



## MEMORANDUM

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DATE: 7/11/12

TO: Kathy Chaston, Steve Frano, and Fatima Sauafea-Leau (NOAA); Faamao Asalele, Christianera Tuitele, Kuka Matavao, and Brian Rippy (AS-EPA); and Trent Biggs (SDSU)

FROM: Horsley Witten Group, Inc. (HW) and the Center for Watershed Protection, Inc. (CWP)

RE: Preliminary Assessment of Faga'alu Watershed Plan and Territorial Stormwater Capacity

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As outlined in Task 1 of our scope of work, this memorandum summarizes: 1) potential supplements to support the Faga'alu watershed plan; and 2) potential regulatory and programmatic gaps related to post-construction stormwater management in American Samoa. Field and training schedules have been provided separately to project partners. No reconnaissance plan for an additional watershed is included at this time, since the project partners have not finalized watershed selection.

The purpose of this initial assessment is to provide HW and CWP with some background on the existing watershed efforts and Territorial stormwater requirements, as well as to generate a list of specific issues to investigate while on island the week of July 19-27, 2012. This memo also provides a preliminary framework for developing the watershed implementation strategy supplement and stormwater findings report, which are deliverables listed under Tasks 3 and 2 of our scope of work, respectively.

### The Faga'alu Watershed

The Draft Faga'alu Village Watershed Management and Conservation Plan (dated 2/10/12) (Village of Faga'alu, 2012), relevant sections of the Watershed Protection Plan (Pedersen, 2000), and the 2010 Integrated Waters Report were reviewed by HW and CWP. The following items were noted as additional elements to include in order to meet USEPA (a-i) watershed planning criteria and/or as items to address during our trip to the island:

1. Sediment, debris, and fisheries management are the key issues addressed in the watershed plan. Streams and nearshore waters for this watershed are also impaired for nutrients and bacteria, but there is no explicit strategy for reducing either. Dr. Guy DiDonato (2005) identifies total nitrogen (TN) as the pollutant of concern in Tutuila and identified piggeries as a prime source on the island. Interestingly, the AS-EPA water quality thresholds are 300 µg/L TN and 150 µg/L total phosphorus (TP) (Vaouli et al., 2010), which is more conservative than typical values of 1 mg/L (1000 µg/L) and 0.1 mg/L (100 µg/L) for TN and TP, respectively (Bricker et al., 2003). Faga'alu is included on the 2004 and 2010 303(d) lists with Total Maximum Daily Loads (TMDL) expected in 2012 for TN, TP, turbidity, and Enterococcus. The ocean shoreline is on the 2004 and 2008 303(d) list for Enterococcus/Undetermined non point source (NPS) Stressor with a TMDL expected in 2015. Reduced pollution in nearshore waters can improve natural resources such as fish, shellfish, and coral reefs that were identified as threats in the watershed plan.

***Actions: Field activities should include identification of nutrient and bacteria sources and potential opportunities to reduce loading. This includes getting a better understanding of the wastewater system in the watershed and potentially an assessment of piggeries.***

2. There appear to be no estimates of load reductions from implementation activities included in the watershed plan; however baseline sediment load monitoring has been conducted by San Diego State University (SDSU). The Pederson report summarizes previous studies that show an exceedance of water quality standards for total suspended solids (TSS) and TN in Faga'alu.

***Actions: Investigate the status of TMDL development, baseline sediment monitoring, and Pedersen summary to incorporate existing loading information into the watershed plan.***

***Collect enough information to estimate load reductions for priority restoration projects. Include this information in tabular format in implementation strategy.***

3. The implementation actions identified in the watershed plan include adopting local stormwater regulations to meet the American Samoa Water and Erosion Control Management Plan.

***Actions: Ascertain information regarding local-level vs Territorial regulations, get a copy of the AS Water and Erosion Control Management Plan, and provide specific recommendations in the watershed supplement and stormwater program findings memo to support this objective.***

4. The implementation actions identified in the watershed plan include identifying and stabilizing eroding stream banks and shorelines with tree plantings. No specific locations are identified at this time.

***Actions: Field activities should include the identification of stream bank/shoreline stabilization and buffer planting sites to help advance this objective. Restoration options should include tree planting as well as other techniques to minimize erosion.***

***Investigate major shoreline outfalls and determine if restoration options can be used.***

5. The implementation actions identified in the watershed plan include monitoring for turbidity and bacteria, but details on monitoring are not provided.

