NACWA Excellence In Management Recognition Program
2018 Award Application
**EXCELLENCE IN MANAGEMENT RECOGNITION PROGRAM**

**Nomination Form**

**APPLICANT INFORMATION**

<table>
<thead>
<tr>
<th>AGENCY NAME</th>
<th>Charleston Commissioners of Public Works, d/b/a Charleston Water System</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITY</td>
<td>Charleston</td>
</tr>
<tr>
<td>STATE</td>
<td>South Carolina</td>
</tr>
<tr>
<td>SERVICE POP.</td>
<td>450,000</td>
</tr>
</tbody>
</table>

**CEO**

<table>
<thead>
<tr>
<th>TITLE</th>
<th>F. K. Hill</th>
</tr>
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<tbody>
<tr>
<td>ADDRESS</td>
<td>103 St. Philip Street</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>CITY</th>
<th>Charleston</th>
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<tbody>
<tr>
<td>STATE</td>
<td>South Carolina</td>
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<tr>
<td>ZIP</td>
<td>29403</td>
</tr>
</tbody>
</table>

**PHONE**

| (843) 727-7150 | HillFK@charlestoncpw.com |

**SIGNATURE OF AGENCY REPRESENTATIVE COMPLETING THE APPLICATION**

**CERTIFICATION STATEMENT**

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons directly involved in gathering and evaluating the information, the information submitted is to the best of my knowledge and belief true, accurate and complete.

In submitting this application, I agree to NACWA using all or part of this application as an example to be posted publicly for future utilities to reference.

<table>
<thead>
<tr>
<th>TITLE</th>
<th>F.K. Hill</th>
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<tr>
<td>CEO</td>
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**NACWA PRIMARY CONTACT SIGNATURE**

<table>
<thead>
<tr>
<th>NACWA PRIMARY CONTACT NAME</th>
<th>F.K. Hill</th>
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<tbody>
<tr>
<td>TITLE</td>
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</tbody>
</table>

| Signature of NACWA PRIMARY CONTACT | F.K. Hill, P.E. |
NOMINATION SUBMITTAL

I am applying for recognition under the following category*: 

☐  Platinum (9 Attributes)
☐  Gold (7 Attributes)
☐  Silver (5 Attributes)

*Applications that do not meet the minimum qualifications for the selected recognition category will be considered for other categories, as appropriate.

I am including the following Attributes in my written narrative. Note that every applicant is required to include Product Quality and Financial Viability as part of their minimum demonstrated Attributes. Please check the appropriate boxes:

☐  Product Quality (Required Attribute)
☐  Financial Viability (Required Attribute)
☐  Customer Satisfaction
☐  Stakeholder Understanding & Support
☐  Operational Optimization
☐  Employee & Leadership Development
☐  Enterprise Resiliency (Inclusive of all enterprise resiliency initiatives, not solely emergency management)
☐  Infrastructure Strategy & Performance
☐  Community Sustainability
☐  Water Resource Sustainability

I have attached or provided hyperlinks and relevant page references to my utility’s Strategic Plan, Financial Plan, and any other Strategic Metrics not otherwise included in your Strategic Plan and Financial Plan. Please check the appropriate boxes and provide hyperlinks, if selected.

☐  Strategic Plan Hyperlink: __________________________

NOTE: Links to all required and supplemental documents can be found on pp. 12-13 of the application.

☐  Financial Plan Hyperlink: __________________________

☐  Strategic Metrics** Hyperlink: _______________________

**not otherwise included in Strategic Plan or Financial Plan

Please submit completed nominations by May 9, 2018 to btrombino@nacwa.org

For questions, please contact: Bredy Trombino, Program Administrator at 202.533.1820 or btrombino@nacwa.org
**Mission**

To protect public health and enhance the environment of our service community by providing clean water services of exceptional quality and value.

**Vision**

By 2017, our 100th anniversary, our Vision is to become worthy of the Malcolm Baldrige National Quality Award for our customers, our community, and our future.

**Core Values**

Teamwork; Ethical behavior & integrity; Accountability; Customer service focus (internal and external); Open/honest communication; Innovation

**Core Competencies**

Treating and distributing high quality drinking water; Collecting, transporting and treating wastewater; Providing abundant water supply for our customers and for fire protection.

