understanding of climate change impacts on water quality.
- Continued coordination with the Long-term Master Water Plan Feasibility Projects; attended meetings with the CIP Project Manager and consultants on the Surface Water Treatment Plant Project to discuss modeling work necessary for the feasibility evaluation; attended Desalination Plant Expansion Feasibility Project meetings to discuss the proposed pilot project; continued quarterly meetings with the member governments to keep abreast the feasibility studies and to re-start negotiations for the reclaimed water credits related to the New Groundwater via Net Benefit from SHARP project. Staff is working with Hillsborough County staff on selection of a test well site for the South Hillsborough Aquifer Recharge Project (SHARP).
- Worked with System Decision staff on reliability and yield modeling scope and schedule for the Feasibility Studies projects.
- Continued collaboration with engineering on the South Hillsborough County Supply Options projects.
- Continued the review of development proposal applications, comprehensive plan amendment applications, and water quality reports within Tampa Bay Water's service area.
- Met with the Hillsborough County Planning Commission staff to discuss the analysis of residential density trends.
- Coordinated with SWFWMD on completing the FY 2021 co-funding applications for select projects.
- Presented at the Florida Section AWWA conference.
- Attended "Champions of Change" regional resilience summit.
- Attended Water Utility Climate Alliance coordination meetings.
- Attended Water Utility Climate Alliance Sea Level Rise Committee meetings.
- Continued work with Water Quality Services to update the Source Water Assessment and Protection Plan and participate in national research.
- Continued work with the Water Quality Services on the WaterSuite GIS platform to complete transitioning and integration of the Land Use Program.
- Continued collaboration with Water Quality Services on Aquifer Vulnerability Assessment project.
- Attended the Exhibit D Modification Study meetings with Water Quality Services.
- Collaborated with Hillsborough County and internal staff on updating the County's Wellhead Protection Maps.
- Continued collaboration and work with the Hillsborough County and Tampa Bay Water staff on the County's initiative to amend its Wellhead Protection Ordinance Maps.
- Provided a tour of Desalination Facility to the SWFWMD employees.
- Attended Water Research Foundation meeting to discuss upcoming projects in 2020.

Systems Decision Support Department

The Systems Decision Support Department functions include the design and implementation of water resources optimization, decision support systems, system performance and reliability analysis and water demand/supply forecast programming at various time scales.

December 2019 and January 2020 Activities Include:

- Reviewed final reports and wrap-up on the project to improve spatial and temporal representation of basin rainfall in Integrated Northern Tampa Bay (INTB) model by using historical radar rainfall. Specifically, working on comparing the result of Bayesian 15-minute basin rainfall with the original INTB basin rainfall.
- Continued working with consultants on the Stochastic INTB Basin Rainfall Generation project, a radar rainfall-based realization to be used in all reliability-related studies that use Integrated Hydrologic Model (IHM)/INTB model and System-Wide Reliability Evaluation (SWRE) model.
- Continued working with consultants on the Uncertainty Analysis Study for surface water parameters of the IHM/INTB model, a step toward replacing the Operational Modeling System (OMS) streamflow with INTB streamflow in the SWRE model.
- Collaborated with Water Research Foundation on the project to develop a multi-objective monthly water allocation model.
- Maintained system administration scripts to automate deployment of Operating System and application on the Scientific Grid Computing System (vGrid), major software updates.
- Continue working with IT on replacement strategy of vGrid systems. Designing the new virtualization configurations for the computing high performance of different model applications. Develop configuration deployment scripts and performing several tests on variate model runs on the new vGrid cluster.
- Continued work on Water Shortage Mitigation Plan (WSMP) implementation. Currently improving rainfall simulation models.
- Continue investigating for the best approach to demonstrate the effective of OROP effectiveness.
- Started an internal project to examine the relationship between influent water quality and chemical use at the regional surface water treatment plant.
- The IHM-INTB Steering Committee (Committee), comprised of staff from Tampa Bay Water and the SWFWMD, is responsible for maintenance of the IHM code, INTB model, and support for users of the IHM and the INTB model. Monthly meetings of the Committee produce collaborative outcomes which meet the responsibilities while sharing resources. Each year, the agencies collaborate to update the IHM-INTB Five Year Roadmap which is specific for each agency with many common, cost-shared support activities.
 - Maintain and modify content for the IHM website.
 - Worked collaboratively with the SWFWMD to extend the historical time series inputs and observation targets by 10 years (2007-2016) for the calibrated INTB model. A more recent land use (2010) snapshot will be used within the extended 10-year timespan. The extended

