

Analysis of Comments Received on San Vitores Road Flood Mitigation Project

Public Law 30-228 appropriated proceeds from the Hot Bond “for resolution of the San Vitores flooding caused by storm water runoff along San Vitores Road north of the Fujita Pump Station by collecting and removing storm runoff via transmission to the Fujita Pump Station to be discharged at a suitable location.” After evaluation of alternatives to satisfy the Law’s requirements, the Bay Outlet option was selected for design and construction and taken through the completed public/agency comment phase. Some members of the public and government agencies have expressed concerns with the proposed Bay Outlet solution. The objective of this communication is to provide a summary of project issues and options so a viable solution can be developed. A description of the project tasks and agencies contacted is attached as Exhibit A.

FLOODING

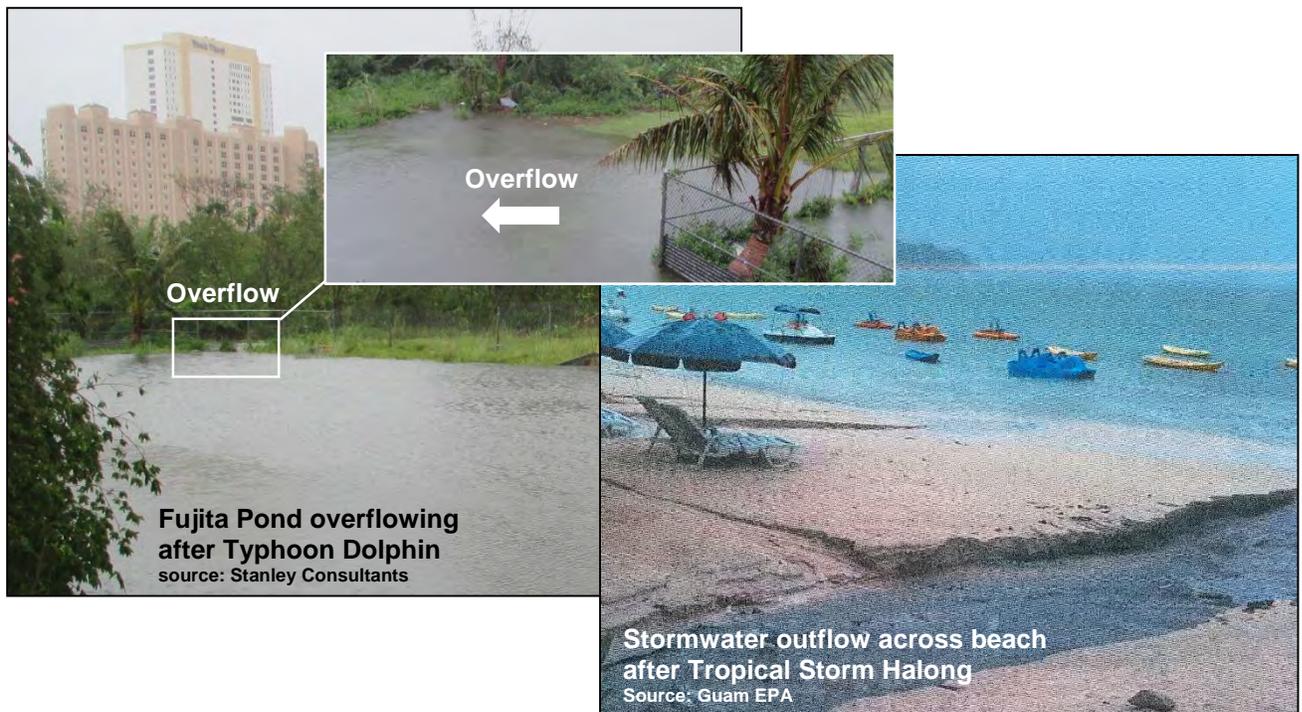
Currently, the low area of San Vitores Road near the Pleasure Island area floods a few times per year. The cause of flooding was established and validated using inspections and field data collected during flood events.



There are 180 acres west of Marine Corps Drive that drain to Fujita Pond via three large box culverts running under San Vitores Road. The box culverts are large enough to convey flood flows and when inspected in 2013 had minimal sediment (they had recently been cleaned). The causes of flooding are the top of Fujita Pond is at a higher elevation than the low spot in San Vitores Road (see photo above) and Fujita Pond is not large enough

to contain heavy rainfall events. During heavy rains the pond fills up, overflows, and causes flooding on San Vitores Road and Fujita Road. The following provides a summary of the sequence of events from rainfall to flooding:

- *No Flooding* - typical rains (less than 3 inches of rain in one day)
 - Developed and undeveloped areas in the drainage basin infiltrate most of the rainfall.
 - The storm sewer system captures remaining stormwater.
 - Storm water flows into Fujita Pond through existing box culverts.
 - Fujita Pond comes up a few inches.
 - Rainfall stops, stormwater infiltrates into Fujita Pond, and the water level goes back down.
- *Flooding* - heavy rains (more than 3 inches of rain in one day)
 - Developed and undeveloped area infiltration does not keep up with rainfall and stormwater flows to the drainage basin low points.
 - Some stormwater is collected, some flows across the beach towards the north end of Tumon.
 - Stormwater is collected along San Vitores Road and starts filling up Fujita Pond.
 - Fujita Pond infiltrates stormwater, but as rain continues the pond keeps rising.
 - As rainfall exceeds 3 inches the pond starts overflowing its northwest corner.
 - The top of Fujita Pond is higher than San Vitores Road so water backs up into San Vitores Road and adjacent properties.
 - Properties in low areas have to handle excess stormwater ponding in San Vitores Road.
 - Stormwater continues to overflow Fujita Pond and starts collecting in the property behind Burger King.
 - As rain continues, more water backs up in the low area of San Vitores Road and more water overflows Fujita Pond.
 - Water overflowing Fujita Pond starts spreading across the property behind Burger King and floods the low area on Fujita Road near the small apartment complex.
 - Over an extended period, this ponded water slowly infiltrates and evaporates.



The severity of flooding is dependent on the amount of rainfall. For example, the 10 inches of rain that fell within 20 hours during Tropical Storm Halong caused widespread flooding. There was sufficient water ponded

on Fujita Road that residents had to use small boats to access their property. At its peak, the water ponded a few feet deep across almost 20 acres around Fujita Road and the low area of San Vitores Road. Similar flooding occurred during Tropical Storm Chan-hom, which produced roughly 11 inches of rain July 4-5, 2015. Fujita Pond again overflowed for several hours, flooding the roadway and surrounding areas and properties. **This is a large quantity of water and requires a substantial solution to fix the problem.**



If nothing is done about the flooding and development of Tumon continues, flooding will get worse. When Fujita Pond overflows, the overflow goes out into undeveloped property behind Burger King, Fujita Road, and the old Fujita Hotel property. If this area develops, the developer will need to raise their building above existing ground to not be periodically flooded. If this occurs there will be less area for the stormwater overflow to infiltrate. Water will pond to even greater depths in flooded areas.

Exhibit B contains a summary of comments received on this project. The major concern by project opponents is the proposed Bay Outlet would concentrate freshwater and pollutants during heavy rains which overflow Fujita Pond and could harm Tumon Bay coral, fish, and habitat.

OPTIONS TO REDUCE FLOODING

Reducing flooding in this area comes down to three basic strategies:

- Infiltrate
- Discharge water to bay/ocean
- Pump the water somewhere else

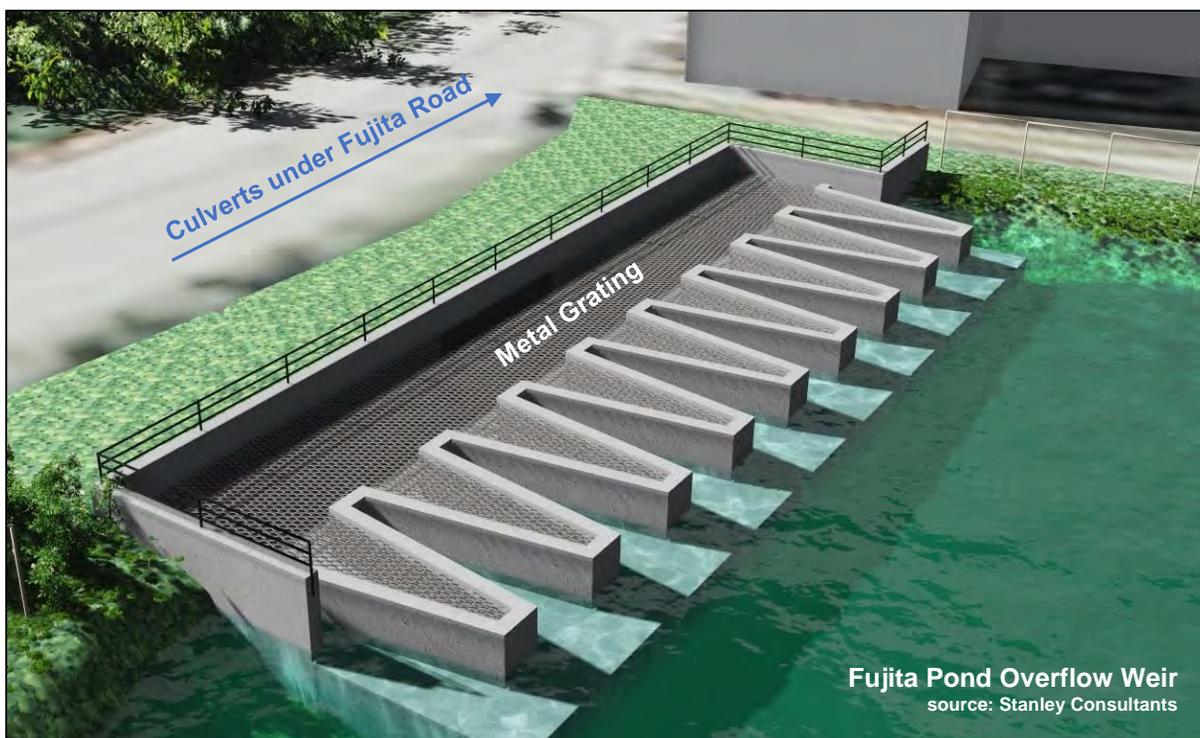
There are a variety of methods to reduce flooding, but all utilize one of these strategies. The Bay Outlet option came out of an alternatives analysis which included six equally effective flood mitigation options. This analysis can be viewed or downloaded from GEDA's website, www.investguam.com. These options were:

- Expanded Detention (i.e. infiltration)
- Bay Outlet
- Ocean Outlet
- Pump to Quarry
- Pump to Sink
- Pumped Ocean Outlet

Over the course of this project several options for reducing flooding have been considered. Although Expanded Detention was initially the preferred option; seven acres of infiltration area was required to effectively reduce flooding so this option was not pursued because the land costs in the area well exceeded the project budget. There is no public land available for detention in the project area. The project area is in one of the most densely developed, high value land areas in Guam and land acquisition could include multiple parcels and drag out for several years. The Bay Outlet was the preferred option that met budgetary constraints as well as providing a simple, effective solution. It could be constructed on GovGuam owned property and discharge to Tumon Bay would occur infrequently, coinciding with heavy rainfall events when there was already a significant quantity of freshwater entering Tumon Bay.

BAY OUTLET OPTION

The Bay Outlet includes a concrete weir (a zig-zagging concrete wall) in Fujita Pond that overflows to concrete box culverts under Fujita Road. The culverts discharge through an outlet structure at the end of Fujita Road and into Tumon Bay. **The top of weir in Fujita Pond is three feet above the normal pond water level which allows the pond to rise and fall during typical rain events without discharge to Tumon Bay.** During heavy rains, the pond level rises three feet and overflows the weir. The top of weir is set below the low elevation of San Vitores Road. The weir overflow maintains the water level in Fujita Pond near the top of weir and minimizes flooding on San Vitores Road. There is metal grating between weir and culvert which prevents trash and debris from flowing out of Fujita Pond. The box culverts convey overflow out to Tumon Bay instead of flooding lands adjacent to Fujita Pond, so it also reduces Fujita Road flooding. The following graphic shows a rendering of the Fujita Pond weir overflow structure.



It is understood that the Guam EPA (GEPA) has been working to remove direct point source discharges of stormwater from private properties into Tumon Bay. This system is not a step back from this objective. This project will involve installing additional inlets along all of San Vitores Road to improve capture of stormwater throughout the drainage area, which will reduce the frequency of outflow to Tumon Bay during smaller rain events. Stormwater that previously flowed directly into Tumon Bay will be captured and brought to Fujita Pond, reducing discharge at this point. Fujita Pond will be expanded to provide 135,000 cubic feet of

storage/infiltration to allow some settlement of stormwater. This storage volume meets the Guam Stormwater Management Manual storage requirement for the untreated, developed area within the drainage area. During heavy rain events, the proposed Bay Outlet provides a defined overflow into Tumon Bay to mitigate flooding on Fujita and San Vitores Road and reduce recurring issues caused by flooding such as property damage, traffic issues, safety concerns, seepage into the sanitary sewer system, and tourist activity interruptions.

Overflow from Fujita Pond will be conveyed to Tumon Bay via concrete box culverts that will be installed under Fujita Road. An outlet structure will be constructed at the end of Fujita Road. The location of the structure was set slightly back from the beach to maintain the existing stretch of open beach during the 360 plus days a year there is no overflow. During discharge events, the overflow will flow out across the beach and into Tumon Bay. Beach raking at the discharge point will be required following overflow events. A maintenance program will be established for this project prior to installation. Beach access via Fujita Road will be maintained. More information on the proposed system and project development can be found in project reference documents which are posted on the GEDA website, www.investguam.com.

