

Enclosure 1 – GWA Public Water Systems Significant Deficiencies

Location/Function	Significant Deficiencies	Impacts	Reference page in Report
<p><b>Sources</b></p>	<ul style="list-style-type: none"> <li>Lack of routine maintenance (both corrective and preventative of sources).</li> </ul>	<p>Potential bacteriological and/or chemical contamination of source</p>	<p>Pages 20 - 22 and 32 - 33</p>
	<ul style="list-style-type: none"> <li>Many wells are located in close proximity to potential sources of fecal and other sources of contamination, and no wellhead protection plan in place for GWA wells.</li> </ul>	<p>Potential fecal contamination of source</p>	<p>Pages 21, 32</p>
	<ul style="list-style-type: none"> <li>Diesel fuel storage tank containment located near intake for Ugum Water Treatment Plant (WTP) is undersized; spill could contaminate the Ugum River.</li> </ul>	<p>Potential chemical contamination of source</p>	<p>Pages 20, 33</p>
	<ul style="list-style-type: none"> <li>Some wells have cracks and other openings in the well pads, well casings and improperly sealed sanitary seals. These are direct openings for contamination to enter wells.</li> </ul>	<p>Potential bacteriological or chemical contamination of source</p>	<p>Pages 21, 32</p>
	<ul style="list-style-type: none"> <li>Missing screens on well casing vents.</li> </ul>	<p>Potential contamination of source</p>	<p>Page 21</p>
	<ul style="list-style-type: none"> <li>Wells have bypass lines that were routed into the ground and off-site without an air gap.</li> </ul>	<p>Potential contamination of source</p>	<p>Page 21</p>
	<ul style="list-style-type: none"> <li>Lack of operating flow meter at spring source makes operation (including chlorine dosing) problematic.</li> </ul>	<p>Difficulty in ensuring adequate chlorination/disinfection</p>	<p>Pages 20 - 22</p>
	<ul style="list-style-type: none"> <li>Santa Rita Spring Box (Clear Well) - Gaps between corrugated metal roof and clear well walls allow entry by animals, birds and reptiles.</li> </ul>	<p>Allows bacteriological contamination to enter source</p>	<p>Pages 24, 29, 33</p>

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<p><b>Treatment</b></p>	<ul style="list-style-type: none"> <li>• Lack of operation and maintenance ( Ugum, Santa Rita Spring.</li> <li>• Lack of operating turbidimeter at Santa Rita spring source.</li> <li>• Plant operators do not regularly conduct jar tests and do not optimize precursor removal, at Ugum WTP .</li> <li>• Inadequate turbidity monitoring and reporting at Ugum.</li> <li>• At least one well (D-5) did not have a chlorination system in place.</li> <li>• At least one well, the well log indicated chlorine gas had run out in past</li> </ul>	<p>Results in unreliable treatment and potential for contamination</p> <p>Possible GWUDI source requires turbidity measurements</p> <p>Could result in Stage 2 Disinfection/Disinfectant Byproducts Rule (DBP) Rule exceedances</p> <p>Treatment Technique M/R violation</p> <p>Inadequate chlorination/disinfection could result in exposure to bacteriological contamination</p>	<p>Pages 23- 24, 34- 35</p> <p>Pages 24, 33</p> <p>Pages 23 , 34</p> <p>Pages 22, 34</p> <p>Pages 23, 34</p> <p>Pages 24, 36</p>
<p><b>Finished Water Storage</b></p>	<ul style="list-style-type: none"> <li>• Severe internal/external rust and corrosion including roofs, roof vents, walls, base and other welds, anchors allows contaminants to enter tanks.</li> <li>• Bolts, many completely rusted through, compromise structural stability of tanks.</li> <li>• Inadequate Site Security (holes in fences, missing gates) and unlocked hatches allow easy access to tanks (as demonstrated by vandalism at many tanks).</li> <li>• Leaking tanks.</li> <li>• Flooded, uncovered and unsecured valve vaults.</li> <li>• No screen or flapper on the storage tanks' overflows.</li> <li>• Ladders not locked, allow easy potential access by vandal.</li> <li>• Ladders severely corroded or no cage will prevent adequate maintenance.</li> </ul>	<p>Allows contaminants to enter tanks</p> <p>Potential for tank failure</p> <p>Potential for access by public and consequent contamination</p> <p>Could allow contamination to enter</p> <p>Potential for access by public and consequent contamination</p> <p>Prevent adequate maintenance</p>	<p>Pages 25, 26, 37</p>
<p><b>Distribution System</b></p>	<ul style="list-style-type: none"> <li>• Inadequate cross connection control program exists within GWA.</li> </ul>	<p>Potential for backflow /backpressure and contamination.</p>	<p>Pages 27, 36, 37</p>

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	<ul style="list-style-type: none"> <li>Undersized water lines impact water pressure and water quality and contribute to potential cross-connections.</li> </ul>	Potential for backflow /backpressure and contamination.	Pages 27, 36, 37
<b>Pumps, Pumping Facilities, and Controls</b>	<ul style="list-style-type: none"> <li>No pump controls at many of the booster pump stations; lack of maintenance Leaking seals in pumps and valves</li> <li>Lack of adequate backup pumps. Flooding of booster pump stations.</li> <li>No controls on well pumps or booster pumps.</li> <li>Leaking pump seals, valves, lines, and highly rusted piping.</li> </ul>	Results in intermittent service and supply, lower reliability and decreased pressure.	Pages 27, 28, 37, 38
<b>Water Quality Monitoring, Reporting and Data Verification</b>	Inadequate monitoring and reporting - Ugum WTP and Santa Rita Spring (turbidity and chlorine residual)	Exceedances (violations) may be going undetected and unreported.	Pages 22, 23, 38
<b>SDWA Compliance</b>	<ul style="list-style-type: none"> <li>Lead and Copper monitoring overdue.</li> <li>Unaddressed Stage 2 Disinfection/Disinfectant Byproducts rule (DBP) Rule MCL Violations, including lack of required public notification</li> </ul>	Monitoring Violation  Exposure of public to DBP's exceeding MCLs	Pages 29, 38
<b>Water System Management, Operations and Administration</b>	<ul style="list-style-type: none"> <li>No formal, comprehensive training program for operators and other personnel.</li> <li>Hydraulic model is neither complete nor accurate enough to make operational or design decisions.</li> <li>No preventative maintenance programs for most operational areas.</li> <li>Data are collected, but do not have the capacity to analyze the information to assist with operational decisions.</li> <li>Lack of Standard Operating Procedures ("SOPs").</li> </ul>	Can result in inappropriate or inadequate operation and negative impacts on water quality  Results in poor design and operational decisions impacting water quality  Many system components in varying levels of disrepair or failure put system at risk for contamination.  Lack of understanding and use of operational data can result in Results in poor system operations and consequent risk for contamination or failure.	Pages 30, 39

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<b>Operator Compliance with Licensing Requirements</b>	<ul style="list-style-type: none"><li>• No proper operator certification for system type.</li><li>• Plant operators do not regularly conduct jar tests.</li><li>• Plant operators and engineering staff did not understand the correlation between ineffective coagulant dosing, inadequate sedimentation and disinfection by product precursor removal.</li><li>• No level 4 operator is actually located on site at the Ugum WTP, as required.</li></ul>	Inadequately trained operators do not perform process control adequately, which impacts finished water quality  Violation of Guam Operator Certification requirement	Pages 31, 39
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