The Commissioners of Public Works of the City of Charleston, d/b/a Charleston Water System (CWS), is a public water and wastewater utility. We protect public health and the environment by providing clean drinking water and wastewater service to the Greater Charleston community.

CWS is an independent public utility governed by an elected Board of Commissioners. Our governance structure and service area are specified by state law. Our Board consists of three Commissioners elected at-large by voters of the City of Charleston to six-year staggered terms. The Mayor of the City and an appointed member of City Council serve as ex-officio members of the Board. Our Chief Executive Officer reports directly to the Commissioners and carries out the policies set by the Board. Four Officers report to the CEO and are responsible for 14 Department Directors.

Our major facilities and assets include five facilities and a vast network of water distribution and wastewater collection pipes, pump stations, and other infrastructure, which total more than $1.3 billion in assets.

Strategic business planning is the cornerstone of CWS’s continuous improvement process. The CWS Strategic Plan occurs across five major strategic areas—Leadership & Strategic Planning, Customer Focus, Measurement, Workforce Focus, and Operations Focus, and integrates the ten attributes of the Effective Utility Management Guidelines. Action plans in these strategic areas assist us in leveraging our core competencies in the accomplishment of our Mission. CWS has developed a unique team approach to strategic plan deployment through teamwork, customer focus, continuous improvement and innovation, which will be the central themes in this application.

All 430 employees are engaged and directly connected to a specific strategic goal by an organizational matrix design, known as the CWS Team Structure. Each associate’s contribution to a strategic goal is acknowledged in their annual performance appraisal. An innovative, monetary Team Incentive program is also utilized to recognize the achievement of strategic plan objectives. This is in addition to an associate’s normal compensation. The CWS Team Structure provides the avenues for communication, innovation and associate engagement. Our focus on measurement and results helps us to learn and track our progress toward excellence.
Product quality, including regulatory compliance and service delivery, is a key performance indicator which is monitored continually. Charleston Water System (CWS) maintains quality primarily through its Environmental Management System (EMS), highly trained/certified associates, extensive sampling and monitoring, and data based decision-making as highlighted below:

- The EMS, based on ISO Standard 14001, is the corporate framework used for management and control of core functions and key processes, as well as communication with key stakeholders and interested parties. This framework provides for a systematic approach to product quality, thus helping to exceed compliance and service delivery requirements, including customer expectations.

- The EMS houses Standard Operating Instructions (SOIs), which are used in conjunction with Apprenticeship Programs, certified by the U.S. Department of Labor, to train associates. Associates are responsible for reviewing SOIs on a systematic basis to ensure continuous improvement and accuracy. Moreover, the CWS Leadership Academy includes seven blocks of training, including leadership fundamentals and continuous improvement methods, to support all key work processes and organizational needs.

- CWS maintains a full-service environmental laboratory, which is certified by the S.C. Department of Health and Environmental Control (SC DHEC), to facilitate compliance with all process requirements.

- All key work processes utilize system-wide SCADA, which permit associates to make real-time data-driven decisions. In addition, this data is compressed and managed by a Hach WIMS database system allowing for statistical analysis, dashboard display, and modeling. Moreover, CWS utilizes a Customer Service System, Computerized Maintenance Management System (CMMS), and Geographic Information System (GIS) that are integrated to optimize predictive, preventative, and corrective maintenance and help exceed customer expectations.

Recent significant improvements related to the above elements include reduction of taste and odor compounds and enhanced filter performance within the Hanahan Water Treatment Plant (WTP); improved removal efficiencies and dissolved oxygen control within the Plum Island Wastewater Treatment Plant (WWTP) unit operations; 100% beneficial reuse of alum residuals; improved system integrity rates; and achievement of significant infiltration/inflow reduction.

CWS has been honored with numerous awards associated with product quality excellence including: NACWA Platinum +8 Peak Performance Award through 2014, with the Silver Award being earned in 2015, the Gold Award in 2016 and the Gold Award in 2017 (pending), 2017 SC DHEC Facility Excellence Award; 2013 Water Fluoridation Quality Award; and the 2012 NACWA Excellence in Management Gold Award. In 2017, the WTP received the prestigious Partnership for Safe Water Presidents Award, and is on track to receive the 15 year Directors Award in 2018. Our WTP has also received the 15 year SC DHEC Area Wide Optimization Award for Excellence, focused on disinfection byproducts control as well as turbidity. The WWTP is also participating in the Partnership for Clean Water Program and has achieved Phase II status. Most noteworthy, CWS received the SC Governor’s Quality Award (SC’s top honor) in 2011 and our journey for performance excellence has continued, becoming the only water/wastewater utility to receive site visits for the Malcolm Baldrige National Quality Award in 2015 and 2016.