As described in Exhibit A, the Bay Outlet option was taken from conceptual to preliminary design and a draft Environmental Impact Assessment was developed. These draft design documents were submitted for agency and stakeholder review in February 2015.

FEEDBACK

Stanley Consultants and GEDA have held meetings with the majority of agencies that received the Bay Outlet draft design submittal and a public meeting was held on March 25, 2015. Comments on the project have now been received via the public meeting or review of project documents. Significant concerns were expressed over the Bay Outlet's maintenance and potential impacts to Tumon Bay. Comments included:

- The Bay Outlet, "*Would Adversely Affect Essential Fish Habitat*".
- "*The impact of fresh water inflow to coral reef must be investigated and addressed....*".
- "*Is this the cure that is worse than the disease?*"

ADDITIONAL OPTIONS CONSIDERED

Over the course of this project several options for reducing flooding have been considered. Expanded detention required acquiring over seven acres of land in lower Tumon which well exceeded the project budget. Other options considered in the alternatives analysis, such as pumping stormwater (Pump to Quarry/Sink) or outletting past the reef (Ocean Outlets) were over \$20M and had significantly greater operational and maintenance risks.

Solving flooding through pumping requires large pumps, mechanical/electrical equipment, significant and reliable power supply, and dedicated maintenance. Due to the high cost, ongoing maintenance requirement, and higher risk of failure involved with a system that only operates a few times a year, the pumping options were eliminated. Constructing an outlet past the reef was also high cost and presented unacceptable impacts. The size of pipe needed was too large to bore under the floor of Tumon Bay, so would be constructed via open cut. This would involve significant impacts to coral/habitat in Tumon Bay and the outlet would be located even closer to the coral than the Bay Outlet. More information can be found in the *San Vitores Road Flood Mitigation Report* which is part of the references documents posted on the GEDA website (<http://www.investguam.com/>).

There is a substantial amount of water causing flooding at San Vitores Road. Solving the flooding will require a substantial solution. During heavy rains Fujita Pond backs up water into San Vitores Road and overflows into several acres of low area surrounding Fujita Road. Solving flooding requires finding somewhere else for this substantial amount of water to go. The public involvement process has generated several comments pointing to additional options to solve flooding. Several of these options are smaller features that could help the problem and need to be included as part of a comprehensive flood mitigation plan to reduce the burden on the larger system. However, these options alone will not solve flooding.

An evaluation of additional options was completed. Considerations included effectiveness, suitability to location, regulations, cost, safety, and operation and maintenance requirements. As a point of comparison, their potential to reduce flooding was analyzed for Tropical Storm Halong which dropped approximately 10 inches of rain on July 30, 2014. The following provides a summary of the additional options considered, listed in order of effectiveness:

Expand Fujita Pond

What is it? Fujita Pond is a small (0.5 acre) detention and infiltration basin that receives all storm water collected by the San Vitores Road storm sewer system. To effectively reduce flooding over a wide range of rain events it would need to be 14 times larger (7 acres) than its current size. Any expansion will help though so the pond should be expanded from its current size and “maxed out” within the surrounding GovGuam property (under ownership or easement). This expansion will help improve infiltration, detention, and settling of stormwater.

Will it help? Yes, but the impact is relative to the area of land available for stormwater detention and there is limited land available for expansion. There are currently underground infiltration basins (0.3 acres or 100 feet by 150 feet) adjacent to Fujita Pond which already provide some infiltration. This property is privately owned but GovGuam has an easement allowing stormwater infiltration on this property. Removing these basins and expanding the pond will provide more infiltration and detention capacity. The parcel that includes Fujita Pond, the GWA pump station, and Police Station is the only GovGuam owned parcel in lower Tumon in the drainage area. The 0.3 acre expansion pushes the pond boundary to the edge of the parcel boundaries. Additional expansion into adjacent police parking by providing underground infiltration (i.e. parking can continue) was reviewed. Only 0.05 acres could be gained by installing infiltration under the Police Station parking so there would be limited flood benefit to the expanding Fujita Pond further. The currently proposed 0.3 acre pond expansion provides an additional 45,000 cubic feet of flood storage and it also provides infiltration. This expansion would have offset the total rainfall volume during Tropical Storm Halong by 2%.

Rain Gardens

What is it? Rain gardens are the size of a planting bed, are less than 1 foot deep, and have an overflow for spilling heavy rains. They have pervious soil and plants that help filter stormwater and improve water quality.

Will it help? Yes, but only as part of the solution. Rain gardens are very effective at improving water quality and reducing runoff for small rain events but not for handling larger rain events. They fill up quickly during a significant rain event and are not deep enough to provide sufficient storage to offset flooding. Guam generally has high infiltration rates, so these vegetated areas would provide continuous infiltration during a rain event.

1.4 acres of rain gardens could be installed if every vegetated area along San Vitores Road (median and adjacent sidewalk areas) was converted to rain garden. These rain gardens would have infiltrated 2% of the total rainfall volume of Tropical Storm Halong. This 1.4 acres represents all of the vegetated GovGuam property north of Fujita Road. Realistically, there is less than 0.2 acres of area suitable for rain garden development within San Vitores Road right of way. However, pervious pavers is another infiltration option which is being reviewed for inclusion in the proposed project. Additional rain gardens would require development on private land so would involve land acquisition or an incentive program to encourage rain gardens on private land. Rain gardens also require maintenance. Any infiltration helps though, so these are being included in project development.

More Enforcement for Infiltration Systems

What is it? Developments are required to collect and infiltrate stormwater. If property owners are required to better maintain their systems this will reduce flooding.

Will it help? Yes, but only as part of the solution. Currently there is no government inspection or enforcement on maintenance of private development infiltration systems. When a development is designed, a system to collect and infiltrate all of the site’s stormwater is required. During the alternatives analysis many of these

systems were inspected. Analysis based on field measurements during rainfall events show that these properties infiltrate rainfall similar to an undeveloped area. There is minimal flow out of the property for light rains, but during heavy rains the infiltration systems cannot keep up and excess stormwater flows out to San Vitores Road. Unless a property is walled in, there will always be some portion of stormwater that runs off the property. During Tropical Storm Halong these properties infiltrated approximately 19% of the total rainfall. With improved maintenance and capture this percentage could be bumped up by a few percentage points, but not enough to solve the issue. It could make a difference though should be pursued if regulatory programs can be initiated to manage.

Injection Wells

What is it? An Injection well is a vertical pipe that extends far below the ground surface and discharges stormwater into the pervious soil layers below ground through perforations in the pipe.

Will it help? Yes, but only in the upper watershed for individual developments. The water table is roughly 5-7 feet below the ground elevation in lower Tumon. Injection wells typically require roughly 100 feet between ground surface and water table to provide sufficient infiltration length. So, injection wells are not feasible in lower Tumon. Below the steep ridge off Marine Corps drive, the ground elevation is roughly 90 feet above the water table. Injection wells could be feasible in this location. Injection wells require pretreatment which involves providing 24-48 hours of storage at the surface level to reduce pollutants/siltation. This means additional land; and GEPA also needs justification that other systems such as infiltration basins will not work.

Relative to Tropical Storm Halong, a single injection well has the capacity to infiltrate 0.1% of the total rainfall volume. Twenty injection wells installed in upper Tumon could infiltrate 2% of the total rainfall volume of Tropical Storm Halong. Outside of private developments, there are no stormwater collection systems in upper Tumon. The land slopes steeply toward Tumon Bay. In addition to the wells, an injection well system that provides infiltration for upper Tumon would require a collection system to capture the drainage which would involve grading, piping, and ditch systems as well as a pretreatment storage basin cut into a steeply sloped area to allow stormwater settling. On a large scale this is not a cost efficient option for reducing flooding. On a development scale injection wells could be an option to reduce runoff from an individual property.

Stop Flow from Marine Corps Drive

What is it? Install curb barriers or additional inlets to keep Marine Corps Drive stormwater on Marine Corps Drive and stop it from flowing down to San Vitores Road.

Will it help? Marginally. Some flow does come off Marine Corps Drive and flows down to San Vitores Road. Relative to Tropical Storm Halong, it is 1% of the total rainfall volume. Marine Corps Drive has its own storm sewer system and it also has a median, so the stormwater flowing to San Vitores Road is from half the roadway width that is not picked up by the Marine Corps Drive system. This flow is concentrated in the gutter so looks like a significant amount of flow. Relative to all the stormwater flow from the 180 acre drainage area, it is not the cause of flooding but any reduction helps. Trench drains across the San Vitores Road intersection with Marine Corps Drive are being added to the proposed design to improve capture into the Marine Corps Drive storm sewer.

Connect to Unused Sewer Pipe

What is it? Connect the Fujita Pond system to the unused sewer pipe under San Vitores Road.

Will it help? This unused 15 to 24-inch sanitary sewer pipe could be part of a solution but would need to connect to a large detention area to be effective. The pipe itself is 3650 feet long has 8650 cubic feet of storage or 0.1% of the rainfall volume of Tropical Storm Halong. This volume would have minimal impact on flooding so the pipe needs to flow to a detention/infiltration area to provide effective reduction in flood volume. Given the density of development and land values of properties along San Vitores Road, it is unlikely that a detention area

could be located adjacent to San Vitores Road, but if this pipe was extended from a location near Fujita Pond to another detention area, it could potentially be utilized to connect these two areas.

Connect to Matapang Infiltration Basins

What is it? The Matapang underground infiltration basins are located beneath Matapang Park. Connect the Fujita Pond system to Matapang to increase infiltration and reduce flooding

Will it help? Not feasible. The Matapang underground infiltration basins are located beneath the Matapang Park located approximately 1600 feet south of Fujita Pond along San Vitores Road. The system was installed during the 2000 San Vitores Road reconstruction to infiltrate drainage from 120 acres south of Fujita Pond. The basin area is 250 feet by 250 feet extending under the parking lot and boat storage area. The system was designed for the 120 acre drainage area and without capacity for additional stormwater. There is usually standing water in the parking lot over several stormwater inlets draining to the system indicating the infiltration basins are not fully draining. During heavy rainfall events the parking lot floods, water backs up on San Vitores Road north of the Holiday Resort, and stormwater flows across the beach indicating the basins are not able to keep up with the current volume of stormwater draining to them. This system is already overtaxed so connecting to the Matapang system is not a viable option.

Provide Chemical or Biological Treatment

What is it? Build a treatment system at Fujita Pond to treat stormwater by mixing with chemical or biological substances that improve water quality prior to discharging into Tumon Bay

Will it help? Not for flood events. Chemical and/or biological treatment of stormwater can be effective at reducing nutrient and pollutant levels but they are typically used to treat normal, not high rainfall events. Systems are set up to treat a specific inflow capacity, normally between 5-20 cubic feet per second (cfs). As a point of reference the Hagatna wastewater treatment plant has a maximum capacity of 15 cfs. A stormwater treatment plant has sensors that read the flow, ph, and other water attributes and mixes chemical or biological substances to the inflow based on this reading. The flow then enters the pond and pollutants and nutrients settle out. When rainfall events cause greater flows, 5-20 cfs still enters the system and is treated, but the excess stormwater flows through a bypass. Fujita Pond only discharges during high rainfall events and it is this event that would require treatment. Overflows at Fujita Pond can range from 5 cfs to 300 cfs depending on the rain event. Given the size of Fujita Pond, it would not be feasible to scale up a treatment system to handle overflow events. Fujita Pond is not big enough to allow settling of all flocculants during high overflow events and building a treatment plant to handle over 100 cfs would cost millions of dollars. There would also be concerns over dosage given the wide range of flows, if the inflow receives too much treatment the water could be toxic so it may create more issues than it solves. Also, treatment plants require continued operation and maintenance. Treatment could be a viable option with an expanded detention area, but even at a \$1.5m/acre it would be more cost effective to expand detention and provide infiltration (an effective treatment) than build a treatment plant.

Raise Low Area of San Vitores Road

What is it? Raise San Vitores Road two feet above the typical flooding depths.

Will it help? Not feasible. To provide an effective reduction in flooding the raise would need to be two feet and extend from the Hyatt to Outrigger. The raise would involve reconstruction of the roadway, building entrances, utilities, driveways, walkways. This would be more than \$20M and disruptive. The solution would also be temporary because flooding would get worse.