- time series will provide 28 years of historical simulation. This work started in FY2017 and will be completed in FY2020.
- Worked collaboratively with the SWFWMD to upgrade technology and to improve the simulation capability of the IHM to meet future decision-support needs. This work is a multi-year effort which started in FY2017.
 - Provided training for staff of SWFWMD and students from University of Central Florida to use the IHM and INTB model.
- A multi-year project is ongoing to build a statewide database containing actual evapotranspiration data using spatial and temporal resolutions of 2 kilometers and at least monthly, respectively. Evapotranspiration represents at least 70% of average annual rainfall and can range from 50% to 90% of annual rainfall for a wet and dry year, respectively. The US Geological Survey (USGS) is performing the work with funding by Tampa Bay Water, all five water management districts, and the USGS. Reviewed first and second round of interim work products for year two and provided comments.
 - Using the INTB model, conduct research with University of Central Florida to investigate the influence of landuse change on streamflow, aquifer levels, and other hydrologic responses in two river watersheds.
 - Support Regulatory Compliance: continuing review of proposed Minimum Flows for rivers and Minimum Levels for lakes, and recovery assessment for the consolidated wellfields; resolved some issues regarding the Consolidated Water Use Permit (CWUP) conditions with the SWFWMD.
 - Continued support of Water Production Division through weekly OROP productions scheduling.
 - Continued support of Water Production Division through weekly surface water availability forecast.
 - Continued support on seasonal surface water availability forecast for monthly Water Production and Science and Technical Divisions coordination meeting.
 - Continued support of agency Asset Management team on level-of-service/risk and continuous improvement projects.
 - Continued to develop applied research concepts applicable to Tampa Bay Water with allied research institutions (Water Utilities Climate Alliance, Florida Water and Climate Alliance, University of Florida, Florida State University, University of South Florida, AWWA, and USGS).
 - Continued member government billing data collection and review process. Attempting to receive member government billing data monthly to track demand changes in different water use sectors. Since the City of Tampa has not provided data for 2018 and 2019, the demand forecast update for 2020 was developed without this data.
 - Annual data collection is continued to update the Long-term Demand Forecast Database.
 - The newly developed long-term probabilistic water demand forecast model is set up for testing using the recent model input data.
 - Implementation of a regional demand management program through a Demand Management Working Group, made up of member government and SWFWMD representatives, is continuing, consistent with the Tampa Bay Water Interlocal Agreement.

- Development of a Geographic Information Systems (GIS) platform needs assessment for the demand management program has been completed and an agreement with the University of Florida to develop the actual platform has been approved. This work has begun with platform completion needed prior to March 2020.
- Continued to provide support for agency-wide level of service enterprise dashboard development as part of the asset management activity by providing data as needed.

Environmental Management and Regulatory Compliance. The Environmental Management and Regulatory Compliance group performs work in four areas: (1) implementation of an Environmental Management (ISO 14001) system, (2) compliance tracking, reporting and implementation of environmental permits, including coordination of permit applications and renewals, (3) collection and submittal of hydrologic and water quality data as required by Water Use Permits, and (4) implementation of our well mitigation program under the Tampa Bay Water Well Mitigation Policy and water use permits.

Environmental Management System

Several Environmental Management System (EMS) initiatives are underway. These include development of processes and procedures to facilitate and track employee training using an on-line Learning Management System, drafting of documented procedures for critical regulatory and operational functions and improving document and data management capabilities. These initiatives are important for the implementation of an EMS that meets ISO 14001 requirements.

Tampa Bay Water is in the process of assessing risks to Tampa Bay Water facilities associated with natural hazards and malevolent acts to meet the requirements of the America's Water Infrastructure Action (AWIA). This Risk and Resilience Assessment is being completed to support the submittal of the required certification form to U.S. EPA by March 31, 2020.

Compliance Tracking: The compliance tracking staff is responsible for generating, reviewing, and providing quality assurance of reports submitted for regulatory compliance. All compliance reports were submitted on time.