***Actions: Investigate existing monitoring protocols of AS-EPA and SDSU and work with them to draft a watershed monitoring plan.***

6. A list of specific retrofit project locations was identified in the Watershed Protection Plan (Pedersen, 2000), which included the following sites:
  - A greater use of Faga'alu Park for the detention of stormwater flows might be accomplished through a combination of improvements: the elimination of curbs around the vehicular parking areas in Faga'alu Park and the expansion of an existing swale along the southwest side of the Park.
  - The use of onsite drywells in new commercial facilities throughout the watershed would enable some filtering of stormwater into the local substrata. The proximity of these areas to the shoreline would, in most cases, not generate any recharge to the basal aquifer.
  - Constructive discussions need to occur between Samoa Maritime and AS-EPA to determine a prudent and feasible course of action that will lead to the reduction or elimination of sediment discharges into Faga'alu. Constructive discussions should consider various options ranging from potential relocation to other practical onsite measures that could be incorporated into quarry operations.
  - The road culvert that transports storm runoff to the shoreline via a 3-foot culvert buried underneath the Park. Along the shoreline where the culvert reappears, there was evidence of significant shoreline erosion and loss of land.
  - Two faatoaga (landslides?) on the steep slopes in the southwest part of the watershed likely generate some turbid runoff during and following heavier rainfall periods.
  - At least two piggeries are located immediately adjacent to Faga'alu Stream that discharge nutrient-enriched wastewater into Faga'alu Stream.

***Actions: Include these sites in the field investigations. As part of the watershed plan supplement, include a list of specific project sites and design concepts as well as a map of potential restoration sites.***

7. There is no specific mention of protecting drinking water intakes as part of the watershed plan. There is one groundwater well in the Faga'alu watershed used by ASPA in the

operation of American Samoa's public water system on the Island of Tutuila (Table 25-5 in Pederson, 2000). This well is located on the west side of the hospital and is immediately adjacent to Faga'alu Stream. The Faga'alu intake along Matafao Stream was one of five surface water sources that served the Territory's centralized public water distribution system. Most villages had individual village water systems that relied upon local stream flows. The Faga'alu intake, which is located about the 812-foot elevation, produced an average flow of 0.32 million gallons per day. It has a potential storage capacity of roughly 1.7 million gallons. The Utilities Master Plan (reportedly) has identified Faga'alu as a location for further wellhead development and reactivation of the Matafao intake (Pedersen, 2000).

***Actions: Investigate further if these areas warrant specific inclusion in the watershed management plan. Review Utilities Master Plan. Assess the area surrounding the wellhead for potential sources of pollution.***

8. The watershed plan does not explicitly address future demands on watershed resources related to future development or population growth, nor is there discussion of implications of climate change (i.e., sea level rise, groundwater table rise and salt water intrusion, increased inundation along stream corridor). The Pedersen Report provides some estimates of new development and mentions the need for inundation mapping that shows vulnerable lands (e.g., climate change predictions/scenarios and/or 5 to 70 feet Mean Sea Level (MSL) 100 year flood elevations (Pedersen, 2000). A quick search on ASDOC Web Portal produced a number of watershed maps showing areas subject to current flood risks.

***Actions: Further investigate existing mapping and predictions for future Village buildout and relevant changes in precipitation and sea level rise in the watershed. Develop list of top expert(s) to provide the Village with tools and resources (e.g., NOAA Coastal Services Center).***

9. The watershed plan lists education and outreach activities, but does not include a specific education plan with an implementation strategy.

***Actions: Investigate the Village's, AS-EPA, NOAA, and other organizations thoughts on developing an education plan for residents, students, park users, businesses, etc. in the watershed.***

#### Post-Construction Stormwater Regulations and Program

The following are the preliminary findings related to the stormwater program:

1. The USEPA Region 9 has authority over the National Pollutant Discharge Elimination System (NPDES) Stormwater permits in American Samoa, which include the 2012 Construction General Permit (MSGP) (# ASR12000) and the 2008 Multi-Sector General Permit (ASR050000).

**Action: Review the Guidance Manual for Runoff Control (October 2001) and associated ASEPA or other local implementation policies and/or guidance related to the CGP and MSGP and identify opportunities where AS-EPA/USEPA could provide more island-specific implementation/design guidance.**

2. The quarry operation and (road) construction have been identified as significant contributors of sediment and turbidity in Faga’alu Stream and Bay. The Quarry does not have an NPDES MSGP or a land use permit (it has been indicated that this operation was “grandfathered as an existing use; however, it is not clear how grandfathering provisions apply to NPDES Permits).