FINDINGS ON ADDITIONAL OPTIONS

The following “additional options” are feasible for managing a portion of the stormwater flowing to Fujita Pond, listed in order of effectiveness:

- Rain gardens
- Infiltration system enforcement
- Injection wells
- Marine Corps Drive capture

For flood mitigation, the purpose of these additional options is to reduce the stormwater flowing to Fujita Pond. Even during a heavy rainfall event, only a portion of the total rainfall runs off and makes its way down to Fujita Pond. When the rain starts falling some is infiltrated into the ground by pervious areas (i.e. vegetated areas) or developed area infiltration systems (i.e. offline areas). Only rain falling on impervious areas and rainfall that is in excess of what can be infiltrated by vegetated and offline areas runs off as stormwater and down to Fujita Pond. The additional options would provide more methods to infiltrate/detain stormwater and reduce the overall volume of stormwater that needs to be handled by the San Vitores Road storm sewer system and Fujita Pond. To analyze the effectiveness of these additional options relative to solving flooding, three rainfall scenarios were analyzed:

1. Major Flooding Rainfall – 10 inch rainfall during Tropical Storm Halong
2. Minor Flooding Rainfall – 3.8 inch rainfall on October 10, 2013
3. Typical Rainfall – ½ inch rainfall

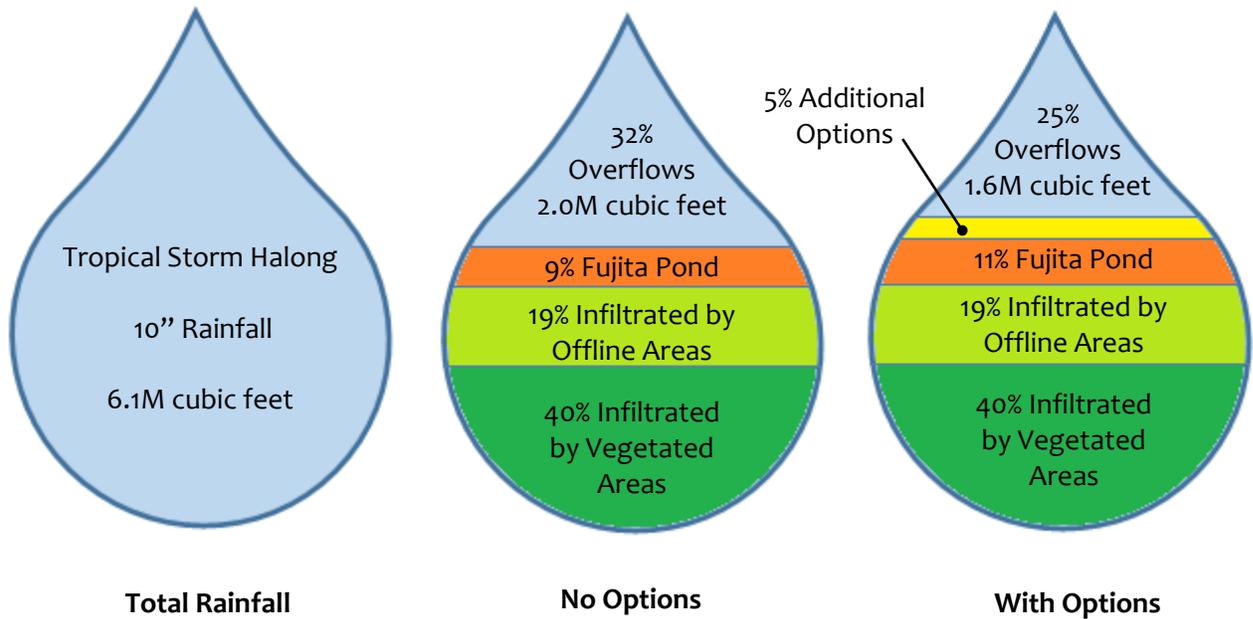
For every rainfall a total volume of water over the drainage area can be determined. The area draining to Fujita Pond is 180 acres and each rainfall event has a total depth. For example, 10 inches of rain over the 180 acre area is 6.1 million (M) cubic feet of rainfall. Out of this total rainfall volume, a portion is infiltrated by vegetated areas, a portion by the infiltration systems of offline areas, and a portion is infiltrated by Fujita Pond. If it is a heavy rain (exceeding 3 inches) Fujita Pond cannot keep up with all the stormwater flowing into it and starts overflowing and backing water up into the low areas of San Vitores Road. This is the overflow volume. With the Bay Outlet, this volume would be conveyed out to Tumon Bay instead of flooding areas surrounding Fujita Pond and San Vitores Road.

The effectiveness of the additional options was evaluated by computing the percentage of the total rainfall volume that could be handled by the additional options. A series of graphics were created to illustrate how the total rainfall volume within the area draining to Fujita Pond is distributed between infiltration and overflow.

The total rainfall volume is represented by a single raindrop sized by the amount of rainfall. This raindrop is divided proportionally based on where this rainwater ends up within the drainage system. This was analyzed for a condition without the additional options (No Options) and a condition with the additional options (With Options) to demonstrate how effective these options are at reducing flooding for the three different rainfall scenarios.

Major Flooding Rainfall

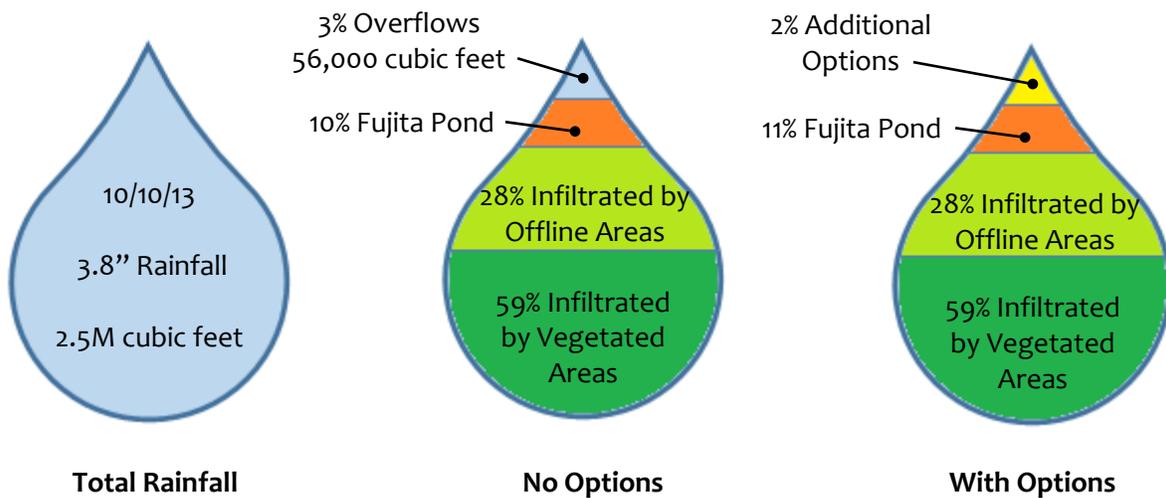
During Tropical Storm Halong roughly 10 inches of rain fell over 20 hours on July 30, 2014 causing extensive flooding on San Vitores and Fujita Road. The magnitude of the Tropical Storm Halong rainfall is similar to the three rain events this summer (2015) that caused flooding. The rains that fell during these storms are a very large volume of water and are enough to overwhelm infiltration and overflow Fujita Pond. The volume of the Tropical Storm Halong rainfall over the 180 acre drainage area was 6.1 M cubic feet. Roughly 2M cubic feet of that rainfall overflowed the drainage system and Fujita Pond which is enough to flood all of Micronesia Mall, 5 feet deep. The following graphic illustrates how this rainfall is distributed within the drainage system.



For a heavy rain event that causes flooding such as Tropical Storm Halong, the additional options have a small impact due to the large volume of stormwater. The Fujita Pond expansion provides a 2% reduction. The other feasible options combined (rain gardens, infiltration system enforcement, injection wells, Marine Corps Drive diversion, and unused sewer pipe) provide a 5% reduction. These reductions are not enough to prevent overflow or the necessity of a major overflow or detention system to handle the large volume of excess stormwater.

Minor Flooding Rainfall

The type of rainfall where these systems could make the difference between flooding and not flooding would be a rain event such as what occurred on October 10, 2013. This 3.8 inch rain event, caused minor flooding and overflow of Fujita Pond. The rainfall volume over the drainage area was 2.5 M cubic feet. With no additional options, approximately 56,000 cubic feet (less than 1 Olympic sized swimming pool) overflows the system. With the pond expansion and other improvements, the runoff volume could be reduced to keep Fujita Pond from overflowing. A representation of stormwater volumes is shown in the following graphic.



The reduction in flooding shown for the October 10, 2013 rain event would only be applicable for rain events causing minor flooding. Even with the improvements, a rain event approaching 4 inches would still cause flooding. The degree of flooding would be slightly reduced, but flooding would still occur. The benefits of these improvements would diminish as the rain increased, as seen in the Tropical Storm Halong example.

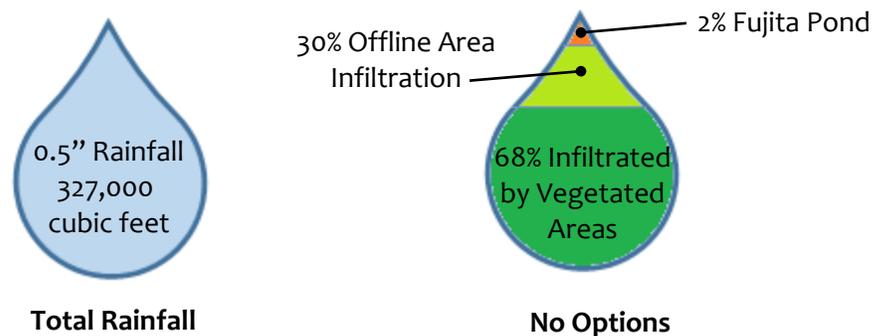
Rainfalls between 3 to 4 inches are the threshold for flooding on San Vitores Road. Rainfalls of this magnitude only happen a few times per year, hence flooding happens a few times per year. This is also how often the Bay Outlet would discharge. Smaller rainfalls cause Fujita Pond to rise, but not overflow.

Opposition groups to the Bay Outlet have said that it “would send the equivalent of three Olympic sized swimming pools of storm water into the middle of the bay for each half inch of rain that falls in Tumon.” This statement is incorrect for the following reasons:

- *Infiltration*: It assumes that all rain falling on the drainage area goes directly out into Tumon Bay with no infiltration or storage. As shown in the examples above, even a 10-inch rainfall volume such as Tropical Storm Halong, is significantly reduced by infiltration prior to overflowing Fujita Pond.
- *Discharge Frequency*: The suggestion that Fujita Pond would overflow and the Bay Outlet would discharge for a half inch of rainfall is also incorrect. A half inch of rain is well below the threshold for flooding on San Vitores Road. Guam receives half inch rainfalls numerous times per year and there is no flooding. It takes rainfalls exceeding 3.5 inches of rain to cause flooding which occur on the order of one to three times per year, which is how often the Bay Outlet would discharge.

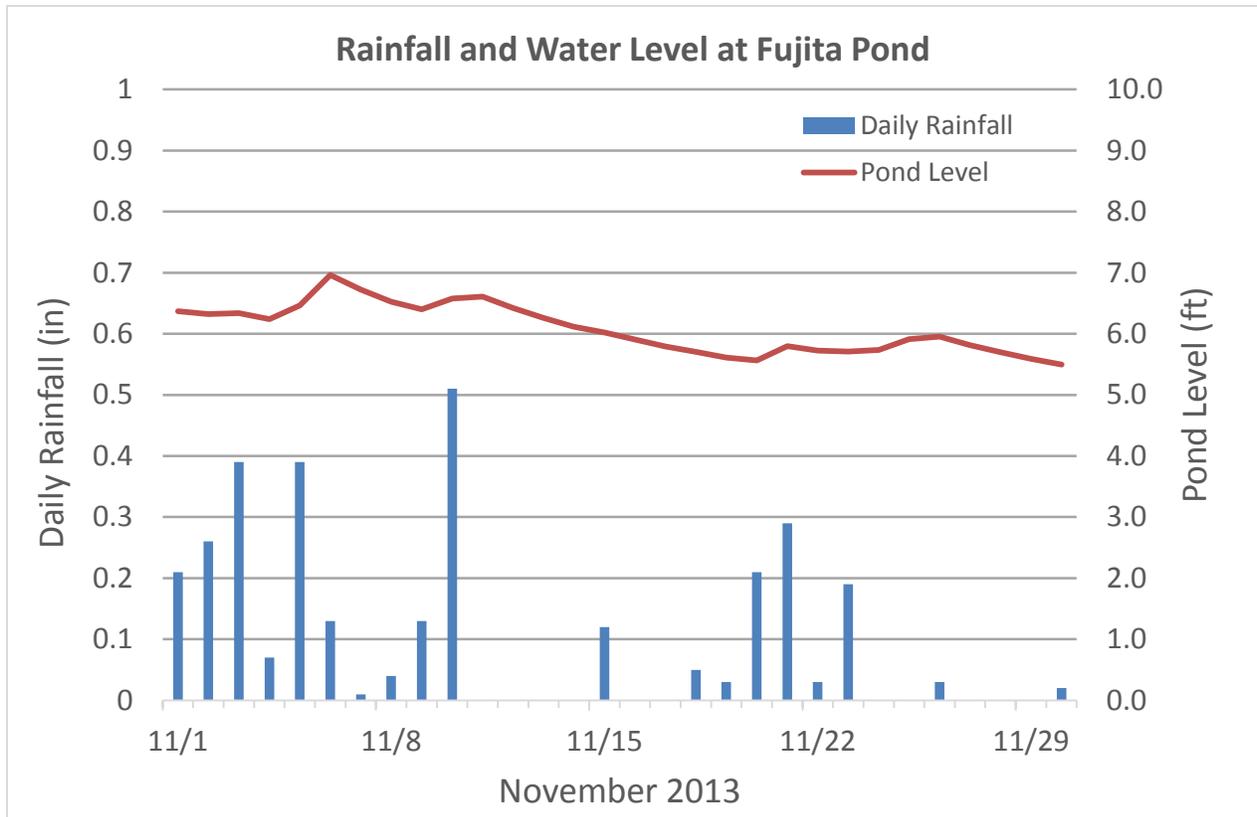
Typical Rainfall

A half inch of rain has minimal impact on Fujita Pond because most of the rain is absorbed by infiltration and the rest is handled by Fujita Pond which rises roughly 2 inches. A graphic representation of stormwater volumes is shown by the following.