Calendar Year to Date Compliance Tracking Activities:

- 2112 total number of compliance reports for 2019

December 2019 and January 2020 Activities Include:

- December 2019 – 189 compliance reports
- January 2020 - 197 compliance reports

Well Mitigation: The well mitigation staff receives and responds to all well complaints and mitigates domestic well issues as required by our Water Use Permits and the Well Mitigation Policy.

Activities completed in December 2019 and January 2020

Total Well Complaints Received:

- December 2019 – 4
- January 2020 - 2

Total Well Mitigations Completed:

- December 2019 - 0
- January 2020 - 0

Environmental Monitoring: The Environmental Monitoring Department staff collect permit-required water level data and completes pre- and post-well mitigation complaint investigations.

December 2019 and January 2020 Activities Include:

- Completed manual water level measurement at 1247 sites twice monthly.
- Maintained and calibrated 356 continuous (hourly) monitoring devices twice monthly.

Water Use Permitting: The staff of the Water Use Permitting Department is responsible for acquiring, renewing, and assessing compliance with all conditions of Tampa Bay Water's Water Use Permits.

December 2019 and January 2020 Activities Include:

- Continued technical analyses and coordination with the SWFWMD on the Consolidated Permit Recovery Assessment Plan. The plan will evaluate the degree of recovery in lakes and wetlands achieved by reducing the Consolidated Permit wellfields pumping to an average annual quantity of 90 mgd. The plan will also assess the degree of any remaining environmental impact and propose a mitigation/offset plan for those impacts, if necessary. The preliminary assessment report of findings for monitored and unmonitored wetlands and lakes on all 11 wellfields was submitted to SWFWMD in December 2018 and shared with all member governments. Continuing to work with SWFWMD to complete technical analyses and field review of sites to confirm the final assessments for all monitored lakes and wetlands. Finalized the wetland mitigation accounting method to be used at the conclusion of the Recovery Assessment process. The final assessment report will be completed by mid-2020 and included in the renewal application package for the Consolidated Permit. Staff continue to write the final Recovery Assessment Report.
- Staff held a pre-application meeting on April 26, 2019 with the SWFWMD and member governments for the renewal of the Water Use Permit for the South-Central Hillsborough Regional Wellfield which expires in December 2020. This permit renewal application was approved by the Board at the October meeting and arbitration was not requested by any member government. The application was submitted to the District on January 2, 2020. District staff reviewed the application documents and issued a Request for Additional Information letter on January 28, 2020. Staff anticipate responding to the District's questions within the next 30 days.

- Tampa Bay Water staff have met with the staff of all member governments to discuss the renewal of the Consolidated Water Use Permit. A pre-application meeting with the SWFWMD and members was held on December 13, 2019. Staff will continue to prepare the renewal application documents which will include the final Recovery Assessment Plan Report. The renewal application will be presented to the Board for consideration and approval in August 2020.
- Supporting the investigation of a potable supply wellfield associated with the South Hillsborough Aquifer Recharge Project/Expansion (SHARP/SHARE) project. HSW Engineering has been retained to assist with the design, construction, and testing of a test production well and monitor wells in the Balm area of southern Hillsborough County. Construction of the wells is expected to begin in Spring 2020.
- Continued regular land management activities at the Regional Reservoir Wetland Mitigation Areas and the portion of the Cypress Creek Wellfield owned by Tampa Bay Water. This work includes application of prescribed fire for vegetation control and fire fuel load reduction at appropriate times of the year and the treatment/maintenance of nuisance vegetation.

Water Quality Services

The Water Quality Services staff is responsible for all water quality sampling and analysis (Laboratory), compliance with Drinking Water and Environmental Resource permits, research on drinking water treatment, and source water quality assessments, and assists member governments in addressing water quality issues in delivered water and in their distribution systems.

Laboratory: The Laboratory is responsible for collecting and analyzing water samples for regulatory compliance, process control, contract obligations, customer inquiries and research needs. The new Inductively-Coupled Plasma/mass spectrometer metals analyzer has been installed and is being optimized for the use of EPA Method 200.8. This new technology will enable our laboratory to perform in-house analysis of regulated trace metals that had previously been sent to contract laboratories for analysis.

December 2019

- Samples collected: 295
- Samples received: 574
- Analyses performed: 5,088

January 2020

- Samples collected: 192
- Samples received: 488
- Analyses performed: 3,625

Source Water Assessment: Department functions include water quality services, source water assessment program, hydrobiological monitoring programs, and regulatory compliance support for Tampa Bay Water environmental and operation permits.

