# Water Infrastructure Advisory Council

## Drinking Water Needs Assessment


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State of Delaware

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# ACKNOWLEDGEMENTS

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The report was presented at a Delaware Water Infrastructure Advisory Council meeting held on February 18, 2015. Input from Council members during the development of the report is also gratefully acknowledged.

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# 1. EXECUTIVE SUMMARY

The water infrastructure assets of the public community systems in Delaware have an estimated replacement value of $4 Billion. The bulk of these assets date back to 1960 or earlier, which means that they are at, or approaching the end of, their useful lives. The "Useful Life" approach to assessing infrastructure needs should be used with great caution because assets can and do fail earlier than predicted and can last far longer than predicted by a useful life assessment alone. Nevertheless, it provides a good order of magnitude assessment, for planning purposes, of the investments that are going to be needed to sustain our capacity as a society to continue to provide safe drinking water.

Based on this approach, the public water systems need to plan for an aggregate investment, over the next 20 years, of about $1 Billion. While this appears to be a daunting number, the investment pattern of many of the major systems appears to be on a pace to bridge a large portion of this need. It should be noted that future investments are likely to be driven, in large part, by the condition of buried infrastructure, an asset class that represents the bulk of replacement value. There is, therefore, a need to begin actively conducting condition assessments to evaluate remaining useful lives of transmission and distribution networks and plan for their orderly replacement or rehabilitation.

Household water rates in Delaware range from a low of 0.20% to a high of 1.38% of median household income. The EPA uses a 2.5% threshold to evaluate the affordability of its regulatory rule making on drinking water standards. This test is applied in aggregate to the median household incomes of households served by small systems across the country. The State of Delaware applies a lower yardstick of 1.5% of median household income when considering making loans and grants to communities under the State Revolving Fund program.

**Key Recommendations**

- The Median Household Income statistic can mask significant income disparities within a community and the cost of water can represent greater than 1% of the income for a significant proportion of households. Utilities may need to offer special programs for lower income households to continue to deliver services without outstripping their ability to pay. The State should consider income distribution, in addition to the "percent of MHI" calculation, as part of its decision making regarding allocations of loans and grants under the SRF program and provide assistance to municipalities with crafting low income assistance programs.
- Investing in the replacement of existing infrastructure is fundamental to the sustainability of the service. Inevitably, these investments require increases in revenue for most utilities. Some, if not all, of this impact can be mitigated by aggressive efforts to reduce cost through improvements in operational efficiency and through efforts to capture revenues through better metering, billing and collection practices. The State should provide support to utilities to make these improvements by making available

grants and short-term loans to make the shorter-lived asset investments that will be needed.

- Utilities interested in taking a comprehensive and structured approach to looking at their operations from a sustainability perspective should consider the use of facilitated approaches to examining their governance, financial policies, management and operational systems such as the Effective Utility Management approach developed by industry associations. The State should consider offering incentives to help drive this process.
- The State already makes the benefits of economies of scale available to municipalities in the area of fleet vehicle procurement; it should consider other opportunities that may be available in the water sector for joint and bulk purchasing arrangements in both commodities and services to help reduce the cost of operations and infrastructure improvements.
- Source water protection programs are critical to long-term risk mitigation for water utilities. They also offer the potential for treatment cost reductions through active interventions to prevent the entry of pollutants into the water source. The State currently has a loan program that allows for the purchase of land or conservation easements. An important aspect of source water protection is the mitigation of agricultural and urban runoff, which may require measures other than land purchase. The State should consider modifying the program to provide loans and grants that can be used as matching funds by utilities to incentivize mitigation activities where land or easement acquisition may not be feasible.

# 2. PREAMBLE

The importance of water systems to our modern way of life lies in their essential role in the protection of public health and property, and the integral role of safe water in our economy and in our overall quality of life. Over the last century, we have seen the public health protections bestowed by access to safe drinking water extended to the vast majority in the United States, in stark contrast to the continued challenges from waterborne diseases faced by large segments of the world's population. Kathy Pape, President and CEO of Pennsylvania American Water Company, emphasized this point during testimony at a Pennsylvania State House hearing on sustainable infrastructure; "We live in a world where 1.1 Billion people must drink from unsafe water sources. As a result of these unsanitary conditions, it is estimated that some 6,000 people die everyday from preventable waterborne disease, most of them children," she noted.[1]

*"We live in a world where 1.1 Billion people must drink from unsafe water sources. As a result of these unsanitary conditions, it is estimated that some 6,000 people die every day from preventable waterborne disease, most of them children".*

At a national level, there is increasing concern over the deteriorating condition of our drinking water infrastructure.

In stark contrast, the Division of Public Health has not recorded a single major waterborne disease incident in the past several decades. The reported minor incidents, usually of the gastric illness variety, have generally been determined to have causes other than contaminated drinking water. [2] The diligence of the Division of Public Health, and the small and large water systems that it oversees, has served to ensure that the benefits of safe drinking water are consistently delivered in our State. The protections derived from these systems depend upon their ability to deliver safe water consistently over the foreseeable future. Unfortunately, success breeds complacency and, at a national level, there is increasing concern regarding the deteriorating condition of the critical water assets that are called upon to deliver these protections.

This State Drinking Water Facility Assessment was commissioned by the Delaware Department of Health and Social Services, Division of Public Health and represents the first of a planned series of periodic needs assessments of the State's drinking water infrastructure. This report takes a top-down view, providing assessments of

- the replacement value of water infrastructure in the State, broken down by utility and functional sub-systems (e.g.; treatment)
- the current investment plans of the utilities, and
- a "rule of thumb" investment needs approach identifying likely needs over the next 20 years (consistent with EPA's own national Needs Assessment reporting to Congress)

[1] "Informational Meeting on the Water and Wastewater Industry," House Consumer Affairs Committee, PA, February 2009

[2] Personal Communication, Ed Hallock, DPH.

A total of 34 systems serve the majority of the population in the State. Four large systems serve about two-thirds of the population with the remainder served by systems classified by EPA as "medium" or "small" community systems.[3] With the exception of United Water Delaware, the City of Wilmington and partially, Newark, all other systems in the State depend on ground water for their water supply. The groundwater-based systems are all organized around individual wells or well fields, associated pump stations, treatment units and finished water storage tanks (which may be ground based or elevated) that feed into local distribution zones. The treatment steps employed range from simple disinfection and fluoridation to more complex pressure filtration, ion exchange and VOC removal steps depending on the ground water conditions at the particular well or well field.

With regard to the surface water systems, United Water draws from the Red Clay and White Clay Creeks and from the Christina River at Smalley's Pond. Wilmington's source is the Brandywine River, supplemented by Hoopes Reservoir, which is primarily a pumped storage system. Newark draws from the Newark Reservoir, which impounds water pumped from the White Clay, and from its South Well Field. Surface water is treated to remove turbidity and TOC through some combination of coagulation/sedimentation and filtration (either sand or membrane). Finished water is distributed into pressure zones by a combination of primary and booster pump stations with pressure management and fire suppression supply provided by ground or elevated storage tanks.

A substantial proportion of the assets comprising the State's water infrastructure date back to the early to mid 1900's. These assets tend to be long-lived (with the exception of rotating assets, useful lives tend to range from 60 to 100 years), spanning several employment cycles and several tens of political cycles. The resulting lack of decision-making continuity creates a significant impediment to sustaining a culture of long-term stewardship, especially given the relatively large dollars involved. To illustrate, the replacement cost, in 2014 dollars, of all of the water assets in the State is estimated to be $4 Billion. Looking out over the next 50 years, it is likely that a majority of these assets would need to be replaced, indicating a needed rate of investment on the order of $80 million annually.

[3] Self-supplied water is a significant component in both Kent and Sussex Counties. Groundwater withdrawals in these counties are dominated by Irrigation use (see Water Supply Coordinating Council 12th Report, 2014)

# 3. WATER SUPPLY CONDITIONS

The Delaware Water Supply Coordinating Council was constituted in 2003 to evaluate and report periodically on water supply conditions in the State. The full reports of the Council are to be found at the University of Delaware website (http://www.wra.udel.edu/resources-publications/). Water supply conditions in New Castle County have improved significantly since the drought of 1999 (which resulted in a drought emergency declaration). Since then, several important water supply projects have been completed by water purveyors in the County, including Aquifer Storage and Recovery projects by Artesian and United Water, a new Reservoir built by the City of Newark and expansion of capacity at the Hoopes Reservoir by the City of Wilmington. Groundwater availability in Kent and Sussex Counties remains under study. As noted in the recent report on water supply conditions, the Delaware Geological Survey believes that "…new data, new methods, and data gaps render those availability estimates inappropriate for future use" and has proposed a study to develop better estimates.[4] This remains an open issue.

# 4. DELAWARE SOURCE WATER PROTECTION PROGRAM

The Source Water Assessment and Protection Program (SWAPP) is a requirement of the 1996 amendments to the Safe Drinking Water Act and is administered by the DNREC. Its purpose is to assess the susceptibility to contamination of all of the water systems in the State. Reports on each of the over 500 systems may be found on the DNREC website.[5] The reports follow a common format and are required to

- **Delineate the source water areas for each intake (watershed) or well (wellhead)**. Generally, this is a mapping exercise identifying the watershed upstream of the intake (for surface water intakes) or an area defined either by the local source water delineation ordinance or by groundwater modeling.
- **Determine the vulnerability of each intake or well to contamination**. The vulnerability assessment is based on a decision tree developed in the Source Water Plan and quantifies the probability that a release could result in the presence of one or contaminants at concentrations above a threshold of concern.
- **Identify existing and potential sources of contamination in the source water area.** This is an inventory of potential discrete sources of contamination within the delineated source water area and also considers potential non-point sources of pollution based on the land use.
- **Determine the susceptibility of the source water area to contamination.** This determination is based on long-term water quality data collected from the source.

[4] Twelfth Report to the Governor and General Assembly Regarding the Progress of the Delaware Water Supply Coordinating Council; Estimates of Water Supply and Demand for Kent and Sussex Counties through 2030, June 2014.

[5] http://delawaresourcewater.org; the program summary in this section draws from the May 2002 Wilmington SWAPP report prepared by the university of Delaware Institute for Public Administration, Water Resources Agency.

Eight categories of contaminants are evaluated in the assessments:

- Nutrients
- Pathogens
- Petroleum Hydrocarbons
- Pesticides
- Polychlorinated biphenyls
- Other Organics
- Metals
- Other Inorganics

Contaminants that have the potential to be present in the source water at levels above the Maximum Contaminant Level in the drinking water regulations are flagged by the report. Appropriate responses to the potential presence of contaminants of concern include searching for an alternative source (sometimes possible in groundwater sourced systems) and technological solutions that can assure the removal of contaminants of concern before distribution.

The companion action to the source water assessments is the development of Source Water Protection Plans by local governments.[6] The planning effort involves delineation of sensitive areas for water resource protection, land use planning to develop appropriate protections for sensitive areas, development of best management practices for water quality and quantity protection for different land use types and the adoption of suitable ordinances to codify and enforce these protections. Generally, the preferred hierarchy of land use controls for new developments within source water protection areas, in descending order of protectiveness, are:

- Preservation as open space and parks
- Limiting impervious cover to 20%
- Allowing impervious cover greater than 20% and no more than 50% only where rooftop runoff is directly infiltrated
- Allowing impervious cover greater than 20% and no more than 50% only where runoff from grassy or forested areas is infiltrated after pretreatment

Utilities across the country and abroad are also beginning to engage actively in conservation and management of forested areas as essential elements of their water quality and quantity risk management strategy. These actions take the form of land acquisition, conservation easements and wildfire risk management among other "natural infrastructure" strategies adopted as a conscious

[6] This section is drawn from the "Source Water Protection Guidance Manual for the Local Governments of Delaware," Revision of May 2005, prepared by the University of Delaware, Institute for Public Administration, Water Resources Agency and is available on the DNREC website.

effort to reduce or avoid capital and operating costs associated with water treatment. [7] It should be noted that this strategy is embedded in the City of Wilmington's Source Water Protection Plan. The City has actively engaged with upstream Pennsylvania communities and conservation groups to collaboratively fund initiatives in agricultural runoff mitigation, and explicitly includes agricultural preservation, forest preservation, re-forestation and riparian buffer restoration as part of its protection strategies. [8]

From the perspective of economic theory, source water impairments represent "external costs" imposed by the economic activity of other actors; for example,

- The deforestation of watersheds to create agricultural lands resulting in increased contaminated runoff which needs to be "treated" by a water withdrawer before use,
- Historic industrial waste disposal practices resulting in later contamination of aquifers, with the cleanup costs incurred by rate or taxpayers

The "producer," in each case, benefits from the externality through reduced costs and increased profits than they would otherwise experience if the cost of the externality were imposed directly on them. The "externality" concept is useful to bring up in the context of this assessment because the impacts of many existing source impairments pre-date the development of source water protection policies. Surface water utilities in the State (Newark, United, Wilmington) depend on a watershed (Brandywine-Christina) that has seen significant deforestation over the past centuries. Agricultural practices and urban runoff impose sediment and nutrient loads that affect the scope and scale of treatment systems that these utilities must deploy in order to conform to SDWA regulations. The costs of these protections are borne by ratepayers of these utilities.

[7] "Protecting forested watersheds is smart economics for water utilities," Gartner, et. al.; Journal AWWA, September 2014.

[8] City of Wilmington Source Water Protection Plan

# 5. REPLACEMENT VALUE OF WATER INFRASTRUCTURE

This study uses the EPA cost model to develop a high level estimate of the replacement value of the infrastructure associated with water supply, treatment, storage and distribution.[9] The EPA report cited contains Linear Regression Cost Models for certain components (e.g.; treatment systems, elevated storage tanks) and unit prices for other components (e.g.; distribution mains, meters) based on actual costs determined through nationwide surveys. The numbers generated by the regression equations are for the construction calendar year 2003. In this report, the R.S. Means Construction Index has been used to escalate the model outputs to 2014. [10] Consultations with key individuals at the various utilities have resulted in certain adjustments to the model costs, particularly with respect to buried assets. Buried asset costs are also significantly higher in the Piedmont region of Northern New Castle County than in the Coastal Plain (the rest of the State) because of the greater difficulty with excavation.

Replacement value is meaningful in the context of this study because it provides a sense of the scope of the asset management challenge associated with the provision of safe drinking water and a yardstick against which investment and policy decisions can be tested for efficacy. While technological innovation can drive the costs down, our emerging knowledge of health risks tends to raise the bar, and the costs, of "safe water." A "big picture" understanding of the scope and scale of the investments that have been put in place over the past century in support of our current way of life provides a counterbalance to our tendency to focus on the short-term.

Three private and one public utility dominate service provision in Delaware and have stewardship of assets with a total replacement value of $2.8 Billion. These "large community systems" (EPA definition, denoting a service population of 100,000 or more) serve over 600,000 people in the State. The next tier of 12 service providers, classified as "medium community systems" (3,300 to 100,000 population) are all public entities, serving 150,000 people and collectively represent replacement assets of $700 Million. The last tier of 18 "small community systems" (less than 3,300 population), serve 25,000 people and manage assets with a value of $180 Million. Asset value per capita is lower for the larger systems, reflecting the benefits of economies of scale and density.

## Replacement Value by System Size

The tables below provide perspective on the relative magnitudes of the replacement values for the public water systems in the State.

[9] 2003 Drinking Water Infrastructure Needs Survey; Modeling the Cost of Infrastructure; The Cadmus Group, Inc.; June 2006

[10] http://rsmeansonline.com/References/CCI/3-Historical%20Cost%20Indexes/1-Historical%20Cost%20Indexes.PDF

| LARGE SYSTEMS – 100,000 or More Population Served | | | |
|---|---|---|---|
| | **Population Served** | **Median Household Income** | **Total Asset Value** |
| Artesian | 250,000 | $60,119 | $ 828,000,000 |
| Tidewater Utilities | 120,000 | $60,228 | $ 457,000,000 |
| United Water | 110,000 | $64,670 | $ 636,000,000 |
| Wilmington | 140,000 | $38,468 | $ 951,000,000 |
| Total | 620,000 | | $2,872,000,000 |

| MEDIUM COMMUNITY SYSTEMS – 3,301 to 100,000 Population Served | | | |
|---|---|---|---|
| | **Population Served** | **Median Household Income** | **Total Asset Value** |
| Camden Wyoming | 4,777 | $58,157 | $19,000,000 |
| Dover | 36,047 | $48,117 | $214,000,000 |
| Georgetown | 6,422 | $44,861 | $45,000,000 |
| Harrington | 3,500 | $46,000 | $13,000,000 |
| Laurel | 3,708 | $31,830 | $15,000,000 |
| Middletown | 19,483 | $78,605 | $59,000,000 |
| Milford | 9,559 | $48,669 | $84,000,000 |
| Millsboro | 3,877 | $49,350 | $15,000,000 |
| New Castle | 5,500 | $73,143 | $33,000,000 |
| Newark | 40,000 | $51,184 | $209,000,000 |
| Seaford | 6,928 | $35,103 | $47,000,000 |
| Smyrna | 10,708 | $51,681 | $58,000,000 |
| Sussex/Dewey | | | $23,000,000 |
| Total | 150,509 | | **$833,000,000** |

| SMALL COMMUNITY SYSTEMS – 3,300 or Fewer Population Served | | | |
|---|---|---|---|
| | **Population Served** | **Median Household Income** | **Total Asset Value** |
| Bethany | 1,060 | $63,000 | $41,000,000 |
| Blades | 1,241 | $34,766 | $7,000,000 |
| Bridgeville | 2,048 | $54,830 | $14,000,000 |
| Clayton | 3,008 | $69,814 | $12,000,000 |
| Dagsboro | 805 | $55,375 | $5,000,000 |
| Delaware City | 1,800 | $55,759 | $14,000,000 |
| Delmar | 1,597 | $36,486 | $13,000,000 |
| Felton | 1,500 | $45,200 | $8,000,000 |
| Frankford | 878 | $42,102 | $7,000,000 |
| Frederica | 774 | $47,325 | $4,000,000 |
| Greenwood | 973 | $33,592 | $8,000,000 |
| Henlopen Acres | 122 | $130,000 | $6,000,000 |
| Lewes | 2747 | $58,125 | $29,000,000 |
| Magnolia | 225 | $34,156 | $4,000,000 |
| Milton | 2,576 | $42,106 | $14,000,000 |
| Rehoboth | 1,327 | $82,500 | $36,000,000 |
| Selbyville | 2,167 | $40,994 | $14,000,000 |
| Sussex Shores | varies | $52,692 | $39,000,000 |
| **Total** | **24,848** | | **$274,000,000** |

A dis-aggregated look at replacement value by asset categories shows that Transmission and Distribution assets ("Mains and Appurtenances") are the dominant component.

| ASSET CATEGORY | REPLACEMENT VALUE |
|---|---|
| Surface Treatment | $ 168,000,000 |
| Well Systems and Treatment | $ 410,000,000 |
| Storage Tanks | $ 272,000,000 |
| Pumping | $ 49,000,000 |
| Mains and Appurtenances | $3,079,000,000 |

This dis-aggregated look at water assets provides a mechanism, at least at a high level, for thinking about an approach to stewardship through timely investments, using the concept of "useful life." While by no means a substitute for rigorous asset management, industry experience indicates that these asset classes tend to have differing life expectancies. EPA's estimates are shown in the accompanying table.[11] Using these rules of thumb it is possible, at a high level, to assign a composite replacement cycle for water assets of about 70-years. In other words, on average, we need to be making investments of about 1.5% (1 in 70) of the replacement value annually to sustain the ability of these critical water assets to continue to provide the level of service we receive today. This approach translates to an annual investment of about $60 Million.

| EPA USEFUL LIFE ESTIMATES | |
|---|---|
| | **Years** |
| Reservoirs & Dams | 80-100 |
| Treatment Concrete | 60-70 |
| Treatment Mechanical & Electrical | 15-25 |
| Trunk Mains | 65-95 |
| Pump Stations – Concrete | 60-70 |
| Pumping Stations – Mechanical & Electrical | 25 |
| Distribution | 65-95 |

[11] http://www.epa.gov/ogwdw/gapreport.pdf
While not specifically called out in this report, other sources suggest 50 - 75 years for the expected useful life of water storage towers and 25-50 years for wells.