Only a small portion of the total volume of a half inch of rain reaches Fujita Pond. Even without additional options, only 2% of the total rainfall volume reaches Fujita Pond, which is enough to raise the water level in Fujita Pond by a couple of inches, not cause flooding or overflow of the pond.

During the alternatives analysis in 2013, Stanley Consultants and EA Engineering installed a rain gage and water level gage in Fujita Pond. The following graphic shows the pond level relative to the daily rainfall during November 2013 when both gages were in place at Fujita Pond. Several half inch rain events occurred and the pond level was only rose by a few inches. It requires a significant rain event, of 3 inches or more to cause flooding under the current condition or overflow of the proposed Bay Outlet under the proposed condition.



The Water and Environmental Research Institute of the Western Pacific University of Guam (WERI) characterized typical rainfall events on Guam (*Sizing of Surface Water Runoff Detention Ponds*, 1997). Their study determined that:

- The average rainfall duration for Guam is approximately 2 hours and the average rainfall depth for Guam is approximately 0.2 inches.
- Approximately 90 percent of rainfalls have intensities less than 0.6 inches per hour rains lasting less than 1 hour and less than 0.2 inches per hour for rains lasting 12 hours.

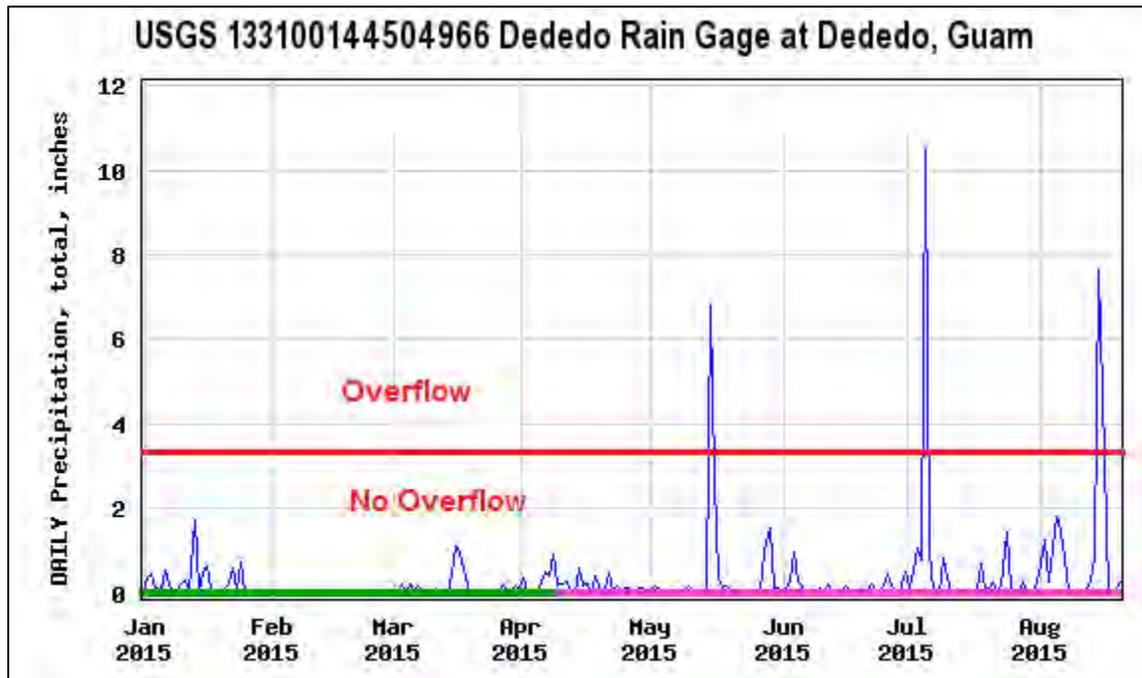
The majority of rainfalls that occur on Guam do not cause flooding and with the proposed Bay Outlet, they would not cause discharge to Tumon Bay. It is the heavy rainfalls (over 3 inches) which occur on the order of one to three times per year that cause flooding and overflow of Fujita Pond. These events are when the Bay Outlet would discharge stormwater to Tumon Bay.

Summary

Stormwater and freshwater are already entering Tumon Bay. During heavy rains:

- Uncontrolled stormwater flows into Tumon Bay at the north end of Tumon Beach.
- Stormwater flows out of Fujita Pond to undeveloped property and into Tumon Bay via infiltration.
- There is seven times more freshwater falling on Tumon Bay from rain than would enter from the Bay Outlet. For instance, roughly 2M cubic feet would have flowed out of the Bay Outlet during the 10 inch rainfall of Tropical Storm Halong versus 13M cubic feet of rain falling directly on Tumon Bay.

The Bay Outlet is an overflow, not a direct outlet, so stormwater would flow to Tumon Bay about as often as significant flooding currently occurs. For example, this year there have been three major rain/flood events that overflowed Fujita Pond. The following graph shows the rain events at the Dededo rain gage which is the nearest gage that compiles daily rainfall amounts in graphic format. During 2015, the Bay Outlet would have discharged three times, on May 15, July 5, and August 15.



Stormwater is already entering Tumon Bay, but the proposed Bay Outlet changes how stormwater enters the bay. It provides better collection but it concentrates the discharge at a location that may provide limited circulation during non-windy conditions. Fujita Pond will provide settling relative to the direct stormwater discharge that currently occurs across the beach. The amount of settlement will depend on the intensity of the rainfall but given its size Fujita Pond will not fully filter out the silt, nutrients, and other elements that stormwater picks for the full range of overflow events. The metal grating over the weir will filter out floating trash and debris but does not act as a full filter for small particles. Improved collection will limit overflow discharge events to heavy rain events so they are infrequent and of short duration.

PROJECT OPTIONS

Given project findings, there are three viable options to mitigate flooding, each with their own set of issues and risks that can be considered in conjunction with efforts to reduce the amount of stormwater entering Fujita Pond.

OPTION		ISSUES/RISKS
1	Do nothing and flood periodically	-Hurts tourism and economy -Flooding will get worse -Increasing risk of damage -Health risks associated with flooded waters
2	Proceed with Bay Outlet, include water quality monitoring	-Potential impacts to bay -Perceived impacts to bay -Project could still be shutdown
3	Find additional area for Expanded Detention or pursue other flood mitigation options	-Need 7+ acres of private property or expensive mechanical system that needs to be maintained -All options exceed project budget by roughly \$10M+

1. **Do Nothing:** In this case the “do nothing” approach is only viable as a short term option. As time goes on, the flooding issue will hinder development, impact tourism, and may ultimately impact Tumon Bay with uncontrolled overflows. Installing a project in the Tumon area will also get more expensive as development and traffic fill in, land value continues to rise, and stricter regulations are put into place.
 - Advantages:
 - No cost to construct
 - Disadvantages
 - Issue remains unsolved and gets worse
 - Property owners continue to be impacted
 - Solutions will continue to get more expensive

2. **Proceed with Bay Outlet, include Water Quality Monitoring:** Mitigating San Vitores Road flooding requires a substantial solution to handle the large volume of stormwater within the project budget. The Bay Outlet provides this solution but there are concerns over impacts to Tumon Bay. A water quality monitoring program will monitor and assess impacts based on periodic sampling of Fujita Pond and Tumon Bay waters. The monitoring program would build upon the existing GEPA beach monitoring program. Enhanced monitoring of Tumon Bay and Fujita Pond would begin prior to project installation and continue during and after construction. The monitoring will measure any substantial changes in Tumon Bay water quality based on actual water samples.

Managing stormwater in Tumon will be an ongoing project. Additional measures can be incorporated into this system to decrease discharge (expand detention, additional infiltration, improved private infiltration systems) and improve water quality (expand detention, private/public BMP’s, rain gardens). Monitoring will provide site specific data on water quality but there could still be disagreement on cause and effect because Tumon Bay receives water from various sources. Even with the monitoring program, there is a risk that the project could be shutdown. Any perceived negative impacts to Tumon Bay water quality (whether related to the Bay Outlet or not) could be used to develop a closure directive for the project.

- Advantages:
 - Solves the flooding problem within available funding
 - Constructed within GovGuam right of way.
 - Impacts assessed on site/event specific data
 - Disadvantages
 - Risk of impact to the Bay
 - Potential continued opposition and shutdown
3. **Reconsider Expanded Detention or Other Flood Mitigation Options:** Expanded detention is the preferred alternative for this project because it keeps most Fujita Pond flood events from overflowing to the Bay, but the likely reality is it would be difficult to complete. The cost to acquire private property exceeds the allotted project budget by over seven million dollars. There is no public land available within the project area for detention. Given the high land value and potential development opportunities, private landowners may be hesitant to sell and it could take years to acquire the necessary property. Land swaps and mixed-use opportunities have been discussed as alternative methods to expand detention, but the large area limits feasibility. Other non-bay/ocean discharge flood mitigation options require pumps. These would be large mechanical systems costing several million dollars that depend on a constant power supply and continued maintenance to operate as required during a flood event. There are more risks of potential failure with these types of systems especially during a severe storm or typhoon magnitude event.
- Advantages
 - Will satisfy all perspectives, less opposition
 - Meets project objective and minimizes discharge to Tumon Bay
 - Less permitting
 - Mixed-use opportunities (parks, beach access, restoration, etc.) for expanded detention
 - Disadvantages
 - Requires acquisition of privately owned land
 - Securing land could be complicated and take time
 - Significant maintenance to function as required and risk of failure
 - Additional cost

RESOLUTION

The summer of 2015 included three major rain events (6+ inches) which caused widespread flooding in the Tumon Area. During this time several meetings have been held between the Governor's Office, Department of Public Works, GEPA, GVB, GEDA, and Stanley Consultants to discuss a path forward to mitigating the recurring flooding on San Vitores Road and Fujita Road. Based on public comments, enhancements were added to the project which include:

- *Additional Inlets:* Additional trench drains will be installed across San Vitores Road to improve capture of stormwater and reduce the quantity of stormwater that runs out to Tumon beach and down to the low area of San Vitores Road.
- *Rain Gardens/Pervious Pavers:* Installing rain gardens or pervious pavers along San Vitores Road to infiltrate a portion of the roadway's stormwater runoff.
- *Marine Corps Drive:* Improvements to help capture (inlets, trench drain, or other) Marine Corps Drive stormwater to keep it within the Marine Corps Drive system and off San Vitores Road.
- *Fujita Pond Improvements:* Improvements will include cleaning Fujita Pond and expanding the pond area by removal of the underground infiltration chambers. Cleaning will maintain the infiltration rate

and expanding the pond will provide a roughly 50% increase in detention volume from the existing condition.

- *Culvert Cleaning*: Improvements will include finishing the culvert cleaning project started in 2013 to remove sediment from the culverts under San Vitores Road between Outrigger and Fujita Pond.
- *Inspect Offline Systems*: A program inspecting offline, private stormwater systems in the project area will be initiated. Inspections will determine if any offline systems are not functioning as designed and contributing too much stormwater to the San Vitores Road drainage system.

Due to the controversy surrounding the Bay Outlet option, the decision was made to implement the above recommendations (now known as Phase 2) immediately, in order to:

- Reduce stormwater escaping the system during heavy rain events which reduces current outflows to Tumon Bay north of Fujita Road.
- Improve stormwater capture along San Vitores Road which is needed for any of the flood reduction options.
- Expand stormwater storage volume of Fujita Pond by 50% which improves water quality.
- Increase stormwater infiltration in the drainage basin.

The above improvements would be implemented regardless of the final option selected for disposal of storm water (Phase 3). Construction of Phase 2 improvements will take approximately one year, during which time additional options can be assessed and additional funding can be sought for Phase 3.

EXHIBIT A

SAN VITORES ROAD FLOOD MITIGATION PROJECT TASKS

The project began in July of 2013. The first task was to define the magnitude and cause of flooding north of Fujita Pond. This task included the following:

- 2-week site visit with four engineers
- Inspect storm sewer network draining to Fujita Pond
- Inspect adjacent storm sewer networks to establish extents of Fujita Pond system
- Inspect tributary drainage area and developed area infiltration systems
- Create GIS database of storm sewer network with location, size, condition, and material information
- Meet with regulatory and utility agencies to gather information
- Review property boundaries for potential Government of Guam (GovGuam) properties in the area
- Meet with property owners to gather information
- Review prior studies and construction drawings of drainage infrastructure
- Review applicable BMP's for project area
- Install rain gages near Fujita Pond and DFS shopping center
- Install water level logger at Fujita Pond
- Complete topographic survey of San Vitores Road and Fujita Pond
- Develop XP-SWMM model of Fujita Pond tributary drainage areas and storm sewer network
- Review applicable stormwater design parameters, standards, and regulations
- Run and calibrate the XP-SWMM model using water level logger and rain gage data

The inspections and stormwater modeling established the cause of flooding as

- Insufficient stormwater inlets along San Vitores Road
- Fujita Pond being undersized and overflowing at an elevation above San Vitores Road.

With this determination, the project moved on to developing solutions to mitigate the flooding.

