



## GUAM WATERWORKS AUTHORITY

Gloria B. Nelson Public Service Building, 688 Rt. 15. Mangilao, GU 96913

### Corrective Action Plan (CAP) (Approved 10/21/2014) Quarterly Update Report

Guam Waterworks Authority Sanitary Survey Significant Deficiencies for the Water System

Prepared By: Paul Kemp, Vangie Lujan and Bill Gilman      **Update:**      Date: June 29, 2015

NEIC Work Product No. VP0989E01 GWA Sanitary Survey Significant Deficiency Items:

### **Preface to the Corrective Action Plan**

#### **Reporting**

Formal updates of the status of management of the Corrective Action Plan will be submitted on a regular basis to Region 9, USEPA.

The reports will be delivered on a quarterly basis beginning at the end of the next calendar-year quarter following the approval date of this Corrective Action Plan. Reporting will continue on a schedule by mutual agreement between GWA and Region 9 USEPA.

Individual approved plans and/or schedules in sections of this plan will, when approved, become a part of this Corrective action Plan. Such approved plans are listed and will be tracked/reported in the addendum at the end of the Plan.

The vehicle to be used for this reporting will be an update of this document.

For Court Order updates/reporting, see the Court Order Submittals.

#### **1. Sources—Lack of routine maintenance (both corrective and preventative of sources).**

- Potential bacteriological and/or chemical contamination of source
- Many wells found to have leaking pipes and valves

#### **Recommendation:**

- Lack of adequate site security—missing or damaged fencing and signs of vandalism (graffiti) on structures should be repaired or replaced.
- Begin routine and corrective maintenance of all wellhead appurtenances and well facilities—meters, valves, pumps, air relief valves, piping pressure gauges, etc.

Remove unnecessary items (old lines, gauges, meters, etc.)

#### **Action Plan:**

GWA is implementing new O&M SOPs, programs and systems on an on-going basis.

<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
As of 06/25/2013.	55 new SOP's Implemented (assisted by CDM, EPA Grant)
Drafts and planed	CDM continues work, particularly on Asset Management
Average one a month by 06/30/2014	Complete new SOP's and implement
<b>Semi-annually beginning 01/2014</b>	<b>Training on SOP's Repeats Continuously</b>
<b>Updates (Reporting per Preface)</b>	



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<p><b>2. Sources—No Wellhead Protection Plan</b></p> <p>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.</p> <ul style="list-style-type: none"> <li>• Potential bacteriological and/or chemical contamination of source</li> <li>• Wells located near potential sources of contamination</li> </ul> <p><u>Recommendation:</u></p> <ul style="list-style-type: none"> <li>• Possible sewage source upstream (Talofofo Falls Park) - Should notify owner/operators of need to notify Ugum WTP if there is a spill or discharge</li> <li>• Recreational activities on the Ugum River at the intake site which currently allow people in close proximity to the intake structure should be evaluated.</li> </ul> <p><u>Action Plan:</u> GWA will build from the existing 1992 Guam Law, Ch. 7 section 7130 of the Water Resource Development and Operating Regulations (GEPA) entitled "Well Head Protection for Public Water Supply Well". BC to develop a plan to improve monitoring of the wellhead. Plan to be in accordance with existing Guam EPA Wellhead Protection.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Proposed Action Item Schedule</th> <th>Task Description</th> </tr> </thead> <tbody> <tr> <td>05/30/2013</td> <td>First Draft for GWA review</td> </tr> <tr> <td>06/03/2014</td> <td>First Draft submitted to USEPA</td> </tr> <tr> <td>06/29/2015.</td> <td>Final Submitted to USEPA.</td> </tr> <tr> <td colspan="2"><b>Updates (Reporting per Preface)</b></td> </tr> </tbody> </table>		Proposed Action Item Schedule	Task Description	05/30/2013	First Draft for GWA review	06/03/2014	First Draft submitted to USEPA	06/29/2015.	Final Submitted to USEPA.	<b>Updates (Reporting per Preface)</b>	
Proposed Action Item Schedule	Task Description										
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06/03/2014	First Draft submitted to USEPA										
06/29/2015.	Final Submitted to USEPA.										
<b>Updates (Reporting per Preface)</b>											