# 6. 20-YEAR INVESTMENT NEED

EPA prepares periodic reports to Congress on the investment needs of the nation's drinking water systems. The latest report covers the period 2011 to 2030. The information in this report is based on statistical surveys of utilities nationwide. The annual investment estimate of 1.5% of replacement value for Delaware translates, over the next 20 years, to an investment of about $1.2 Billion. This compares well with the EPA's latest estimate of an investment need (2011 dollars), nationwide, of $384 Billion, an investment need of $1.2 Billion per million people.[12]

| | 2014 Replacement Value | 20-year Investment Need |
|---|---|---|
| **SMALL SYSTEMS** | $ 274,000,000 | $ 82,200,000 |
| **MEDIUM SYSTEMS** | $ 833,000,000 | $249,900,000 |
| **LARGE SYSTEMS** | $2,872,000,000 | $861,600,000 |
| **Total** | **$3,979,000,000** | **$1,193,700,000** |

It should be noted that investments by the large private water companies are already at the 1.5% rate. It is possible that some of these investments are in support of growth and new territory. The Public Service Commission rate-making process also encourages investments, to the extent they are considered "used and useful," a test that should certainly be met by the renewal of worn out infrastructure. The large systems, municipal and private, also appear to be making infrastructure investments on a consistent, measured basis.

| LARGE SYSTEMS 100,000 or More Population Served | | | |
|---|---|---|---|
| | **TOTAL ASSET VALUE** | **6-Year Investment Plan** | **Annualized Forward Rate** |
| Artesian | $ 828,000,000 | $ 96,000,000 | 1.93% |
| Tidewater Utilities | $ 457,000,000 | $ 43,000,000 | 1.57% |
| United Water | $ 636,000,000 | $ 46,000,000 | 1.20% |
| Wilmington | $ 951,000,000 | $ 69,000,000 | 1.21% |
| TOTAL | **$2,872,000,000** | **$208,000,000** | **1.21%** |

[12] EPA - Drinking Water Needs Survey and Assessment: Fifth Report to Congress, EPA 816-R-13-006, April 2013

| MEDIUM SYSTEMS 3,301 -100,000 Population Served | | | |
|---|---|---|---|
| | **TOTAL ASSET VALUE** | **6-Year Investment Plan** | **Annualized Forward Rate** |
| Camden Wyoming | $ 19,000,000 | $ 4,000,000 | 3.75% |
| Dover | $214,000,000 | $15,000,000 | 1.19% |
| Georgetown | $ 45,000,000 | | |
| Harrington* | $ 13,000,000 | $ 4,000,000 | 5.13% |
| Laurel | $ 15,000,000 | | |
| Middletown** | $ 59,000,000 | $11,000,000 | 3.17% |
| Milford | $ 84,000,000 | $18,000,000 | 3.54% |
| Millsboro | $ 15,000,000 | | |
| New Castle | $ 33,000,000 | | |
| Newark | $208,000,000 | $22,000,000 | 1.75% |
| Seaford | $ 47,000,000 | | |
| Smyrna* | $ 58,000,000 | $ 7,000,000 | 2.15% |
| Sussex/Dewey | $ 23,000,000 | | |
| **TOTAL** | **$832,000,000** | **$81,000,000** | 1.64% |

*Investment plan represents system expansion

**Prior years actual

| SMALL SYSTEMS 3,300 or fewer people served | | | |
|---|---|---|---|
| | **TOTAL ASSET VALUE** | **6-Year Investment Plan** | **Annualized Forward Rate** |
| Bethany | $ 41,000,000 | | |
| Blades | $ 7,000,000 | | |
| Bridgeville | $ 14,000,000 | | |
| Clayton | $ 12,000,000 | | |
| Dagsboro | $ 5,000,000 | | |
| Delaware City | $ 14,000,000 | | |
| Delmar | $ 13,000,000 | | |
| Felton | $ 8,000,000 | | |
| Frankford | $ 7,000,000 | | |
| Frederica | $ 4,000,000 | | |
| Greenwood | $ 8,000,000 | | |
| Henlopen Acres | $ 6,000,000 | | |
| Lewes | $ 29,000,000 | $3,400,000 | 1.96% |
| Magnolia | $ 4,000,000 | | |
| Milton | $ 14,000,000 | $ 300,000 | 0.36% |
| Rehoboth | $ 36,000,000 | $ 225,000 | 0.10% |
| Selbyville | $ 14,000,000 | | |
| Sussex Shores | $ 39,000,000 | | |
| | **$274,000,000** | **$3,925,000** | |

# 7. AFFORDABILITY OF THE DRINKING WATER SERVICE

Public Water supply in Delaware is organized as distinct service territories, which are designated through the issuance of Certificates of Public Convenience and Necessity (CPCN). The CPCN defines the boundaries of the service area for each service provider. Within their service territories, municipally owned systems have the ability to define how the service is paid for, subject to the approval and oversight of their governance systems. Private utilities are subject to regulatory and rate making oversight by the Public Service Commission. Almost universally, the financial model that is used is the establishment of a water rate for water usage coupled with a flat service charge linked to the "readiness to provide" the service. A related model is the use of Equivalent Dwelling Units as the basis for the water charge (irrespective of the actual water used by the customer). The typical billing cycle is quarterly; monthly billing cycles are also coming into vogue as the cost of service provision has risen over time. In many instances, the water bill is combined with a sewerage bill, which can be of the same order of magnitude as the water bill.

The question of "affordability" is becoming a greater topic of political debate as the cost of the service has risen over time. The roots of the drinking water service lie in the protection of public health. A growing body of regulation seeks to identify and control the levels of biological, organic and inorganic contaminants in the water supply that pose risks to human health. As the science of both detection and risk assessment has become more sophisticated, the definition of what constitutes "safe" water has also evolved, requiring increased efforts to manage sources of supply and treat, and safely deliver, water meeting increasingly stringent standards to the customer. Regulatory changes have therefore been a major driver of cost increases. A second looming issue, one that has received a great deal of attention in the past decade, is the problem of aging water infrastructure and the large bills coming due for the renewal and replacement of this infrastructure. As a consequence, we are likely to see continued increases in the cost of providing the service.

The metric in current use for defining affordability is the percent of Median Household Income (within a particular service territory) represented by the annual household bill for water. EPA's affordability threshold for household drinking water is 2.5% for small systems applied collectively across the nation. This metric is used to determine whether a Primary Drinking Water Regulation will result in undue economic hardship. [13]

Delaware's use of the metric is tied to decisions involving financial assistance to communities for needed investments in water infrastructure to address both regulatory compliance and renewal and replacements. The most recently proposed policy sets the affordability threshold at 1% of MHI for financial assistance with water projects, subject to a further threshold of 2% of MHI for the combined household costs for water and sewer. The effect of the policy is to

[13] "Affordability Assessment Tool for Federal Water Mandates," Joint report from US Conference of Mayors, AWWA, and WEF; 2013. The general thrust of the report is to challenge the EPA's use of MHI as the basis of its affordability standard, ignoring the often significant disparities in income encompassed in the determination of MHI.

discount the interest rate on State Revolving fund loans; in addition the State can offer principal forgiveness and extend the term of the loan beyond the current 20 years.

The rates of three private water systems and four municipal systems exceed the affordability threshold. The rates used in the calculations are drawn largely from a University of Delaware Report; [14] more current information is drawn from rates published on system websites.

## LARGE SYSTEMS

Among the large systems, Artesian and Tidewater Utilities are currently above 1% based on 2013 rates.

| System | Affordability Index | Rate Year |
|---|---|---|
| Artesian | 1.05% | 2013 |
| Tidewater Utilities | 1.25% | 2013 |
| United Water | 0.89% | 2013 |
| Wilmington | 0.83% | 2013 |

## MEDIUM SYSTEMS

None of the Medium-sized systems have affordability indices above 1%, based on 2011 rates.

| System | Affordability Index | Rate year |
|---|---|---|
| Camden-Wyoming | 0.74% | 2011 |
| Dover | 0.38% | 2011 |
| Georgetown | 0.73% | 2015 |
| Harrington | 0.84% | 2011 |
| Laurel | 1.11% | 2014 |
| Middletown | 0.24% | 2014 |
| Milford | 0.45% | 2011 |
| Millsboro | 0.36% | 2011 |
| New Castle | 0.59% | 2011 |
| Newark | 0.73% | 2011 |
| Seaford | 0.36% | 2011 |
| Smyrna | 0.63% | 2011 |
| Sussex County and Dewey | 0.55% | 2011 |

[14] Water Rates in Delaware and Surrounding States, Draft October 2013, University of Delaware, Water Resources Agency, Institute for Public Administration

however, the most recent rate (2014) for Laurel pushes the index for this community above the threshold.

## SMALL SYSTEMS

Among the small systems, the communities of Blades, Frankford and Greenwood show household costs above 1% of MHI.

| System | Affordability Index | Rate year |
|---|---|---|
| Bethany | 0.56% | 2014 |
| Blades | 1.38% | 2014 |
| Bridgeville | 0.39% | 2011 |
| Clayton | 0.35% | 2011 |
| Dagsboro* | | |
| Delaware City | 0.63% | 2013 |
| Delmar | 0.75% | 2011 |
| Felton | 0.34% | 2008 |
| Frankford | 1.25% | 2014 |
| Frederica | 0.55% | 2011 |
| Greenwood | 1.14% | 2011 |
| Henlopen Acres* | | |
| Lewes | 0.47% | 2011 |
| Magnolia | 0.64% | 2011 |
| Milton | 0.76% | 2011 |
| Rehoboth | 0.20% | 2011 |
| Selbyville | 0.62% | 2011 |
| Sussex Shores | 1.19% | 2014 |

*No data

# 8. NEEDS ASSOCIATED WITH REGULATORY COMPLIANCE

A review of Drinking Water Notices issued by public water suppliers in Delaware over the period 2005 to 2014 show a total of four violations.[15] Of these, two were for regulated substances and two were for unregulated contaminants for which there are provisional health advisories.

| System | Violation | Type | Action | When |
|---|---|---|---|---|
| Artesian | Perfluorooctane sulfonate | unregulated, provisional | removed well from service | 2014 |
| Bethany | TTHM | Regulation | changed disinfectant | 2005 |
| New Castle | Perfluorooctane sulfonate | unregulated, provisional | removed well from service | 2014 |
| United Water | Fluoride | Regulation | stopped fluoride addition to ASR system | 2012 |

Under the Safe Drinking Water Act, EPA is required to issue a list, on a five-year cycle, of no more than 30 contaminants to be monitored by public water systems. So far, EPA has published 3 rounds of unregulated contaminants under the Act. As noted by the response to the perfluorooctane sulfonate contamination (PFOS), this rule can have a significant impact on water systems, requiring the abandonment of water sources or the institution of new treatment methods to resolve the contamination.

The State website lists numerous other violations related to private water systems, predominantly for nitrate and total coliform. Public water suppliers drawing from aquifers underlying agricultural land uses are vulnerable to nitrate contamination and potentially from the migration of other agricultural chemicals.

The list of unregulated contaminants from UCMR(3), issued in 2012, is illustrative. PFOS, the contaminant of concern for Artesian and New Castle, is part of UCMR(3).

[15] http://www.dhss.delaware.gov/dph/hsp/drinkingwaternotices.html

## UCMR 3 Contaminants and Corresponding Analytical Methods

### Assessment Monitoring (List 1 Contaminants)

| Contaminant | Analytical Methods EXIT Disclaimer |
|---|---|
| **Volatile Organic Compounds** | **EPA 524.3** |
| 1,2,3-trichloropropane | |
| 1,3-butadiene | |
| chloromethane (methyl chloride) | |
| 1,1-dichloroethane | |
| bromomethane (methyl bromide) | |
| chlorodifluoromethane (HCFC-22) | |
| bromochloromethane (halon 1011) | |
| **Synthetic Organic Compounds** | **EPA 522** |
| 1,4-dioxane | |

| | |
|---|---|
| **Metals** | **EPA 200.8 Rev 5.4, ASTM D5673-10, Standard Methods 3125 (1997) (excluding chromium-6)** |
| vanadium | |
| molybdenum | |
| cobalt | |
| strontium | |
| chromium * | |
| chromium-6 | EPA 218.7 |
| **Oxyhalide Anion** | **EPA 300.1, ASTM D6581-08, Standard Methods 4110D (1997)** |
| chlorate | |

| Perfluorinated Compounds | EPA 537 Rev 1.1 |
|---|---|
| perfluorooctanesulfonate acid (PFOS) | |
| perfluorooctanoic acid (PFOA) | |
| perfluorononanoic acid (PFNA) | |
| perfluorohexanesulfonic acid (PFHxS) | |
| perfluoroheptanoic acid (PFHpA) | |
| perfluorobutanesulfonic acid (PFBS) | |

* Monitoring for total chromium – in conjunction with UCMR 3 Assessment Monitoring – is required under the authority provided in Section 1445(a)(1)(A) of SDWA.

⇧About this rule

**Screening Survey (List 2 Contaminants)**

| Contaminant | Analytical Methods |
|---|---|
| **Hormones** | EPA 539 |
| 17-β-estradiol | |
| 17-α-ethynylestradiol (ethinyl estradiol) | |
| 16-α-hydroxyestradiol (estriol) | |
| equilin | |
| estrone | |
| testosterone | |
| 4-androstene-3,17-dione | |

⇧About this rule

**Pre-Screen Testing (List 3 Contaminants)**

| Contaminant | Analytical Methods |
|---|---|
| **Viruses** | EPA 1615 |
| enteroviruses | |
| noroviruses | |

The impact of the UCMR program on future costs is likely to be significant because the levels at which these contaminants become of concern may not be amenable to the treatment methods currently in use. As illustrated by the New Castle and Artesian notices involving PFOS, these entities are in uncharted territory with regard to the treatment actions that will be necessary; if it is feasible, abandonment of the source may be the most economical action. Utilities, and the State, may need to pay greater attention to prevention activities to protect sources from contamination. This will require engaging pro-actively with other actors in the community to fund modifications to current operating practices. Working with the agricultural community on application rates and timing of fertilizers and other chemicals is an example of such actions.

# 9. IDENTIFIED SYSTEM NEEDS

A compilation of the categories of investment needs for the systems is presented in the table below. This information was gathered from two sources: the larger systems tended to have capital plans, typically for a six-year period; for the smaller systems, the information is drawn from the on-site survey conducted by the DHSS/Rural Water Association team. The predominant needs are for wells, treatment and distribution networks. Systems also identified needs associated with equipment upgrades including SCADA systems that may not qualify for typical 20 year loans. Large systems have made or proposed a total six-year investment of $208 Million, representing an annual rate of 1.21% of the replacement value of their combined assets; Six of the thirteen medium systems have identified $47 Million in needs, an annual replacement rate of 0.95% of combined asset replacement value.

| IDENTIFIED NEEDS FOR LARGE AND MEDIUM SYSTEMS | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Surface Treatment** | **Well Systems and Treatment** | **Storage Tanks** | **Pumping** | **Mains and Appurtenances** | **No breakout** | **Other** |
| Artesian | | ◆ | | ◆ | ◆ | | |
| Tidewater Utilities | | | | | | ◆ | |
| United Water | | | | | | ◆ | |
| Wilmington | ◆ | | | ◆ | ◆ | | ◆ |
| | | | | | | | |
| Camden-Wyoming | | ◆ | ◆ | | ◆ | | |
| Dover | | ◆ | ◆ | | ◆ | | ◆ |
| Georgetown | | ◆ | | | | | |
| Harrington | | ◆ | ◆ | | ◆ | | |
| Laurel | | ◆ | | | | | |
| Middletown | | | | | ◆ | | |
| Milford | | ◆ | ◆ | | ◆ | | ◆ |
| Millsboro | | | | | ◆ | | |
| New Castle | | ◆ | | | ◆ | | |
| Newark | | ◆ | | | ◆ | | ◆ |
| Seaford | | | ◆ | | ◆ | | |
| Smyrna | | ◆ | ◆ | | ◆ | | |
| Sussex County and Dewey | | | | | | | ◆ |

Small systems tended to have similar needs as the large and medium systems, again dominated by wells, treatment and distribution system investment needs. Information for making assessments of the proposed pace of investments is generally unavailable for small systems. Notably, Lewes is proposing a relatively large six-year investment of $3.5 Million, an annual pace of 1.96% of replacement value.

| IDENTIFIED NEEDS FOR SMALL SYSTEMS | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Systems** | **Surface Treatment** | **Well Systems and Treatment** | **Storage Tanks** | **Pumping** | **Mains and Appurtenances** | **No breakout** | **Other** |
| | | | | | | | |
| Bethany | | | | | ◆ | | |
| Blades | | ◆ | | | ◆ | | ◆ |
| Bridgeville | | | | | ◆ | | |
| Clayton | | ◆ | | | ◆ | | ◆ |
| Dagsboro | | | | | ◆ | | |
| Delaware City | | | | | ◆ | | ◆ |
| Delmar | | ◆ | | | ◆ | | ◆ |
| Felton | | | | | ◆ | | ◆ |
| Frankford | | | | | | | ◆ |
| Frederica | | | ◆ | | ◆ | | |
| Greenwood | | | | | | | |
| Henlopen Acres | | | | | | | |
| Lewes | | | | | ◆ | | |
| Magnolia | | | | | | | |
| Milton | | | | | | | |
| Rehoboth | | ◆ | ◆ | | ◆ | | ◆ |
| Selbyville | | ◆ | ◆ | ◆ | | | |
| Sussex Shores | | ◆ | | | ◆ | | ◆ |

# 10. DRINKING WATER STATE REVOLVING FUND PROGRAM

The fund is capitalized through a combination of annual Federal grant awards and required State matching funds. In keeping with the primary public health protection function of the Department, disbursements from the fund prioritize treatment and the achievement of drinking water standards.

As of July 31, 2014, the Drinking Water Revolving Fund has disbursed a total of $168.7 Million dollars. 80% of the funds went out as loans and the remaining represent a combination of state grants and principal forgiveness.

| LIFE OF PROGRAM | | |
|---|---|---|
| **Fund Distribution** | **Percent** | **$ million** |
| Treatment | 32.8 | 55.4 |
| Distribution | 36.2 | 61.0 |
| Storage | 23.6 | 39.7 |
| Source | 1.7 | 2.9 |
| Other | 5.7 | 9.7 |
| | **100** | **168.7** |
| Fund Sources | | |
| SRF Loan | 80.0 | 135.0 |
| State Loan | 0.3 | 0.5 |
| State Grants | 3.8 | 6.5 |
| Fed Principal Forgiveness | 15.9 | 26.8 |

Program Beneficiaries include both public and privately owned utilities in a wide range of system sizes. In FY 2015, the State proposes to make disbursements totaling $9.9 million and expects to have $34.9 million available for disbursements in FY 2016. In FY 2011 through FY 2013 the State closed on loans totaling $39.7 million, in a roughly four to one split between public and private borrowers.

[Source: Presentation by DNREC to WIAC on October 13, 2014; Drinking Water SRF Cash Flows as of 9/30/2014]

The criteria that the State uses to develop the project priority list and intended use plan is included as an appendix to this report.

| BORROWERS | | |
|---|---|---|
| **PUBLIC** | | **PRIVATE** |
| Bethany | Laurel | Wilkerson Water |
| Blades | Lewes | AWC |
| Bridgeville | Middletown | Granada MHP |
| Clayton | Milford | TUI |
| Dagsboro | Millsboro | |
| Delmar | Milton | |
| Dover | Rehoboth | |
| Felton | Seaford | |
| Frankford | Selbyville | |
| Georgetown | Smyrna | |
| Greenwood | Wilmington | |

# 11. POLICY PRESCRIPTIONS

The sustained ability of water systems, over the past century, to deliver safe drinking water has had the perverse effect of significantly undervaluing the service in the public mind. As a consequence, there is little natural public support for increases in rates to help pay for increasing costs arising from both treatment needs and infrastructure replacements and upgrades. It is necessary to actively engage the public, through forums and direct outreach, to develop and maintain understanding of the centrality of the service in protecting the individual household from potentially catastrophic consequences of water–borne diseases. This is not an easy undertaking for water systems because it is not a core competency. Depending on the community, the question of long-term affordability by the economically weaker sections of the community must also be addressed as part of such a dialogue.

Median Household incomes for municipalities within the State range from a low of $31,830 for Laurel to a high of $130,000 for Henlopen Acres. Obviously, the challenges faced by individual municipalities with regard to sustaining infrastructure investments vary considerably in severity and the responses to these challenges must be individually tailored. As noted earlier in this document, the EPA has directly addressed affordability through the establishment of an "affordability index," based on Median Household Income (MHI), that informs its internal policy decisions regarding the implementation of new regulatory requirements by affected communities. The State of Delaware also uses MHI as an affordability index, but applies it to decisions regarding financial support.

The United States Conference of Mayors, the American Water Works Association and the Water Environment Federation jointly released a report, the "Affordability Assessment Tool for Federal Water Mandates" in 2013 specifically challenging the use of MHI as an affordability measure in regulatory rule making, citing "no discernible relationship between MHI and the incidence of poverty" from an examination of 21 cities with MHI's within $3,000 of the national MHI. Poverty rates in these cities ranged from 14.1% to 23.3%. The report also identifies the growing income disparity within communities, with large clusters at each end of the income spectrum, which results in a disproportionate impact of water and wastewater costs on lower income neighborhoods. The report urges consideration of alternative affordability criteria and offers, as an example, the consideration of cost impacts by household income quintiles. To illustrate this point, the income distribution for Wilmington, DE (a city with MHI well below the State MHI) and the associated cost impacts of current rates are shown in the table below:[16]

[16] Source: factfinder2.census.gov website.

| WILMINGTON, DE 2010 INCOME DISTRIBUTION DATA<br>MEDIAN HOUSEHOLD INCOME $39.761<br>TOTAL HOUSEHOLDS 28,871 | | | |
|---|---|---|---|
| **Household Income** | **Number** | **% of households** | **Cost as % income** |
| Less than $14,999 | 5723 | 20% | 2.1% |
| $15,000 to $34,999 | 7511 | 26% | 0.9% |
| $35,000 to $74,999 | 8127 | 28% | 0.4% |
| $75,000 to $149,999 | 5576 | 19% | 0.2% |
| $150,000 or more | 1934 | 7% | |

## FACING UP TO THE CHALLENGE

The core message of the Buried No Longer Report is that the infrastructure in use by most communities dates back to major developmental phases (such as the post WWII boom) when major investments were made in a relatively short time span. Because of the long-lived nature of buried infrastructure (in particular) the replacement demand also tends to be lumpy. Most utilities have not established financial plans to account for this challenge, preferring to deal with problems as they arise rather than in a systematic way.

The way out of this conundrum must begin with the explicit recognition by both communities and community leadership that the water supply enterprise they are engaged in is central to their well-being. The stewardship obligation for the enterprise is multigenerational. The long-term sustainability of individual water systems is also an important matter for the State.

State action in connection with this issue revolves primarily around support for the construction of new and replacement infrastructure through the State Revolving Fund Program. To use a computer analogy, infrastructure is the "hardware" that supports the delivery of water service. The State's role, through the SRF program, is primarily focused on the hardware. The "software" that drives the actions that deliver the service is made up of people, programs, operational and financial management systems, governance systems and policies. The stewardship mindset resides, weakly or strongly, in this software. Effective long-term stewardship depends on the effectiveness of all of the components that make up the water system – the hardware and the software. The water industry has long recognized this challenge and the various industry associations, in concert with EPA, have developed a systematic approach that utilities can follow to achieve consistent success in executing their mission. This approach to Effective Utility Management (the acronym EUM is widely used) is embodied in a joint publication released in 2008. [17]

[17] "Effective Utility Management," EPA, AMWA, APWA, AWWA, NACWA, NAWC, WEF joint publication, 2008.