Develop Potential Mitigation Solutions (Task 1)

A number of mitigation solutions were reviewed for the project area. San Vitores Road flooding is caused by a large quantity of stormwater and requires a substantial solution. Six technically feasible alternatives that equally solved the flooding issue were established:

- Expanded Detention
- Bay Outlet
- Ocean Outlet
- Pump to Quarry
- Pump to Sink
- Pumped Ocean Outlet

A conceptual design was developed for each alternative which was scaled to solve flooding for 2-year design storm up to the 25-year design storm. The following were analyzed for each alternative:

- Land requirements
- Permitting and regulatory requirements
- Size of system required
- Construction equipment, materials, and staging
- Construction cost estimates
- Operation and maintenance requirements

- Environmental impacts
- Schedule

A draft report and summary presentation was prepared on the six flood mitigation alternatives. Stanley Engineers were on island for one week in December 2013. A presentation of the six flood mitigation alternatives was given to:

- GEDA
- Department of Public Works (DPW)
- Guam Environmental Protection Agency (GEPA)
- Bureau of Statistics and Plans (BSP) Coastal Management Program (CMP)
- Guam Visitors Bureau (GVB)

In addition, the project was coordinated with:

- U.S. Army Corps of Engineers (USACE)
- State Historical Preservation Office (SHPO)
- Water and Environmental Research Institute (WERI)
- Parsons (the Department of Public Works engineering consultant for the NPDES process)
- Environmental Protection Agency (USEPA)
- Guam Waterworks Authority (GWA)

Major concerns voiced during the coordination process were maintenance plans for the proposed systems and that Fujita Pond was contaminated with sanitary sewage, therefore, sanitary sewer discharges would damage Tumon Bay. No agencies indicated that any of the alternatives would be unpermissible at these meetings. Following the December 2013 discussions, two months of water quality testing was completed on Fujita Pond and showed no contamination of sanitary sewage.

Flood mitigation alternatives were evaluated on the following criteria:

- Reduce Flooding
- Cost Effective
- Operation and Maintenance
- Schedule
- Constructability
- Impact to Environment
- Permitting Requirements
- Public Perception

All mitigation alternatives were equally effective at reducing flooding but had specific advantages and disadvantages. Due to its simplicity and with no discharge to Tumon Bay, Expanded Detention was established as the highest scoring alternative. Because there was no undeveloped GovGuam property in the area, the cost of Expanded Detention was estimated at almost double the allotted project funding due to land acquisition.

The Bay Outlet was the second highest scoring alternative and was the only option within project funding. Potential permitting issues were acknowledged but the Bay Outlet provided a simple, effective solution, and could be constructed on GovGuam owned property. Discharge to Tumon Bay would occur infrequently and coincide with heavy rainfall events when there was already a significant quantity of freshwater entering Tumon Bay.

Other options, such as pumping stormwater or outletting past the reef were over \$20M and had

significantly greater operational and maintenance risks.

As the second highest scoring alternative that resolved the flooding issue, and the only option within the project budget, the decision was made to proceed with the Bay Outlet.

Advancing Bay Outlet (Task 2)

In Task 1, the Bay Outlet was presented with several variations, as a culvert, as a vegetated channel, and with a lagoon at the downstream end. Concept drawings were developed for each option. An evaluation of the three options was performed considering the same criteria as used in the Task 1 alternatives evaluation. The Culvert Option was the highest scoring option.

A report summarizing the three options, Culvert, Vegetated Channel, and Vegetated Channel Lagoon was submitted to GEDA in October 2014. Stanley Consultants were on-island and met with the following agencies in November of 2014 to discuss the Bay Outlet options:

- GEDA
- DPW
- GEPA
- Bureau of Statistics and Plans (BSP) Coastal Management Program (CMP)
- Department of Agriculture, Division of Aquatic & Wildlife Resources (DAWR)
- GVB
- SHPO
- USACE
- U.S. Fish and Wildlife (USFWS)
- National Oceanic and Atmospheric Administration Fisheries Service – Pacific Islands Regional Office (NOAA)

Each agency was provided with a summary of Bay Outlet options. In general, it was agreed by agencies that the Culvert Option would have the least impact to terrestrial species and historical remains. Concerns were beach erosion, maintenance responsibility, Fujita Road flooding, volume and rate of discharge into Tumon Bay, and Fujita Pond water quality. No regulatory barriers had been raised during the November meetings so it was decided to advance with the Culvert Option

With feedback from agencies, preliminary design and a draft Environmental Impact Assessment (EIA) of the Culvert Bay Outlet option proceeded. Agency concerns were incorporated into the development of the EIA. Between November 2014 and February 2015, Stanley Consultants advanced design of the Bay Outlet and additional stormwater inlets on San Vitores Road to allow detailed discussion with all regulatory agencies and impacted utilities. Relative to the existing condition, the draft EIA concluded that with proper maintenance, impacts of the proposed bay outlet would be short-term, indirect, and negligible due to the infrequency of discharge.

Preliminary drawings and the draft EIA were submitted in February 2015 to the following agencies and stakeholders for review:

- GEDA
- DPW
- GEPA
- Bureau of Statistics and Plans (BSP) Coastal Management Program (CMP)
- DAWR
- GVB
- SHPO
- USACE (declined to receive copy)

- U.S. Fish and Wildlife
- NOAA
- Guam Land Use Commission
- Department of Land Management
- Tamuning Mayor's Office
- GWA
- Guam Power Authority (GPA)
- Docomo Pacific
- Guam Telephone Authority (GTA)
- IT&E
- iConnect
- Guam Police Department (GPD)
- Guam Fire Department (GFD)

Stanley Consultants met with the majority of these agencies and presented at a public meeting hosted by the Tamuning Mayor's office and GEDA in late March 2015. Coordination with agencies continued following the visit in April 2015 to solicit missing comments or provide additional information. In these comments and at the public meeting stronger concerns were expressed on volume of freshwater, nutrient input, and pollutants going to the bay, and impacts to coral, fish, and habitat.

In May 2015, following review of the comments, GEDA made the decision to pause work on the Gravity Bay Outlet option to allow policy, agency, and technical consultations to occur on the approach to take moving forward.

The summer of 2015 included three major rain events (6+ inches) which caused widespread flooding in the Tumon Area. During this time several meetings have been held between the Governor's Office, Department of Public Works, GEPA, GVB, GEDA, and Stanley Consultants to discuss a path forward to mitigating the recurring flooding on San Vitores Road and Fujita Road. Based on public comments, enhancements were added to the project such as rain gardens, pervious pavers, and additional trench drains.

However, due to the controversy surrounding the Bay Outlet, the decision was made to separate project improvements into phases and proceed immediately with project improvements at Fujita Pond and on San Vitores Road which include the enhancements listed above, additional curb inlets and cleaning out and expanding Fujita Pond. These improvements would be implemented regardless of the final option selected for disposal of storm water. Construction of Phase 2 improvements will take approximately one year, during which time additional options can be assessed for flood reduction and additional funding can be sought.

Agency and public comments and meeting minutes are contained in Exhibit B.

EXHIBIT B

SAN VITORES ROAD FLOOD MITIGATION PROJECT COMMENTS AND MEETING NOTES

This exhibit contains documentation of all comments and meetings, from November 2014 to the present. All 219 comments received from meetings, letters, and comment forms have been collected in the comment log which is the first set of documents. Comments are listed in order of date received. Then meeting notes and comment letters are provided, in order of date held/received.



NAME OF PROJECT: San Vitores Road Flood Mitigation Project
DESIGN PACKAGE: Draft Design Submittal/EIA
DATE: 9/3/2015
DESIGNER: Stanley Consultants

REVIEWER TO COMPLETE							DESIGNER TO COMPLETE		
Comment Number	Document	Date Received	Date Reviewed	Reviewer	Organization	Reference Sheet Number	Review Comment	Concur, Nonconcur, For Information Only (FIO)	Response
1	EIA	2/26/2015	3/13/2015	DAWR	Dept of Agriculture		<p>Alternative 2, the Channel Lagoon Option, is the preferred alternative, for the following reasons:</p> <p>The original Fujita Road Pond was used by the federally listed Mariana moorhen (<i>Gal/inula chloropus guami</i>) for nesting, as recently as August 2012. Adults with chicks were photographed and videotaped in the pond at that time. When water hyacinth (<i>Eichornia crassipes</i>) that covered approximately 113rd of the surface area of the pond was removed, the moorhens relocated. This action negatively affected an endangered species. Partial mitigation for this could be the construction of the pond mentioned in Alternative 2. Water hyacinth can serve a dual purpose in this alternative; both as an introduction to the pond to enhance habitat for moorhens, as well as, water hyacinth can be, and has been used as a natural water cleanser, removing chemicals such as heavy metals from water in treatment plants. The hyacinth can be periodically thinned from the newly constructed pond, removing contaminants from the system.</p>	Non-Concur	<p>In this design, pond adjacent to Tumon Bay is not designed to hold water over time. Draw down of the pond would occur between storm events, so it would not provide additional moorhen habitat, the water would also be somewhat saline due to its location close to the Bay. Water hyacinth would not likely be established in the pond due to the draw down in between storms. Water hyacinth is highly invasive and intentional establishment of it in the ponds would likely not be acceptable. If it did become established, it could spread to other locations as a result of overflowing of the ponds during high volume storm events that result in discharge. Text was added to Section 3.8.2 to state: Based on correspondence with DAWR, a pair of moorhens with chicks were observed in the pond in August 2012.</p>
2	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		<p>The contractor's preferred alternative, Alternative 1, the culvert alternative, appears to require construction in a plot of land along the north side of Fujita Road known to contain a colony of the locally endangered Guam Tree Snail (<i>Partula radiolata</i>). Before any work can begin, a mitigation plan must be developed to address potential impacts on this species. Alternative 2 does require construction in a wooded area. A survey for the tree snails should be conducted before construction can begin.</p>	Concur	<p>Very limited impacts/clearing of vegetation will occur along Fujita Road in association with project development. Impacts to vegetation in the area where the Guam tree snail has been reported will be restricted. Based on a site visit conducted in March 2014, there is one flametree, one monkeypod and one pago that overhang the road in the area where the snails were reported. There are a few lower branches that overhang the road that might need to be trimmed back to the edge of the road. No other impacts to vegetation would be allowed. Construction crews will be notified of the occurrence of the snail and the need to avoid the area. Construction fencing will be placed to protect vegetation and restrict access to the area during construction. Dust control will also be required to minimize potential for effects to the snail in associated with dust during construction. As a result no effects to the snail would be expected as a result of implementing Alternative 1. Text has been added to Section 3.8.2 and 3.8.4 to discuss the occurrence of the snail in proximity to the project area and to Section 5 to include mitigation to avoid any effects to the snails.</p>
3	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		<p>All alternatives proposed will have an indirect impact to the locally listed, Micronesian starling (<i>Aplonis opaca</i>), or sali, in Chamorro. The sali, has been observed in forested areas within Tumon Bay. In August 2012, two individuals were observed within the proposed site.</p>	Concur	<p>Section 3.8.4 and Section 5 (Mitigation) of the EIA currently state: If Micronesian starlings are observe in proximity to the Alternative 1 site during construction activities, the Guam DAWR will be notified to determine appropriate steps to avoid any impacts to the bird.</p>



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4	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		Migratory birds occur during the wintering months and use the existing Fujita Road Pond. Migratory birds are protected under the Migratory Bird Treaty Act of 1917. These birds should not be harmed.	Concur	Section 5 of the EIA includes a construction BMP that states: If active bird nests are found in close proximity to the project site during construction, actions will be taken to avoid adverse effects to the nest in compliance with the MBTA.
5	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		The pond should act as a settling area, allowing solids and larger particulate matter to fall from the water column, instead of being carried on to the Tumon Bay Marine Preserved Area (MPA) reef flat. This pond should also allow for some percolation of runoff water into underlying limestone before entering the Tumon Bay MPA. These two actions will help increase the quality of water being discharged in to this sensitive environmental area. The alternative also has the benefit of being a more natural appearing alternative than the concrete exit point of alternative I.	Concur	Fujita Pond will act strictly as a settling/infiltration basin for the majority of storm events with no discharge to Tumon Bay. Overflow events will occur following large rainfalls but the pond will still provide some settling and infiltration. Task 1 included installation of a pond level logger. The storage/infiltration parameters of Fujita Pond are discussed in pages 4-18 to 4-21 of the Task 1 Report (included as appendix of EIA)
6	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		The EIA fails to discuss in detail the expected output (discharge) of each proposed Alternatives. Of great concern, is erosion of the output into Tumon MPA. All alternatives construction ends at the Mean Higher High Water (MHHW). It is not define as to what the true value of the MHHW in the EIA.	Concur	All alternatives would have the same discharge rate, there is no reduction in the channel/lagoon option due to the small amount of storage provided. The EIA will be updated with a discharge table and definition of MHHW (2.8 feet elevation on project datum provided. Will add text on erosion potential.
7	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		All vegetation cleared from the site will need to be replaced with native tree species. Consult with Department of Agriculture's Forestry Soil Resources Division to obtain a list of native tree species for the project.	Concur	There will be limited vegetation and tree removal under Alternative 1 (Fujita Road option). Any trees specified will be native
8	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		The concrete planters should consist of additional smaller planters to help reduce discharge velocity at the outlet slab.	Non-Concur	Incorporation of vegetated groundcover is being reviewed for the outlet design to provide greater roughness and reduction in velocity. The use of planters would be to obscure the outlet and spread out discharge. The planters must be tall enough that they are not overtopped by the discharge, if they are too small there will not be enough soil material within the planter to support growth.
9	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		All of the alternatives mention the need for periodic maintenance to maintain peak functionality of the drainage system. It is not clear which party is responsible for the maintenance of these systems; DPW, GWA, or GVB, a private contractor? It should be noted that some of the flooding in Tumon could be averted if hotels and businesses performed regular maintenance on existing drainage features. A visit to a site flooded during heavy rains last November revealed every drainage grate in the parking area of a hotel are completely clogged with trash, soil, and sand.	Concur	DPW is responsible for maintaining stormwater utilites located within the public right of way (i.e. San Vitores Road, Fujita Pond, Fujita Road). Maintenance of infiltration/drainage systems on private property are the responsibility of the property owner. GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.