<p><b>3. Sources Ugum— Diesel fuel storage tank containment located near intake for Ugum Water Treatment Plant (WTP) is undersized;</b></p> <p>Diesel fuel storage tank containment located near intake for Ugum Water Treatment Plant (WTP) is undersized; spill could contaminate the Ugum River. Potential chemical contamination of source</p> <ul style="list-style-type: none"> <li>• Diesel fuel storage tank containment area at the intake was visibly undersized and was designed to discharge to the ground where it could flow downhill to the Ugum River</li> </ul> <p><u>Comment:</u> This item was incorrectly evaluated. Tank is dual walled construction. Containment is adequate.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Proposed Action Item Schedule</th> <th>Task Description</th> </tr> </thead> <tbody> <tr> <td></td> <td>Provide documentation verifying dual wall construction.</td> </tr> <tr> <td>05/08/2013</td> <td>Verification sent to EPA – Complete</td> </tr> </tbody> </table>		Proposed Action Item Schedule	Task Description		Provide documentation verifying dual wall construction.	05/08/2013	Verification sent to EPA – Complete
Proposed Action Item Schedule	Task Description						
	Provide documentation verifying dual wall construction.						
05/08/2013	Verification sent to EPA – Complete						

<p><b>4. Sources Well— Some wells have cracks and other openings in the well pads, well casings and improperly sealed sanitary seals.</b></p> <p>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. Potential bacteriological or chemical contamination of source.</p> <ul style="list-style-type: none"> <li>• Cracks in well pads and well casings and improperly sealed sanitary seals</li> <li>• Lack of well pads at some locations</li> </ul> <p><u>Action Plan:</u> Initiate repair. Document completion of repair. Engage consultant for independent confirmation of repair work and production of report.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Proposed Action Item Schedule</th> <th>Task Description</th> </tr> </thead> <tbody> <tr> <td>12/1/2013</td> <td>Initiate repair work</td> </tr> <tr> <td>2/1/2013</td> <td>Engage consultant Brown and Caldwell</td> </tr> <tr> <td>4/30/2013</td> <td>Complete repair work</td> </tr> <tr> <td>5/5/2013</td> <td>Draft report to GWA</td> </tr> <tr> <td>6/6/2013</td> <td>Report sent to USEPA - Complete</td> </tr> </tbody> </table>		Proposed Action Item Schedule	Task Description	12/1/2013	Initiate repair work	2/1/2013	Engage consultant Brown and Caldwell	4/30/2013	Complete repair work	5/5/2013	Draft report to GWA	6/6/2013	Report sent to USEPA - Complete
Proposed Action Item Schedule	Task Description												
12/1/2013	Initiate repair work												
2/1/2013	Engage consultant Brown and Caldwell												
4/30/2013	Complete repair work												
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<p><b>5. Sources Well— Missing screens on well casing vents.</b>          Potential contamination of source.</p> <ul style="list-style-type: none"> <li>• Missing screens on well casing vents</li> </ul>	
<p><u>Action Plan:</u>          Initiate repair. Document completion of repair. Engage consultant for independent confirmation of repair work and production of report.</p>	
Proposed Action Item Schedule	Task Description
12/1/2013	Initiate repair work
2/1/2013	Engage consultant Brown and Caldwell
4/30/2013	Complete repair work
5/5/2013	Draft report to GWA
6/6/2013	Report to USEPA
5/13/2013	Report sent to USEPA - Complete