The attributes of effectively managed utilities are enumerated below:

- Product Quality
- Customer Satisfaction
- Employee and Leadership Development
- Operational Optimization
- Financial Viability
- Infrastructure Stability
- Operational Resiliency
- Community Sustainability
- Water Resource Adequacy
- Stakeholder understanding and Support

The EUM primer also recognizes that effective management is critical to achieving successful outcomes and identifies five "Keys to Management Success":

- Leadership
- Strategic Business Planning
- Organizational Approaches
- Measurement
- Continual Improvement Management Framework

> *"Because water and sanitary services are lifeline issues, water and wastewater utilities have a public health obligation to find a way to provide services to low income customers while maintaining sustainable finances."*
>
> Excerpt from "Thinking Outside the Bill: A Utility Manager's Guide to Assisting Low Income Customers," AWWA, 2014, Second Edition.

A number of management and engineering consultants can offer EUM guidance to utilities seeking to shore up their sustainability practices. EUM practice is still evolving as utilities apply and modify it to suit their particular circumstance.

## OPPORTUNITIES FOR STATE SUPPORT

While new revenues are likely to be needed in the coming decades to address the looming investment need, utilities are also finding that there are opportunities to free up cash and bring in revenues simply by taking a hard look at their operations and their metering, billing and revenue collection practices. The deregulation of energy markets has raised costs but also offers opportunities to find creative ways to reduce energy consumption through efficiency improvements and operational controls. Utilities are also finding that relatively small investments in metering infrastructure can pay significant dividends through higher revenue receipts.

With these examples in mind, the State should consider offering financial support to utilities to engage in a facilitated process to improving the "software" through EUM or equivalent approaches. This could initially take the form of simple benchmarking of management practices and policies currently in place:

- Energy use and procurement practices
- Infrastructure leakage assessments
- Metering and Billing systems

The State could also offer assistance, through legislative action if needed, to allow utilities to take advantage of economies of scale for construction activities such as pipeline, valve and hydrant replacements and slip-lining of pipe and in the creation of billing and collection co-ops. The State could incentivize utilities to improve their practices by making progress towards effective management practices a component of the financial assistance evaluation and prioritization process.

With regard to affordability: this report begins to address the issue by identifying communities that are likely facing the issue of affordability of the water service by low income residents. State assistance to these communities could take the form of grant assistance to study the problem specific to the utility and develop approaches to achieving affordability in a sustainable way. Globally, the definition of affordability currently used by the State in its financial assistance prioritization process could be modified to explicitly take income distribution within communities into account.

# 12. METHODS

The Division of Public Health began work on this project in April 2014. With the support of the Rural Water Association, staff conducted structured interviews with municipal and private water utilities across the State. The results of these interviews are summarized in the System Summaries section of this report. The survey is structured to gather information on

- Type and condition of current infrastructure,
- Status of source water protection plans and ordinances,
- Adequacy of supply, capacity of treatment and storage, fire protection
- Demographics (primarily MHI)
- Financial condition, financing needs and potential financing sources
- Financing constraints
- Feedback on the SRF program

Interviewees represented utility leadership at the management and operational levels.

| INTERVIEW PARTICIPANTS LARGE SYSTEMS | | | |
|---|---|---|---|
| Artesian** | DiNunzio | Joseph | Chief Financial Officer |
| Tidewater Utilities | Kalmbacher | Jeremy | Director of Engineering |
| United Water** | Skomorucha | Susan | General Manager |
| Wilmington | Demo | Matt | Project Management Consultant |

**Interviews with the private utilities Artesian and United Water were not based on the structured interview and focused more on gathering information on infrastructure and on investment history and future investment plans.

Interview participants for the medium and small utilities are shown in the pages that follow. All of these interviews followed the interview format. Henlopen Acres did not participate in the process.

| INTERVIEW PARTICIPANTS MEDIUM SYSTEMS | | | |
|---|---|---|---|
| Camden-Wyoming | Scott | Harold | Water Supervisor |
| Dover | Lyon | Jason | Water/Wastewater Manager |
| Georgetown | Dvornick | Gene | Town Manager |
| | Bradley | William | Public Works Director |
| | Givens | Laura | Finance |
| Harrington | Tieman | Teresa | City Manager |
| | Moore | David | Public Works Director |
| Laurel | Foskey | James | Laurel Public Works Director |
| | Hoageson | Jim | GMB/Consultant |
| Middletown | Kersey | Wayne | Public Works Director |
| | Fletcher | Keith | Water Dept. Supervisor |
| Milford | Helmick | Eugene | Water Dept. |
| | Dennehy | Brad | Public Works Superintendent |
| | Retzlaff | Erik | DBF/Consultant |
| Millsboro | Lingo | Faye | Town Manager |
| | Niblett | Kenny | Public Works Director |
| | Sauer | Bill | Finance Director |
| New Castle | Guyer | Jay | Municipal Services Commission |
| | Patone | Pam | Municipal Services Commission |
| Newark | Coleman | Tom | Director of Pub. Works & Water Res. |
| | Filasky | Tim | Deputy Director |
| | Neimeister | Mark | Water Operations Superintendent |
| Seaford | Slatcher | Dolores | City Manager |
| | Anderson | Charles | Assistant City Manager |
| | Mears | Berley | Public Works Director |
| Smyrna | Hugg | David | Town Manager |
| | Gede | Mark | Water Dept. |
| | Evans | Bill | Public Works Director |
| | Martinez | J | |
| Sussex County | Eldreth | Robert | Environmental Services |
| and Dewey | Sheridan | Heather | Environmental Services |

| INTERVIEW PARTICIPANTS SMALL SYSTEMS | | | |
|---|---|---|---|
| Bethany | Connery | Janet | Finance Director |
| | Foreman | Ron | Water Department Director |
| Blades | Prettyman | Vicky | |
| | Slater | Brandon | Water & Maintenance Supervisor |
| | Loar | Jason | DBF/Consultant |
| Bridgeville | Savage | Jesse | Town Manager |
| | Kimball | Scott | Water Department Director |
| | Loar | Jason | DBF/Consultant |
| Clayton | Hurlock | Jeff | Public Works Director |
| | Faulkner | Gary | Water Dept. |
| Dagsboro | Long | Stacey | Town Manager |
| Delaware City | Penman | Rob | Artesian Water Contract Ops |
| | Cathcart | Richard | City Manager |
| | Gwynn | Dawn | |
| Delmar | Bynum-King | Sara | Town Manager |
| | Taylor | Joshua | DBF/Consultant |
| Felton | Greene | Rebecca | Town Manager |
| | Lupinetti | Amy | Town Clerk |
| | Hughes | Ralph | Water Supply Specialist |
| Frankford | Truitt | Terry | Town Manager |
| Frederica | Reger | Pete | Councilman |
| | Russum | Dustan | Public Works Director |
| Greenwood | McDonnell | John | Town Manager |
| Henlopen Acres | | | |
| Lewes | Gordon | Darrin | Lewes Board of Public Works |
| Magnolia | Fowler | Scott | Water Operator |
| Milton | Rogers | Kristy | Acting Town Manager |
| | Wingo | Greg | Public Works Director |
| | Collier | John | Councilman |
| | Savage | Carlton | Pennoni/Consultant |
| Rehoboth | Lynn | Sharon | City Manager |
| | Blizzard | Howard | Water Dept. Supervisor |
| | Carins | Barbara | Water Dept. |
| Selbyville | Dickerson | Bob | Town Administrator |
| Sussex Shores | Dorey | Brad | Director of Operations |

The interviews were followed by an intensive data-gathering phase on the major water infrastructure components for each system. Information sources included direct communication with the utilities, the State's Drinking Water Information System database and the Check Up Program for Small Systems (CUPSS) data collected by the Rural Water Association as part of its support and outreach to small rural systems. The information collected was at a level sufficient to gainfully utilize the EPA cost model to develop estimates of replacement values for system infrastructure. [18]

Generally, use of the model requires an understanding of the capacities of wells and well pumps, treatment system types and capacities, storage tank types and capacities, and transmission and distribution buried infrastructure lengths and sizes. Estimates for large raw water impoundments and dams are not included in this study because they tend to be highly site specific and are, in most cases, are legacies that are irreplaceable. Not all municipal utilities have detailed information on the location and length of their buried infrastructure. In these situations, the Department of Transportation's mileage figures for the municipality (used for the distribution of Municipal Street Aid funds) were used as a surrogate.[19] The likely effect of this substitution is an underestimation of the length of transmission and distribution pipelines that the municipality owns.

# 13. SYSTEM SUMMARIES

This Section is organized by system size, using the EPA classification for Large, Medium and Small systems. A summary description of assets is provided for each system, together with the tabulation of major asset replacement value. A narrative is included on capital plans, if any, median household income, household costs based on the latest available rate information and information gathered during the survey conducted by the DHSS team.

| SMALL SYSTEMS, DEFINED AS SERVING A POPULATION OF 3,300 OR LESS | |
|---|---|
| Bethany | Frederica |
| Blades | Greenwood |
| Bridgeville | Henlopen Acres |
| Clayton | Lewes |
| Dagsboro | Magnolia |
| Delaware City | Milton |
| Delmar | Rehoboth |
| Felton | Selbyville |
| Frankford | Sussex Shores |

[18] 2003 Drinking Water Infrastructure Needs Survey; Modeling the Cost of Infrastructure; The Cadmus Group, Inc.; June 2006

[19] Municipal Fund Distribution Tabulation, Fiscal Year 2015; State of Delaware Department of Transportation

The relative size of these systems is affected by the nature of the community, with beach communities catering to tourism and seasonal population variations tending to have more robust infrastructure needs relative to their nominal populations.

These communities are all characterized by groundwater sources from both confined and unconfined aquifers.

| MEDIUM SYSTEMS, DEFINED AS SERVING POPULATIONS OF 3,300 AND 100,0000 | |
|---|---|
| Camden-Wyoming | Millsboro |
| Dover | New Castle |
| Georgetown | Newark |
| Harrington | Seaford |
| Laurel | Smyrna |
| Middletown | Sussex County |
| Milford | Dewey |

| LARGE SYSTEMS, DEFINED AS SERVING POPULATIONS OF 100,000 OR MORE | |
|---|---|
| **Municipally Owned** | |
| Wilmington | The Wilmington system is the oldest system in the State. The system depends entirely on surface water from the Brandywine River. The Hoopes Reservoir, the largest raw water reservoir in the State, is primarily a pumped storage system although it does receive recharge from a small catchment area. |
| **Investor Owned** | |
| Artesian Water | Artesian Water is a groundwater-based utility with operations in all three Delaware Counties and the State of Maryland. |
| Tidewater Utilities | Tidewater Utilities is a subsidiary of the Middlesex Water Company based in New Jersey. It is also a groundwater based utility with operations predominantly in Kent and Sussex Counties |
| United Water Delaware | United Water Delaware is a subsidiary of United Water, also based in New Jersey, which is wholly owned by Suez Environnement, France. The Delaware system depends on surface water drawn from the Red Clay Creek and Christina River. |

# 14. SMALL SYSTEMS, 3,300 OR FEWER PEOPLE SERVED

| System | Population Served | Median Household Income |
|---|---|---|
| Bethany | 1,060 | $63,000 |
| Blades | 1,241 | $34,766 |
| Bridgeville | 2,048 | $54,830 |
| Clayton | 3,008 | $69,814 |
| Dagsboro | 805 | $55,375 |
| Delaware City | 1,800 | $55,759 |
| Delmar | 1,597 | $36,486 |
| Felton | 1,500 | $45,200 |
| Frankford | 878 | $42,102 |
| Frederica | 774 | $47,325 |
| Greenwood | 973 | $33,592 |
| Henlopen Acres | 122 | $130,000 |
| Lewes | 2,747 | $58,125 |
| Magnolia | 225 | $34,156 |
| Milton | 2,576 | $42,106 |
| Rehoboth | 1,327 | $82,500 |
| Selbyville | 2,167 | $40,994 |
| Sussex Shores | varies | $52,692 |
| **TOTAL** | **24,848** | |

# BETHANY

Population Served: 1,060

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $12,980,302 |
| Storage Tanks | $ 4,024,358 |
| Mains and appurtenances | $23,888,600 |
| **TOTAL** | **$40,893,261** |

Summary of major assets:

The assets of this system reflect its status as a beach community drawing significant seasonal residents and tourists. The system consists of 8 wells, treatment for iron removal and two large storage tanks for finished water. The distribution system includes 30 miles of buried mains.

Capital Plans**:**

NOT AVAILABLE

Affordability:

Bethany is a relatively affluent community with a median household income (MHI) of $63,000. The typical household burden for the water service represents 0.56% of MHI (an annualized cost of $355 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/15/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>J Connery, Bethany<br>R Foreman, Bethany | **SYSTEM: BETHANY** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 5 wells all used in rotation. Savannah's Landing and Salt Pond served as out-of-town customers. interconnected for emergency use with Tidewater Utilities and Sussex Shores. Peak demand supply is more than adequate. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Treat for pH control, iron removal by aeration, enhanced coagulation with potassium permanganate, green sand filtration, Fluoride addition, and disinfection with Chloramines to avoid formation of Disinfection By-products. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | New elevated storage tank nearing completion of 500,000 gallons. Wet well of 100,000 gallons of partially treated water also available for fire/emergency. fire flow supply is adequate. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br><br>Meters in proper condition/working? | 3 fulltime employees for water. Plant upgraded in 1992. 1 existing standpipe holding 1,000,000 gallons. Oldest distribution sections are 1960's and composed of galvanized pipe - about 7%; transite = about 24%; ductile iron = about 9% and PVC = about 67%. Most of distribution is 6" or larger. Few deadens; mostly looped. Valves and hydrants are operable and mapped. Flushing program = twice per year - to get ready for peak season and to winterize plus throughout the year as needed. System has been hydro-modeled. 100,000 gallon wet well for filter backwash + a 21,000 gallon holding tank; ability to recycle backwash into clarifier but usually discharge from holding tank to the county sewer system. Rates are tiered in usage blocks with a base rate of $25 per year; billings are semi-annual. $1.07 per front foot dedicated to debt retirement. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | In-town rate is $3.50 for the first 10,000 gallons and $4.50 up to 40,000 gallons; $5.50 for all usage over 40,000 gallons; out of town is $5.50 for all usage. Town philosophy is not to expand further at present; service area locked in by Tidewater and Sussex Shores. Few opportunities for public-private partnerships as they are currently built out, provided there are no changes or annexations. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | First priority wish would be to replace remaining transite pipe. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Probably internally. Very well-run system with financials in good order including reserves. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum would pass if needed. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Debt Limit is 1.9 million for short term debt; long term limit is based on a % of assessable base. |
| **Pros/Cons of DWSRF** | |
| | Cumbersome paperwork, but not a deterrent. |
| **What would make the program more enticing?** | |
| | DWSRF program suggestions = use ACH method of payment rather than paper checks; the amount of documentation and reporting is sometimes burdensome. |
| **Feedback** | |

# BLADES

Population Served: 1,241

Summary of major assets:

The system consists of 3 wells, treatment for iron removal and one storage tank for finished water. The distribution system includes 6 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $1,788,751 |
| Storage Tanks | $692,119 |
| Mains and appurtenances | $4,777,720 |
| **TOTAL** | **$7,258,590** |

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $34,766 is significantly below the MHI for the State as a whole. The typical household burden for the water service represents 1.38% of MHI (an annualized cost of $480 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/24/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>V Prettyman, Blades<br>B Slater, Blades<br>J Loar, DBF | **SYSTEM: BLADES** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Source water ordinance is not in place. Source Water Protection Plan not updated. 2 wells. Backup well funded by DWSRF. Upon drill completion chromium was detected at 100x MCL. No consecutive supply. Another well is needed for redundancy. No allocation issues. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Chlorine, fluoride, manganese and iron removal w/ greensand, pH adjustment with caustic. No compliance issues. Treatment plant is ok. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br><br>Trouble meeting fire flow due to storage? | Do not buy or sell water. 150,000 gallon elevated storage tank. Do not have tank maintenance contract. They have no compliance issues. Meets fire flow needs. Want a low interest rate low term for tank maintenance. (Desperately needed) |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Most distribution was installed between 1979 and 1981. Mostly PVC. Majority of leaks are because they are not backfilled properly. Valves and hydrants in good working order. Meters are ok. System is looped. Everything is metered and have and idea of unaccounted for water. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Backwash goes to sewer. |

| **Utility and Financing Needs** | |
|---|---|
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br><br><br><br><br>Basis for user rate charges? | User rates were just increased to cover water costs. MHI is low. CPCN issues are unknown. There are no funds from water rates being held in reserve. The Town has little funds to work with for O&M and would consider short term/low interest loans to cover O&M expenses. Water rates: Base rate 21.50 for 2,000 gallons. Billed monthly. They have increased water rates. Many homes have personal wells. The MHI is 28,864. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 3-5 or 5-7 year needs: distribution expansion to reach Route 13. Town thinks State should pay for infrastructure to improve economic development. New well issue needs to be resolved with DNREC asap. Need SCADA/electrical upgrades and security upgrades. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Whoever has the best deal. Thinks DWSRF should be used in lieu of Municipal Street Aid for supplemental funding. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum would fail at this time. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Town is not comfortable borrowing more money at this time. |
| **Pros/Cons of DWSRF** | |
| | too much red tape, wage rates are unreasonable |
| **What would make the program more enticing?** | |
| | Free money, O&M financing, more easily accessible emergency funds |
| **Feedback** | |
| | Would like to continue with CUPSS program need more training. Don't have SCADA but would like. Would like help with providing security around wells with fencing, cameras, lights, electrical security panel, and portable generator. |

# BRIDGEVILLE

Population Served: 2,048

Summary of major assets:

The system consists of 6 wells and two storage tanks for finished water. The distribution system includes 10 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $4,363,348 |
| Storage Tanks | $1,949,033 |
| Mains and appurtenances | $7,962,867 |
| **TOTAL** | **$14,275,248** |

Treatment is limited to the addition of chemical for corrosion inhibition and disinfection.

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) is $54,830, slightly below the MHI for the State as a whole. The typical household burden for the water service represents 0.39% of MHI (an annualized cost of $212 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/3/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>J Holloway, DRWA<br>J Savage, Bridgeville<br>S Kimball, Bridgeville<br>J Loar, DBF | **SYSTEM: BRIDGEVILLE** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br><br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 6 wells. Allocation is at 25% of permit. No Source Water Protection Ordinance in place. Source Water Assessment needs updating. Planning and zoning review protects source water from potential contamination. One well with high nitrates is blended to get finished water below MCL. No trouble meeting peak demand or fire flow. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Chlorine and fluoride. No compliance issues other than nitrates mentioned above. Plants need no upgrades. |
| **Storage** | |
| Type<br><br>Tank maintenance plan in place?<br><br>Trouble meeting fire flow due to storage? | 2 elevated tanks: 1-125K gallon, 1-400k gallon. Potential development may call for more storage. Tank maintenance was not discussed. No trouble meeting fire flow. Peak demand is roughly 50% of available capacity. Tanks maintenance is under contract. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | The oldest mains in town were installed in the 1940's and 1950's. They are becoming more problematic and the Town closed a DWSRF loan to replace the worst. Valves are located and working. There are a few dead ends on the outskirts of Town. Fire flow may be restricted due to tuberculation in the old mains. Mains are not adequately sized. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No iron removal, no backwash. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | User charges cover water costs, MHI is high due to Heritage Shores development. CPCN needs to be updated to include Heritage Shores. Water Rates $1.79 up to 5,000 gallons; $2.35 for 5,001 to 10,000 gallons; $2.79 for 10,001 and above. MHI is approx. $30,000. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Next 3-5 years will call for more main replacements. Meters will be replaced in Summer/Fall 2014 using DWSRF |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | DWSRF if it remains competitive (1.5% interest) folowed by USDA/RD. Development pays for development. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum over $1.5M will not pass at this time. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Changed charter for 1.5 million with out referendum. No debt limit if borrow from state for feds. |
| **Pros/Cons of DWSRF** | |
| | Prevailing wages and paperwork is a nightmare. Would like to see a decrees in red tape - costly. USDA has less red tape. |
| **What would make the program more enticing?** | |
| | Planning Grant funds, mapping funds, decreased requirements like Buy American and Davis Bacon |
| **Feedback** | |
| | Hope to do water infrastructure plan. |

# CLAYTON

Population Served: 3,008

Summary of major assets:

The system consists of 4 wells, and two storage tanks for finished water. The distribution system includes 8.5 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $4,363,348 |
| Storage Tanks | $1,949,033 |
| Mains and appurtenances | $7,962,867 |
| **TOTAL** | **$14,275,248** |

With the exception of Well 4, which requires treatment for Arsenic removal, the remaining wells are limited to chemical addition.

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) is $69,814, slightly above the MHI for the State as a whole. The typical household burden for the water service represents 0.35% of MHI (an annualized cost of $244 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/29/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>G Faulkner, Town of Clayton<br>J Hurlock, Town of Clayton | **SYSTEM: CLAYTON** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 4 wells w/ 1 on standby due to arsenic. Wellhead protection ordinance in place and Source Water Protection plan underway as part of Comp Plan update. Interconnected with Artesian Water for both occasional demand load and emergency use as needed. No problem meeting peak demand with native capacity PLUS Artesian purchased water. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Treatment: Arsenic removal with granular Ferric Hydroxide impregnated filters; Chlorine & Fluoride addition. Filters rotated, with one in use and one idle, and backwash every 16 days; backwash decanted to sewer system. Water is also blended to achieve best available quality and prolong filter life. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Storage is with 2 town-owned elevated storage tanks of 100,000 gallons each and town is pursuing an agreement to use an Artesian-owned 500,000 gallon tank. Storage is ample but if development continues at the same pace, another tank might be needed in 5 years +/-. Fire flow demands adequate with Artesian interconnect. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Distribution - approx.. 3-5 miles of mains; the oldest, about 5% of total, is cast iron or ductile, with the majority of that being ductile; newer areas are all PVC - about 50% of total. There is "a lot" of 4" pipe in the town, but larger diameters are within reach for fire flows if needed. Current allocation was recently increased, and average pumpage is 200,000 gpd. System is mostly looped with a few dead ends and newer development is all looped. Valves are mostly located and operable, particularly the newer ones. Hydrants work and are flushed regularly. Meters are an average of 5 years old and the town is in the process of systematically switching out iTron meters as the batteries, etc. fail. Resiliency issues: the town has generators and feels that the interconnection alone will protect its ability to provide water in the event of a prolonged power outage or other emergency. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Arsenic backwash goes to sewer, not a lot of sludge. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | Water rate is $9.50 for the first 2,000 gallons and $4 per 1,000 after that for all classes of customer. Rate revenue is in excess of department costs and overage is usually allocated to the General Fund according to the dept. staff. Service territory is bordered by Artesian to the west and southwest of town boundaries. Official policy is that development pays for development, rather than the town extending services. Public private partnership opportunities are developer exactions and interconnection and/or purchase of water in bulk from Artesian. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | First priority for capital expenditure would be replacing mains in the oldest part of town, some of which are 100 years old +/-. If development continues, an additional well and treatment plant would also be needed. Money for technology upgrades would also be desirable, particularly for SCADA upgrades. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Development pays for development; already have private partnership in place |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum would probably pass based on need. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | Town frowns on borrowing and thinks DWSRF funds are too expensive. More rewards should go to well-run systems. Would consider grant/loan combo. Mandated lowered MCLs--as with arsenic should be paid for with federal funds. |
| **Feedback** | |
| | Wastewater goes to Kent Co., but town owns the collection system for the old part of town, while newer parts discharge directly to the county. Low-interest, short term technology loans |

# DAGSBORO

Population Served: 805

Summary of major assets:

Dagsboro is a purchased water system. Its assets are limited to one storage tank for finished water and 4 miles of buried mains.

