Remediation

Long-Term Plan

Assumptions in All Alternatives

• Five wells currently funded by Navy have permanent treatment
• Combined capacity of above treated wells is 1.0 MGD
• Available purchased water without PFOS/PFOA detections
  • Aqua – 0.0 MGD
  • Forest Park – 0.8 MGD (minimum required is 0.6 MGD)
Remediation

Long-Term Water Demand Projections

- Average day demand is 2.3 MGD (based on 10-yr average)
- Maximum day demand is 2.9 MGD (based on historic peaking factor)
- Future Average Day Demand – 3.2 MGD
- Future Maximum Day Demand – 4.0 MGD
Alternative 1 – Purchase All Water

**Highlights**
- Discontinue daily use of all wells
- Maintain wells funded by Navy for emergency use
- Discontinue use of Aqua Interconnection
- Additional capacity required to purchase - 1.5 MGD (current) and 2.4 MGD (ultimate)

**Estimated Costs**
- Capital Costs - $4,280,000 (not including capacity fee)
- Annual O&M - $0/year
- Additional Annual Purchased Water Cost - $1,735,000/year
- Total Annual Costs at Implementation - $1,735,000/year
Alternative 1 – Purchase All Water

Potential Concerns

• High cost to customer if additional funding is not secured
• Loss of water independence
  • Rate control
  • Future water quality control
  • Emergency
• Loss of competition between Aqua, Forest Park, and HWSA’s own wells
Alternative 2 – Treat All Sources

**Highlights**
- Treatment on HWSA Wells and Aqua Interconnection
- Total available capacity 3.6 MGD
- 1.3 MGD surplus capacity (current) and 0.4 MGD surplus (ultimate)

**Estimated Costs**
- Capital Costs - $14,620,000
- Annual O&M - $1,320,000/year
- Additional Annual Purchased Water Cost - $182,500/year
- Total Annual Cost at Implementation - $1,502,500/year
Alternative 2 – Treat All Sources

Potential Concerns

- Maintenance of 10 treatment facilities (15 total – 5 Navy covered costs)
- High capital and O & M costs
- Construction impact to residents/businesses (Wells and Aqua)
- Feasibility of construction at all sites
- Longer Construction/Implementation Period
Alternative 3 – Purchase Water above What is Covered under Cooperative Agreement

**Highlights**

- Continued use of wells funded by Navy
- Additional capacity required to purchase - 1.1 MGD (current) and 2.2 MGD (ultimate)

**Estimated Costs**

- Capital Costs - $4,280,000 (not including capacity fee)
- Annual O&M - $0
- Additional Annual Purchased Water - $820,000
- Total Annual Cost at Implementation - $820,000
Alternative 3 – Purchase Water above What is Covered under Cooperative Agreement

Potential Concerns

• Loss of water independence
  • Rate control
  • Future water quality control
  • Emergency
• Loss of competition between Aqua, Forest Park, and HWSA’s own wells
Alternative 4 – Treat Higher Capacity Sources and Purchase Remaining Water Needed

Highlights

• Continued use of wells funded by Navy
• Treatment on five additional wells and Aqua interconnection
• 1.1 MGD surplus capacity (current) and 0.2 MGD surplus (ultimate)

Estimated Costs

• Capital Costs - $10,620,000
• Annual O&M - $720,000
• Annual Purchased Water Costs - $365,000
• Total Annual Cost at Implementation – $1,085,000
Alternative 4 – Treat Higher Capacity Sources and Purchase Remaining Water Needed

Potential Concerns

• Maintenance of treatment facilities at Horsham PFOS/PFOA standard
• Implementation period longer than purchase only
Alternative 5 – Central Treatment and Purchase

Highlights
• Two “centralized” units - East and West portion of Township
• Discontinue use of Aqua Interconnection
• Approximately 9 miles of raw water mains
• Just enough capacity to meet future projected demand

Estimated Costs
• Capital Costs - $17,000,000
• Annual O&M - $800,000
• Annual Purchased Water Cost - $365,000
• Total Annual Cost at Implementation – $1,165,000
Alternative 5 – Central Treatment and Purchase

Potential Concerns

• Higher cost to customer than other treatment alternatives, even thought treatment is centralized
• Raw water mains throughout the Township within public right-of-way
• Additional treatment and regulatory challenges
• Significant construction impacts to residents and Township Roads – 9 miles of raw water lines
Alternative 6 – New Wells

Highlights

- Objective to drill new wells within Township that do not require treatment for PFOS/PFOA
- Current HWSA wells are distributed throughout the Township and all have detectable levels of PFOS/PFOA
- Significant investment required with very little chance of finding wells of sufficient capacity that would meet Horsham water quality goals
- Alternative 6 discarded due to lack of feasibility
## Side by Side Comparison