<p><b>6. Sources Well— Wells have bypass lines that were routed into the ground and off-site without an air gap.</b>          Wells have bypass lines that were routed into the ground and off-site without an air gap. Potential contamination of source. Many wells found to have bypass lines that were routed into the ground and off-site without an air gap</p>	
<p><u>Action Plan:</u>          Initiate repair. Document completion of repair. Engage consultant for independent confirmation of repair work and production of report.</p>	
Proposed Action Item Schedule	Task Description
12/1/2013	Initiate repair work
2/1/2013	Engage consultant Brown and Caldwell
4/30/2013	Complete repair work
5/5/2013	Draft report to GWA
6/6/2013	Report to USEPA
5/23/2013	Report sent to USEPA - Complete

<p><b>7. Sources Spring--Lack of operating flow meter at spring source makes operation (including chlorine dosing) problematic.</b>          Difficulty in ensuring adequate chlorination/disinfection</p> <p><u>Recommendation:</u>          Remove heavy vegetative growth around the clear well structure.          Implement routine and corrective maintenance at all spring appurtenances—meters, valves, pumps, piping, pressure gauges, etc.</p>	
<p><u>Action Plan:</u>          Initiate repair. Document completion of repair.</p>	
Proposed Action Item Schedule	Task Description
12/1/2013	Initiate repair work
4/30/2013	Complete repair work
6/6/2013	Report to USEPA
5/23/2013	Report sent to USEPA - Complete

<p><b>8. Sources Spring-- Santa Rita Spring Box (Clear Well) –</b>          – Gaps between corrugated metal roof and clear well walls allow entry by animals, birds and reptiles. Allow bacteriological contamination to enter source.</p>	
<p><u>Action Plan:</u>          Initiate repair. Document completion of repair.</p>	
Proposed Action Item Schedule	Task Description
05/08/2013	Reported to USEPA - Complete



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<b>9. <u>Treatment-- Lack of operations and maintenance (Ugum, Santa Rita Spring)</u></b>	
<u>Recommendation:</u>	
<ul style="list-style-type: none"> <li>• Implement routine and corrective maintenance at all spring appurtenances—meters, valves, pumps, piping, pressure gauges, etc.</li> </ul> <p>Ugum training on O&amp;M will be regular refresher classes on annual basis.</p>	
<u>Action Plan:</u>	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
Santa Rita Spring (Ground Water)	
05/08/2013	Santa Rita Spring O&M training was completed an has been sent to USEPA.
05/08/2013	O&M is now under Production Section.
05/31/2014 etc.	Santa Rita Spring O&M training will have annual refreshers.
Ugum Surface Water Treatment Plant	
11/19-23/2012	Latest Training by Siemens/Smithbridge
07/23/2013	Additional Specialized training on coagulation optimization for membranes
08/01/2013	Training certification sent to USEPA
<b>07/01/2014 and thereafter.</b>	<b>O&amp;M training will have annual refreshers.</b>
Completed under Court Order	See Court Order Section II C 26 Ugum SOP's - Complete

  

<b>10. <u>Treatment-- Lack of operating turbidimeter at Santa Rita Spring source.</u></b>	
<u>Action Plan:</u>	
Initiate repair. Document completion of repair.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
05/08/2013	Verification submitted to USEPA - Complete

  

<b>11. <u>Treatment-- Plant operators do not regularly conduct jar tests and do not optimize precursor removal at Ugum WTP.</u></b>	
<u>Action Plan:</u>	
Prepare Bid or Change Order for TOC. Prepare documentation of training. Provide copies of regular reporting.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
5/15/2013	Prepare change order for installation of TOC and appurtenances. Smithbridge
08/12/2013	Completed installation of on-site TOC analyzer.
08/15/2013	Completed training of operators on site TOC analyzer.
07/23/2013	Additional Specialized training on coagulation optimization for membranes
08/01/2013	Training certification sent to USEPA – Complete

  

<b>12. <u>Treatment-- Inadequate turbidity monitoring and reporting at Ugum</u></b>	
<u>Action Plan:</u>	
Address re-programming SCADA. Provide copies of daily submittals sent to GEPA and monthly submittals, and send example reports to USEPA as documentation.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
06/06/2013	Send documentation of conformance to USEPA
05/30/2013	Sent documentation of conformance to USEPA - Complete