Product Quality metric results are collected across key work processes. These results are systematically reviewed and action plans developed to address gaps under the CWS Improvement and Innovation Model.
Charleston Water System (CWS) has been developing comprehensive financial policies for many years and has geared the financial metrics to be aligned with the key ratios monitored by the three major bond rating agencies. In particular, CWS compares its annual financial results with the data published by Fitch Ratings Public Finance group where information is gathered by bond rating category.

Moreover, CWS uses the national data to establish internal benchmark comparisons and targets for each of its key financial metrics. In the table below, the “Days of Cash on Hand” rose in 2017 to 1,867 days compared to the AAA benchmark of 692 days. This difference in cash above traditional operational needs allows CWS to begin funding more of its capital needs from operations rather than borrowing.

During the last eight years, our Finance staff has developed their own benchmarking calculations for comparable utilities across the country. Because the financial data is not readily available on web sites, we extract financial information and calculate the financial ratios for other utilities for our internal use. This eliminates delays and allows our staff to be able to make timely comparisons. CWS is the only utility in the United States to participate in the European Benchmarking Cooperation’s annual international benchmarking project.

In NACWA’s 2015 Financial Survey Highlights report, a challenge highlighted was progress that utilities have made toward funding the obligations of Other Post-Employment Benefits (OPEB), which often represents retiree health insurance. The funded ratio average presented in the report was 14% with the highest being 79%. According to the 2017 actuarial report following the latest accounting standards, CWS has funded 40% of its OPEB obligations.

Part of our annual rate process is updating our long-term forecasting models for our 5-year financial projections. In 2017, CWS updated its multi-year rate study (Black & Veatch Water Rate Study, p.23; Black & Veatch Wastewater Rate Study, p.23) and has approved a rate increase for 2018 to fund current year capital improvement plan. A rate study will be completed in 2018 in preparation for a 2019 Bond issue.

Over the last 17 years, CWS has received eight bond rating increases and now has the highest bond ratings available with Moody’s and Standard & Poor’s rating agencies. In receiving the 2015 rating upgrade to Aaa with Moody’s, CWS is currently in a group of 14 stand-alone combined water & wastewater utilities in the country that has received Moody’s highest rating. In Moody’s 2017 rating report, they state that “…the rating further incorporates the system’s healthy financial position with very high levels of liquidity and stable debt service coverage that consistently exceeds projections, and slightly elevated debt profile with principal payout that is in line with the useful life of the asset.” By maintaining adequate liquidity levels based on a liquidity policy approved by the Commissioners, CWS does not have to keep a debt service reserve fund, which reduces annual debt payments by 10%.

<table>
<thead>
<tr>
<th>Summary of Ratios for CWS</th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Service Ratio</td>
<td>201%</td>
<td>228%</td>
<td>215%</td>
</tr>
<tr>
<td>Bond Ratings</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Standard &amp; Poor’s</td>
<td>AAA</td>
<td>AAA</td>
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<tr>
<td>Fitch</td>
<td>AA+</td>
<td>AA+</td>
<td>AA+</td>
</tr>
<tr>
<td>Moody’s</td>
<td>Aaa</td>
<td>Aaa</td>
<td>Aaa</td>
</tr>
<tr>
<td>Quick Ratio</td>
<td>2.84</td>
<td>3.29</td>
<td>3.03</td>
</tr>
<tr>
<td>Current Ratio</td>
<td>3.57</td>
<td>4.52</td>
<td>4.90</td>
</tr>
<tr>
<td>Days of Cash on Hand</td>
<td>1,867</td>
<td>1,821</td>
<td>1,633</td>
</tr>
<tr>
<td>Days of Working Capital</td>
<td>1,843</td>
<td>1,782</td>
<td>1,630</td>
</tr>
<tr>
<td>Free Cash - % of Depr.</td>
<td>107%</td>
<td>138%</td>
<td>122%</td>
</tr>
<tr>
<td>Operating Margin</td>
<td>54%</td>
<td>55%</td>
<td>53%</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>3.84%</td>
<td>4.02%</td>
<td>3.18%</td>
</tr>
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</table>
Charleston Water System’s (CWS) Strategic Plan includes the following Customer Focus goals: (1) Engage and satisfy wholesale customers and large users, (2) Foster understanding and appreciation of the value of our services, (3) Improve customer support and communication mechanisms based on customer’ key support requirements, (4) Establish strong partnerships with key community groups and stakeholders, and (5) Establish a “Customer Care” program to proactively address customer and community concerns related to construction and field operations.