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10	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		<p>Increased focused freshwater input to Tumon has the potential for a variety of problems, both human health and aesthetic. Enteromorpha algae grows in Tumon where freshwater enters at the beach. Heavy growth of Enteromorpha is unsightly, and large amounts of dead algae emits an unpleasant odor. Removal of Enteromorpha can be costly and continuous. It is likely this freshwater input will lead to increased Enteromorpha growth in the vicinity of the outflow. Freshwater input can also lead to increased growth of dinoflagellates, the "San Vitores Blood" blooms in Tumon Bay. Dinoflagellates can be unsightly, and also cause human health concerns. Large amounts of dinoflagellates in the water can cause skin irritation, and as in red tide events in the U.S. mainland, cause seafood to be unsafe for human consumption.</p>	Non-Concur	<p>Untreated/uncontrolled stormwater is already entering Tumon Bay near Outrigger. This project improves collection and provides additional settling time in Fujita Pond. Both WERI (WERI Tech Report No. 110, 2005) and Dr. Matson articles evaluating blooms in Tumon Bay attribute the combination of factors causing algae blooms to nutrients within freshwater (additional phosphorous), not specifically freshwater. Dr. Matson's 1991 article on the "Blood of San Vitores" indicates, "Blooms largely occur at salinities greater than 25%".</p> <p>Record of these blooms being toxic is not provided in any reports that were reviewed on Tumon Bay.</p>
11	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		<p>A focused stream of freshwater discharged in to Tumon Bay will effect corals, other marine organisms, and fish habitat in the region of discharge. This can lead to changes in fish populations, coral and invertebrate distribution, and increased algal growth.</p>	Non-Concur	<p>Disharge only occurs during heavy rain events which are infrequent. During rain events significant enough for Bay Outlet discharge, the Bay outlet will account for less than 15% of the overall freshwater entering Tumon Bay. The coral and fish habitat are several hundred feet out from the outlet point, which will allow some mixing of the freshwater outflow.</p>
12	EIA	2/26/2015	3/16/2015	DAWR	Dept of Agriculture		<p>Increased freshwater input to Tumon will affect the quality of a snorkeling experience. Freshwater is less dense than saltwater, and floats on the surface. The resulting halocline causes blurry vision when looking through the water. The freshwater entering Tumon bay is also colder than the salt water in the bay. A focused discharge of freshwater will create a large area of cooler water, affecting the comfort of snorkelers in the area, and affecting the health of cool intolerant marine organisms in the area.</p>	Non-Concur	<p>Overflow events associated with Fujita Pond are expected to occur approximately 2 - 3 times per year in association with high volume storm events. During these storm events, large volumes of freshwater would also be entering the bay in association with the rainfall event which by itself would effect visibility for snorkelers during and for a short period following the rainfall event. the Fujita Pond water quality samples taken during rain events showed water temps between 25-27C. Typical Guam sea surface temperatures are 27-30 C, so the stormwater would not be significantly cooler. The source of the coolest water would be the rainfall that occurs over the bay so discomfort to snorkelers during the short period following the discharge event would be expected to be minimal.</p>
13	EIA	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation		<p>Additional Storm Water Inlets: It is unclear how the waters expected from the 25 inlet structures will affect capacity.</p>	FIO	<p>The additional inlets capture the stormwater runoff more effectively, the bay outlet provides an overflow for heavy rainfall events so Fujita Pond does not flood and create ponding on San Vitores Road</p>
14	EIA	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation	Page 3-21	<p>Given the maximum depth to the water table of 10 feet and the plan to have the channel and the lagoon above this, there should be no adverse impacts to the bedrock.</p>	Concur	



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15	EIA	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation	Page 3-30	"...overflow from Fujita Pond reaches Tumon Bay during high volume storm events" is not supported in the document.	Concur	Some pond overflow collects in the low spot on Fujita Road, this infiltrates and flows into the Bay. If the rainfall event is large enough the low area of Fujita Road overtops and water spills into the Bay. Will provide additional discussion in EIA.
16	EIA	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation		All options would have an area of potential effect (APE) greater than the dimensions stated	Non-Concur	No specific dimensions are stated for the APE, however the construction area for the preferred Fujita Road option would be within Fujita Road Right-of-Way which is 40-45 feet and there would be no visual effects to historical resources occurring from this option.
17	EIA	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation		A review of these archived materials indicates that there are intact deposits below and along the road. The potential for the culvert option to impact these deposits remains high, especially considering the extent of the excavations needed to accommodate the culverts.	Concur	An archaeological monitoring plan will be developed for the construction phase. The soil boring monitoring will provide some additional insight into probability of historical deposits
18	Design	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation		A 1993 archaeological project investigated the property the Fujita Ponding Basin currently occupies as well as a corridor extending seaward from it approximately 185 meters long that was parallel to and east of Fujita Road. The corridor appears to have tested the area slated for the channel. However, as with so many of the maps included with PHRI reports they float in space and it is difficult to precisely locate the project on either a topographic map or air photo. See the project map. The proposed channel options will undoubtedly adversely impact intact prehistoric cultural deposits along their length.	Concur	An archaeological monitoring plan will be developed for the construction phase. The soil boring monitoring will provide some additional insight into probability of historical deposits. The majority of construction area for the Culvert option has already been excavated. While this does not eliminate the potential for discovery of historic remains, it does significantly reduce the potential for excavating undisturbed items.
19	Overall	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation		The project as it is described in the EIA will have adverse impacts on cultural historical properties in the Fujita Road area. Both the culvert and channel designs will encounter known sites as described above. Of the three design options, the culvert option potentially will have the least impact because of disturbance from previous utilities sub-Fujita Road.	Concur	
20	Overall	2/26/2015	3/12/2015	Ray Blas and Lynda Aguon	Dept of Parks and Recreation		Based upon the existing site information and the description of the project an archaeological data recovery plan may be indicated. It is definitely needed for the channel options and possibly also for the culvert option.	Concur	Will discuss with Dept Parks and Rec following completion of the soil boring monitoring report.
21	EIA	2/26/2015	3/18/2015	M. Borja, F. Taitano & C. Cruz	Dept of Land Management	Section 3.2.2, Page 3-2, Lines 31-33	"...the bordering properties are zoned as Commercial." Being that the entire Tumon area is zoned "H" (Hotel-Resort) recommend change to read that the bordering properties are of commercial uses.	Concur	Text revised based on the comment to state: The areas adjacent to Fujita Road and the area encompassing San Vitores Road in proximity to the proposed project area are zoned as Hotel/Resort (Guam.Gov 2015).
22	EIA	2/26/2015	3/18/2015	M. Borja, F. Taitano & C. Cruz	Dept of Land Management	Section 3.2.3, Page 3-4, Line 1	"The Guam Seashore Reserve is public property on Guam." Considering that the Guam Territorial Seashore Protection Act of 1974 (Chapter 63, Title 21 GCA) defines the Seashore Reserve as both public and private lands. We feel that this statement could be misleading and recommend that the reference to the ownership of the Seashore Reserve is referenced to the project site (Fujita Road), which is a public owned property.	Concur	The text was revised to state: The Guam Seashore Reserve adjacent to Fujita Road is public property.



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23		2/26/2015	3/18/2015	M. Borja, F. Taitano & C. Cruz	Dept of Land Management		It is our position that the proposed project as an infrastructure improvement project and its design, to be outside the Seashore Reserve. The proposed San Vitores Road Flooding Mitigation Project will not be subjected to the Guam Land Use Commission or the Guam Seashore Protection Commission application process.	Concur	Text was added to Section 3.2.4 to state: "Based on input from the Guam Department of Land Management, the proposed project is an infrastructure improvement project and is designed to be outside the Seashore Reserve. As a result, the proposed project under Alternative 1 will not be subject to the Guam Land Use Commission or the Guam Seashore Protection Commission application process for development within the Seashore Reserve. No effects to the Guam Seashore reserve would occur.
24		2/26/2015	3/18/2015	M. Borja, F. Taitano & C. Cruz	Dept of Land Management		It is also our position that, in line with Section 3.11 of the EIA (Coastal Zone) the Department of Land Management supports the issuance of a positive Federal Consistency Certification for the proposed project.	Concur	It has been determined by the Guam Bureau of Statistics and Plans that the project has no federal nexus so a Consistency Determination under the Guam CZMP is not required. However, the Bureau of Statistics and Plans has reviewed the EIA and has stated that the project will be beneficial as a result of the mitigation of flooding in and adjacent to the project area. They recommend that best management practices and ongoing and long term maintenance be implemented.
25		2/26/2015	3/18/2015	M. Borja, F. Taitano & C. Cruz	Dept of Land Management		In addition the Department of Land Management, in line with the general provision of the island's Land Use Laws, supports the inclusion of Best Management Practices (BMPs), Section 5.0 of the EIA (Mitigation Measures), to promote the protection of the public's health, safety and general welfare.	Concur	
26	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		DPW requested that the roadway ponding spread width criteria used in design of the additional inlets be included in the project drawing notes.	Concur	Will include in drawing notes
27	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		Cover over the culvert was discussed. DPW does not have concerns as long as a 2' minimum cover is maintained.	Concur	
28	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		DPW requested that the pond design be modified to include an access path, including 12 foot concrete ramp at 4h:1v max. to access the pond for dredging.	Concur	Pond design will be revised to include.
29	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		DPW requested that the project use the DPW standard pavement section, 1" surface course, on 2" base course, on 8" aggregate, on 12" of subbase. DPW indicated that aggregate grade A is difficult/expensive to obtain so to use grade C for all base aggregate. DPW to provide design standard.	Concur	Road section will be revised
30	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		DPW requested that any street lights removed on the project be salvaged to DPW	Concur	Note will be added to drawings
31	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		DPW requested any exposed metal grating or attachment hardware be reviewed for corrosion resistance. Potentially use stainless steel or resin composite.	Concur	Corrosion potential will be reviewed and corrosion resistant materials utilized on project
32	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		DPW requested the size of concrete apron around new inlets be reduced and a maximum depression of ¼" be used to provide better bicycle pathway on roadside.	Concur	Inlet details will be revised



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33	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		Maintenance of the proposed system was discussed. DPW requested a summary of recommended maintenance tasks and frequency be included with the project documentation.	Concur	Maintenance tasks/frequency will be provided
34	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		Maintenance of the proposed system was discussed. DPW indicated capacity/equipment to maintain pond and culvert but not the beach. Timing of maintenance may vary with availability of staff/equipment	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
35	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		Maintenance of the proposed system was discussed. DPW indicated pond maintenance will be included in the DPW maintenance schedule but, given current limitations, it may not get maintained as often as it should be.	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
36	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		Maintenance of the proposed system was discussed. DPW would have no objections to having GVB consider the option of having maintenance crews from the businesses that will benefit from the pond maintain it and that GVB be given a copy of the pond maintenance requirements.	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
37	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		Maintenance of the proposed system was discussed. DPW recommended beach maintenance be discussed with GVB and Department of Parks and Recreation.	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
38	Design	2/26/2015	3/24/2015	F. Benavente & P. Slagel	Dept of Public Works		It was agreed that Stanley will stay in communication with DPW on design and modifications.	Concur	
39	Design	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		Shall maintain emergency apparatus access for duration.	Concur	Will require in project documents
40	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		Improvements made to water line/fire hydrants will need to be reviewed.	Concur	Drawings will be provided for review
41	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		An Emergency Plan from the contractor is needed for the duration of construction to address emergency access and access to the fire hydrants/fire suppression water	Concur	Will require in project specs
42	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		Maintain clear access to hydrants during construction.	Concur	Will require in project documents
43	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		Coordination with the GFD Fire Marshall and GWA (Heidi Ballendorf) needed if construction will temporarily affect water to the hydrants.	Concur	Will require in project documents
44	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		Maintain water pressure to the hydrants or provide fire suppression water tank.	Concur	Will require in project documents
45	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		Contractor needs to maintain one lane of access along Fujita Road at all times	Concur	Is required in project documents
46	Meeting	2/26/2015	3/17/2015	Capt. Castro	Guam Fire Dept. Fire Prevention Bureau		12' foot ingress/egress corridor from Fujita Road to the beach is acceptable. No parking/fire line signs should be posted above the corridor.	Concur	Will provide signage in project documents
47	Meeting		3/19/2015	Board	GEDA		Concerned about stakeholder concerns, especially rain/fresh water into Tumon Bay.	Concur	Will provide additional discussion in EIA
48	Meeting		3/19/2015	Board	GEDA		Erosion at the outfall point.	Concur	Key to this issue will be maintenance. GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.