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<b>13. Treatment-- At least one well (D-5) did not have a chlorination system in place</b>	
Action Plan: Explain that D-5 well is not a point of entry into the potable distribution system issue.	
Proposed Action Item Schedule	Task Description
6/6/2013	Report to USEPA
05/31/2013	Report sent to USEPA - Complete

<b>14. Treatment Well-- At least one well, the well log indicated chlorine gas had run out</b> in the past (April 29, 2012) <u>Inadequate chlorination/disinfection could result in exposure to bacteriological contamination.</u>	
Action Plan: GWA to provide the log sheets. This finding is a result of an incorrect assessment	
Proposed Action Item Schedule	Task Description
6/6/2013	GWA to send USEPA the log sheet – interpretation was incorrect.
05/31/2013	Sent to USEPA - Complete

<b>15. Water Storage-- Severe internal/external rust and corrosion</b> including roofs, roof vents, walls, base and other welds, <u>anchors allows contaminants to enter tanks.</u>	
Recommendation: GWA should properly maintain facilities and grounds (remove overgrown vegetation, take away garbage, repair security breaches, etc.	
Action Plan: This is a Court Order project. Work performed will be in accordance with the 2011 court order.	
Proposed Action Item Schedule	Task Description
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports

<b>16. Water Storage-- Bolts, many completely rusted through, compromise structural stability of tanks.</b> <u>Recommendation:</u> Potential for tank failure	
Action Plan: This is a Court Order project. Work performed will be in accordance with the 2011 court order Paragraph 29.	
Proposed Action Item Schedule	Task Description
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports

<b>17. Water Storage-- Inadequate Site Security</b> (holes in fences, missing gates) and unlocked hatches allow easy access to <u>tanks (as demonstrated by vandalism at many tanks).</u> Potential for access by public and consequent contamination.	
Action Plan: This is a Court Order project. Work performed will be in accordance with the 2011 court order Paragraph 29. GWA will correct on tanks undergoing major repairs.	
Proposed Action Item Schedule	Task Description
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports

<b>18. Water Storage-- Leaking tanks.</b> <u>Recommendation:</u> Could allow contamination to enter.	
Action Plan: This is a Court Ordered project. Work performed will be in accordance with the 2011 court order Paragraph 29.	
Proposed Action Item Schedule	Task Description
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports



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<b>19. Water Storage-- Flooded</b> , uncovered and unsecured valve vaults Could allow contamination to enter.	
<u>Action Plan:</u> This is a Court Ordered project. Work performed will be in accordance with the 2011 court order Paragraph 29. GWA will correct on tanks undergoing major repairs.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports
<b>20. Water Storage-- No screen or flapper</b> on the storage tanks' overflows. Potential for access by public and consequent contamination.	
<u>Action Plan:</u> This is a Court Order project. Work performed will be in accordance with the 2011 court order Paragraph 29. GWA will correct on tanks undergoing major repairs.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports
<b>21. Water Storage-- Ladders</b> not locked, allow easy potential access by vandals.	
<u>Action Plan:</u> This is a Court Order project. Work performed will be in accordance with the 2011 court order Paragraph 29. GWA will correct on tanks undergoing major repairs.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports
<b>22. Water Storage-- Ladders</b> severely corroded or no cage will prevent adequate maintenance	
<u>Action Plan:</u> This is a Court Order project. Work performed will be in accordance with the 2011 court order Paragraph 29.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
In Progress – Court Order.	See CO Section II C Paragraph 29, Quarterly and Annual Reports
<b>23. Distribution System-- Inadequate cross connection control program</b> exists within GWA. Potential for backflow/backpressure and contamination.	
<u>Action Plan:</u> Engage consultant to develop how GWA can plan for backflow prevention program. Create report documenting procedures for implementing a program.	
<b>Proposed Action Item Schedule</b>	<b>Task Description</b>
02/01/2013	Engage consultant Brown and Caldwell
05/05/2013	Submit draft plan for GWA review
06/05/2013	Submitted draft plan to USEPA
12/31/2013	Draft Detailed Cross-Connection Control Plan.
Pending	Detailed Cross-Connection Control Plan Approved.
12/31/2014	GWA processing positions to man and execute this project..
Pending Approval of Plan	Cross-Connection Control Implementation Schedule.
Pending approved schedule	Operating Cross-Connection Control Section in Operation
<b>Updates (Reporting per Preface)</b>	