Capital Plans: NOT AVAILABLE

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | - |
| Storage Tanks | $1,552,502 |
| Mains and appurtenances | $3,185,147 |
| **TOTAL** | **$4,737,649** |

Affordability:

The median household income (MHI) is $55,375, slightly below the MHI for the State as a whole. The typical household burden for the water service could not be determined.

| | |
|---|---|
| Date: 4/10/14<br>In attendance:<br>J Park, DWSRF<br>J Holloway, DRWA<br>S Long, Dagsboro | **SYSTEM: DAGSBORO** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br><br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Buy water in bulk from Millsboro |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | No treatment or source - distribution only |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 500,000 capacity storage tank. Limited capacity with Millsboro - 90,000 gallons per day. Want to relook at purchasing EDUs. Maintenance contract with southern corrosion. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Fire flow potential is ample. Some pressure issues on the south end of town due to inadequately-sized pipe. Some dead-end lines causing quality and pressure problems at times. Valves are maintained under the annual maintenance and operations contract with Artesian. Meters are about 6 years old and batteries are starting to fail - about 50 so far. Current agreement with Millsboro - 90,000 gpd, with actual use averaging 65 gpd. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Pays Millsboro: $3.00 per 1,000 gallons; Residential rates $40.00 for 3,000 gallons, $4.00 per 1,000 gallons thereafter; Commercial rate $4.00 per 1,000 gallons. MHI is unknown. CPCN - non known, not prohibited. Makes developer pay for annexation. |

| | |
|---|---|
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Future financing needs include looping of remaining dead-end lines; also developments requesting 70+/- connections with sunset in the next 3-5 years if no movement by the developers; those may require additional expense for distribution. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Anticipate application DWSRF for funding to loop distribution. |
| **Referendums/ Borrowing 'concensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Current reserves = about $40,000 un-restricted + about $200,000 earmarked for specific projects or requirements. |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | Suggestions for DWSRF: making smaller projects and equipment eligible for funding to allow flexibility for smaller systems. |
| **Feedback** | |

# DELAWARE CITY

Population Served: 1,800

Summary of major assets:

The system consists of 2 wells, treatment for iron removal and two storage tanks for finished water. The distribution system includes 9 miles of buried mains.

Capital Plans: NOT AVAILABLE

| ASSET | REPLACEMENT VALUE |
|---|---|
| TREATMENT | $2,715,190 |
| Storage Tanks | $1,950,163 |
| Mains and appurtenances | $8,159,647 |
| Wells and Well Pumps | $1,220,026 |
| **TOTAL** | **$14,045,027** |

Affordability:

The median household income (MHI) of $55,759 is slightly below the MHI for the State as a whole. The typical household burden for the water service represents 0.63% of MHI (an annualized cost of $351 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: June 17, 2014<br>In attendance:<br>H Warren, DWSRF<br>K Srinivasan, KS Group<br>R Penman, AWC<br>D Gwynn, DE City<br>R Cathcart, DE City | **SYSTEM: DELAWARE CITY** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 2 wells installed in the 70's. Pump 3M/month. No fire flow issues. Would consider using wells at Governor Bacon. No consecutive supply, no interconnection. Would consider using Governor Bacon interconnection. No allocation issues. Source water protection ordinance unknown. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | chlorine, fluoride, greensand with potassium permanganate. Plants are old and need modernization. No compliance issues. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 1-250k elevated tank. Would consider using Governor Bacon new elevated tank with interconnection. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Breaks are few and due to construction when they occur. System is made of mostly ductile iron between 4 and 8 inches installed in the 60's. No tuberculation issues. No fire flow issues. Valves and hydrants in good working order. Flushed 1x/yr. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | backwash goes to sewer |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Rate study probably needed. Unclear about borrowing issues and abilities. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Interconnection with Gov. Bacon, Meter replacement, Plant modernization including SCADA. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | No development occurring except Gov Bacon--private/public partnership. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | wanted to know more about DWSRF terms and possible financing |

# DELMAR

Population Served: 1,597

Summary of major assets:

The system consists of 5 wells, and two storage tanks for finished water. The distribution system includes 7 miles of buried mains.

Aeration and chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $5,659,745 |
| Storage Tanks | $2,077,056 |
| Mains and appurtenances | $5,574,007 |
| **TOTAL** | **$13,310,809** |

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $36,486 is significantly below the MHI for the State as a whole. The typical household burden for the water service represents 0.75% of MHI (an annualized cost of $274 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/24/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>S Bynum-King, Delmar<br>J Taylor, DBF | **SYSTEM: DELMAR** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 2 wells. Borrowed funds from DWSRF to install a new well to replace a high iron well, but EPA and MDE found PCE. Well project is on hold. Source Water Ordinances in place. Source Water Protection Plan has not been updated. No problems meeting peak demand. No consecutive supplies. Considering a connection with Salisbury depending on funding source. No allocation issues. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Chlorine, fluoride, pH adjustment via aeration, ortho-poly corrosion inhibitor. Iron issues in not-in-service-well. Plant is about 15 years old (1998) and is in need of upgrades. Green sand removal for iron. |
| **Storage** | |
| Type<br><br>Tank maintenance plan in place?<br><br>Trouble meeting fire flow due to storage? | 2 elevated tanks: 1-150k gallon, 1-250k gallon. Service agreement in place. Meets fire flow demand. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Mains are 40-75 years old. Most of the distribution system is mapped. Flushing program is in place. Main breaks are predictable. Mains are not adequately sized. Town has used DWSRF funds for past several years to replace distribution where most needed. Everything is metered in town except 1 area in Maryland (Breckenridge has sewer but not water) |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Iron backwash goes to sewer. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Charges cover water costs, reserve is maintained. No CPCN issues at time of Assessment. Residential rates; $3.50 per 1,000 gallons. Commercial $5.00 per 1,000 gallons. Billed quarterly. MHI 34,740 CPCN- have an agreement with Tidewater to annex but nothing has been done.. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 3-5 years in order: (after well issue has been resolved and new well is installed) distribution upgrades, meter replacement (currently have an application with DWSRF for meters) Want upgrade lime feed, SCADA and Electrical controls, well, security (electronic gates and cameras). |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Development should pay for development. Multiple funding agencies will continue to be used based on best offer. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | No borrowing issues. Referendum for increased debt would probably fail. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Able to use impact fees/reserves if needed. |
| **Pros/Cons of DWSRF** | |
| | Wage rates are a barrier for DWSRF funds; would like to see continued financing flexibility. |
| **What would make the program more enticing?** | |
| | Free money, decrease wage rate requirements. Quicker access to money. |
| **Feedback** | |
| | |

# FELTON

Population Served: 1,500

Summary of major assets:

The system consists of 3 wells, and one storage tank for finished water. The distribution system includes 6 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,234,219 |
| Storage Tanks | $839,488 |
| Mains and appurtenances | $4,777,720 |
| **TOTAL** | **$7,851,427** |

Two of the wells have chemical feed systems only, the third well receives treatment for Arsenic removal in addition.

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $45,200 is significantly below the MHI for the State as a whole. The typical household burden for the water service represents 0.34% of MHI (an annualized cost of $154 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/22/14<br>In attendance:<br>J Park, DWSRF<br>J Holloway, DRWA<br>K Srinivasan, KS Group<br>T Tieman, Harrington<br>D Moore, Harrington | **SYSTEM: FELTON** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 wells; Well #4 is active, Well # 2 is for extreme emergencies (has a tractor motor), Well # 3 is a backup well. Main well - #4, contains arsenic and treatment has been upgraded for its removal approx.. 2007. Can meet capacity. Source water meets peak demands. All well go through treatment facility. Has well head protection in place. No interconnection. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Treatment Chlorine and Ferric Chloride. Natural Fluoride. No pH problem. Well #4 has arsenic - pull through Iron to get arsenic out. Filter out iron before distribution. Macro light backwashing recycling tank. |
| **Storage** | |
| Type<br><br>Tank maintenance plan in place?<br><br>Trouble meeting fire flow due to storage? | One 200,000 gallon storage tank. Has tank maintenance with Southern Corrosion. Fire flow can be meet with tank but not meet with out tank. Tank maintenance plan includes interior & exterior on a set schedule for 5yrs locked and can be extend to 10 yrs. Pumping capacity is 270 gpm from the filter, & 320 gpm if filter is bypassed. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | 1940 is when service started. Few main breaks a year. Mains are adequately sized. Have galvanized pipe lines. Most leaks are due to the galvanized pipes. During road construction they replace service lines. System has a few dead ends. All valves work and location is known. System can be adequately flushed after a contamination event. 95% of Hydrants work but need serviced. All meters work and are replaced when broken. Do handheld reads manually, equipment malfunctioning. Distribution system are old concrete transite pipes and have old lead goose neck. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Manually backwash recycle system. Backwash goes into recycle tanks. Overflow goes to Kent County Sewer. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | Rates are $38.00 base charge for up to 15,000 gallons. $2.00 per 1,000 gallons thereafter. Also bill out a $26 debt service fee. Billed quarterly. MHI is $45,200. CPCN with Tidewater on west side of town off Walnut street. Developer exactions for a new tank site if/when it arises. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br><br>Backwash<br><br>Other | Priority financing needs are as follows:<br>Replace outdated motor controls that are difficult to repair. Replace old mains that constitute 30-40% of the total distribution system. If any more property is annexed a new well will be needed. Painting and cleaning of the elevated storage tower to commence in 2014. |
| **Where would you look for financing?** | |
| Private funding<br><br>Bonds<br><br>SRF<br><br>USDA<br><br>Developer<br><br>Public/Private partnerships | Have one USDA loan & have one SRF loan (1999). Finances with the better deal. Including going to market. No known public or private partnership for future. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum is not required. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br><br>Charter change? | Have a water impact fee account and puts money in budget for Capital Improvement. The current debt ceiling is currently far above the present outstanding debt. |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | Suggestions for DWSRF program is for a physical billing that shows remaining principal, payment to date, etc. rather than town having to remember to make the payment |

# FRANKFORD

Population Served: 878

Summary of major assets:

The system consists of 3 wells and one storage tank for finished water. The distribution system includes 3 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $3,810,635 |
| Storage Tanks | $612,421 |
| Mains and appurtenances | $2,388,860 |
| **TOTAL** | **$6,811,915** |

There are two treatment systems, one featuring ion exchange and the other iron removal using greensand filters.

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $42,102 is significantly below the MHI for the State as a whole. The typical household burden for the water service represents 1.25% of MHI (an annualized cost of $526 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/10/14<br>In attendance:<br>J Park, DWSRF<br>J Holloway, DRWA<br>Terry Truitt, Frankford | **SYSTEM: FRANKFORD** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 Wells, with one dormant/inaccessible in the old, abandoned plant. Potential upgrade to deal with TTHM and other problems like that. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Treatment issues are DBP, specifically TTHM |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Capacity is adequate for current population & boundaries; if annexation occurs, additional capacity may be needed. Annexation is proposed in the next 2 +/- years and more storage will be needed. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Interconnected with Dagsboro but no actual contract in place. Dead-end lines are Frankford School Road, Coffman Culdesac, Shockley Cedar Lane, and by the high school. Have had service line breaks. Most valves are mapped and identified (worked with DRWA to GIS locations). Commercial meters need upgraded, half are digital and can be read with wand. Need to make meters uniformed and replace commercial meters. Some are original. (over 10 years old). Need a meter replacement plan. Hydrants are located and operational. There is no billing software in use that makes use of the electronic readings and they use Quick Books for both record keeping and billing. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Backwash issues/need = more frequent decanting of backwash water |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Water Rates: $6.00 bi-monthly customer charge & 8.75 per 1,000 gallons. A charter amendment to allow expansion of the boundaries & therefore the CPCN for the proposed annexation area not currently served. It is currently in the House. Funding needs anticipated are meter installation to update & establish uniformity; billing software to make full use of electronic readings: and town maintenance estimated at $125,000. |

| | |
|---|---|
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Would like to see radio controlled meters. Proper billing software for utility billing. Implementation of maintenance for water tank, tower maintenance. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Public-private partnership opportunities = growth and development across 113 and developer-installed improvements like a new tower; potential for interconnections with utilities to the north and south (Dagsboro & Selbyville respectively). Use Bond or Bank. Interest rate with SRF is not good. Willing to check and compare municipal request with Drinking Water and Dept. of Agriculture. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Debt ceiling in charter is $2.1 million. Capital Reserves in place approx. $60,000. |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | Suggestions for SRF - a line of credit concept that would allow small systems to borrow with little red tape for small improvements and emergencies. |
| **Feedback** | |
| | |

# FREDERICA

Population Served: 774

Summary of major assets:

The system consists of 2 wells, and one storage tank for finished water. The distribution system includes 3 miles of buried mains.

Treatment is limited to chemical feed for disinfection and fluoridation.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $1,704,468 |
| Storage Tanks | $260,671 |
| Mains and appurtenances | $2,388,860 |
| **TOTAL** | **$4,353,999** |

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $47,375 is below the MHI for the State as a whole. The typical household burden for the water service represents 0.55% of MHI (an annualized cost of $261 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/22/14<br>In attendance:<br>J Park, DWSRF<br>J Holloway, DRWA<br>K Srinivasan, KS Group<br>P Rager, Frederica<br>D Russum, Frederica | **SYSTEM: FREDERICA** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 2 wells, with capacity at 500 gpm. With the exception of a main going under the river to a new development, redundancy was judged to be adequate. Water Supply was judged as adequate for peak demand. Reps were unsure about a WHP ordinance but thought one was in place. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Treatment is Chlorine and Fluoride addition only. No other non-compliance or water quality issues. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | One Elevated storage tank of 100,000 gallons capacity. A new tank is being planned, and when it goes live the old one will be dismantled. A tank maintenance agreement is currently under consideration. Fire flow demands are thought to be adequately met. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Mains were re-done in 1993 so there are few breaks in main lines. Mains are adequately sized and can meet reasonably anticipated fire flow demand. System is not completely looped; quite a few dead ends still exist. Valves are mostly located or locatable but it is unknown if all of them are operable. Hydrants are located and operable. Meters are less than 1 year old and are radio read; meter readings still being performed by the vendor due to change in town personnel & lack of opportunity to train. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Current user charge is a flat rate regardless of usage: $90/quarter or $81/quarter for seniors. Median Household income is $47,328 per one website and $55,893 according to another. Artesian has a CPCN for an area that is already annexed into town; reps were not sure how or why that occurred. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Financial needs/priorities are as follows:<br>o A new elevated storage tower<br>o loop remaining dead-end lines<br>o locate and cap old mains that were supposedly replaced and are still believed to be live<br>o an extension under the river to the south is needed to make service redundant in case of fire or emergency; there is currently no other way to serve that area if the present line is compromised.<br>Annual rate at $360 per year is about 0.6-0.7% of MHI.<br>Opportunities for public-private partnerships are developer exactions. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Preferred financing options are DWSRF and USDA - whichever has the most attractive terms. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | Suggestions for the program: application paperwork is difficult for towns with small staff - only 1 or 2 people to work on it; also paying money up front is sometimes impossible even if it is for reimbursable expenses. |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |

# GREENWOOD

Population Served: 973

Summary of major assets:

The system consists of 4 wells, and two storage tanks for finished water. The distribution system includes 5 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,518,136 |
| Storage Tanks | $1,369,983 |
| Mains and appurtenances | $3,981,433 |
| **TOTAL** | **$7,869,552** |

Wells receive chemical feed treatment only.

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $33,592 is significantly below the MHI for the State as a whole. The typical household burden for the water service represents 1.14% of MHI (an annualized cost of $383 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/3/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>J Holloway, DRWA<br>J McDonnell, Greenwood | **SYSTEM: GREENWOOD** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 wells. Source Water Ordinance and Source Water Protection Plan both are fairly current. No issue with redundancy or meeting peak demands. Permit information unknown. No consecutive supplies. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Fluoride, chlorine, pH adjustment using caustic soda, nitrate removal. No compliance issues. Plants are new or newly renovated as of 2011. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | No trouble meeting fire flow. Storage capacity: 1 250,000 gal elevated tank; proposals for tank maintenance contract under consideration. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | The Town upgraded all of their distribution system using DWSRF funds in the recent past (2/3 years). Main breaks are infrequent and the distribution system is made of PVC. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No iron removal; no sludge. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | User charges and rate design: $20 customer charge for 0 usage.<br>$30 up to 3,000 gallons ; $2.42 per 1,000 gallons thereafter<br>MHI is below state median. Rates are about 1.5% of MHI |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 3-5 year plan would include distribution on the east side of Rt 13. This would be a developer expense. DWSRF (as stated) funded new distribution, new storage, and treatment upgrades over the past 10 years. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Financial needs would include expansion across Route 13 for new or un-served areas. DWSRF would be first preference for funding, with USDA/RD second. Public-Private partnerships would take the form of developer-installation improvements. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum would probably pass if favorable rates were offered. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Close to debt ceiling--95% of operating costs |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | More money to due larger project. Low interest rate around 1.5 |
| **Feedback** | |
| | General comment re: SRF program - to remember that "one size does not fit all" when it comes to funding & debt impact on customers, as well as size of project needs. |

# HENLOPEN ACRES

Population Served: 122

Summary of major assets:

The system consists of 11 wells and a combination of hydropneumatic tanks for finished water. The distribution system includes 4 miles of buried mains.

Aeration and chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,304,612 |
| Storage Tanks | $318,292 |
| Mains and appurtenances | $3,185,147 |
| **TOTAL** | **$5,808,051** |

Capital Plans: NOT AVAILABLE

Affordability:

The median household income (MHI) of $130,000 is significantly higher than MHI for the State as a whole. The typical household burden for the water service is unknown.

*NOTE: No Survey was conducted for this utility*

# LEWES

Population Served: 2,747

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $11,195,207 |
| Storage Tanks | $1,436,544 |
| Mains and appurtenances | $15,925,734 |
| **TOTAL** | **$28,557,484** |

Summary of major assets:

The system consists of 5 wells, two storage tanks for finished water. The distribution system includes 20 miles of buried mains.

Aeration and chemical feed systems constitute the treatment system for one of the plants; the other receives chemical feed only

Capital Plans:

The latest plan available on the website is the capital plan for the six-year period 2011 to 2016. The plan calls for expenditures on the water distribution system of $1.9 million and on the water supply system (water production) of $ 1.5 million. This represents an annual investment rate in distribution infrastructure of 2.02% and in production infrastructure of 2.2%, and an overall investment rate of 1.96% of replacement value. This compares well with useful life-based recommendations.

Affordability:

The median household income (MHI) of $58,125 is comparable to the MHI for the State as a whole. The typical household burden for the water service represents 0.47% of MHI (an annualized cost of $273 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/1/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>J Holloway, DRWA<br>D Gordon, LBPW | **SYSTEM: LEWES** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Seasonal fluctuations in both population and usage are significantly higher, approx. 3-10 times. 5 wells with an average depth of about 180 ft.; well locations moved upland/inland to avoid possibility of saltwater intrusion. Capacity is 3,500 gpm, and peak use is approx. 1 mgd; estimated 40-50 years of excess capacity given accuracy of trends and prediction. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | New treatment plant. Treat with Fluoride, Chlorine and pH adjustment with caustic soda. No iron removal or other filtration. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Backup generator ensures fire flow adequacy, without necessity of additional storage. Present elevated storage tank is 300,000 gallons. Tank maintenance is contracted, with annual inspections, detailed inspections every 5 years and painting and refurbishing every 10 years. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Vulnerability Assessment and Emergency Response Plan are up to date; member of DeWARN mutual assistance and ER coop. Few main breaks per year but the last one was serious, with over 60 valves involved and numerous sized mains coming together in the same intersection. Mostly looped but a few dead end lines need to be addressed. Valves are located and operable for the most part. Hydrants are mostly operable and are regularly flushed twice per year. The CIP includes replacement plan for meters over the next 5 years. Mains are severely tuberculated in some areas Talking to Tidewater for interconnection for emergencies. Have 2 onsite generators. Valves and pipe size are mapped. Flush twice a year. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | |

| **Utility and Financing Needs** | |
|---|---|
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | Current rates are an Ascending Block rate with a $15 base charge.$ 0.90 for the first 4,500 gallons, $1.65for the next 4,500 and $2.00 for all usage over 9,000. Their service area adjoins the Tidewater Utilities CPCN on the southwest side of their territory. The MHI for the service area is relatively high, especially for Sussex County, and the result is that low rates amount to a very small share of that MHI. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br><br>Treatment<br><br>Storage<br><br>Distribution<br><br>Backwash<br><br>Other | Main financial needs for the next 5-7 years is for new valves/replacements in some areas, some pipe upgrading and replacement, and the ability to extend to underserved areas with failing septics and wells. Intent is to do as many capital projects and improvements as possible with their own funds to avoid all the strings that come with federal money; Director estimates a 30-40% increase in project costs due to Davis Bacon requirements. Application submitted to DWSRF at time of Assessment for this issue. Another application has been submitted to install valves so the distribution can be sectored for maintenance/main replacement/breaks. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Public Works recently built a new treatment plant with internal funding. Wage Rates were the determining factor for non-use of the DWSRF program. Development pays for development. Interconnections with Artesian or Tidewater would be considered for emergency use. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Lewes has a Board of Public Works. Referendums were not discussed. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | Don’t like to borrow from DWSRF because of the Davis Bacon Wage Rates. They are to restrictive and counter acts the interest rate. Day labor is way above total cost of project. Takes too much money away from project money. Should have more access to grant funds. Bonus for well or properly managing their towns. |
| **What would make the program more enticing?** | |
| | Favorable funding should be available to properly-maintained and successfully run water systems. Principal forgiveness should not only go to disadvantaged communities. |
| **Feedback** | |
| | Would participate in Resiliency Workshop if offered. |

# MAGNOLIA

Population Served: 225

Summary of major assets:

The system consists of 3 wells and a single storage tank for finished water. The distribution system includes 2 miles of buried mains.