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Purchase All Water</th>
<th>Treat all Wells and Aqua</th>
<th>Purchase Needed Water</th>
<th>Combo Treat and Purchase</th>
<th>Central Treat and Purchase</th>
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<tbody>
<tr>
<td>Capital w/o PennVest Grant</td>
<td>$4,280,000</td>
<td>$14,620,000</td>
<td>$4,280,000</td>
<td>$10,620,000</td>
<td>$17,000,000</td>
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<tr>
<td>Capital w/ PennVest Grant</td>
<td>$0</td>
<td>$4,620,000</td>
<td>$0</td>
<td>$620,000</td>
<td>$7,000,000</td>
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<tr>
<td>Capacity Charges (not eligible for PennVest Grant)</td>
<td>Up to $10,500,000</td>
<td>$0</td>
<td>Up to $7,000,000</td>
<td>$0</td>
<td>$0</td>
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### Below Assume the $10,000,000 PennVest Grant

<table>
<thead>
<tr>
<th></th>
<th>Debt Service Cost to Customer per year</th>
<th>Annual O&amp;M</th>
<th>Purchase Water - At Implementation</th>
<th>Annual Cost At Implementation</th>
<th>Cost Per Year to Customer at Implementation for Annual Costs (7700 connections)*</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$66</td>
<td>$29</td>
<td>$44</td>
<td>$4</td>
<td>$44</td>
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<td>$0</td>
<td>$720,000</td>
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<tr>
<td></td>
<td>$1,735,000</td>
<td>$182,500</td>
<td>$820,000</td>
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<td></td>
<td>$1,735,000</td>
<td>$1,502,500</td>
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<td></td>
<td>$225</td>
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<td>$107</td>
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<td>$151</td>
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<tr>
<td>Total Cost to Customer per Year*</td>
<td>$291</td>
<td>$224</td>
<td>$151</td>
<td>$145</td>
<td>$195</td>
</tr>
<tr>
<td>Impacts to Township and Residents (Construction/Roads)</td>
<td>LOW</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td>HIGH</td>
</tr>
<tr>
<td>Impacts to Water Independence (Rates, Quality, Emergency)</td>
<td>HIGH</td>
<td>LOW</td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
</tr>
</tbody>
</table>

*Note: Total costs presented per year include the existing $100 per year surcharge*
Remediation

Long-Term Plan

Six Alternatives Evaluated

1. Purchase all water
2. Treat all sources where PFOS/PFOA are detected
3. Purchase water needed above those sources being funded through Cooperative Agreement (Five wells)
4. Install treatment at higher producing sources and purchase remaining water needed
5. Install two centrally located treatment facilities and purchase remaining water needed
6. Identify locations for new wells to replace wells containing PFOS/PFOA
Remediation

Long-term Plan

Assumptions in All Alternatives

• Purchased water price is based on current pricing
• GAC is treatment proposed
• New 1 MG storage tank and additional interconnection with NWWA along County Line Road (see next two slides for plan/picture)
• 2.5 miles of water main extensions to make public service available to private well owners (0-70 ppt)
Compensation

• The capital improvements grant is of great help in assisting HWSA and Council achieve both long-term and short-term goals, but there are additional costs, such as the cost of designing treatment systems, which are not covered by the grant. To cover those costs, HWSA was forced to impose a surcharge on all users.
• Council is of the strong opinion that the military must leave our community as it found it, and Council agrees with the many residents who have expressed frustration with the military’s reluctance to restore our water to the Horsham Standard.
• For this reason, Council has added a fourth prong its approach to PFCs-COMPENSATION
Long Term Remediation Action Plan:

1. Continued use of permanent treatment systems at Wells 26 & 40.
2. Convert temporary treatment systems at Wells 10, 17 & 21 to permanent systems.
3. Permanent Treatment System on five additional wells:
   1. Well 2
   2. Well 4
   3. Well 19
   4. Well 20
   5. Well 22 – restored to service to the public supply on February 25, 2019 with permanent GAC treatment installed.
Long Term Remediation Action Plan:

1. HWSA wells #1, #3, #7 and #9 are to be placed in reserve status as potential future supply options
2. Permanent Treatment System on the Aqua PA interconnection – mobilization and material delivery began March 2019
3. Additional interconnection with North Wales Water Authority – completed and in service July 18, 2018
Long Term Remediation Action Plan:

1. 1.8 miles of new water main to make public water available to properties with private wells impacted by the PFAS contamination – completed May 2018

2. North Wales Water Authority: 600,000 gpd minimum purchase

3. Completion of the Long Term Plan will result in a total of 11 permanent PFAS treatment systems and provide for the continued supply of drinking water meeting the “Horsham Standard” for years to come.
Compensation

- Representative Todd Stephens was instrumental in securing a Ten Million Dollar Grant to be used for capital improvements to be used for treatment and remediation of PFCs in our drinking water.
Long Term Remediation Action Plan:

• PennVest Board awarded the $10M grant on January 25, 2017.
• Tentative contract schedule:
  • Advertise for bids mid-March
  • Receive bids late April
  • Award contracts early May
• PennVest settlement is tentatively scheduled for June 8, 2017.
Remediation

Here is an example of a two unit GAC Filter. Each remediated well will need a dual filter. Each filter must be custom-designed and built for the well it treats.
Carbon Filters Being Installed

Each permanent GAC filter will be housed in a building like this one. The GAC filters will be located near the well it treats. Each filter needs to be tested for forty-five days before the water from the well can be used in our system. In order to speed up the remediation schedule, some wells will be treated with temporary filters while the permanent filters are designed and installed.

Photo courtesy of Warminster Municipal Authority