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<p><b>24. Distribution System-- Undersized water lines</b> impact water pressure and water quality and contribute to potential cross-connections. Potential for backflow/backpressure and contamination.</p>	
<p><u>Action Plan:</u> Engage consultant to develop how GWA can plan for small diameter pipeline replacement program. Create report documenting procedures for implementing a program.</p>	
Proposed Action Item Schedule	Task Description
02/01/2013	Engage consultant Brown and Caldwell
05/05/2013	Submit draft plan for GWA review
06/05/2013	Submitted draft plan to USEPA
10/01/2013	Approved Plan/CIP for line replacement.
12/31/2013	Submit Approved Plan/CIP for line replacement to PUC.
04/30/2014	Approved of Plan/CIP for line replacement by PUC.
07/01/2014	Begin line replacement program for small diameter pipelines.
01/01/2020	Complete small diameter pipeline replacement.
<b>Updates (Reporting per Preface)</b>	

<p><b>25. Pumps-- No pump controls</b> at many of the booster pump stations; lack of maintenance. Leaking seals in pumps and valves results in intermittent service and supply, lower reliability and decreased pressure. <u>Recommendation:</u> Implement routine and corrective maintenance at all spring appurtenances—meters, valves, pumps, piping, pressure gauges, etc.</p>	
<p><u>Action Plan:</u> Initiate repair. Engage consultant for independent analysis and condition assessment of booster pumping stations. Consultant to develop schedule and cost estimates for implementing upgrades of booster pumping stations. Consultant to prepare a report for rehabilitation program.</p>	
Proposed Action Item Schedule	Task Description
12/01/2012	Initiate immediate repairs
02/01/2013	Engage consultant Brown and Caldwell
02/26/2013	5-year CIP approved by CCU
04/30/2013	Complete immediate repairs
05/05/2013	Submit draft report to GWA for review
09/06/2013	Submitted draft report to USEPA for approval
03/30/2014 <b>GWA proceeding.</b>	Final plan for booster station repairs.
EPA Approval pending	Submit Approved Plan/CIP for booster station repairs to PUC.
	Approved of Plan/CIP for booster station repairs by PUC.
	Begin program for booster station repairs, copy to USEPA.
	Complete first round booster station repairs.
<b>Updates (Reporting per Preface)</b>	



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<b>26. Pumps-- Lack of adequate backup pumps.</b> Flooding of booster pump stations.	
Results in intermittent service and supply, lower reliability and decreased pressure	
<u>Action Plan:</u> Initiate repair. Engage consultant for independent analysis and condition assessment of booster pumping stations. Consultant to develop schedule and cost estimates for implementing upgrades of booster pumping stations. Consultant to prepare a report for rehabilitation program.	
Proposed Action Item Schedule	Task Description
12/01/2012	Initiate immediate repairs
02/01/2013	Engage consultant Brown and Caldwell
02/26/2013	5-year CIP approved by CCU
04/30/2013	Complete immediate repairs
05/05/2013	Submit draft report to GWA for review
09/06/2013	Submitted draft report to USEPA for approval
03/30/2014 <b>GWA proceeding.</b>	Final plan for booster station repairs.
EPA Approval pending	Submit Approved Plan/CIP for booster station repairs to PUC.
	Approved of Plan/CIP for booster station repairs by PUC.
	Begin program for booster station repairs. copy to USEPA
	Complete first round booster station repairs.
<b>Updates (Reporting per Preface)</b>	