Chemical feed systems on each well constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,087,040 |
| Storage Tanks | $353,026 |
| Mains and appurtenances | $1,592,573 |
| **TOTAL** | **$4,032,639** |

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $34,156 is significantly lower than MHI for the State as a whole. The typical household burden for the water service represents 0.64% of MHI (an annualized cost of $219 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| 1-Jul-14<br>In attendance:<br>H Warren, DWSRF<br>S Fowler, Town of Magnolia | **SYSTEM: MAGNOLIA** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | No formal well head or source water protection ordinance. Contamination potential fairly low with current location of wells. 3 wells 2 primary/1 back up. Total available pumping is 800 gpm from both wells. No trouble meeting peak demand from wells. No consecutive supplies, no interconnections. No fire flow problems due to storage. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | No compliance issues, chlorine, fluoride, fe sequestration. Plants are not modern, but have very little treatment. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 55k elevated tank only. Maintenance plan in place. No fire flow problems due to storage. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | 4 breaks in the last 18 months, service lines are more troublesome than mains. Flush hydrants monthly. No fire flow issues due t distribution. Distribution installed in 1926 and is cast iron. Upgrades occurred in 1980 when 6"-8" mains were installed and the system was looped. in 1986, W Walnut St was upgraded to 6" and 8" mains made of PVC. 20 hydrants in town. 6 valves were upgraded last year. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | no backwash |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | See DRWA/Jean for more info. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Upgrade mains and service lines, install SCADA |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Town is not intersted in taking on debt at this time. Would consider a loan/grant package. Town has not borrowed from the DWSRF. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | grant funds |
| **Feedback** | |
| | HW Comments--Not sure if a major fire event occurred that there would be enough water |

# MILTON

Population Served: 2,576

Summary of major assets:

The system consists of four wells and two storage tanks for finished water. The distribution system includes 13 miles of buried mains.

Chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,180,744 |
| Storage Tanks | $1,384,237 |
| Mains and appurtenances | $10,351,727 |
| **TOTAL** | **$13,916,708** |

Capital Plans:

Capital outlays for the six-year period beginning with the current budget year are estimated at $50,000 annually. Funding for current year capital expenditures are drawn from current reserves. This pace of investment represents 0.36% of replacement value, significantly below a useful-life-based composite target of 1.5%. Milton is also currently paying back on an SRF loan at the rate of $48,000 annually.

Affordability:

The median household income (MHI) of $42,106 is significantly lower than MHI for the State as a whole. The typical household burden for the water service represents 0.76% of MHI (an annualized cost of $320 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/1/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>J Park, DWSRF<br>Greg Wingo, Milton<br>Carlton Savage, Pennoni<br>John Collier, Milton<br>Kristy Rogers, Milton | **SYSTEM: MILTON** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 4 wells in use. Blend a high nitrate well, 3 wells constantly running. Source Water Protection Ordinance under development. Source Water Protection -- need to connect with DNREC to provide most recent. There is not enough water produced from the wells to provide redundancy. There are no consecutive supplies. The Town had trouble meeting peak demand last summer and had to enforce strict use ordinances. Allocation information unknown. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | chlorine, fluoride. Current treatment plant is antiquated and needs updating. Another well and treatment plant is needed on the South side of Town. Blended to reduce nitrate issue in one of the wells. Unaccounted water issues are partly resolved and down to about 7%. Replaced meters and fixed leaks that helped account for most of the unaccounted water. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 1-75k elevated tank, 1-150k elevated tank in use but both are only kept 3/4 full. Another storage tank is needed on the South side of town. Water pressure is sometimes an issue. A tank maintenance contract is in place. Fire flow is an issue. Capacity is close to the current peak demand and permit capacity. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | The Town flushes 1x/month, mostly for hydrant maintenance. There are 4-5 dead ends. Main breaks are expected and in familiar areas. Majority of the valves are located and are not all in working order, mostly due to damage during construction. Oldest mains are 50-55 years old. Meters are about 10 years old and battery life is waning. Mains are made of ductile iron for the most part. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No iron removal, therefore no backwash handling. |

| Utility and Financing Needs | |
|---|---|
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br><br><br>Basis for user rate charges? | The Town doesn't have a good handle on CPCN issues. Artesian is close by and they are not sure of Tidewater boundaries. MHI was unknown at time of Assessment. User fees seem to be reasonable and cover water costs.Current rate is $3.00 per 1,000 gallons with a $35 availability charge per customer. Potential overlap of CPCN area with Artesian in some areas. Current rate = approx. $600 per year for an average, 5,000 gallon per month user. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Improvement needs for the next 5-7 years would include security controls and SCADA update, replacement of the oldest mains in the downtown core, a new storage tank, looping of dead ends, and a new well and treatment plant on the south side of town. Install a loop at Wagmon's Development, |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | The Town has applied for DWSRF funds in the recent past. Referendums fail if no principal forgiveness is offered. Development pays for development, the Town is considering a emergency connection with Artesian presently. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br><br>General public response | Referendums have failed in Milton for drinking water loans it the recent past. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br><br>Charter change? | The Town can borrow $500k or less without referendum and seems to not have any pressing borrowing issues at this time other than failed referendums |
| **Pros/Cons of DWSRF** | |
| | Suggestions for improvement of the SRF program were some ability to judge whether any principal forgiveness is likely before going to referendum. |
| **What would make the program more enticing?** | |
| | Principal forgiveness |
| **Feedback** | |
| | Town would seek funding for security upgrades including fencing, SCADA, lighting and generators |

# REHOBOTH

Population Served: 1,327

Summary of major assets:

The system consists of 11 wells, 2 elevated tanks and one hydro-pneumatic tank for finished water. The distribution system includes 20 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $16,192,980 |
| Storage Tanks | $4,279,446 |
| Mains and appurtenances | $15,925,734 |
| **TOTAL** | **$36,398,159** |

Treatment systems are individually sited, with Aeration being applied at 4 wells and Granular Activated Carbon at one well; all wells feature chemical feed systems. As a beach community, the water infrastructure also supports significant seasonal residents and tourism.

Capital Plans:

The budget available on the website is for 2014/2015 and lists budgeted expenditures for distribution improvements of $225,000. This represents a 0.62% reinvestment rate for the system as a whole and a 1.4% reinvestment rate for distribution infrastructure.

Affordability:

The median household income (MHI) of $82,500 is significantly higher than MHI for the State as a whole. The typical household burden for the water service represents 0.20% of MHI (an annualized cost of $165 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/15/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>H Blizzard, Rehoboth<br>B Carins, Rehoboth<br>S Lynn, Rehoboth<br>L (?) Rehoboth | **SYSTEM: REHOBOTH** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 7 wells, 3 off line due to DNREC issue (Lynch plant) ; Source Water Protection plan not updated; Source Water Ordinance in place. Enough water from wells for fire flow and redundancy IF all wells are on line IF Lynch wells are in use. Consecutive supply with Dewey Beach and some surrounding developments (1 meter), In talks with DNREC on allocation permit |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Fluoride, chlorine, caustic, aeration, carbon filter on Lynch wells. Compliance issues with DRNEC are unknown but existing. Other plants are 46 and 23 years old. Modernization is needed. Lynch plant/wells are 5 years old. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 3 elevated tanks: 1-500k, 1-1M, 1-1M in Dewey. Fire flow not an issue with tanks/storage. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | 6.5 miles of transite mains, 4" and 8" cast iron mains throughout oldest section of town (installed in 1940's). Poly phosphate used for corrosion inhibitor. 10% dead ends, doing valve and hydrant testing at time of Assessment. Mapping was completed, but not easily accessed by Water Dept. (with IT dept.). 95% of Town is metered, other is known i.e.: Town Hall, fire station. Tuberculation in older cast iron mains is an issue. Mains probably down to 1/2 diameter. Population approx. 5,000 year round. Serves Town of Dewey Beach as well. Approx. 5-6,000 meters/customers |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No fe removal, no backwash |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | User charges cover water costs. CPCN issues -- Tidewater and Artesian surround service area. Water rates are charged based on meter size + peak and non-peak rates<br>* non-peak, in-town = $1.67/1,000 gallons<br>* peak, in-town = $2.67/1,000 gallons<br>* out-of-town rates at 1.5 the in-town rate |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Financing needs for 3-5 years/priorities: Use of available wells allowed by regulators; New tank/storage west of the canal; possibly new well west of canal; upgrade two older water treatment plants; replace old cast iron mains, then transite as they fail; Upgrade (actually fix) SCADA system |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Looking into bonds to finance Ocean outfall and new Town Hall. Would look into USDA funding for Town Hall and DWSRF for water infrastructure. Development pays for development, then mains go to town for repair/maintenance. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Commission is not looking to borrow funds at this time with other 2 projects in the works or very closely pending |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | HW Notes: system has many needs that could be sold into a loan (my opinion) |

# SELBYVILLE

Population Served: 2,167

Summary of major assets:

The system consists of 3 wells and 2 elevated tanks for finished water. The distribution system includes 11 miles of buried mains. Greensand filters for iron removal and chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $3,687,731 |
| Storage Tanks | $1,241,173 |
| Mains and appurtenances | $8,759,153 |
| **TOTAL** | **$13,688,057** |

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $40,994 is significantly lower than MHI for the State as a whole. The typical household burden for the water service represents 0.62% of MHI (an annualized cost of $254 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/17/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>Bob Dickerson, Selbyville | **SYSTEM: SELBYVILLE** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 2 main wells that alternate every 2 hours. 5 wells but MTBE contamination prevents use. Source Water Ordinance in place. Source Water Protection plan not updated. Wells produce enough water for redundancy. No consecutive supplies. No trouble meeting peak demand. Allocation permitting being worked out with DNREC. Wellhead protection delineation is under way by DNREC. A Source water protection ordinance is in place. Town will have excess capacity once aeration is in use and all 5 wells are usable. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Chlorine, fluoride, caustic soda for pH adjustment, potassium permanganate, CP33 for corrosion inhibitor, green sand filters. Compliance issues with MTBE and DBPs. Processes are antiquated and a new treatment plant or substantial upgrades are required. Current loan in place with DWSRF to do so. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 2 storage tanks (unknown quantity); no maintenance contracts, meets fire flow demands. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Main breaks are infrequent. Town has dead ends that require frequent flushing (in combination with DBP issue). Looping of lines may be needed to fully address DBP issues as well as improve overall quality.Most of the distribution system was installed in the 1960's. Most valves and hydrants are located and in good working order. Meters are in good working order. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Backwash is currently non-compliant with DNREC standards. The town had planned to install a recovery/recycle systems for its filter backwash but money was diverted to addressing the MTBE problem instead; backwash recovery is still another priority. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | User fees cover water costs. Rates have been raised over last 5 years a small amount each year. Council is hesitant to raise rates further. MHI is low. CPCN issues are not problematic, but Artesian and Tidewater are close by. The Town would consider an emergency connection if funding was enticing to do so.Water rates are $4.22 for in-town and $4.75 for out of town customers; includes 18,000 gallons per quarter for $76.00. MHI is low - approx. $23-25k. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Most pressing needs in order: DBP resolution including backwash recovery (compliance), Storage tank on east side of Town, Booster pump at Pepper Ridge and loop of dead ends, refinance existing debt |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | USDA and DWSRF depending on best offer. Town uses both agencies. Town believes the State should contribute towards infrastructure to attract economic development. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendum would not pass. Town is not interested in taking on new debt. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | attractive funding |
| **Feedback** | |
| | system has become convoluted with merging of CW and DW programs, point of contact has been unclear, should have left them separate |

# SUSSEX SHORES WATER COMPANY

Population Served: Varies

Summary of major assets:

The system consists of 8 wells, one hydro-pneumatic tank, one ground mounted tank and one elevated tank for finished water. The distribution system includes 40 miles of buried mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $5,064,233 |
| Storage Tanks | $1,584,634 |
| Mains and appurtenances | $31,851,467 |
| **TOTAL** | **$38,500,334** |

Chemical feed systems constitute the treatment system.

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $52,692 is lower than the MHI for the State as a whole. The typical household burden for the water service represents 1.19% of MHI (an annualized cost of $627 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: July 22, 2014<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>B Dorey, Sussex Shores | **SYSTEM: SUSSEX SHORES** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 FTE's in system operations. 4 wells on-site using the Pocomoke aquifer; 4 wells off-site, using the Columbia aquifer. Distribution system is a mixture of Concrete-Asbestos, Galvanized, Ductile & Cast iron, PVC and HDPE; diameters vary from 2" to 16". Interconnected with Bethany Beach for emergency only. Service area is from 5th St. in Bethany Beach to the Coast Guard Station/Delaware Seashore St. Park. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | mini-surface water system like Bethany Beach; Treatment is Chlorine, pH adjustment with Lime; iron sequestration, Flocculation, sedimentation and aeration. No compliance issues |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 2 Ground level storage tanks - 100,000 gal installed in the 1970's; 50,000 gal. installed in 1999. 2 Elevated storage tanks - 300,000 gal installed in 1991; 400,000 gal. installed in 2007. Tank painting is planning in the coming year. Fire flow demand/supply is more than adequate. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | 2"-16" cement, ductile, galvanized, hdpe, PVC-O, PVC installed 1950's to late 1990's; system is looped, valves are located and a bit of exercising is done, hydrants are flushed 2x/yr, few dead ends with automatic flushers, no DBP issues; very few main breaks--mostly due to construction. No fire flow distribution issues. System is mostly looped. Valves are located and exercised periodically. Hydrants are located and flushed twice per year to maintain water quality in seasonal fluctuation. System is fully metered with the average age being 12 years; meters are Senses. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Filter Backwash goes to a reservoir where evaporation takes care of it, without need to decant. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Rates include a quarterly demand charge based on meter size. Ascending tiered rate starting at $3.64 per 1,000 gal for the first 5,000 gal, $5.19 for 5,001 - 20,000 gal, $6.61 for all over 20,000 gal. No CPCN conflicts past or anticipated. Developer pays for infrastructure. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Financing funding needs: SCADA/technology via shorter term $ programs, Changes in treatment process are planned, Painting of the tank is planned, Distribution upgrades and replacements, Equipment to re-cycle filter backwash |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | System has never used DWSRF due to extra administrative costs & red tape involved; With the small staff, the extra costs mean it is more cost efficient to borrow small amounts through commercial lending than to borrow a large amount via the DWSRF. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | Too much red tape, borrowing would require PSC approval, too much administration costs |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | |

# 15. MEDIUM SYSTEMS, 3,301 to 100,000 People Served

| System | Population Served | Median Household Income |
|---|---|---|
| Camden Wyoming | 4,777 | $58,157 |
| Dover | 36,047 | $48,117 |
| Georgetown | 6,422 | $44,861 |
| Harrington | 3,500 | $46,000 |
| Laurel | 3,708 | $31,830 |
| Middletown | 19,483 | $78,605 |
| Milford | 9,559 | $48,669 |
| Millsboro | 3,877 | $49,350 |
| New Castle | 5,500 | $73,143 |
| Newark | 40,000 | $51,184 |
| Seaford | 6,928 | $35,103 |
| Smyrna | 10,708 | $51,681 |
| Sussex/Dewey | | |
| **TOTAL** | **4777** | |

# CAMDEN-WYOMING

Population Served: 4,777

Summary of major assets:

The system consists of 3 wells and two elevated tanks for finished water. The distribution system includes 16 miles of buried mains.

Chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,562,174 |
| Storage Tanks | $3,573,831 |
| Mains and appurtenances | $12,740,587 |
| **TOTAL** | **$18,875,592** |

Capital Plans:

The investment plan for the next six years has identified $4.3 Million in needs. The funded portion is currently $1.6 Million. The planned level of expenditures represents 3.75% of replacement value on an annualized basis.

Affordability:

The median household income (MHI) of $58,157 is comparable to the MHI for the State as a whole. The typical household burden for the water service represents 0.74% of MHI (an annualized cost of $430 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: July 23, 2014<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>H Scott, CWSWA | **SYSTEM: CAMDEN WYOMING** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 11 FTE Employees - serving both water & sewer. 2 wells alternating in production; capable of 500 gpm, 3rd well under development. Average production is 350,000 gpd. No interconnection or consecutive supply. No problem meeting fire flow demand or peak demand. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Treatment is limited to Chlorine and Fluoride addition. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 2 Elevated storage tanks - 1 MG and 300,00 gal. Tank maintenance under contract with Corrosion Control. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | miles unknown; Distribution system is approx.. 30% ductile and cast iron mixed; 70% PVC; new developments are 100% PVC. Few main breaks in a year, sometimes none. Mains range from 4" to 12". System is looped and looping is required for new development. Valves are located and operable. Hydrants are located and operable; replaced as needed.<br>System is fully metered, with about 1/3 of meters approaching 20 years old; 2/3 remaining are in new to newer development. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | no backwash |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br><br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Rates are $27.00 per quarter base bill/minimum bill and $5.22 per 1,000 gallons starting at 0. Conflict of CPCN potential & currently with Tidewater at south side of town. Policy was changed in last few years so that development pays for development. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Funding needs/wish list: New elevated storage tower for south of town. Meter change out for oldest meters. No plans at present for treatment or distribution upgrades. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Authority shies from DWSRF because of soft costs involved with putting together a pre-app with no guarantee of funding, projects in towns are usually small enough to finance with internal funds. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | System has never used DWSRF largely due to soft costs up front without guarantee of funding and red tape involved. Also added costs due to Davis Bacon Wage requirements. In the case of certain projects, such as tank installation, Davis Bacon has less impact and they may consider for that purpose or for other large amount of funds. They use their own forces as much as possible to save on costs for smaller scale projects like main replacement. |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | |

# DOVER

Population Served: 36,047

Summary of major assets:

The system consists of 16 deep wells, 8 shallow wells and 6 elevated tanks for finished water. The distribution system includes 195 miles of buried mains. Ozonation, GAC and chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $16,785,046 |
| Storage Tanks | $10,340,815 |
| Mains and appurtenances | $186,946,432 |
| **TOTAL** | **$214,072,292** |

Capital Plans:

The Capital Improvement Plan for the six-year period 2014-2019 totals $15.2 Million, an annualized rate of 1.18% of infrastructure replacement value. The distribution of investments is $7 Million for wells and treatment systems (6.9% of replacement value), $6 Million for new storage (9.7% of replacement value) and $500,000 for new distribution mains (0.04% of replacement value). These investments appear to be for system expansion.