A major focus has been placed on performance indicators aligned with service levels and key customer requirements, which have resulted in overall customer satisfaction ratings between 8.0 and 9.0 for every survey since 2012.

The Customer Complaint Database was developed and integrated across all departments and assimilated within the Customer Resource Information System, referred to as “CRIS.” Information is systematically captured, tracked, resolved, and analyzed to ensure customer expectations are met. This database allows CWS to statistically analyze complaints and deploy improvements. For example, a high number of “Water Taste and Odor” complaints led to a series of improvements, including new treatment equipment at the plant, an enhanced process for lab monitoring, and refined capturing and communicating of taste and odor complaints—all of which helped to dramatically reduce taste and odor complaints. In another example, the high number of “Estimated Time of Arrival” complaints for water service activation led to a GPS/Vehicle Routing project allowing us to give customers a scheduled window of time for service activation. We are also upgrading our Automated Call Distribution system to the ASPECT phone system. This upgrade will provide for chat, text, virtual hold, and improvement of electronic notification software programs that accommodate out-dialing for reverse emergency notification to critical customers such as hospitals and dialysis clinics.

We evaluate each associate on customer service during annual performance appraisals. Our intent is to have an engaged two way relationship with our customers, which allows us to not only hear from them but to be able to timely react and communicate results that are efficient and also effectively meet their needs. Our Customer Satisfaction Results have consistently exceeded utility benchmarks and our success is evident with a 9.1 overall customer satisfaction rating for three consecutive years.
Stakeholder understanding and support is crucial to our success and continual improvement. Charleston Water System (CWS) has tailored 8 of the 23 areas of our 2013-2017 Strategic Plan to address stakeholder needs:

1. Our value for stakeholder partnerships creates a caring approach for our customers, which encourages understanding of community concerns related to construction and field operations;
2. Establish and foster strong relationships with key community groups and stakeholders in our service area;
3. Foster an understanding and appreciation of the value of our services and support of our mission;
4. Deploy a system for managing the quality and availability of needed data for suppliers, associates, partners, customers and other stakeholders;
5. Foster a culture of sharing knowledge and best practices across departments to improve operational efficiency;
6. Enhance associate engagement to drive organizational excellence;
7. Improve supply chain management to enhance performance and deliver customer value;
8. Enhance our leadership in environmental initiatives and be a nationwide leader in community involvement initiatives. Stakeholders must understand who we are, so we engage with the media to make sure everyone is aware of our successes and understands our challenges, resulting in 200 news items annually. We also have a robust website and social media presence (Facebook, Twitter, YouTube), and disseminate our quarterly Water Wise newsletter via customer bills. Additionally, we have an annual vendor fair allowing vendors to come into our offices and discuss the best way to do business with CWS.

Our community outreach program strengthens ties with stakeholders via service-related projects: Trident United Way (TUW) giving, TUW Day of Caring, Habitat for Humanity, Water For People, Water Mission, Good Neighbor Fund, Earth Day, Charleston Green Committee, First Day School Festival, Charleston Green Fair, Beach/River Sweep, and Teachers’ Supply Closet. We also provide free water at more than 75 events annually, speak to community groups/schools, and arrange plant tours.
Charleston Water System’s (CWS) current Strategic Plan includes its Mission to "protect public health and the environment..." along with its Vision to "become worthy of the Malcolm Baldrige Quality Award for our customers, our community and our future." To that end CWS has identified four key processes which are the primary focal areas of all business operations: (1) Treat Water, (2) Distribute Water, (3) Collect Wastewater, and (4) Treat Wastewater.

CWS has also identified 12 key support processes: (1) Strategic Planning; (2) Environmental Management System (EMS); (3) Information Technology; (4) Procurement; (5) Lab Services; (6) Fleet Maintenance; (7) Engineering & Construction (and Master Planning); (8) Customer Liaison Functions; (9) Accounting, Budgeting and Finance; (10) Auditing; (11) Develop Workforce; and (12) Manage Assets.