<b>27. Pumps-- No controls on well pumps or booster pumps.</b>	
Results in intermittent service and supply, lower reliability and decreased pressure.	
<u>Action Plan:</u> Initiate repair. Engage consultant for independent analysis and condition assessment of booster pumping stations. Consultant to develop schedule and cost estimates for implementing upgrades of booster pumping stations. Consultant to prepare a report for rehabilitation program.	
Proposed Action Item Schedule	Task Description
12/01/2012	Initiate immediate repairs
02/01/2013	Engage consultant Brown and Caldwell
02/26/2013	5-year CIP approved by CCU
04/30/2013	Complete immediate repairs
05/05/2013	Submit draft report to GWA for review
09/06/2013	Submitted draft report to USEPA for approval
03/30/2014 <b>GWA proceeding.</b>	Final plan for booster station repairs.
EPA Approval pending	Submit Approved Plan/CIP for booster station repairs to PUC.
	Approved of Plan/CIP for booster station repairs by PUC.
	Begin program for booster station repairs, copy to USEPA
	Complete first round booster station repairs.
<b>Updates (Reporting per Preface)</b>	





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<b>28. Pumps-- Leaking pump seals, valves, lines, and highly rusted piping.</b>	
Results in intermittent service and supply, lower reliability and decreased pressure.	
<u>Action Plan:</u> Initiate repair. Engage consultant for independent analysis and condition assessment of booster pumping stations. Consultant to develop schedule and cost estimates for implementing upgrades of booster pumping stations. Consultant to prepare a report for rehabilitation program.	
Proposed Action Item Schedule	Task Description
12/01/2012	Initiate immediate repairs
02/01/2013	Engage consultant Brown and Caldwell
02/26/2013	5-year CIP approved by CCU
04/30/2013	Complete immediate repairs
05/05/2013	Submit draft report to GWA for review
09/06/2013 <b>GWA proceeding.</b>	Submitted draft report to USEPA for approval
Pending EPA Approval	Final plan for booster station repairs.
	Submit Approved Plan/CIP for booster station repairs to PUC.
	Approved of Plan/CIP for booster station repairs by PUC.
<b>Maintenance work in progress</b>	Begin program for booster station repairs, copy to USEPA
	Complete first round booster station repairs.
<b>Updates (Reporting per Preface)</b>	

<b>29. Water Quality-- Inadequate monitoring and reporting – Ugum WTP and Santa Rita Spring (turbidity and chlorine residual) exceedances (violations) may be going undetected and unreported.</b>	
<u>Recommendation:</u> Continue to improve utility-wide communications to address previous lack of complete communication between departments.	
<u>Action Plan:</u> GWA has made this KPI and it is managed via weekly reports	
Proposed Action Item Schedule	Task Description
06/06/2013	GWA to submit weekly report documentation to USEPA.
05/30/2013	GWA submitted documentation to USEPA. Complete

<b>30. SDWA Compliance-- Lead and Copper Rule monitoring overdue.</b>	
<u>Action Plan:</u> GWA has implemented the required LCR monitoring and will proceed to complete and continue as required by the rule without waiting for GEPA to approve the schedule and process. If GEPA ever decides to participate, GWA will make additions that are requested.	
Proposed Action Item Schedule	Task Description
12/04/2012	Routine Procedure started.
06/14/2013	Round 1 completed with all sample results below both Pb and Cu action levels.
12/31/2013	Completed second Round of Monitoring
01/31/2014.	Lab results verify GWA is in compliance. - Complete