Affordability:

The median household income (MHI) of $48,117 is lower than the MHI for the State as a whole. The typical in-city household burden for the water service represents 0.38% of MHI (an annualized cost of $183 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: July 8, 2014<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>K Srinivasan, KS Group<br>J Lyons, City of Dover | **SYSTEM: DOVER** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 14 Deep wells; 7 shallow wells. All wells can be used depending on demand; in summer - 10 in use daily; winter - 6-7. Average production is 5 MGD; Peaking is avg. 9 MGD; allocation is 15 MGD. 4 Interconnections with Tidewater with 3 connections for bulk purchase and 1 for emergency. 3 developments served with bulk purchase via master meter. Plant capacity is approx.. 5 MGD. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br><br>Processes antiquated? Need modernization? | Each deep well has its own "micro-treatment" equipment; shallow wells go directly to the treatment plant. Treatment is Chlorine, Fluoride, UV disinfection, Lime & FeCl added at the main plant; just disinfection at the deep well, micro treatment locations. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 6 Elevated storage tanks - 3-1 million cap.; 3-250,000; new 1 million gal. tank is planned, and a site has yet to be identified. No fire flow demand issues. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | FY 15 - upgrade of the main plant is planned. Few main breaks per year; widespread rather than concentrated in an area. Oldest distribution lines are ca. 1920's. Approx. 60% is cast iron installed in the 1960's. Approx. 25% is ductile iron. Approx. 15% is mixture of transite, HDPE and PVC . 195 miles of distribution; Valves and hydrants are all located via GIS system; majority is operable, although no formal exercise program is in place. System is fully metered, with some approaching the 20 year mark. FY 16 is the beginning of a meter replacement plan. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | no backwash |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | City has a 5-year CIP that rolls forward with each FY. Rates: In town - $2.50 per month customer charge per EDU + $3.00 per 1,000 gallons used. Out of town - $4.25 per 1,000 gallons. There have been CPCN conflicts in the past on the East and West sides of the city, known as Stonebrook; no new conflicts or expansions are anticipated. Developer pays for infrastructure needed for his site, + $2,100 per EDU impact fee. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | For future borrowing/financing needs:<br>Remote control meters for replacement/upgrade<br>SCADA to be upgraded over a 2 year period<br>Upgrade mains so that all are 8 inch or larger<br>Loop dead-end lines<br>Replace remaining lead goosenecks |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Council must pre-approve any expenditure greater than $25,000. |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | no issues with program, may consider funding for plant upgrades |
| **Feedback** | |

# GEORGETOWN

Population Served: 6,422

Summary of major assets:

The system consists of 9 wells and 2 elevated tanks for finished water. The distribution system includes 42.5 miles of buried mains. Aeration and Greensand filtration coupled with chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $9,267,131 |
| Storage Tanks | $1,587,502 |
| Mains and appurtenances | $33,842,184 |
| **TOTAL** | **$44,696,817** |

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $44,861 is significantly lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.73% of MHI (an annualized cost of $332 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/17/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>G Dvornick, Georgetown<br>W Bradley, Georgetown<br>L Givens, Georgetown | **SYSTEM: GEORGETOWN** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Source Water Plan not recently updated. Source Water Protection Ordinance in place. 6 wells, 2 more in Summer 2014. Chlorine, fluoride, caustic for pH adjustment, aeration, green sand filters for fe removal. No consecutive supplies. No trouble meeting peak demand. Allocation issues unknown. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br><br><br><br>Processes antiquated? Need modernization? | There are 3 distinct treatment systems in place - King St., SCI and DTCC. Chlorine, fluoride, caustic for pH adjustment, aeration, green sand filters for fe removal. PCE compliance issues being addressed by upgrading King St Plant. Iron issues being addressed by shutting down SCI plant and wells and replacing both on S RR Ave. DWSRF Funding all projects mentioned here. Plants are antiquated and need upgrades. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 1-125k gallon elevated tank, 1-250k gallon elevated tank. No fire flow problems. Tank maintenance plan in place with 3 years remaining. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | DWSRF funded a service line replacement project in Summer 2013. Main breaks have decreased substantially since that time. System has 1 or 2 dead ends. About 5% of old mains are transite; breaks are relatively frequent on State maintained roads where lines weren't replaced due to cost. Valves and hydrants are mapped and operable; exercised regularly. System is fully metered under a project completed in 2004, with the exception of the Fire Dept. Meters are at the end of the battery life and batteries will have to be replaced soon. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Backwash issues will be eliminated with shut down of SCI plant. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | Rates will increase on May 1st. Impact fees have not been waived. Town reserves have not been what they should be but could cover emergencies. CPCN is getting updated now. No real issues with Tidewater or Artesian close to Town borders. Town anticipates needing funds for implementation of improvements recommended by Energy Audit currently underway. MHI is $44,861 per the US Census. Water Rate is .82%of MHI • 1.5% of MHI would = $24,756 in additional revenue • 2.0% of MHI would = $43,618 " " • 2.5% of MHI would = $62,480 " " Public Private partnership opportunities would take the form of |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 5 years in order: storage tank on east side of 113, transited main replacement in 1 or 2 small areas. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | All options are considered. Public/private partnerships are investigated. Development should pay for development. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br>General public response | Referendum would not pass at this time. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br><br>Charter change? | Town is at borrowing limit.Reserves = retained fund balance(s) from all funds + approx. 2% contingency each year. Borrowing limit is 75% of assessable base. |
| **Pros/Cons of DWSRF** | |
| | DWSRF has onerous regulations such as Buy American |
| **What would make the program more enticing?** | |
| | Free money; Suggests more competitive or lower interest rate for SRF to make more enticing and a relaxing of restrictions and requirements that add to project costs, such as Buy American, etc. |
| **Feedback** | |
| | State should consider group purchasing agreement for storage tank maintenance. Flush tax is supported but residents should not be double-taxed. Energy funds should be available. |

# HARRINGTON

Population Served: 3,500

Summary of major assets:

The system consists of 4 wells and one elevated tank for finished water. The distribution system includes 11.8 miles of buried mains. Chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $1,699,137 |
| Storage Tanks | $839,488 |
| Mains and appurtenances | $10,335,801 |
| **TOTAL** | **$12,874,425** |

Capital Plans:

The Capital Plan for the period 2014-2018 lists $1.8 Million for Wells, $1 Million for storage and $1 Million for distribution system improvements. System expansion in cited as the driver for the proposed investments.

Affordability:

The median household income (MHI) of $46,000 is lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.84% of MHI (an annualized cost of $386 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/22/14<br>In attendance:<br>J Park, DWSRF<br>J Holloway, DRWA<br>K Srinivasan, KS Group<br>T Tieman, Harrington<br>D Moore, Harrington | **SYSTEM: HARRINGTON** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 wells, all at the same location and installed ca. 1950's; all used in rotation. Interconnected to Del State Fairground for emergency/fire protection only.<br>Adequate source water for peak demand. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Treat with Chlorine, Fluoride, and will begin orthophosphate to control orange water. Processes in compliance with current regulations; only problem is iron/orange water. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | One elevated storage tower with 200,000 gallons capacity; installed ca. 1955. New tank is under consideration, as well as contract for maintenance. Fire flow can be met, but Operator must be vigilant during fire event to prevent draining tower. Original system installed in 1940's. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Pipe composition: 75% ductile with cement lining; 4% transite; 10% cast iron; 11% PVC. Some main breaks as expected, particularly in spring and fall; usually involves a bell or flange connection which are mostly lead. 80% of distribution system is undersized with a lot of 4" and 6" mains. About 7 deadens. Most of valves are operable with approx.. 8% having problems. Valves are mapped but sometimes the maps are not accurate when in the field. Flushing is adequate following potential contamination. Hydrants are located and operable. Meters are new in 2013 and functioning properly. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No Backwash |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | MHI is approx.. $46,000. Current rate is flat rate regardless of usage, but a new rate structure is ready and will go into effect in July - $35 base/customer charge + $3.55 per 1,000 gallons. MHI is about $46,000; Average user bill is $52.75 for 5,000 gal = $211/quarter. Average bill for 5,000 gallons/month = 0.4% of MHI. No CPCN conflicts in area surrounding town. Current sewer rate is $8.10 per 1,000 of water used, with $2.34 per 1,000 gallons received going to Kent Co. for treatment. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Would like new wells, mains, tower, and service lines. The current wells are all in the same location, same strata, and old. Need a new water tower and would like to have well and tower together. Need redundancy. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Financing needs as follows:<br>A new well and storage tower estimated at $2.845 million. Replacement of old, under-sized mains estimated at $1.36 million. Choice of financing programs would depend on most favorable terms and city has own reserve funds to use for local match. The only opportunity for public-private partnerships would be developer exactions. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br>General public response | 2 referendums for borrowing have failed in 2012 and the threshold for borrowing without referendum was raised as a result - now $3.5 million . Another referendum is planned for improvements to the water system. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Debt limit is 25% of assessable base. |
| **Pros/Cons of DWSRF** | |
| | Suggestions for DWSRF program - it is very difficult to get a referendum passed when there is no idea of how much if any of the principal will be forgiven; suggest a setaside of total for forgiveness or some other means of determining eligibility up front. |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |

# LAUREL

Population Served: 3,708

Summary of major assets:

The system consists of 3 wells and 3 elevated tanks for finished water. The distribution system includes an estimated 12 miles of buried mains. Chemical feed systems constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $2,272,445 |
| Storage Tanks | $3,346,595 |
| Mains and appurtenances | $9,555,440 |
| **TOTAL** | **$15,174,480** |

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $31,830 is significantly lower than the MHI for the State as a whole. The typical household burden for the water service represents 1.11% of MHI (an annualized cost of $354 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/24/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>J Folskey, Laurel<br>J Hoageson, GMB | **SYSTEM: LAUREL** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 2 wells; only using 1. Well on 8th and Maple off line due to high nitrates. Source water ordinances are in place. Source Water Protection Plan has not been updated. One well does not meet redundancy recommendations. No consecutive supplies. No allocation issues. Town used to blend 2nd well to decrease nitrates in finished water, but no longer uses 2nd well. Would have to in an emergency. Well does not produce enough to meet peak demand without storage. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | iron sequestration, chlorine, fluoride. Nitrate issues for out-of-service well. Looking into carbon filters for nitrate removal. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 3 elevated tanks: 1-150k gallon, 1-325k gallon, 1-500k gallon (under construction at time of Assessment). No fire flow issues due to storage. Would have issues if storage was depleted and relied on well production only. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | 25% of the distribution system has been replaced. Most if it is 40-50 years old and made of cast iron, ductile iron, and transite. 4" mains that have a fair amount of tuberculation. Distribution system is mapped, 50% of the valves are located. Hydrants could 'use some work'. Town would like to replace 15-20 meters that are not working correctly. Mains are not properly sized to meet fire flow in some areas. Town has borrowed from DWSRF for main replacements for the past several years and has targeted worst areas. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No fe removal--no backwash issues. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Water rates cover water costs and Town uses water/sewer to supplement budget. There is a 50% delinquency rate with water fees. Rates: residential-$11 for water a month, overage is $3.50 per 1,000 gallons. $35 for sewer a month $4.50 per 1,000 gallons. Commercial 14.00 base water, overage $4.00 per 1,000 gallons; 42.00 base sewer, $5.50 per 1,000 gallons. No rate increases-unable due to low MHI. MHI is low 27,000. CPCN's-NO. . |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 1-3 year priorities in order: Replacement well for high nitrate well, distribution replacement including service lines. SCADA is needed. Would like to have security - Fencing, lights, and cameras |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | The Town has been using DWSRF and USDA funds for several years. They are at the borrower limit and have a very poor populace. The Town is dependent on 0% interest loans to do any public works projects. Users cannot afford rate increases. Thinks the State should pay for infrastucture to increase economic development. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br>General public response | Town is at borrowing limit and has recently (past 2 or 3 years) gone to Legislature to increase the borrowing capacity. Public would not respond well to referendum. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Town cannot afford any more debt. |
| **Pros/Cons of DWSRF** | |
| | In the recent past, DWSRF has provided 100% principal forgiveness and 0% interest loans. Laurel qualifies as a disadvantaged community. |
| **What would make the program more enticing?** | |
| | more favorable loan terms (as in same rates as in prior years) |
| **Feedback** | |
| | Town would be interested in grants for security improvements such as fencing, cameras, and lighting. |

# MIDDLETOWN

Population Served: 19,486

Summary of major assets:[20]

The system consists of 7 wells, 3 elevated tanks for a total capacity of 3.5 MG, a small standpipe, a small clear well and a reservoir. The distribution system includes 60 miles of buried mains, based on DELDOT street mile information.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $5,677,912 |
| Storage Tanks | $5,200,860 |
| Mains and appurtenances | $47,777,201 |
| **TOTAL** | **$58,655,972** |

Treatment provided includes iron removal and chemical feed.

Capital Plans:

The assessment of investment pattern for Middletown is based on actual expenditures made by the city over the period 2000-2014. The average annual investment over this 7-year period was $1.6 Million, an annualized investment rate of 4.16% of asset replacement value.

Affordability:

The median household income (MHI) of $78,605 is significantly higher than the MHI for the State as a whole. The typical household burden for the water service represents 0.24% of MHI (an annualized cost of $185 for 15,000 gallons per quarter of water use).

[20] The data associated with this table may be incomplete.

| | |
|---|---|
| Date: 6/3/2014<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA | **SYSTEM: MIDDLETOWN** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 4 wells with 3 in service on a rotating basis; 4th is being upgraded. Wellhead protection ordinance in place, but Source Water Protection plan needs update. Interconnected with Artesian, with some customers actually in their CPCN; town pays Artesian for the water consumed by these, but doesn't buy water in bulk at present. Peak demand can be met with any one well out of service. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Treatment is Fluoride, Chlorine, phosphate for hardness; use green sand filters for iron removal. Currently meeting regulations and MCL's. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 1.5 million gal elevated storage tank owned by the town and 1.5 million owed by Artesian with town having access to it. Southern Corrosion Control under contract for tank maintenance; will soon need to be renewed or re-bid. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Approximately 61 miles of road, with about 50 miles of mains; about 5 miles of pipe are transite and remainder is 100% ductile iron. Mains are all 6" to 12" and adequate for peak and fire flow demands. System is looped. Valves are 95% located and operable; valves are exercised annually. Hydrants are operable, mostly new or replaced systematically; flushing is 2x per year. 100% metered, and in the process of changing batteries in old meters as needed. Resiliency issues: generators are in place, and are started periodically; simulation of emergencies and contingencies are done regularly and the town is a DeWARN member. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Backwash water decants through a re-cycling system that takes in most of the decant; excess goes to the sewer. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | Water rate is a $10.26 minimum bill with no gallon allowance; Rate per 1,000 gal is $3.08 for all customers. MHI is $68,671 and Median Family Income is $75,000+. Town's service area is surrounded by Artesian almost entirely. Public Private partnerships consist of developer exactions; and cooperative CIP projects with Artesian where town pays a pro rata share of debt depending on project location and purpose. Otherwise development pays for development except where DE Economic Dev. or similar organization contributes to a given project. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | #1 priority for them would be replacement of remaining transite pipe. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | DWSRF has been favorable, but would still shop around, development pays for development in most cases (exception being economic development). Already in partnership with Artesian. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br>General public response | Referendum is required for any borrowing in excess of 4% of the assessable base. It was felt the voters would approve of a referendum on borrowing if it benefited them and didn't impact rates too drastically. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Borrowing limit is 15% of assessable base. Not close to debt ceiling |
| **Pros/Cons of DWSRF** | |
| | Suggestions for DWSRF: more principal forgiveness; easier payback; shorter terms for smaller amounts/items; prevailing wage requirements add about 30% to project costs. |
| **What would make the program more enticing?** | |
| | It would also be attractive to be able to borrow for upgrade or replacement of the current SCADA system or other new control technology in general. |
| **Feedback** | |
| | Program should consider 'materials only' funding with requirements that work would get done with Town personnel and on stringent schedule. |

# MILFORD

Population Served: 9,559

Summary of major assets:

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $12,329,557 |
| Storage Tanks | $6,609,515 |
| Mains and appurtenances | $65,295,508 |
| **TOTAL** | **$84,234,580** |

The system consists of 13 wells, 10 of which appear to be operational, 3 elevated and 1 ground storage tank for finished water. Clear wells at the treatment plants and a reservoir make up the balance of storage. The distribution system includes 82 miles of buried mains.

Aeration and Chemical feed systems constitute the treatment system.

Capital Plans:

The Capital Plan for the period 2013-2018 identifies a number of improvements totaling 17.8 Million, of which $9.8 million is funded. The planned expenditures represent 21% of the replacement value of the system; the funded portion represents 11.6% of asset replacement value. On an annualized basis, the investment plan represents 3.5% of replacement value.

Affordability:

The median household income (MHI) of $48,669 is lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.45% of MHI (an annualized cost of $219 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/8/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>J Park, DWSRF<br>E Helmick, City of Milford<br>B Dennehy, City of Milford<br>E Retzlaff, DBF | **SYSTEM: MILFORD** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 10 wells; 3 inactive Source Water Assessment not updated with Well 9 abandonment, Source Water Protection Ordinances in place, Wells provide enough water to meet peak demand with current population and commercial users and provide redundancy, No consecutive supplies, Use exceeds allocation permit--City has been working with DNREC to correct for the past few years |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Chlorine, fluoride, aeration. No compliance issues with Well 9 out of service (and to be abandoned), Washington Street plant to be rebuilt this summer with DWSRF funds |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Currently 3 elevated storage tanks - 2 @250,000 gal. & 1 @ 500,000 gallons. New elevated tank out for bid on 5/9/14. 400,000 gallons available for fire flows in the clear wells. Tank maintenance plan in place, no trouble meeting fire flow due to |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Breaks rarely occur in misc. places and mostly due to construction. Over 1200 valves are in place and the City is working towards a valve replacement program using internal funding sources. Many valves are not located or not working. No trouble meeting fire flow due to distribution. Oldest mains are dated 1920's to 1930's. Mains are made of cast and ductile iron/PVC/Asbestos cement. Mains are not tuberculated and a main replacement program is not in the Capital Improvement Plan; although discussion prompted thought on replacing the oldest mains in the future. Hydrants are in good working order. Meters are in good working order and are mostly less than 10 years old. Most of the system is mapped and the Water Facilities Plan is less than 2 years old. Approx. 431,000 lf of pipe. Meters are working good. Residential meters are about 10 years old. Need to get commercial meters upgraded. System is looped. Citizens complain about smell, taste, and dirty water. Have SCADA. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No backwash/iron removal. Iron removal is on Well 9 which is not in service at this time. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Rates cover water costs and are ascending in scale. Commercial users make up 74% of use. There are no CPCN issues at this time. Ascending block rate structure with a base charge based on meter size. Sewer rates are based on water usage in all classes of customer. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 3-5 year needs are: water tower on SE side of City (mains and wells in that area are currently being constructed with USDA funds), valve replacement, SCADA upgrades, Plant upgrades on the Seabury and 10th St plants, Storage tower on North Side of City (pending development), then distribution replacement working from the oldest areas first |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | They are currently using both DWSRF and USDA funds for construction projects. Development paying for development is mixed. The City is encouraging growth on the SE Side of Rt 1 by installing wells and a transmission main to undeveloped properties. Town has approx. $5million in reserves but no reserve built into the rate calculation. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | The City decided to a fund $3.5M valve replacement project from reserves rather than go out to referendum in Feb. 2014. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | See above. The City is hesitant to take on debt and/or present the idea for referendum. |
| **Pros/Cons of DWSRF** | |
| | Wage rates are a deterrent from DWSRF funds. Other funding agencies to not require state or federal wages to be used. |
| **What would make the program more enticing?** | |
| | Discontinuation of wage rate requirements (not possible per federal grant conditions) |
| **Feedback** | |
| | Town would seek funding for security upgrades including fencing, SCADA upgrades, lighting and generators |

# MILLSBORO

Population Served: 3,877

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $12,329,557 |
| Storage Tanks | $6,609,515 |
| Mains and appurtenances | $65,295,508 |
| **TOTAL** | **$84,234,580** |

Summary of major assets:

The system consists of 5 wells and 3 elevated tanks for finished water. The distribution system includes 11 miles of mains.

Greensand filtration and chemical feed constitute the treatment system. Four Vertical turbine lift pumps convey water into the storage and distribution network post treatment.

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $49,350 is lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.36% of MHI (an annualized cost of $178 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/17/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>B Sauer, Millsboro<br>K Niblett, Millsboro<br>F Lingo, Millsboro | **SYSTEM: MILLSBORO** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | The Town has a very strong Source Water Protection Ordinance in place. The Source Water Protection Plan has not been updated. They use 3 wells. No consecutive supplies. No trouble meeting fire flow demands. Allocation information is unknown. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Iron removal using green sand filters (dyno-blend), chlorine, fluoride, pH adjustment using lime. Plant was completed in 2009. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 3 elevated tanks: 1-250k gallons, 1-100k gallons, 1-500k gallons, and access to Dagsboro's 500k tank via an interconnection. No trouble meeting fire flow. Maintenance plan in place. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Distribution is made up of transite/asbestos cement and 4" cast iron installed din 1950's and 1960's. Main breaks are not usually an issue but there is some tuberculation. Valves are mapped and 1 doesn't work. Meters are the responsibility of the home owner/consumer. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Iron sludge goes to sewer. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | Water rates cover water costs. CPCN Issues will be updated with an updated Comp Plan which is currently being worked on. Present water rate is $3.00 per 1,000 gallons; an average user pays about $22.50 per quarter for usage averaging 7,500 gallons. An EDU is equated to 219 gpd. A developer would pay for design and installation of any infrastructure necessary to serve a new development. It is hoped that the current CPCN area can be expanded within the next 18 months for a specific project. 1 cent on the water rate generates approx. $15,000. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Most pressing needs over the next 5 years will be main replacements. Additional treatment capacity is the obligation of Plantation Lakes developers. For future needs the town views both the DWSRF and the USDA as first choices for financing. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | USDA or DWSRF are considered for funding capital projects. Growth pays for growth (development) |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br>General public response | The chances of a referendum be passed by voters would depend on the purpose and timing of the request. Any amount of debt requires a referendum. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Debt limit is 25% of assessable base |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | Improvements to DWSRF program:<br>* Lower interest rate and longer term options<br>* more money available in grants or principal forgiveness * the ability to be more proactive in project planning and financing * a quicker turnaround for smaller projects with a shorter term optio, quickly accessible emergency fundn |
| Feedback | |

# NEW CASTLE

Population Served: 5,500

Summary of major assets:

The system consists of 4 wells and 2 elevated tanks for finished water. The distribution system includes 30 miles of mains.