Through the 2013-2017 Strategic Plan cycle, CWS utilized the Malcolm Baldrige Criteria along with the ISO 14001 EMS to drive operational optimization. In initiating its next strategic planning cycle, CWS’s management team closely reviewed the Effective Utility Management (EUM) criteria and concluded that the similarities in the programs made the EUM a natural fit for a water utility that seeks continual improvement. Over the next five-year strategic planning cycle, CWS will be using the EUM guidelines in conjunction with the Baldrige Criteria and the ISO14001 Criteria to ensure continuous operational optimization.

Operational process design follows the SIPOC model: Suppliers, Inputs, Processes, Outputs, and Customers. Process maps have been developed for all key processes and key support processes. A large number of sub-process maps have also been developed. Process mapping is used to analyze the efficiencies of the process flow. As inefficiencies are discovered, processes are revisited in search of improvement. Improvement initiatives follow quality principles and the Plan-Do-Check-Act (PDCA) continuous improvement framework, which is also used in the EMS.

CWS uses the ADLI model (Approach-Deployment-Learning-Integration) for process and system optimization. Systematic measurement of key performance indicators (KPIs) and performance indicators (PIs) enable CWS to make effective use of data from automated systems such as Supervisory Control and Data Acquisition (SCADA) and on-line monitoring systems. Continuous improvement is identified through measurement, analysis, trends, benchmarking, etc. CWS uses three (3) processes to drive operational optimization: (1) the EMS Improvement Program; (2) Corporate Team Incentive Program; and (3) Department Team Incentive Programs where monetary incentives are provided to associates for accomplishing incentive tasks. All are aligned with our Mission, Vision, and Strategic Plan. All improvement programs are team-based, with specific guidance documentation and reporting requirements. For example, CWS trains associates in Lean Six-Sigma techniques which are then utilized in a team based environment to solve problems and optimize processes.

One of CWS’s core values is innovation. CWS conducts Innovation Forums during staff and leadership meetings. These sessions include open brainstorming that starts with the statement: “Wouldn’t it be great if...,” and the staff involved will begin to brainstorm on items that support the Mission, Vision, and Values of the organization. These ideas are captured and then reviewed through innovation roundtables for implementation. CWS personnel stay abreast of new technologies through industry publications, associations, workshops, conferences, and collaboration with local colleges. CWS is a member of the ISLE TAG organization and the Water Environment Federation’s LIFT Program. These entities meets on a routine basis to review and evaluate emerging technologies.
Charleston Water System’s (CWS) most current Strategic Plan includes the following workforce focus goals: Enhance associate engagement to drive organizational excellence; identify and deploy innovative solutions that create a high performing workforce; and improve safety for both on-the-job injuries and vehicle accidents to reduce at-fault accidents to zero (Ref. Workforce Engagement Factors).

CWS strives to hire the best qualified, right-fit candidates for long-term employment relationships. A standard procedure for the selection process is used to measure the candidates’ qualifications against criteria based upon the core competencies of the open position. Since 2012, CWS conducted surveys and focus groups to determine what factors affect associate satisfaction and engagement. We encourage our associates to better themselves and prepare for promotional opportunities. We provide numerous opportunities for skills training as well as developmental training.

Associate knowledge is institutionalized through Standard Operating Instructions (SOIs), training programs, and our Leadership Academy. CWS invests significantly in our workforce through the Leadership Academy, which supports the professional development of our associates with increased knowledge and skills to be effective leaders in meeting customer needs. Each of the seven leadership blocks consist of a series of related classes, meeting one day per week for four to six weeks of training. Career development is incorporated into each associates’ annual performance appraisal (Ref. CWS Academy of Leadership Excellence Course Descriptions).

In support of our need for continuous improvement and innovation, CWS pursued certifications for six U.S. Department of Labor registered apprenticeship programs to provide career pathways for skilled-trades associates. Certified cross-training, managed through the completion of job competency matrices, ensures adaptability and flexibility. Performance expectations and behaviors are integrated into SMART goals on individual associate performance appraisals. Departmental performance measures align with the Effective Utility Management (EUM) metrics. EUM results are monitored for training and development, retention and satisfaction, and managing core competencies. To improve recruiting, learnings from these indicators are formulated into corrective actions by Human Resources.