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<b>31. SDWA Compliance-- Unaddressed Stage 2 Disinfection/Disinfectant Byproducts rule (DBP) Rule MCL Violations, required public notification.</b>	
<u>Action Plan:</u> Continue to report in CCR and add quarterly mailings to Central (GU0000003) and or Southern (GU0000001) System customers. GWA to await schedule for Navy water compliance schedule from Fena Reservoir for Central (GU0000003).	
Proposed Action Item Schedule	Task Description
05/20/2013	Southern (GU0000001) System is now compliant with Stage 2 DBP Rule
05/20/2013	Central (GU0000003) System is compliant with Stage 2 DBP Rule in all areas except one small part of Agat. Mailings to all Central Customers will continue until clear.
06/06/2013	Initiated quarterly mailings to affected customers. [Central (GU0000003)]
Consecutive System Management	GWA continues to reduce purchases of water from the Fena SWTP which has made the difference in the Central (GU0000003) System.
Navy Water is now in compliance	DBP exceedance Central (GU0000003) System has ended with changes in the Navy Fena Surface Water Treatment Plant's operations, achieving compliance with the Stage 2 DBP Rule.
Quarterly mailings are discontinued.	Complete
<b>Updates (Reporting per Preface)</b>	

<b>32. Administration-- No formal, comprehensive training program for operators and other personnel.</b> Can result in inappropriate or inadequate operation and negative impacts on water quality.	
<u>Action Plan:</u> GWA to complete an annual Workforce Development Report	
Proposed Action Item Schedule	Task Description
01/16/2014	First Annual Workforce Development (Training) Report.
Regular Training Scheduled	Adapted dependent on subject matter. Ranging from Weekly to Annual.
<b>Updates (Reporting per Preface)</b>	

<b>33. Administration-- Hydraulic model</b> is neither complete nor accurate enough to make operational or design decisions. Results in poor design and operational decisions impacting water quality.	
<u>Action Plan:</u> This is a Court Ordered project. Work performed will be in accordance with the 2011 court order Paragraph 29(a)(2).	
Proposed Action Item Schedule	Task Description
05/03/2013	Submitted Hydraulic Model report to USEPA under CO 29(a)(2). Complete

<b>34. Administration-- No preventative maintenance programs for most operational areas.</b> Many system components in varying levels of disrepair or failure put system at risk for contamination.	
<u>Action Plan:</u> GWA is working with USEPA and CDM to improve Asset Management	
Proposed Action Item Schedule	Task Description
In Progress	GW/CDM-Smith Asset Management program
Continuously updated	GW/CDM-Smith Asset Management program
<b>Updates (Reporting per Preface)</b>	



## GUAM WATERWORKS AUTHORITY

Gloria B. Nelson Public Service Building, 688 Rt. 15. Mangilao, GU 96913

### Corrective Action Plan (CAP) (Approved 10/21/2014) Quarterly Update Report

Guam Waterworks Authority Sanitary Survey Significant Deficiencies for the Water System

Prepared By: Paul Kemp, Vangie Lujan and Bill Gilman      **Update:**      Date: June 29, 2015

NEIC Work Product No. VP0989E01 GWA Sanitary Survey Significant Deficiency Items:

<b>35. Administration-- Data are collected, but do not have the capacity to analyze</b> the information to assist with operational decisions. Lack of understanding and use of operational data can result in poor system operations and consequent risk for contamination or failure.	
<u>Action Plan:</u> GWA will improve data collection and assessment function – SOP's and Training are in planning stages.	
Proposed Action Item Schedule	Task Description
2013	New SOP's and Training
2013 through 2018	Five year development plan for staff capacity for data retrieval and analysis.
<b>Evolves as data collection develops.</b>	<b>Some staff positions require creation through approvals by the CCU, PUC and Guam Legislature</b>
<b>Updates (Reporting per Preface)</b>	

<b>36. Administration-- Lack of Standard Operating Procedures (“SOPs”).</b>	
<u>Action Plan:</u> GWA will conduct SOP training	
Proposed Action Item Schedule	Task Description
As of 06/25/2013.	55 new SOP's Implemented (assisted by CDM, EPA Grant)
Drafts and planed	CDM continues work, particularly on Asset Management
Average one a month my 06/30/2014	Complete new SOP's and implement
<b>09/06/2013</b>	<b>Reported status to USEPA</b>
<b>Semi-annual - Continuous</b>	<b>Training on SOP's</b>
<b>Updates (Reporting per Preface)</b>	