December 2019 and January 2020 Activities Include:

Water Quality Services

- Assisted with Tampa Bay Water's AWIA risk and resiliency assessment for facilities.
- Assisted with source water and environmental impact components of Master Water Plan feasibility studies for Regional Surface Water Treatment Plant and Desal Facility.
- Provided as-needed technical support for implementation of Tampa Bay Water's Performance Dashboard.
- Attended monthly Water Quality Work Group meetings to discuss water quality issues with member government staff.
- Assisted Water Production and Decision Support with member Point of Connection and data evaluation for Exhibit D standards and Total Organic Carbon (TOC) project.
- Continued development/implementation of Exhibit D water quality dashboard.
- Continued working with Laboratory and Compliance staff to improve water quality data management.
- Continued implementation of online continuous source water quality monitoring plan for Tampa Bypass Canal including assessment of parameter/equipment options with anticipated completion by mid-2020.
- Continued implementation of online continuous source water quality monitoring plan for Alafia River including assessment of USGS and Tampa Bay Water parameter/equipment options with anticipated implementation in fall 2020.
- Continued maintenance and calibration activities for Tampa Bay Water continuous water quality sensors in Alafia watershed and Reservoir.

Source Water Assessment and Protection Program (SWAPP)

- Continued vulnerability assessment project to identify and prioritize potential groundwater contamination sources for Tampa Bay Water wellfields (follow-up from 2019 pilot project).
- Continued project to further evaluate current and legacy sources, environmental factors and chemical interactions affecting in-stream fluoride concentrations in the Alafia River.
- Completed draft annual watershed/water quality assessment for Alafia River.
- Continued land use reviews and development of additional data layers for Tampa Bay Water's SWAPP GIS platform.
- Continued multi-utility Water Research Foundation project on Source Water Risk Management Framework and Tampa Bay Water business case for Source Water Protection.
- Continued multi-utility Water Research Foundation project on Decision Support Framework for Drinking Water Treatment Plants- workshop scheduled for April 2020.

Hydrobiological Monitoring Programs (HBMP)

- Met with SWFWMD staff to discuss Alafia River and TBC/Hillsborough River WUP-required documents: 2019 HBMP Design Update and scoping for WY 2020 Alafia River and TBC/Hillsborough River multi-year interpretive reports.
- Continued WUP-required Alafia River and TBC/Hillsborough River HBMP routine data collection and assessment.
- Continued HBMP statistical and mechanistic model updates for water quality assessment with anticipated completion in early 2020.
- Continued Desal Facility water quality monitoring program.

Stakeholder and Other Activities

- Continued working with the FDEP and Mosaic on Alafia River and South-Central Hillsborough Regional Wellfield water quality management issues- discussed watershed changes and reclaimed lands projects at December 2019 meeting.
- Participated in January 2020 workshop with USGS to present and discuss Tampa Bay Water data use and needs for source water quality.
- ANSI/AWWA G300 Source Water Protection Standard (committee member)- updated standard anticipated in 2020.
- U.S. EPA Water Security Division: Online Water Quality Monitoring Forum (steering committee member)- ongoing.
- Nitrogen Management Consortium (member)- ongoing.
- Tampa Bay Estuary Program (TBEP) Technical Advisory Committee and Management Board (member)- ongoing.
- Tampa Bay Regional Planning Council/Agency on Bay Management (member)- ongoing.

Table 1. Agency Water Use Permits (Active)

Water Supply Facility/Project	Permit Duration	Expiration Date
South Central Hillsborough Wellfield	13 years	December 2020
Pasco Lake Augmentation	6 years	January 2021
Lake Loyce Augmentation	6 years	January 2021
Triangle Lake Augmentation	6 years	January 2021
Monsees Pond Augmentation	6 years	January 2021
Consolidated Permit Wellfields	10 years	January 2021
Brooker Creek Preserve Wetland Augmentation	8 years	July 2021
Big Fish Lake Augmentation	10 years	June 2025
Carrollwood Wells	20 years	December 2030
TBC/Hillsborough River Facility	23 years	December 2030
TBC/Harney Water Transfer Facility	20 years	July 2031
Alafia River Facility	20 years	November 2032
Brandon Urban Dispersed Wellfield	20 years	August 2039