Aeration and Chemical feed constitute the treatment system.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $4,487,492 |
| Storage Tanks | $4,226,394 |
| Mains and appurtenances | $23,888,600 |
| **TOTAL** | **$32,062,487** |

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $73,143 is higher than the MHI for the State as a whole. The typical household burden for the water service represents 0.59% of MHI (an annualized cost of $434 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date:<br>In attendance:<br>H Warren, DWSRF<br>K Srinivasan, KS Group<br>P Patone, MSC<br>J Guyer, MSC | **SYSTEM: NEW CASTLE** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br><br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 wells used, 30 days rest between use. Started construction on 4th well to be used for back up. Allocation is 1-6M/day. Use is 600k/day. Well head and source water protection plans and ordinances in place. No consecutive supplies. 2 interconnections with Artesian. No demand issues from wells. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Fluoride, chlorine, lime, aeration, iron sequestration, sodium hexametaphosphate for pH stability. No compliance issues, no treatment issues |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 600k elevated tank installed in 1949, 1M elevated tank installed in 1980. Maintenance performed in-house. No fire flow issues. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br><br>Looped system?<br><br>Working and located valves?<br><br>Flushing program?<br><br>Working hydrants?<br>Meters in proper condition/working? | 14 main breaks in 19 years. No fire flow issues. Mains are adequately sized 6"-16". Valve replacement already occurred. Very little 4" mains--mostly hydrant laterals. Interested in researching cleaning and lining vs. replacement. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | No backwash |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Fees maintained adequately. Rate study to be performed this summer. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Mains. MSC is actively looking into best solutions |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Possibly DWSRF, but have financed all major improvements internally. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | 2 years ago, charter was amended to allow MSC to borrow |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | Would be interested in pilot grant for non-destructive main research; interested in CUPSS program with DRWA |

# NEWARK

Population Served: 31,454

Summary of major assets:

The system consists of a combination of surface and groundwater supplies. A 317 MG raw water reservoir (not included in the asset calculation) supplies the conventional surface water treatment system; a well field with 5 wells and treatment systems for VOC and Iron provides additional supply. Nine storage tanks (a combination of standpipes, elevated tanks and ground mounted tanks) store finished water. The distribution system includes 150 miles of mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Surface Treatment | $15,014,471 |
| South Well Field Treatment | $7,059,105 |
| Wells and Pumps | $2,855,397 |
| Storage Tanks | $39,393,963 |
| Mains and Appurtenances | $142,560,000 |
| Booster Pumps | $2,028,106 |
| **TOTAL** | **$208,911,042** |

Capital Plans:

The capital plan for the period 2014-2018 proposes $22 Million in water system improvements, an annualized rate of 1.76%

Affordability:

The median household income (MHI) of $51,184 is lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.73% of MHI (an annualized cost of $374 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: July 30, 2014<br>In attendance:<br>J Park, DWSRF<br>J Holloway, DRWA<br>K Srinivasan<br>T Coleman<br>T Pulaski<br>M Ninmeister | **SYSTEM: NEWARK** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Combination surface and groundwater with White Clay reservoir est. 2004; cap. = 317-318 MG;<br>4 active wells and development of a 5th in the works; a 6th is shut down due to contamination. Interconnected with United Water and Artesian for emergencies, rarely used. No issues with source water meeting demand now that reservoir is operable. Well head protection is in place. No problems meeting peak demands |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Surface water treatment is Aluminum Sulfate addition for coagulation, clarifier, anthracite/garnet filter Lime addition, and gas Chlorine and Fluoride added per regulation. Groundwater treatment is aeration and air stripper for VOC removal, Greensand filter, Hypochlorite, Fluoride and polyphosphate addition. There are some treatment /contamination issues in wells that are not currently in use; none in active sources. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Approx. 2 days' use available in finished water storage + clear wells at the various treatment sites. 4 standpipes and 2 elevated storage tanks + concrete ground level tanks; approx.. 3.2 MG total. Tank maintenance is via outside contract. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Approx. 150 miles +/- of mains. Average about 20 main breaks per year with a high of about 30, and low about 10; number of breaks per year is on the increase. About 2% of the mains are 4 inch or smaller, mostly in the oldest parts of town. These oldest mains are targeted for systematic replacement over time, plus some replacement as a break or repair is required. 2 long dead-end lines, one of which is planned for looping in the near future. Valves are or are being located as a GIS project underway progresses. Valves work with few exceptions; City has an exerciser but it is used infrequently due to ease of use issues; would like to purchase a different type/model. Hydrants work and are under a planned maintenance program; flushed annually and "aggressively". Smart meters were installed in 2013 - Senses AMI brand meters. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Filter backwash goes into a tank and then into the sanitary sewer at some treatment sites or into industrial ponds at others and evaporation takes care of it from there. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | MHI for city = $49,195 per internet demographic website. MHI for Greater Newark Area = $63,975 per same website. Rates are inclining block with 2 tiers for in-town and 2 for out of town users. (copy of rate schedule sent via email). There is some overlap with United Water CPCN in certain areas, but city has no current plans to serve the affected areas. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Approx. 40% of mains are ca. 1950's; another 40% are newer, particularly in suburban areas more recently developed, and about 20% in the core town are old, as far back as 1900. First priority for funding would be replacement of the oldest, or undersized mains. Second would be changing the intake point in the reservoir to improve source water quality. Some tank painting and repair is already planned and funded through the CIP. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | All loans require referendum. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | A charter amendment is under consideration that would allow the City to borrow up to 2% of the assessable base without a referendum. Currently any borrowing requires a referendum and deters the city from utilizing the DWSRF. If that amendment is passed the staff would like to use the program. |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | City would like to see some funding on a shorter term for technology improvements such as help with the IT/GIS project, and an early warning type system for source water monitoring that would allow them to respond to spills or contamination before a plume reached the treatment system. |
| **Feedback** | |

# SEAFORD

Population Served: 6,928

Summary of major assets:

The system consists of 5 wells; one well is treated for iron and a second for organics; the remaining wells only receive chemical feed. Four elevated tanks store finished water. The distribution system includes 38 miles of mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $10,704,799 |
| Storage Tanks | $6,034,555 |
| Mains and appurtenances | $30,258,894 |
| **TOTAL** | **$46,998,247** |

Capital Plans:

NOT AVAILABLE

Affordability:

The median household income (MHI) of $35,103 is significantly lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.36% of MHI (an annualized cost of $126 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 4/3/14<br>In attendance:<br>C Anderson, Seaford<br>J Park, DWSRF<br>J Holloway, DRWA<br>B Mears, Seaford<br>D Slatcher, Seaford<br>H Warren, DWSRF | **SYSTEM: SEAFORD** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Well and Source Water Plan last updated in 2007. No consecutive Supply. No problems with source water meeting peak demands. Delanie Well the nitrates are on the rise. Need to abandon the Nylon plant do not use anymore. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | pH adjustment, carbon filtering, iron sequestration, chlorine, fluoride. Plants are in good condition. No compliance issues. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Individual storage was not discussed, but the Town has several elevated tanks. No additional storage is needed at this time. Tank maintenance contracts are in place. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Most critical mains were replaced in 2009/2010 with ARRA DWSRF funds. Distribution is in good working order. The City does not meter. Users are charged a flat rate. Main breaks are predictable where undersized mains are known to exist. Some mains are undersized and some are transite composition and targeted for replacement. Valve location and operation presents a possible candidate for DRWA GIS mapping. |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Drip into system. Treatment plant cannot adequately handle backwash from filtration process. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Current user rates are below 1.5% of MHI, and city is reluctant to increase to bring up to recommended levels used by USDA loans/grants; city manager stated a provisions that allows funding to pay for growth into un-served and/or under-served areas would be desirable; she suggested some means of packaging a project into include needed improvements and a percentage for growth. Residential rates are based on 9,000 gal./EDU charge per month. |

| | |
|---|---|
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | 3-5 years would be distribution to serve the north end of Town and to continue expansion on the east side of Rt 13. After 5 years, a storage tank would be needed based on development/demand. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | The city has adequate reserves that amount to approximately 5% of the non-debt expenditure budget. Opportunities for public-private partnership take the form of developer exactions and installation of infrastructure prior to city acceptance of facilities. Basis for residential, commercial, and industrial sewer user rate charges are most everyone |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | Referendums not passing at this time. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | Comfortable with debt limit, would take on more debt if voters allowed it. |
| **Pros/Cons of DWSRF** | |
| | Doesn't allow funding for growth/economic development. |
| **What would make the program more enticing?** | |
| | Very low interest rates, 5 year loans for O&M, ability to combine growth/expansion with fix-it-first. Ability to accommodate or include growth in a project would make the DWSRF more attractive to the city . Ability to apply for shorter term projects or large scale maintenance items like Tank maintenance/repair/ rehabilitation would al be desirable |
| **Feedback** | |
| | Would like to expand mostly pipe work and lift stations. North End Tower Station well like to go 1,000 feet of pipe work. |

# SMYRNA

Population Served: 10,708

Summary of major assets:

The system consists of 5 wells and 3 elevated storage tanks for finished water. The distribution system includes 50 miles of mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $13,670,186 |
| Storage Tanks | $4,536,887 |
| Mains and appurtenances | $39,814,334 |
| **TOTAL** | **$58,021,407** |

Treatment at three well locations and consist of a combination of Aeration, Greensand treatment and chemical feed systems.

Capital Plans:

Smyrna has spent $5.5 Million over the last six years and plans to spend $7.5 Million over the next six years on capital improvements to its system; thee investments are related to extension of service to North Duck Creek. Investments over the previous six years have been more focused on asset replacement and totaled $5.6 Million, an annualized rate of 1.6%.

Affordability:

The median household income (MHI) of $51,681 is lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.63% of MHI (an annualized cost of $327 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date: 5/29/14<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>D Hugg, Town of Smyrna<br>M Gede, Town of Smyrna<br>J Martinez, Town of Smyrna<br>B Evans, Town of Smyrna | **SYSTEM: SMYRNA** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 3 FT Water & Sewer staff members. 4 wells, 3 in use and 1 for backup. Demand can be met with largest well out of service. Source Water Protection Ordinance in place, ca. 2011. No present interconnection/consecutive supply, but one potentially within 5-10 years with Tidewater as TUI is currently serving an area that is actually in Smyrna CPCN territory by mutual agreement. Water allocation recently (2013) increased. |
| **Treatment** | |
| List treatment<br>Any compliance issues?<br>Processes antiquated? Need modernization? | Treatment is Fl & Cl2 addition, plus iron removal, pH control with Caustic Soda, and aerationfor VOC's. No present compliance issues other than high iron levels. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Storage = 3 clear wells totaling 10k gallons+; 3 elevated storage towers at 750k, 400k and 275k gal. Tank maintenance contract with Utility Services, with one tower recently cleaned, painted and disinfected, now back in service; other 2 towers scheduled for 2014 also. No trouble meeting fire flow demand. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Distribution system = approx. 50 miles of lines; oldest lines are 1940's vintage transite pipe. About 5%; about 25% PVC and about 70% ductile iron. Average 10 main breaks per year in a normal year; most breaks/leaks are in service lines rather than mains. Mapping of distribution system is underway through KCI as town's engineer. Most breaks can be attributed to soil acidity and resulting corrosion of copper services. Mains are adequately sized for the most part. No fire flow demand issues. System is mostly looped with only a few dead ends. Not all valves are located and many/most either inoperable or unknown; Town started an exercise program a few years ago so many old valves caused leaks that were untenable; exercise program was stopped and leak repairs are done under pressure to avoid further damage to old valves. Hydrants are located and operable; flushing program is every three months so that repairs are made when needed. Town is fully metered and Badger, remote read meters are 8-10 years into a 15 year life cycle. Meter batteries need to be replaced at this time |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Backwash water is handled on 2 wells by discharging into the town's own sanitary sewer; backwash on a third well is handled by lagoon, which has lately caused a problem with iron buildup; town is working on a solution to that issue. |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br><br>MHI<br><br>CPCN issues?<br><br>User fee % as % of MHI<br><br>Basis for user rate charges? | MHI = $51,536. Water rate structure is conservation minded, with an ascending scale of charges, starting at $3.00 per thousand gallons plus a $10 base charge. The town will be doing a rate analysis with the assistance of DRWA in the near future. Rates are cost-based, but loss is starting to creep up to where an increase is likely. Town service area is pretty much surrounded by both Artesian and Tidewater CPCN's; expansion will have to contend with that as it arises. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br><br>Treatment<br><br>Storage<br><br>Distribution<br><br>Backwash<br>Other | Prioritized financial needs for the next 5-10 years:<br>A new well to address water quality issues (specifically iron). A new elevated storage tower to the north. Looping of the north end mains, replacements as a lower priority as road work is done throughout town. An additional treatment plant - probably at same site as the new well or tower. Some expansion to the north under Duck Creek to allow for growth of commercial sector. Public-Private partnership potential = developer exactions. For resiliency following a disaster they would need backup generators for the wastewater side and mobile water storage like trailer mounted tanks or water buffalos. Water/well buildings could use additional security measures such as cameras, tamper proof windows, etc. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | DWSRF or USDA first. Development usually pays for development, would consider emergency-only connection with Tidewater. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br><br>General public response | Borrowing only requires a referendum if the amount exceeds 12.5% of the assessable base; town is currently around 4% or the assessable base so referendum potential is not an issue. |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | Suggestions for DWSRF - a separate category or specific pot of money to fund technology advancements such as motor controls, SCADA, etc. As for improvements to the DWSRF, they feel their experience has been good so far. |
| **What would make the program more enticing?** | |
| | Funding for technology, short term financing |
| **Feedback** | |

# SUSSEX COUNTY AND DEWEY

Population Served: Varies

Summary of major assets:

The system consists of 2 wells with treatment systems for VOC and chemical addition. Four storage tanks (ground mounted, hydro-pneumatic, elevated) store finished water. The distribution system includes 20.6 miles of mains.

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $1,906,035 |
| Storage Tanks | $4,550,201 |
| Mains and appurtenances | $16,403,506 |
| **TOTAL** | **$22,859,742** |

Capital Plans:

Planned expenditures for capital improvements in the Sussex County budget show a minimal $8,000 per year. The system does not currently have proposed capital improvements for the water system.

Affordability:

The median household income (MHI) of $41,750 is significantly lower than the MHI for the State as a whole. The typical household burden for the water service represents 0.55% of MHI (an annualized cost of $230 for 15,000 gallons per quarter of water use).

| | |
|---|---|
| Date:<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>R Eldreth, Sussex County<br>H Sheridan, Sussex County | **SYSTEM: SUSSEX COUNTY** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br><br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 2 wells at Air Park. Interconnection with Rehoboth Beach. Consecutively supplied by Rehoboth Beach. No wells or source water issues. No peak demand or fire flow issues. Sussex County operates the Dewey Beach water system and the Air Park in Georgetown. Air Park information was obtained, but not included in this report. |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Treatment is Chlorine addition, pH control with Caustic Soda, Orthophosphate for Iron removal; Activated Carbon filters. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | 1,000,000 gallons of storage; 3 elevated tanks and one 650k gal ground tank. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br><br>Looped system?<br><br>Working and located valves?<br><br>Flushing program?<br><br>Working hydrants?<br>Meters in proper condition/working? | 1975 construction of distribution and overall system; most pipe is C900; approx.. 20% other materials - ductile and some schedule 21. System service area is largely built out and no substantial additions or growth is expected. Tank maintenance is performed with a washout every other year; re-painting as needed. Distribution system has many deadens; only one loop at Hall Ave. and every other street dead ends. Valves are all located and operable; replaced as needed. Hydrants flushed regularly, and just recently flow tested and flushed. System is not metered; customers pay a flat rate per EDU.<br>29.6 miles of mains. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Filter backwash is re-cycled. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | No potential CPCN conflicts other than adjacent boundary with Rehoboth. $305 per year. See Jean's notes. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Wish list: Upgrade technology for monitoring distribution, especially dead-end lines. Upgrade sub-standard service lines. A Chlorine booster pump/station for the off season to maintain residual. |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Dewey has not used DWSRF funds. Sussex County has applied to DWSRF for a new water system in the Inland Bays area. Dewey is built out and has no development issues. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | County has never used the DWSRF so far; have no suggestions for improvements to the program. |
| **Feedback** | |
| | |

# 16. LARGE SYSTEMS, 100,000 or More People Served

| System | Population Served | Median Household Income |
|---|---|---|
| Artesian | 250,000 | $60,119 |
| Tidewater Utilities | 120,000 | $60,228 |
| United Water | 110,000 | &64,670 |
| Wilmington | 140,000 | $38,468 |
| **TOTAL** | **620,000** | |

# ARTESIAN

Population Served: 250,000

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $149,227,831 |
| Storage Tanks | $66,672,200 |
| Mains and appurtenances | $612,358,850 |
| **TOTAL** | **$828,258,881** |

Summary of major assets:

The system consists of 52 separate well systems, with each system comprised of from 1 to 7 wells, for a total of 115 wells. In addition, Artesian also uses two Aquifer Storage and Recovery systems for backup supplies during droughts. While many of the wells require no additional treatment (except for the minimum required chemical feed) the ones that do treat, on a case by case basis, for iron removal, organics, arsenic and radium. Thirty storage tanks (a combination of elevated and ground mounted tanks for a total storage capacity of 42 MG) store finished water. The distribution system includes 758 miles of mains.

Capital Plans:

Artesian typically files its capital plans only for the one-year period associated with its current rate filing. The surrogate for a look-ahead plan is to view what was spent on capital improvements in prior years to get a sense of the pace of investment. Accordingly, for the period 2009-2014, the company's capital expenditures total $96 Million in water system improvements, an annualized rate of 1.93% of asset replacement value.

Affordability:

The State's median household income (MHI) of $60,119 has been assigned to Artesian by virtue of its State-wide operations. The typical household burden for the water service represents 1.05% of MHI (an annualized cost of $630 for 15,000 gallons per quarter of water use).

# TIDEWATER UTILITIES

Population Served: 120,000

| ASSET | REPLACEMENT VALUE |
|---|---|
| Wells/Pumping/Treatment | $80,597,250 |
| Storage Tanks | $20,046,359 |
| Mains and appurtenances (incl. Southern shores) | $356,037,751 |
| **TOTAL** | **$456,681,360** |

Summary of major assets:

The system consists of 84 separate well systems, with each system comprised of from 1 to 4 wells, for a total of 152 wells. Treatment systems for individual well units range from iron removal filters, ion exchange, granular carbon systems and nitrate removal. Forty three storage tanks (a combination of elevated and ground mounted tanks for a total storage capacity of 5.9 MG) store finished water. The distribution system includes 650 miles of mains.

Capital Plans:

TUI provided its actual and proposed capital improvements for the period 2009-2018; the pace of actual and proposed investments is remarkable consistent, averaging $ 6-$7 Million per year, an annualized rate of 1.57% of asset replacement value.

Affordability:

The median household income (MHI) of $60,228 is comparable to that of the State as a whole. The typical household burden for the water service represents 1.25% of MHI (an annualized cost of $753 for 15,000 gallons per quarter of water use)

| | |
|---|---|
| 7/15/14<br>In attendance:<br>H Warren, DWSRF<br>J Park, DWSRF<br>K Srinivasan, KS Group<br>J Kalmbacher, TUI | **SYSTEM: TIDEWATER UTILITIES** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | 170 wells; use County zoning for Water Resource Protection Areas; Nitrate contamination in Sussex; TOC is an emerging issue in parts of the system;Emergnecy interconnections with Dover, Bethany |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Treatment systems vary by well, no compliance issues; covered in system detail provided separately; |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | Storage tank info provided separately, investment plan includes adign additional storage; no fire flow issues |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | Detaile dinformation on mains provided; Transite pipe in some zones |
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | |

| | |
|---|---|
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | Regulated utility; assign composite MHI because of wide geographic scope of operations. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Will provide aggregate investment plan; generally address a variety of needs |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | Use SRF, corporate sources |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | NA |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | NA |
| **Pros/Cons of DWSRF** | |
| | Cons--cannot fund fire flow specific projects, state wages are too high, Davis Bacon is onerous, cannot fund growth-related projects |
| **What would make the program more enticing?** | |
| | |
| **Feedback** | |
| | |

# UNITED WATER DELAWARE

Population Served: 110,000

| ASSET | REPLACEMENT VALUE |
|---|---|
| Treatment | $101,512,726 |
| Storage Tanks | $38,843,000 |
| Mains and appurtenances | $493,222,630 |
| Pumps (Bellevue only) | $2,726,563 |
| **TOTAL** | **$636,304,919** |

Summary of major assets:

This surface water system draws its supply from the Red Clay/ White Clay and Christina River each with its own intake system and treatment plant. The total treatment capacity is 36 MGD, utilizing conventional treatment technologies (sedimentation, sand filtration). Nineteen storage tanks (a combination of standpipes, elevated and ground mounted tanks, and the covered Edgemoor Reservoir, for a total storage capacity of 31 MG) store finished water. The distribution system includes 510 miles of mains.

Capital Plans:

United expects to spend $46 Million over the next six years, an annualized rate of 1.2% of asset replacement value.

Affordability:

The median household income (MHI) of $64,670 is comparable to that of the State as a whole. The typical household burden for the water service represents 0.89% of MHI (an annualized cost of $576 for 15,000 gallons per quarter of water use).

# WILMINGTON

Population Served: 140,000

| ASSET | REPLACEMENT VALUE |
|---|---|
| Treatment | $51,635,622 |
| Pump Stations - Raw | $26,347,349 |
| Pump Stations - Finished | $18,254,747 |
| Storage Tanks | $26,488,842 |
| Mains and Appurtenances | $827,904,000 |
| **TOTAL** | **$950,630,561** |

Summary of major assets:

The surface water supply for the Wilmington system is drawn almost exclusively from the Brandywine River; the Hoopes Reservoir, a pumped storage system also has a small watershed associated with it than provides some recharge during rain events. A gravity intake supplies the smaller Brandywine Filtration Plant. Two raw-water lift stations transfer water to the Porter and Hoopes reservoirs that supply the Porter Filtration Plant. The Brandywine Plant was recently migrated to membrane technology to provide greater protection against spore-formers and viruses. The Porter Plant is a conventional sand filtration system. Eleven storage tanks (10 elevated tanks and the buried Cool Spring Reservoir) provide a storage capacity of 21 MG for finished water. The distribution system includes 392 miles of mains.

Capital Plans:

The capital program for the period 2014-2018 contemplates a total of $69 Million in investments, an annualized rate of 1.21% of asset replacement value, with over one-half devoted to transmission and distribution upgrades.