**Action: Gain a better understanding of the of which sites in the watershed have a MSGP, review relevant stormwater pollution prevention guidance and applicable facility operation and good housekeeping provisions for quarry operations.**

3. American Samoa is not required to have a stormwater program to meet the six minimum control measures of the Phase II Municipal Separate Storm Sewer System (MS4) permit, which include: public outreach and education, construction site management, post-construction controls, good housekeeping, illicit discharge detection and elimination, and public involvement and participation. However, these are elements of a basic stormwater program that American Samoa could proactively pursue. Specifically, the pollution prevention activities and public outreach and education measures should be pursued. In fact, some current activities already qualify as meeting these control measures (e.g., stream cleanups, ESC contractor training).

**Action: Discuss with agency staff the potential to adopt additional program elements.**

4. AS-EPA's regulatory authority for runoff control is currently derived from the AS water quality standards and the coastal management program administrative rules. Title 24 Ch 1 Environmental Quality Act and Title 24 Ch 2 Water Quality Standards appear to be the primary Territorial regulations related to water quality measures.

Title 26 Ch 2 Coastal Management Program establishes the Project Notification Review System--the land use permitting system and the enforcement capabilities and also cover siting rules regarding coastal areas, streams, and wetlands. These regulations can be accessed at the following:

[www.asbar.org/index.php/legal-resources/regulations/91-regulations/natural-resources-and-environment/2213-coastal-management](http://www.asbar.org/index.php/legal-resources/regulations/91-regulations/natural-resources-and-environment/2213-coastal-management).

It is not clear what authority other agencies or local governments have in drainage control. While regulatory and enforcement authority is deemed sufficient by AS-EPA and DPW staff, updates to these regulations may be appropriate in order to develop and adopt a stormwater manual to include design and performance standards for stormwater structural

and nonstructural practices. CNMI and Guam may provide two different examples of how erosion control and post-construction stormwater regulations could be integrated into the existing regulatory structure.

***Action: Contact DPW to get more information on Public Works regulations relating to stormwater management and drainage standards, zoning and building codes, and other related regulations.***

***Review regulations and available design guidance with island staff while on island and prior to field assessment to gain a better understanding of the permitting and plan review process associated with construction and post-construction stormwater management for new development and redevelopment activities.***

***Discuss recommendations for regulatory updates with agency staff at interagency meeting. Regulatory updates can include structural and non-structural stormwater practices, reducing impervious cover, etc.***

5. Some stormwater practices exist in American Samoa, including permeable pavers (observed), biofiltration (reported), and some infiltration (reported). Currently, there is no design manual or established set of sizing standards, which leads to a subjective and unpredictable review and approval process. In the opinion of HW and CWP, American Samoa could benefit from a basic level of stormwater treatment for pollution generating storm events. Obviously, the lack of space on much of the island may limit the ability to provide detention and flood protection during large storm events; however, management of the smaller, more frequent storms to provide for recharge and/or pollutant removal is appropriate. Adaptation of the CNMI/Guam and Palau stormwater manuals would be beneficial for American Samoa. Adaptations should include specific measures to address hydrocarbons and floatables.

***Action: Tour some existing stormwater facilities while on island. Generate a list of appropriate practices and adaptation of design elements that address American Samoan specific pollutants of concern (e.g., trash, oils, nutrients, sediment) and physical conditions (e.g., vegetation, soils, precipitation, and water table).***

***Discuss with agency staff the need for developing a post-construction standards and design manual, to include appropriate water quality design storm based on local updated precipitation statistics. What is the best approach for reaching consensus on the general management standards and criteria?***

## Reconnaissance Plan for the Vatia Watershed

The actual watershed (TBD).

***Action: Prior to departing for American Samoa, HW/CWP to review the Watershed Protection Plan (Pederson, 2000) for information pertaining to selected watershed and generate a field map for field investigations.***

### References

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- Vaouli, LT Elena, Christianera Tuitele, Edna L. Buchan, Josephine Regis, Phil Wiles, and Nate Ilaoa. 2010. Integrated Water Quality Monitoring and Assessment Report. American Samoa Environmental Protection Agency.
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