<b>37. Operator Compliance-- No proper operator certification for system type.</b> Inadequately trained operators do not perform process control adequately, which impacts finished water quality.	
<u>Action Plan:</u> GWA disputes the described deficiency. <b>GWA has always been in compliance.</b>	
Proposed Action Item Schedule	Task Description
06/06/2013	Submit Certification information USEPA.
<b>05/24/2013</b>	<b>Certification information sent to USEPA - Complete</b>

<b>38. Operator Compliance-- Plant operators do not regularly conduct jar tests.</b> Inadequately trained operators do not perform process control adequately, which impacts finished water quality.	
Proposed Action Item Schedule	Task Description
5/15/2013	Prepare change order for installation of TOC and appurtenances. Smithbridge
08/12/2013	Completed installation of on site TOC analyzer.
08/15/2013	Completed training of operators on site TOC analyzer.
<b>07/23/2013</b>	<b>Additional Specialized training on coagulation optimization for membranes</b>
<b>08/01/2013</b>	<b>Training certification sent to USEPA - Complete</b>



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Prepared By: Paul Kemp, Vangie Lujan and Bill Gilman      **Update:**      Date: June 29, 2015

NEIC Work Product No. VP0989E01 GWA Sanitary Survey Significant Deficiency Items:

<b>39. Operator Compliance-- Plant operators and engineering staff did not understand the correlation between ineffective coagulant dosing.</b>	
Inadequately trained operators do not perform process control adequately, which impacts finished water quality.	
Proposed Action Item Schedule	Task Description
5/15/2013	Prepare change order for installation of TOC and appurtenances. Smithbridge
08/12/2013	Completed installation of on site TOC analyzer.
08/15/2013	Completed training of operators on site TOC analyzer.
07/23/2013	Additional Specialized training on coagulation optimization for membranes
08/01/2013	Training certification sent to USEPA - Complete

<b>40. Operator Compliance-- No level 4 Operator is actually located on site at the Ugum WTP, as required.</b>	
Violation of Guam Operator Certification requirement.	
<u>Action Plan:</u>	
Level 4 operators are not required at Ugum, Current status requires only Level 3 operators. <b>GWA has always been in compliance.</b>	
Proposed Action Item Schedule	Task Description
06/06/2013	Submit Certification information USEPA.
05/24/2013	Certification information sent to USEPA - Complete

### Status Summary: as of August 09, 2013

Corrective Action Plan Legend	Fill Color	Items
Information and/or future steps	No Fill	
<b>Completed – no further action-or pending EPA approval</b>	Green	<b>27</b>
<b>Court Order Managed items</b>	Blue	<b>09</b>
<b>In Progress – Continuous (Long Term Commitment)</b>	Orange	<b>04</b>



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Prepared By: Paul Kemp, Vangie Lujan and Bill Gilman

Update:

Date: June 29, 2015

NEIC Work Product No. VP0989E01 GWA Sanitary Survey Significant Deficiency Items:

### Addendum

#### Approved Plans and Schedules from the preceding Corrective Action Plans sections.

Individual approved plans, projects and schedules in above sections of this plan will, when approved, become a part of this Corrective action Plan. Such approved plans are listed and will be tracked/reported here. The actual approved plans, projects and schedules will be attached following this section.

Item No.	Task Description	Plan Submitted for approval	Plan/Project Approved	Update/Completion Date
02	Wellhead Protection Plan	06/30/2013		
23	Cross Connection Control Program Plan	12/31/2013		
24	Undersized Water Line Replacement	06/05/2013		
25	Water Booster Station Pump Controls	09/06/2013		
26	Water Booster Station Pump backup pumps	09/06/2013		
27	Water Well & Booster Station Pump Control feedback system	09/06/2013		
28	Water Booster Station Maintenance/Repair	09/06/2013		