Affordability:

The median household income (MHI) of $38,468 is significantly lower than that of the State as a whole. The typical household burden for the water service represents 0.83% of MHI (an annualized cost of $319 for 15,000 gallons per quarter of water use.

| | |
|---|---|
| Date: July 1, 2014<br>In attendance:<br>H Warren, DWSRF<br>J Holloway, DRWA<br>K Srinivasan, Kash Group<br>M Demo, City of Wilmington | **SYSTEM: WILMINGTON** |
| **Wells** | |
| Source Water Protection Plan Updated recently?<br>Source Water Protection Ordinances in place?<br>If not, what is in place to prevent contamination from new sources?<br>Enough water produced from wells to provide redundancy?<br>Consecutive Supply?<br>Trouble meeting peak demand from wells?<br>Close to allocation permit? | Source is surface water from the Brandywine. 2 plants--Brandywine 14 MGD and Porter 36 MGD. No consecutive supplies. No trouble meeting demand from source. Pump capacity - 85 MGD |
| **Treatment** | |
| List treatment<br><br>Any compliance issues?<br><br>Processes antiquated? Need modernization? | Membrane filtration (new) coagulation, sedimentation, filtration, fluoride addition, FeCl added to aid coagulation; Lime for pH control. No compliance issues. Both plants updated within the last 4 years. |
| **Storage** | |
| Type<br>Tank maintenance plan in place?<br>Trouble meeting fire flow due to storage? | See handout. Maintenance plan in place. No fire flow issues due to lack of storage. Finished water storage - 58 MG in 12 facilities, both elevated and reservoir. Raw water storage - 2 Billion Gal at Hoopes reservoir. Tank maintenance on a rolling 10-12 year re-paint schedule. |
| **Distribution** | |
| How many main breaks?<br>Are they mapped?<br>Is cause known?<br>Are mains adequately sized?<br>Trouble meeting fire flow due to distribution?<br>Looped system?<br>Working and located valves?<br>Flushing program?<br>Working hydrants?<br>Meters in proper condition/working? | 400 miles of mains. Approx 125 miles are over 75 years old. Main breaks are predictable in older sections. City has been working with DWSRF for several years to replace/line mains at about $5M per year. City working with a contractor to operate valves and hydrants and catalog performance. 39,000 meters with about 36,000 residential. Meters were installed in 2003-2006 and are to be replaced annually starting this year. Large meters over 20 years old are becoming a priority for replacement. |

| | |
|---|---|
| **Backwash** | |
| Handling?<br>Sludge disposal issues?<br>Cost effective? Other alternatives considered? | Filter backwash goes directly to wastewater for treatment/handling. |
| **Utility and Financing Needs** | |
| User charges adequate to cover water costs?<br>MHI<br>CPCN issues?<br>User fee % as % of MHI<br>Basis for user rate charges? | See handout. User rates are fairly high and increase regularly. Rates and ability to perform distribution upgrades go hand in hand. MHI - approx.. $38,000. Rates per ordinance #13-009 copy provided. No CPCN conflicts or potential conflicts. No wholesale/bulk customers. Interconnection with Artesian & United. |
| **What are the most pressing needs in the next 5 years?** | |
| Source<br>Treatment<br>Storage<br>Distribution<br>Backwash<br>Other | Continuation of distribution upgrades |
| **Where would you look for financing?** | |
| Private funding<br>Bonds<br>SRF<br>USDA<br>Developer<br>Public/Private partnerships | DWSRF, sometimes bonds. DWSRF must maintain a rate of 62.5% of MBY for the City to consider funding. The City is built-out and has no development issues. |
| **Referendums/ Borrowing 'consensus' at date of interview** | |
| Charter requirements<br>General public response | council approval |
| **Close to debt ceiling? Or at 'comfortable' debt limit?** | |
| Charter requirements<br>Charter change? | usually no issues with approval |
| **Pros/Cons of DWSRF** | |
| | |
| **What would make the program more enticing?** | |
| | Suggestions for DWSRF were for some allowance to be made for contingencies and change orders, particularly when bids come in at or near the budgeted DWSRF loan allotment. Also suggest that CWSRF be closer to DWSRF in interest and requirements to make it more attractive. |
| **Feedback** | |
| | |

# 17. RURAL WATER CUPSS REPORTS

The Check Up Program for Small Systems is an asset management tool developed by EPA for small water and wastewater systems.[21] Using the program, small systems can develop and maintain a record of their assets, schedule maintenance tasks and assess their financial situation. The Rural Water Association offers guidance and support with the use of this software tool. Included with this report is a sample CUPSS reports for a small system participating in the program. For security reasons, the report does not identify the town and only contains samples of tabular information to illustrate the scope of the report.

[21] Information on the CUPSS program is available on the EPA website: http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/index.cfm

# Asset Check Up Report

**Prepared for:**

RURALTON DRINKING WATER SYSTSEM
RURALTON, DELAWARE

**Prepared by:**

[redacted]

[redacted]

**Prepared using:**

# Table Of Contents

## 1 Introduction

The Asset Check Up report includes an overview of the Town of [redacted] Drinking Water System, an asset summary and risk matrix which includes a listing of the high risk assets, and asset details and the associated task scheduled for the upcoming years.

The Town of [redacted] System consists of Source, Pumping Facility, Treatment, Storage, Distribution assets serving the Town of [redacted]. The utility produces an average of 100,000 gallons per day and delivers an average of _____ gallons of water per day to approximately 468 connections. The utility is not interconnected or shared with other drinking water utilities. Maps of the utility are maintained by the utility at the Town Hall and the Water Treatment plant, both located on [redacted]

The following is a breakdown of customer categories:

1. **RESIDENTIAL – 452 OR 97%**

2. Commercial – 16 or 3%

## 2 Asset Schematic

## 3 Asset Inventory

The following sections discuss the asset risk, asset summary and asset details including the task summaries for each asset. The asset risk matrix plots each asset according to its risk value which is assigned based on the Consequence and Probability of Failure. CUPSS calculated this risk value based on what you entered for each asset's condition, consequence of failure, redundancy and expected useful life. The Asset Inventory Summary, Table 3.1, identifies the high, medium and low risk assets. Those assets identified as high risk will need immediate attention and evaluation.

### 3.1 Asset Inventory Summary

***Figure 3.1 Asset Risk Matrix - *NOTE REFER TO TABLE BELOW USING PRIORITY NUMBERS WITHIN THE ASSET RISK MATRIX***

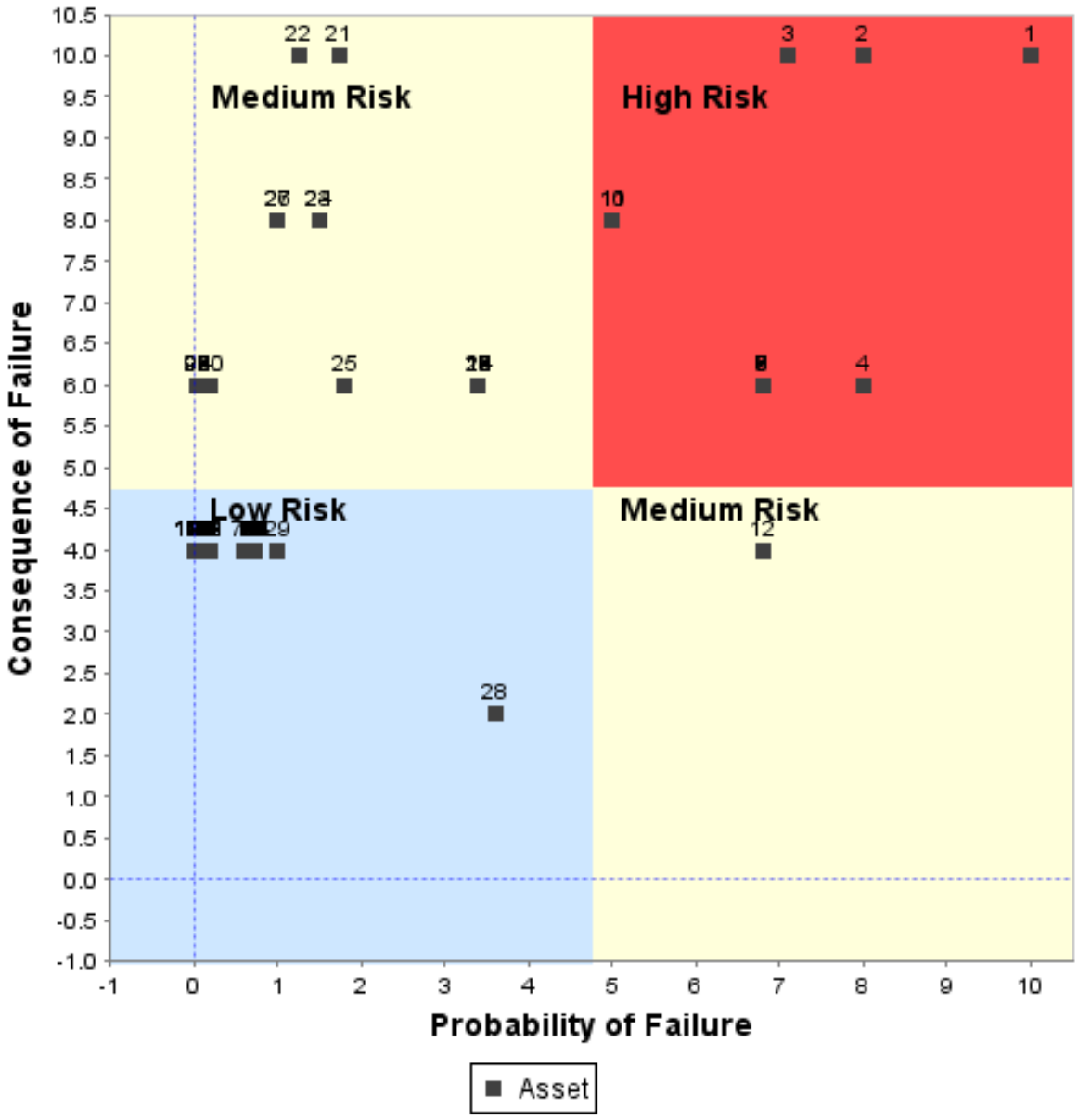

***Table 3.1 Asset Inventory Summary {ABBREVIATED SAMPLE}***

| Priority | Asset | Category | Asset Type | Risk | Replacement Date |
|---|---|---|---|---|---|
| 1 | Main Tank Valve | Distribution | Valves | High Risk – Immediate Attention | 02/01/2012 |
| 2 | Main System Control Panel | Treatment | Motor Controls / Drives | High Risk – Immediate Attention | 02/01/2014 |
| 3 | Elevated Storage Tank | Storage | Concrete & Metal Storage Tanks | High Risk – Immediate Attention | 02/01/2025 |
| 4 | Backwash Control Panel | Treatment | Motor Controls / Drives | High Risk – Immediate Attention | 02/01/2014 |
| 5 | Fluoride Saturator Tank | Treatment | Treatment Equipment | High Risk – Immediate Attention | 02/01/2016 |
| 6 | Potassium Permanganate Tank | Treatment | Treatment Equipment | High Risk – Immediate Attention | 02/01/2016 |
| 7 | Potassium Permanganate Mixer | Treatment | Treatment Equipment | High Risk – Immediate Attention | 02/01/2016 |
| 8 | Sodium Hypo Tank | Treatment | Treatment Equipment | High Risk – Immediate Attention | 02/01/2016 |

| Priority | Asset | Category | Asset Type | Risk | Replacement Date |
|---|---|---|---|---|---|
| 9 | Sodium Hydroxide Tank | Treatment | Treatment Equipment | High Risk – Immediate Attention | 02/01/2016 |
| 10 | Well #1 | Source | Wells and Springs | High Risk – Immediate Attention | 02/01/2012 |
| 88 | Hydrant #59 | Distribution | Hydrants | Low Risk – Routine Maintenance | 02/01/2052 |
| 89 | Hydrant #60 | Distribution | Hydrants | Low Risk – Routine Maintenance | 02/01/2052 |
| 90 | Hydrant #68 | Distribution | Hydrants | Low Risk – Routine Maintenance | 02/01/2052 |
| 91 | Hydrant #61 | Distribution | Hydrants | Low Risk – Routine Maintenance | 02/01/2053 |
| 92 | Backwash Valve#1 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |
| 93 | Backwash Valve #2 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |
| 94 | Backwash Valve #3 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |

| Priority | Asset | Category | Asset Type | Risk | Replacement Date |
|---|---|---|---|---|---|
| 95 | Backwash Valve #4 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |
| 96 | Backwash Valve #5 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |
| 97 | Backwash Valve #6 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |
| 98 | Backwash Valve #7 | Treatment | Valves | Medium Risk – Aggressive Monitoring | 02/01/2036 |

3.2 Asset Details

## Asset Maintenance Details {ABBREVIATED SAMPLE}

**Asset Priority:** 1

**Asset Name:** Main Tank Valve

**Associated Asset:** Elevated Storage Tank

**Location** [redacted]

**Associated Location:** [redacted]

**Latitude:** 0.0

**Longitude:** 0.0

**Storage Capacity Days:** None

**LF:** None

**Acre:** None

**Asset Category:** Distribution

**Asset Type:** Valves

**ID:** None

**Size:** 10 inch

**Asset Status:** Active

**Condition:** Good

**Probability of Failure:** High

**Consequence of Failure:** Catastrophic

**Capacity:** Fullsized

**Installation Date:** 01/01/1979

**Original Cost:** 0

**Replacement Costs:** 7000

**Maintenance Cost:** 0

There are no tasks associated with this asset.

## Asset Maintenance Details

**Asset Priority:** 2

**Asset Name:** Main System Control Panel

**Associated Asset:** Backwash Control Panel

**Location:** [redacted]

**Associated Location:** [redacted]

**Latitude:** 0.0

**Longitude:** 0.0

**Storage Capacity Days:** None

**LF:** None

**Acre:** None

**Asset Category:** Treatment

**Asset Type:** Motor Controls / Drives

**ID:** None

**Size:** None

**Asset Status:** Active

**Condition:** Good

**Probability of Failure:** High

**Consequence of Failure:** Catastrophic

**Capacity:** Fullsized

**Installation Date:** 01/01/2004

**Original Cost:** 0

**Replacement Costs:** 20000

**Maintenance Cost:** 0

There are no tasks associated with this asset.

**Consequence of Failure:** Minor

**Capacity:** Fullsized

**Installation Date:** 01/01/1979

**Original Cost:** 0

**Replacement Costs:** 2000

**Maintenance Cost:** 0

There are no tasks associated with this asset.

## Asset Maintenance Details

**Asset Priority:** 36

**Asset Name:** Hydrant #16

**Location** [redacted]

**Latitude:** 0.0

**Storage Capacity Days:** None

**Acre:** None

**Asset Type:** Hydrants

**Size:** None

**Condition:** Good

**Consequence of Failure:** Minor

**Installation Date:** 01/01/1979

**Replacement Costs:** 2000

**Associated Asset:** None

**Associated Location:** None

**Longitude:** 0.0

**LF:** None

**Asset Category:** Distribution

**ID:** None

**Asset Status:** Active

**Probability of Failure:** Low

**Capacity:** Fullsized

**Original Cost:** 0

**Maintenance Cost:** 0

There are no tasks associated with this asset.

## Asset Maintenance Details

**Asset Priority:** 37

**Asset Name:** Hydrant #19

**Associated Asset:** None

**Location** [redacted]

**Associated Location:** None

**Latitude:** 0.0

**Longitude:** 0.0

**Storage Capacity Days:** None

**LF:** None

**Acre:** None

**Asset Category:** Distribution

**Asset Type:** Hydrants

**ID:** None

**Size:** None

**Asset Status:** Active

**Condition:** Good

**Probability of Failure:** Low

**Consequence of Failure:** Minor

**Capacity:** Fullsized

**Installation Date:** 01/01/1979

**Original Cost:** 0

**Replacement Costs:** 2000

**Maintenance Cost:** 0

There are no tasks associated with this asset.

---

## Asset Maintenance Details

**Asset Priority:** 92

**Asset Name:** Backwash Valve#1

**Associated Asset:** Green Sand Filter #1

**Location:** [redacted]

**Associated Location** [redacted]

**Latitude:** 0.0

**Longitude:** 0.0

**Storage Capacity Days:** None

**LF:** None

**Acre:** None

**Asset Category:** Treatment

**Asset Type:** Valves

**ID:** None

**Size:** 6 inch

**Asset Status:** Active

**Condition:** Good

**Probability of Failure:** Low

**Consequence of Failure:** Moderate

**Capacity:** Fullsized

**Installation Date:** 01/01/2004

**Original Cost:** 0

**Replacement Costs:** 2000

**Maintenance Cost:** 0

There are no tasks associated with this asset.

## Asset Maintenance Details

**Asset Priority:** 93

**Asset Name:** Backwash Valve #2

**Associated Asset:** Backwash Valve#1

**Location:** [redacted]

**Associated Location** [redacted]

**Latitude:** 0.0

**Longitude:** 0.0

**Storage Capacity Days:** None

**LF:** None

**Acre:** None

**Asset Category:** Treatment

**Asset Type:** Valves

**ID:** None

**Size:** 6ch in

**Asset Status:** Active

**Condition:** Good

**Probability of Failure:** Low

**Consequence of Failure:** Moderate

**Capacity:** Fullsized

**Installation Date:** 01/01/2004

**Original Cost:** 0

**Replacement Costs:** 2000

**Maintenance Cost:** 0

There are no tasks associated with this asset.

# APPENDIX

## Drinking Water SRF Program

## Project Prioritization Process

# 2014 DWSRF Project Priority List and Intended Use Plan

Water Infrastructure Advisory Council

October 15, 2014

# DWSRF Project Priority List Ranking Criteria

I. Quality Deficiencies
II. Quantity Deficiencies
III. Treatment/Design
IV. Security Measures
V. Financial Need
VI. Regulations & Compliance
VII. Regionalization
VIII. System Design
IX. Bonus Points

# DWSRF Project Priority List Ranking Criteria

**I. Quality Deficiencies**

| | | |
|---|---|---|
| Acute Public Notice | E. Coli | 80 |
| | Nitrate | 80 |
| | Nitrite | 80 |
| | Total | |
| Non-Acute Public Notice REQUIRED or Exceendence of a future regulation such as PCE group | Total coliform bacteria | 60 |
| | Volatile Organic Compounds (including MTBE) | 60 |
| | Disinfection By Products | 60 |
| | Synthetic Organic Compounds | 60 |
| | Trace Metals | 60 |
| | Regulated VOCs | 60 |
| | Unregulated SOCs | 60 |
| | Turbidity | 60 |
| | Radiologicals | 60 |
| | Lead/Copper | 60 |
| | Total | |
| Secondary Standards | Iron | 20 |
| | Trace Metals (Manganese, Silver, Copper) | 20 |
| | pH | 20 |
| | Chloride | 20 |
| | Total Dissolved Solids | 20 |
| | Sulfate | 20 |
| Complaint-based | Taste | 20 |
| | Odor | 20 |
| | Color | 20 |
| | Total | |

**II. Quantity Deficiencies**

| | | |
|---|---|---|
| Acute | Water pressure <25 psi | 50 |
| | Lack of adequate supply | 50 |
| | Total | |
| Chronic | Lack of adequate storage | 25 |
| | Water pressure >100 psi | 25 |
| | Water shortages (during peak demand) | 25 |
| | Total | |

# DWSRF Project Priority List Ranking Criteria

**III. Treatment/Design**

| | | |
|---|---|---|
| Infrastructure | Degraded treatment facility | 30 |
| | Inadequate source-intake structure | 30 |
| | Faulty pumping station | 30 |
| | Inaccurate controls/instrumentation, lack of SCADA system | 30 |
| | Unsatisfactory storage | 30 |
| | Aging or corroded transmission mains | 30 |
| | Aging or corroded distribution mains | 30 |
| | Lack of meters/broken meters | 30 |
| | Replacement of contaminated source with uncontaminated source | 30 |
| | Lack of disinfection treatment | 30 |
| | Lack of corrosion control treatment | 30 |
| | Lack of nitrate removal treatment | 30 |
| | Lack of other proper treatment | 30 |
| | Inadequate filtration | 30 |
| | Nonfunctioning backflow prevention device | 30 |
| | Lack of critical component redundancy | 30 |
| | Unreliable emergency power source | 30 |
| | Total | |

# DWSRF Project Priority List Ranking Criteria

**IV. Security Measures**

| | | |
|---|---|---|
| | Treatment plant | 25 |
| | Storage site | 25 |
| | Distribution system | 25 |
| | Source | 25 |
| | Electronic | 25 |
| | Total | |

**V. Financial Need**

| | |
|---|---|
| Economic Indicator | If a proposed project will increase existing residential drinking water user rates above 1% of a community's MHI, or 2% of MHI for combined water and wastewater, the PWS may qualify for additional loan subsidies in the following order:<br><br>1. Principal Loan Forgiveness (after project completion)<br>2. Lower Interest Rates<br>3. Extended Loan Terms (up to 30 years) |

# DWSRF Project Priority List Ranking Criteria

**VI. Regulations and Compliance**

| | | |
|---|---|---|
| Compliance with Regulations | Lead/Copper Rule | 40 |
| | Surface Water Treatment Rule | 40 |
| | Stage 1 DBP | 40 |
| | Stage 2 DBP | 40 |
| | LT I Enhanced Surface Water Treatment Rule | 40 |
| | LTII Enhanced Surface Water Treatment Rule | 40 |
| | Radon | 40 |
| | Radionuclides | 40 |
| | Filter Backwash Rule | 40 |
| | MTBE primary standard | 40 |
| | Groundwater Rule | 40 |
| | Arsenic | 40 |
| | Total | |
| Compliance/ Enforcement Status | Significant Non-Compliance | 15 |
| | Active Bilateral Compliance Agreement | 15 |
| | Alternate Contaminant Level | 15 |
| | Active Administrative Compliance Order | 15 |
| | Total | |

**VII. Regionalization**

| | | |
|---|---|---|
| Project to Result in: | Consolidation of multiple non-complying water systems | 25 |
| | Consolidation with 1 non-complying water system | 20 |
| | Consolidation of complying water systems | 15 |
| | Service to areas of existing private wells with water quality deficiencies | 20 |
| | Service to areas with existing private wells | 15 |
| | Emergency interconnection with another public water system | 15 |
| | Total | |

# DWSRF Project Priority List Ranking Criteria

**VIII. System Description**

| | | |
|---|---|---|
| Population Served | 25 to 1,000 | 10 |
| | 1,001 to 10,000 | 15 |
| | ≥ 10,000 | 5 |
| | Total | 15 |
| Public Water System Type | Municipality | 10 |
| | Other Community | 5 |
| | NTNC (non-profit) | 3 |
| | TNC (non-profit) | 1 |
| | Total | 10 |

**VIIII. Bonus Points**

| | | |
|---|---|---|
| Project was on a prior PPL | Multiyear project partially funded | 15 |
| | Bypassed | 15 |
| | Below funding line | 10 |
| | Comprehensive list only | 5 |
| | Total | 0 |
| Positive Practices | Rate structure promotes conservation | 2 |
| | Metered at service connections | 2 |
| | Water loss of 10% or less | 2 |
| | Certified operator with proper endorsements | 2 |
| | Document maintenance schedule review | 2 |
| | Cross connection control program | 2 |
| | Evaluation by Capacity Development for existing systems | 2 |
| | Total | 14 |
| Green Reserve | 0-25% total project | 5 |
| | 25-50% total project | 10 |
| | 50-75% total project | 15 |
| | 75-100% total project | 20 |
| | Total | |