We utilize a pay-for-performance compensation system—unusual in the public sector. The market is surveyed every three years to ensure salaries are competitive.

Our recognition programs include Associate of the Quarter and Year, “SPOT” awards and “High Fives,” all of which promote high performance.

CWS also offers a variety of benefits and wellness programs, an Employee Assistance Program and a Wellness Task Force. Our Recreation and Civic Committee sponsors fun associate activities, civic-minded fundraising, and coordinates volunteer activities year-round.
Charleston Water System (CWS) utilizes a strategic planning process for long-term planning of its enterprise resiliency efforts. Leadership and staff work together as part of this process to establish goals and measures for improvement and sustainability of the organization. CWS’s strategic planning cycles include goals in the areas of (1) emergency preparedness and continuity of operations, (2) partnering with key suppliers, vendors and stakeholders, (3) safety and the reduction of at-fault injuries, and (4) associate development and knowledge retention.

CWS utilizes the ISO 14001 Environmental Management System (EMS) to identify business risk. Business aspects are identified throughout the organization. Data is used in grading the areas of regulatory, environmental, waste minimization, financial impacts, industry standards, and innovative technology. If significant aspects are identified, improvement programs are developed. Standard Operating Instructions (SOIs) also serve as a key component of the EMS, as well as process documentation.

CWS leverages its EMS to ensure emergency plans are effective, continuously reviewed, and drilled upon each year. These plans range from hurricane/hazardous weather to chemical spill and prevention. Plans are deployed through the organization’s key work processes and include SOIs, checklists, and contacts with key suppliers and stakeholders that have partnered with CWS to ensure continuity of operations.

Emergency response plans are further deployed and integrated to ensure that all critical operations throughout CWS have been identified and are equipped with backup power and telemetry systems, e.g., Supervisory Control and Data Acquisition (SCADA). The water and wastewater plants, remote storage pump stations, and regional wastewater pumping stations are all supported by emergency generator or diesel engine drive power supplies.

The CWS Information Technology (IT) department has integrated emergency procedures that include provisions for the backup of all IT applications and data that support all key work processes. The plans also address on-call procedures and resourcing to ensure mitigation measures are in place to prevent or limit the extent of an emergency.

CWS emergency response staff has received National Incident Managements System (NIMS) training. CWS has strengthened its partnerships with other state and local organizations through an interagency agreement with the S.C. Water/Wastewater Agency Response Network (SCWARN). These agreements ensure that resourcing will be available to expedite water/wastewater system recovery in the event of a widespread emergency; e.g., hurricane. CWS is an Organizing Member of the Charleston Resilience Network (CRN), which is a volunteer-based network of government and private sector organizations and businesses with the mutual goal of increasing community resilience. The mission of the CRN is to foster a unified regional strategy to share science-based information, educate stakeholders and the public, and to enhance long-term planning decisions that result in a more resilient community.

CWS has an extensive safety awareness program that includes training, accident investigation and root cause analysis, and both personal and team member accountability. CWS’s personal safety program is part of every associate’s performance appraisal. Safety is also a key component of the corporate monetary incentive program.

CWS utilizes a series of apprenticeship programs to manage personnel development and knowledge retention. The programs consist of both classroom education and on-the-job training. Technical licensing is required of all operational staff to ensure highly competent operators are managing critical processes.
In order to address strategic goals and challenges identified in the Strategic Plan, Charleston Water System (CWS) has invested significant effort into developing its Asset Management (AM) program. The coordinated effort, based on the ISO 55000 AM suite of standards, focused on establishing a program framework suitable to the CWS organizational context. The adopted framework consists of four primary pillars supported by a comprehensive AM Policy. These pillars include a Strategic Asset Management Plan (SAMP), Asset Information Management System, Tactical Asset Management Plans, and the Asset Portfolio. CWS began the development of the SAMP in 2016 which included conducting a stakeholder expectations analysis; administering the Institute of Asset Management Self-Assessment Methodology AM maturity survey; researching benchmarking data and identifying best practices; reviewing external customer input, including survey results; establishing AM program metrics and targets, AM gap analysis, and reporting; setting AM objectives and delivery strategies; and analysis of resource requirements. In addition to these significant strategic accomplishments, progress continues on tactically focused AM tasks including developing a plant asset register framework, establishing asset criticality scoring criteria, analysis and documentation of current Computerized Maintenance Management System (CMMS) processes, and developing and delivering a risk awareness initiative. These efforts resulted in the identification of a clear path to achieve the optimal investments in CWS infrastructure to ensure our assets achieve the ideal level of performance at the lowest level of risk possible.