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49	Meeting		3/19/2015	Board	GEDA		Signs to keep away skaters/loiterers.	Concur	Signage and other elements to maintain intended use of public amenity features will be incorporated.
50	Meeting		3/19/2015	Board	GEDA		Landscaping around the pond.	Concur	Will incorporate
51	Meeting		3/19/2015	Board	GEDA		Artwork at the outfall. Ask about budget. GVB branding.	Concur	Will get GVB input/involvement as design moves out of regulatory phase
52	Meeting		3/19/2015	E. Calvo, Board	GEDA		Considerations needed to consider increased pedestrian traffic.	Concur	Sidewalk along Fujita Road has been discussed, but this will reduce parking. Will need to be decided amongst DPW/GVB/GEDA/Stakeholders
53	Meeting		3/19/2015	E. Calvo, Board	GEDA		Who will manage the space when construction is completed?	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
54	Construction Schedule	2/16/2015	2/16/2015	GBT	CHA	General	Include at least 1 month for permitting at the beginning and 1 month for closeout at the end.	Concur	Schedule has been adjusted
55	Construction Schedule	2/16/2015	2/16/2015	GBT	CHA	General	Durations for completion seem optimistic based on historical data here in Guam; consider increasing the total duration from 30 weeks at least 52.	Concur	Schedule has been adjusted to 10 months, will consider increasing time from NTP to mobilization. Need to try to keep/incentivize contractor to limit duration of road disturbance
56	Construction Schedule	2/16/2015	2/16/2015	GBT	CHA	General	Identify long lead items in procurement task 5 such as precast items, box culvert, transformer, sheet piling, fiber optic, rip rap, etc.	Concur	Schedule has been adjusted to 10 months, will consider increasing time from NTP to mobilization for additional procurement time. Construction items on this project are fairly standard so not anticipating normal procurement time. Will identify long lead time items as bid documents are put together.
57	Construction Schedule	2/16/2015	2/16/2015	GBT	CHA	General	Underground clearances take a long time to obtain in GU and they are processed like another permit. Include at least 1 month for underground clearances prior to any excavation tasks such as utility relocations task summary 10.	Concur	Schedule has been adjusted to 10 months, will consider increasing time from NTP to mobilization for additional underground clearance times.
58	Specification List	2/16/2015	2/16/2015	GBT	CHA	General	Include a section for temporary traffic control.	Concur	Will incorporate
59	Specification List	2/16/2015	2/16/2015	GBT	CHA	General	In future submittals, under section 014529 and 014100, identify if the owner needs to procure separately any 3rd party structural/soils/DOT testing and 3rd party inspection services.	Concur	Will discuss with GEDA/GEDA PMO as bid documents are developed.
60	Estimate	2/16/2015	2/16/2015	GBT	CHA	General	Identify any necessary 3rd party inspection services for structural elements and/or paving & utilities, if the owner should procure them separately and include in the estimate.	Concur	Will discuss with GEDA/GEDA PMO as bid documents are developed.
61	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a list of required inspections per DOT and Guam Building Dept. regulations. This list may be provided to DPW for concurrence.	Concur	Will discuss with DPW/GEDA PMO as bid documents are developed.
62	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a table in the plans for all required inspections and testing.	Non-Concur	Will provide submittal table as part of specifications
63	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include traffic control plans and construction sequencing. Use DPW/DOT approved Maintenance of Traffic details.	Concur	Will provide details and general requirements, there are several methods of staging the contractor can use
64	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include general notes and symbols.	Concur	Will incorporate
65	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include inlets and structures tables.	Concur	Will incorporate
66	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include key plan with sections and corresponding plan references.	Concur	Key plan is provided in current drawing set
67	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a general note to obtain all underground clearances prior to excavation, and to coordinate with the CM and program archaeologist and approved monitoring plan per SHPO.	Concur	Will incorporate



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68	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Verify if the contractor or local utility provider will remove/reinstall the fiber optic line and if the owner needs to procure this package separately.	Concur	Will review with GTA/Telecomm companies
69	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a general note to obtain a cutting/pruning permit from the Dept of Agriculture prior to tree removals.	Concur	Will incorporate
70	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Does the labyrinth weir or culvert structure reinforced concrete require any soils/structural Special Inspection? Who should procure the services? Owner/EOR/CM?	FIO	Contractor, with QA done by CM
71	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include pavement marking plan.	Concur	Will incorporate
72	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include signage plans.	Concur	Will incorporate
73	Specification List	2/16/2015	2/16/2015	GBT	CHA	General	Include landscaping, sodding, mulching, fertilizer, top soil, ornamental planting, floating silt curtain, concrete planters, sunshade, benches, railing, pavers, trench drain, bollards, colored concrete, grating, hydrants, concrete driveways.	Concur	Will incorporate
74	Specification List	2/16/2015	2/16/2015	GBT	CHA	General	Include concrete driveways.	Concur	Will incorporate
75	Drawings	2/16/2015	2/16/2015	GBT	CHA	C07, C13	The work limit/ROW is inside the edge of the pavement on the southbound lane at STA 9+50 to 10+00.	FIO	May need to get temporary easement or adjust work limits. Will review
76	Specification List	2/16/2015	2/16/2015	GBT	CHA	General	Include electrical, fiber optic, lighting, transformer.	Concur	Will incorporate
77	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a general note to obtain hauling/dumping permit.	Concur	Will incorporate
78	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Coordinate ADA and bollard details with Lyon and the Pedestrian Safety project and GVB Bus Turnouts.	Concur	Will incorporate, please provide contacts for these projects
79	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include ADA details.	Concur	Will incorporate, if needed.
80	Specification List	2/16/2015	2/16/2015	GBT	CHA	General	Include temporary sanitary sewer service.	Non-Concur	Contractor may be able to switch from existing to proposed with no temporary. We have note indicating that service must be maintained, whether this is through temporary or switching over to new pipe will be up to contractor.
81	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a general note to salvage removed items and turn over to owner (or reinstall) such as street lights, chain link fence, mailboxes, etc.	Concur	Will incorporate
82	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a general note to obtain hauling/dumping permit.	Concur	Will incorporate
83	Estimate	2/16/2015	2/16/2015	GBT	CHA	General	Per note 2 on sheet C08, include existing electrical and telecommunications utilities relocated by others. Is this a separate procurement for the owner?	FIO	No, this was a placeholder. Have verified with GPA that electric will be included, need to confirm with GTA/Telecom
84	Estimate	2/16/2015	2/16/2015	GBT	CHA	last page	Explain what "contractor items" and "undeveloped design details" means on the estimate.	Concur	Will include on subsequent submittal. Contractor items is a sum of the "Contractor Costs" listed at the top of the cost estimate table. Includes Mobilization through Profit. "Undeveloped design details" is meant to cover design items that have not been fully developed at this stage. With this being a draft design submittal there are a few items that have not been fully established, such as foundation materials/prep below the structures (need soil borings), specifics on relocation of electrical/telecommunications. By the draft final, these items will have been established and this cost item will be removed.



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85	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a list of the undeveloped design details.	Non-Concur	This will be removed by the next submittal
86	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Clearly identify areas of encroachment of the limit of work into private property.	Concur	Will review if temporary easements are necessary
87	Drawings	2/16/2015	2/16/2015	GBT	CHA	C13	Investigate the possibility of installing inlets along Fujita Road that connect to the pond to reduce localized flooding. (Near Tumon Shores Apartments, for example).	Concur	Will review
88	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Include a table of required permits.	Concur	Will provide in subsequent submittal
89	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Coordinate design with DPW to discuss the future work in Tumon (Sandcastle café, Duesitani one-way, GVB's bus turnouts, etc.)	Concur	Please provide contact.
90	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	The beach erosion is a concern because maintenance may not occur so it's likely the erosion will rarely, if ever, get backfilled after an outfall event. That's a very busy stretch of beach with lots of tourism/BBQ's. It's a popular jogging/walking trail, too – should we consider integrating a walkway around the potential erosion trail and on top of the outfall???	Concur	This has been reviewed but would involve construction below the Mean Higher High Water and would involve additional permitting and regulations. Also, this walkway would have to extend below mean sea level, so would really impact the look of that stretch of beach. Burying it by a foot or two was also reviewed but that still requires maintenance. It was decided that an established maintenance program/responsibility would be most effective.
91	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	How often will the pond have to be cleaned/dredged?	FIO	Typically every 5-10 years is recommended. Our project will not impact the amount of sediment that collects in the pond, however if the silt starts reducing the infiltration rate there would be more frequent discharge. As requested by DPW, a list of maintenance tasks and frequency will be provided
92	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	I thought the testing of the pond did raise some flags??? It was not compliant after large rainfall events, correct?	Concur	There are higher EC Bacteria levels than the Guam standard for Tumon Bay, but no higher than what is typical for urban stormwater. Currently, Tumon Bay water samples are higher than the EC Bacteria level standard following rainfall events, meaning, this project should not have significant impact on the water quality of Tumon Bay relative to its current condition. Also, there was no evidence of contamination from Sanitary Sewage as had been suggested.



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93	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Note, there's lots of fish/snorkeling close to shore and not necessarily just near the coral formations. What'll happen to the fish? How long would it take to dissipate the freshwater after an outfall event?	Concur	This system will discharge after over 3 inches of rain, so there will already be a large pulse of freshwater going into Tumon Bay. There are also several springs that discharge freshwater to the Bay, so the Bay ecosystem already receives freshwater during large rainfall events. There will be higher freshwater concentrations nearshore at the outlet, but these will mix with saltwater further out into the bay. There is already a freshwater outflow near outrigger which does not show evidence of harming habitat. This project will capture that stormwater. With the new discharge point, some shifting of habitat could occur, but given the limited number of discharge events, it is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent.
94	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	The limit of existing sidewalk and curb removals should be depicted on the plan and a note should be added that all sidewalk removals should be terminated at an existing joint.	Concur	Will add
95	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	The color and pattern of the proposed stamped concrete should be coordinated with the owner and depicted on the plans.	Concur	The visual amenities of the outlet structure will be reviewed and refined going into the next submittal
96	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Provide the final certified survey maps.	Concur	Will provide
97	Drawings	2/16/2015	2/16/2015	GBT	CHA	General	Stamp the drawings with a Guam-registered Professional Engineer and sign over the professional engineering stamp. Include a space in the title block.	Concur	Will stamp once drawings are bid issue
98	Drawings	2/16/2015	2/16/2015	GBT	CHA	C04	Provide detail for the point of connection between the existing culverts and the pond at GL E/7 - are any improvements planned?	FIO	No improvements are planned at the existing culvert inflow.
99	Drawings	2/16/2015	2/16/2015	GBT	CHA	C04	Can the depth of the dredging be estimated for the bid documents?	Concur	Will check with DPW on elevations used for previous dredge.
100	Drawings	2/16/2015	2/16/2015	GBT	CHA	C04	Can the demolition items be quantified and summarized on a separate sheet for the bid?	Concur	These will be broken out as individual unit cost for the larger items, then lump sum for minor.
101	Drawings/Specs	2/16/2015	2/16/2015	GBT	CHA	General	Coordinate asphalt design with DPW/DOT.	Concur	See DPW comments
102	Specs	2/16/2015	2/16/2015	GBT	CHA	General	Include a spec for the standardized HOT Bond project sign.	Concur	Will provide
103	Public Meeting			Comment Form 1			Rainfall is not the problem, the increase in impervious surfaces is. Look at the source rather than just output (stormwater at Fujita Pond).	FIO	Flooding is due to a variety of issues, with impervious area being one of them. As discussed in the Task 1 report, the drainage analysis included an inspection of the storm sewer system and watershed. New developments are required to collect and infiltrate their own stormwater onsite. Undeveloped land is good at infiltrating stormwater. Flooding occurs during heavy, intense rains where stormwater runs off both developed and undeveloped sites and overwhelms Fujita Pond which is not large enough to handle 180 acres of stormwater runoff.



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104	Public Meeting			Comment Form 1			Investigate low impact design retrofits: - Rainwater catchment for reuse. - Reducing impervious surface. - Numerous smaller catch basins (Rain Gardens)	Concur	BMP's were investigated and discussed in the Task 1 report. There is limited space within GovGuam ROW for BMP installation and other properties are privately owned. Rain gardens can help improve water quality but they will not solve the flooding issue. As shown in the Task 1 report detaining and infiltrating a 10-yr storm (10 inches of rain) would require a 7 acre pond, 4 feet deep. Rain gardens are typical the size of a planting bed to allow for maintenance. To maintain vegetation, rain gardens hold less than 1 foot of water so they do not damage vegetation. To use rain gardens instead of a detention pond would require over 28 acres of rain gardens. Rain gardens can be a small part of the solution and will help improve water quality but will not solve the flooding issue. There would need to be land acquisition or an incentive program to encourage rain gardens on private land. Rain gardens also require maintenance. This would need to be part of any installation program. Potential installations are being reviewed under current design.
105	Public Meeting			Comment Form 1			Because freshwater can also impact coral, fish, invertebrates, algae, etc. in high volumes, this should take many smaller drainages and infiltration areas		Whether infiltration is divided into multiple areas or a single area, roughly 7 acres would be required to prevent discharge for up to the 10-year storm. This would still be in the range of \$19M, as estimated for expanded detention option in the Task 1 report. This is \$7M above project funding so this is why the Bay Outlet option is being pursued. A large volume of freshwater currently enters the bay via rainfall, groundwater seepage and stormwater overflows.
106	Public Meeting			Comment Form 1			Discharge in one place - it will shift habitats	FIO	Discharge in one place over time could shift habitats or habitat use. However, discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent.