CWS addresses the improvements and expansion needs of its treatment plants, water distribution system, and wastewater collection system through a Capital Improvement Program (CIP) derived from master plans. The master planning process assesses system infrastructure needs and improvements using criteria such as service area growth projections for capacity requirements; asset management attributes for condition, performance and reliability to determine rehabilitation and/or replacement requirements; current or pending regulatory compliance requirements; and social/environmental concerns. The planning period typically covers 20 to 25 years. Updates are made as needed to address the effects of changing or unforeseen conditions. Based on the established criteria referenced above and relative need and importance, projects are prioritized and grouped into phases of approximately five years. Each phase comprises a CIP cycle funded through issuance of municipal bonds and cash following approval by elected officials. The master planning assessment also includes source water for the water treatment plant and receiving waters for the wastewater treatment plants to ensure the treatment processes meet water quality standards.

The CWS Environmental Management System (EMS), based on ISO Standard 14001, is the corporate framework used for management and control of core functions and key processes, as well as communication with key stakeholders and interested parties. Within the EMS framework, CWS Engineering & Construction establishes minimum standards, specifications, and standard operating procedures for the administration, design, and construction of all capital projects. The EMS framework provides for a systematic approach to infrastructure management, thus helping to ensure integrity and long service life.

Each of these infrastructure and strategy initiatives is supplemented by metric results that are collected across key work and support processes. These results are systematically reviewed and action plans developed to address gaps under the CWS Improvement and Innovation Model.
Charleston Water System’s (CWS) previous and current Strategic Plans include the following strategic goals that (1) enhance our leadership position in environmental stewardship, (2) fulfill our societal responsibility and strengthen key communities in order to be a nationwide leader in the industry for community involvement initiatives, and (3) optimize overall cost and/or usage of energy, chemicals, and other materials.

CWS protects its service community through its Environmental Management System (EMS) based on ISO 14001 guidelines. CWS was the first municipal utility to become ISO 14001 certified. The EMS program is sustained by our Environmental Policy, and the Environmental Management Strategic Team. The EMS program has led to numerous environmental improvement projects that have resulted in cost savings and improved efficiencies while having a positive impact on the environment.

CWS has been honored with the following awards associated with sustainability: 2017 S.C. Department of Health and Environmental Control (SC DHEC) Facility Excellence Award; 2017 (pending) and 2016 NACWA Gold Performance Excellence Award; 2017 U.S Environmental Protection Agency Directors Award; Phase III Partnership (Hanahan Water Treatment Plant); 2017 AWWA Partnership for Clean Water Phase II Award; 2017 Department of Energy Better Plants Program Level Partnership; 2014 Green Business Challenge, Live Oak Award (highest honor by the City of Charleston); and the 2015 S.C. Smart Business Recycling Award (SC DHEC).

Through the Civic and Recreation Committee and associated guidance policies, CWS associates and senior leadership strengthen our service community through mission-related service projects. Examples include Trident United Way (TUW) employee donations; TUW Day of Caring; Habitat for Humanity, Water For People, Red Cross, James Island Connector Run, Water Mission, Good Neighbor Fund; Earth Day; First Day School Festival; Beach/River Sweep; Teachers’ Supply Closet; potable water at numerous community events; and donations of labor and equipment for archeological and historic preservation purposes. All associates are provided the opportunity and encouraged by senior leadership to be on the Civic and Recreation Committee and to contribute to and volunteer for community events and causes.

CWS senior leadership and many associates are very involved in local, state, and national water-related committees and associations which promote water adequacy, protection, environmental management, business continuity, and management. These include industry associations such as NACWA, AMWA, AWWA, WEF and their state affiliates; local and state Chambers of Commerce; Charleston Regional Development Alliance; Council of Governments committees; S.C. Water Quality Association; S.C. Department of Transportation, the City of Charleston Technical Review Committee, Charleston County Roadwise, and many others.

CWS has taken a leadership role in positively impacting regulatory requirements and watershed management. To protect the Bushy Park Water supply for future generations, CWS has partnered with the U.S. Geological Survey and TetraTech, LLC to conduct a comprehensive multi-year study of the reservoir. This study includes extensive water quality work along with hydrodynamic and bathometric analysis, which will lead to the development of a computer simulation model that can be used to project water quality and water quantity. This project is scheduled to be finalized by early 2019. Through the U.S. DOE Better Plants Program, CWS has pledged to participate in a systematic program designed to reduce energy consumption. Additionally, CWS has seen a steady decrease in energy consumption over the last several years in virtually all areas by initiating special programs in conjunction with the local energy provider, such as computer-managed energy management systems, LED lighting, smart switches, low-energy fluorescents, window tinting, and energy efficient equipment.
Charleston Water System (CWS) utilizes two distinct surface water resources, the Edisto River and the Bushy Park Reservoir, for its treatment and distribution of potable water for the Greater Charleston area. These raw water sources are monitored on a continual basis. CWS’s Edisto River intake pulls from a natural water resource and conveys water for treatment via a 22-mile long gravity flow tunnel system that was constructed in the late 1920s. The second source is the Bushy Park Reservoir. The reservoir is served by the Santee Watershed, which is the second largest watershed east of the Mississippi River. It stretches from the coast of South Carolina into the Appalachian Mountains in North Carolina. This reservoir is man-made and was created by a private enterprise group in 1954 to provide a long-term fresh water source for the Greater Charleston area. In 1964, CWS purchased the Bushy Park Reservoir, and by the mid-1990s had constructed an 11-mile tunnel so that it could serve as an additional raw water source. These two sources are permitted to provide 250 million gallons per day (MGD). In 2017, the average raw water usage from these two sources was 62 MGD. All of the CWS raw water sources are recognized and permitted by the S.C. Department of Health and Environmental Control. The permits are issued for a forty-year period, expiring in 2054.

To protect water sources for future generations, CWS has partnered with the U.S. Geological Survey and TetraTech, LLC to conduct a multi-year study of the reservoir (discussed earlier). This three-part study includes a report on the Hydrologic Characterization of the Bushy Park Reservoir, the Characterization of Water Quality in the reservoir and a Hydrodynamic Model of the Reservoir (still in development). This study sets a foundation for future water resource protection plans.

In addition to having two raw water sources, CWS has initiated the planning of a future Aquifer Storage and Recovery (ASR) system within its distribution system. The initial ASR Feasibility Study identified three separate locations within the Charleston region where ASR would suit the objectives and needs of CWS; those being improved water quality in outlying areas, emergency storage and water supply, and seasonal storage to address production level fluctuations. In the past year, Charleston Water has secured the property necessary to site the future ASR well.

In 2017, CWS Board approval was granted for the hiring of a Water Resource Manager. This position will be dedicated to building on the current programs that protect the two water sources and the associated infrastructure.

CWS maintains four, 25-year Master Plans, with one being the 2014 Water Treatment Plant Master Plan. This plan includes: population, water demand, and capacity evaluation & predictions; regulations evaluation; existing facilities evaluation (all segments of treatment individually evaluated); recommended improvements; description of alternatives; evaluation of alternatives; and, capital improvements implementation plan (from table of contents). The Master Plans are updated every five years, with the most recent updates being completed three years ago. The Master plans use reliable governmental projections, along with Chamber of Commerce Growth projections, so that future demand can be projected to 2035. This is necessary in order to address the potential needs of CWS’s service community, and identify capital improvement projects that need to be implemented. CWS is an Organizing Member of the Charleston Resilience Network (CRN), which is a volunteer-based network of government and private sector organizations and business with the mutual goal of increasing community resilience. The mission of the CRN is to foster a unified regional strategy to share science-based information, educate stakeholders and the public, and to enhance long-term planning decisions that will result in a more resilient community.
Required and Supplemental Documents

Required Documents


Attribute 1: Product Quality


Attribute 2: Financial Viability (Required documents)


Attribute 6: Employee & Leadership Development

Attribute 8: Infrastructure Strategy & Performance


Attribute 9: Community Sustainability


U.S. Better Plants Program. https://betterbuildingssolutioncenter.energy.gov/partners/charleston-water-system

Attribute 10: Water Resource Sustainability