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107	Public Meeting			Comment Form 1			High discharge events can have significant impacts on marine habitat. Ex. Tropical Storm Tingting (2004) - river discharge/rain during low tide severely impacted the reef flat in Pago Bay.	Non-Concur	Discharge associated with an overflow event at Fujita Pond would not be expected to be on the order of Tropical Storm Tingting. Discharges associated with Tingting would have included flows from the Pago River, etc. The volume of discharge was much greater than would be occur with a Fujita Pond discharge event. During a severe tropical storm/typhoon event, large volume discharges associated with overland runoff, runoff from impervious surfaces, etc. would be expected to occur all along the shoreline of Tumon Bay.
108	Public Meeting			Comment Form 1			Discharge will increase algae, may include dinoflagellates that can irritate due to lack of mixing in that area.	Non-Concur	Untreated/uncontrolled stormwater is already entering Tumon Bay near Outrigger. This project improves collection and provides additional settling time in Fujita Pond. Both WERI and Dr. Matson articles evaluating blooms in Tumon Bay attribute one of the combination of factors causing algae blooms to nutrients within freshwater (additional phosphorous), not specifically freshwater.
109	Public Meeting			Comment Form 1			One of only a handful of public access locations in Tumon - this project will decrease water quality and beach contours and aesthetics.	Non-Concur	The outfall structure will include an improved beach access, providing a stable, paver path for accessing the beach. The majority of the time this will be a dry area. Maintenance will be important and is being reviewed by GEDA to help establish an effective and sustainable maintenance plan.
110	Public Meeting			Comment Form 1			Don't do this!	Non-Concur	Your comment is noted but the residents/businesses of Tumon who are flooded have a different perspective.
111	Public Meeting			Comment Form 2			We're told that the only filtration system is the pond itself, so when the heavy rains fall within a short period of time and flows out of the new outlet, the water will not be filtered. So not only sewage may/will be flowing into the ocean but vehicle fluids from the streets as well.	Non-Concur	Water quality in Fujita Pond has been tested and there is no evidence of sewage contamination. A water quality monitoring program for the project is being reviewed as part of the operation/maintenance of the facility. Bringing stormwater to the pond is a treatment, which is more than is being done with the stormwater that currently flows directly to the bay.
112	Public Meeting			Comment Form 2			Has the impact that the freshwater influx will have on all the fish, invertebrates, algae and any other marine life in Tumon Bay (been reviewed)? What about sedimentation, pollutants, and the thermal changes. And if it has, was it tested on all stages of life (e.g. larval, reproductive, etc.)	Non-Concur	Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent.
113	Public Meeting			Comment Form 3			Does this project rely on the Fujita Pond remaining a pond? And if so, what is preventing future development of that land?	FIO	This land is owned by GovGuam and contains the police station, pump station, and Fujita Pond. These are necessary functions for the area so this land would not be sold unless these functions were located elsewhere.



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114	Public Meeting			Comment Form 4, Juanita Blaz. Tel. 688-4752			Extra outlets into - rain gardens, taro patches, banana patches (edible landscaping)	Non-Concur	BMP's were investigated and discussed in the Task 1 report. There is limited space within GovGuam ROW for BMP installation and other properties are privately owned. Rain gardens can help improve water quality but they will not solve the flooding issue. As shown in the Task 1 report detaining and infiltrating a 10-yr storm (10 inches of rain) would require a 7 acre pond, 4 feet deep. Rain gardens are typical the size of a planting bed to allow for maintenance. To maintain vegetation, rain gardens hold less than 1 foot of water so they do not damage vegetation. To use rain gardens instead of a detention pond would require over 28 acres of rain gardens. Rain gardens can be a small part of the solution and will help improve water quality but will not solve the flooding issue. There would need to be land acquisition or an incentive program to encourage rain gardens on private land. Rain gardens also require maintenance. This would need to be part of any installation program. Potential installations are being reviewed under current design.
115	Public Meeting			Comment Form 4, Juanita Blaz. Tel. 688-4752			Worried about one (1) outlet into our bay.	FIO	This project provides a controlled overflow outlet with settling treatment provided by Fujita Pond. Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent. Providing multiple outflows would require obtaining additional land along the bay and constructing additional treatment ponds and dividing up the existing storm sewer infrastructure. This is not feasible.
116	Public Meeting			Comment Form 4, Juanita Blaz. Tel. 688-4752			Less access for our people to reach the beachside.	Non-Concur	The outfall structure will include an improved beach access, providing a stable, paver path for accessing the beach.
117	Public Meeting			Comment Form 4, Juanita Blaz. Tel. 688-4752			Sewer untreated water into beach (trash)	Non-Concur	Water quality in Fujita Pond has been tested and there is no evidence of sewage contamination. A water quality monitoring program for the project is being reviewed as part of the operation/maintenance of the facility. Bringing stormwater to the pond is a treatment, which is more than is being done with the stormwater that currently flows directly to the bay. There will be a screen over the inlet to the culvert which will prevent trash from entering and flowing to the bay.



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118	Public Meeting			Comment Form 4, Juanita Blaz. Tel. 688-4752			No maintenance. Clear culverts and repair sand wash off.	Concur	Maintenance is important and is being reviewed by GEDA to help establish an effective and sustainable maintenance plan.
119	Public Meeting			Comment Form 5			Excess nutrients from the runoff will encourage nuisance algae blooms, especially since Fujita Road is at the part of Tumon Bay with the least amount of Tidal Flow.	Non-Concur	Untreated/uncontrolled stormwater is already entering Tumon Bay near Outrigger. This project improves collection and provides additional settling time in Fujita Pond. Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any impacts associated with a discharge event would likely be minor and short term in extent.
120	Public Meeting			Comment Form 5			This point source pollution will cause blooms that will make Tumon Bay lose its pristine appearance weeks of gross water has a far worse effect on tourism than a single occasional day of having to deal with flooding.	Non-Concur	Untreated/uncontrolled stormwater is already entering Tumon Bay near Outrigger. This project improves collection and provides additional settling time in Fujita Pond. Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any impacts associated with a discharge event would likely be minor and short term in extent.
121	Public Meeting		3/31/2015	J. Duenas			For many years, perhaps over 35 years, Guam EPA has pursued a policy of eliminating direct shoreline/shore area discharge of stormwater to Tumon Bay. The preferred solution defies this policy in a big way. The decision to recommend the direct discharge of stormwater into Tumon bay is not only short sighted focusing on cost, but fails to understand the enormous adverse impact this solution will have on the use of the bay by tourists and local residents. This alternative should be wholly rejected. The question is why it was allowed to proceed to preliminary design.	Non-Concur	<p>The project team has met with GEPA four times over the course of project development:</p> <ul style="list-style-type: none"> -August 2013 at the kickoff of the analysis phase -December 2013 to present concept alternatives -November 2014 to discuss preliminary design gravity bay outlet -March 2015 to discuss comments on EIA/Draft Design package <p>These meetings included GEPA staff who would be responsible for permitting this project. A policy prohibiting discharge of public stormwater has never been mentioned. Meetings with other permitting agencies were also conducted at these times. All permitting agencies have been informed of this project from the initial stage of analysis to the current point. No one has ever said this project is not permissible. The bay outlet is not a direct discharge, it is a stormwater overflow for an infiltration pond. Meaning, there is treatment being provided and discharge only occurs when the capacity of the stormwater pond is exceeded. Design has to proceed to a preliminary level to review project feasibility, estimate costs, and present and discuss the project with stakeholders.</p>



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122	Public Meeting		3/31/2015	J. Duenas			The entire selection of alternative solutions focus on the Fujita ponding basin as the cause of the flooding problems. Working backwards from a budget, the engineer uses cost as the deciding factor in selecting the preferred alternative. I believe the engineer is remiss in not considering alternatives that involve significantly reducing the quantity of stormwater discharging into the ponding basin. In my opinion (having lived in Tumon for over 12 years and having observed the overland flow of storm runoff into and within the Tumon basin from many different areas) a significant quantity of stormwater can be intercepted and disposed of at many locations. In fact, I suspect that many developed areas contribute a significant amount of storm runoff because either no drainage disposal system exists to handle runoff from the developments or, in many cases, the drainage disposal systems required by development permits no longer function as designed or at all. The engineer should stop any further design and consider alternatives to reduce rather than accommodate runoff. I believe the preliminary engineering and detailed cost estimating work on the direct discharge alternative was a waste of time and money as it was apparently done without affirmative support from key regulatory agencies such as Guam EPA, the Fish & Wildlife Division of the Guam Department of Agriculture, Coastal Zone Management (of BSP) and the Department of Parks and Recreation.	Non-Concur	Please review the Task 1 and Taks 2 reports which were included in the appendix of the EIA. That documents that this alternative was established from a series of potential alternatives using a set of project criteria (including cost). It also documents the source of flooding and discussion with agencies and stakeholders.
123	Public Meeting		3/31/2015	J. Duenas			While the direct shore area discharge of stormwater is a nonstarter, expansion of the Fujita ponding basin does have merit as it increases the storage capacity of this disposal facility.	FIO	To provide sufficient storage to eliminate the need for a discharge, Fujita Pond would need to be expanded to roughly 6 times its current size
124	Public Meeting		3/31/2015	J. Duenas			As an attendee commented during the public information meeting last week, a do nothing alternative is preferred because while doing nothing will result in the occasional temporary flooding of San Vitores Road, the direct discharge alternative will result in permanent adverse, irreversible and irreparable environmental and economic impacts to Tumon Bay.	Non-Concur	This problem will only get worse as Tumon continues to develop and there is less undeveloped area for stormwater to pond. This is not a direct discharge but an overflow. Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any impacts associated with a discharge event would likely be minor and short term in extent.
125	Public Meeting		3/31/2015	J. Duenas			The elevation of the discharge culvert invert(s) is well below the typhoon surge elevations that can reach +13 feet MSL at extreme high tides. Unless the Engineer can show otherwise, severe storms will drive ocean surge inland through the discharge culverts and overtop the weir (set at elevation +8) and likely result in the inundation of the Fujita basin and adjacent areas causing severe property damage in addition to surcharging the SVR culverts draining to the basin and causing further damage to properties along SVR.	Non-Concur	There is always going to be flooding during a typhoon. A storm surge of 13 feet MSL would already overtop Fujita Road and other sections of this area of Tumon. Typhoons typically involve large rainfalls, for instance, Typhoon Pongsona which caused the 13 feet MSL storm surge also dropped 20 inches of rain, the equivalent of a 100-year storm. Significant flooding was occurring even without the storm surge. This project would have minimal impact on the severity of flooding during a typhoon.



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126	Public Meeting		3/31/2015	J. Duenas			The proper functioning and good condition of the weir structure and discharge culverts will depend on timely maintenance of these facilities. The task is said to fall on the Department of Public Works. Anyone who believes that DPW is up to the task is probably not from this island.	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
127	Public Meeting		3/31/2015	J. Duenas			Direction and focus must be placed on either reducing the runoff/storm discharge into the Fujita basin or allowing for overflow of the Fujita basin to other areas inland. For example:		
128	Public Meeting		3/31/2015	J. Duenas			a. Use of the abandoned 30" diameter sewer interceptor sloping inland toward the "Slingshot" concession area and either developing a storm drainage collection and disposal facility there, or as an area where the runoff can stored and transmitted to other areas for disposal.	Non-Concur	These are privately owned lands and provide 1 out of the 7 acres required to infiltrate enough stormwater to mitigate the flooding. This could be part of a solution which includes acquisition of additional land but there are more suitable areas within the watershed to infiltrate stormwater
129	Public Meeting		3/31/2015	J. Duenas			b. Explore the possibility of discharging Fujita basin overflows into the drainage system connected to the Matapang Beach infiltration gallery.	Non-Concur	The Matapang infiltration basin currently floods during rainfall events, it was inspected as part of the Task 1 report and does not have sufficient capacity to take more stormwater.
130	Public Meeting		3/31/2015	J. Duenas			c. Requiring all developed areas with on-site drainage disposal systems to test and confirm that their systems currently function as designed and, if not, require that the systems be refurbished or reconstructed to original design and permit conditions. Require that owners of existing developments confirm that their disposal systems continue to function properly through a regulated annual or bi-annual permitting system.	Non-Concur	Offline areas only account for a portion of the total drainage area. Flooding will still occur even if these areas have improved maintenance. It would improve but not solve the issue and is currently being reviewed by GEPA as part of an inspection program. However, a substantial solution is still required to solve this issue.
131	Public Meeting		3/31/2015	J. Duenas			d. In areas that are currently undeveloped, provide localized improvements to intercept, collect and dispose of runoff. This solution appears favorable in areas upland of SVR where the water table is well below existing surface grades.	Non-Concur	This would require dividing the existing stormwater collection system into numerous smaller systems, acquiring 7 acres of land required to infiltrate the excess stormwater at numerous locations around the watershed, and maintaining these numerous systems. This is less feasible and likely more costly than providing a single or 2-3 areas in the low portions of the watershed.
132	Public Meeting		3/31/2015	J. Duenas			e. Require that storm runoff from public highways such as Route 1, Happy Landing Road and other roads intersecting SVR be improved with localized on site drainage collection and disposal systems.	Non-Concur	This would require dividing the existing stormwater collection system into numerous smaller systems, acquiring 7 acres of land required to infiltrate the excess stormwater at numerous locations around the watershed, and maintaining these numerous systems. This is more costly than providing a single or 2-3 areas in the low portions of the watershed.
133	Public Meeting		3/31/2015	J. Duenas			f. Use of all of the above to significantly reduce runoff to and overflow of the Fujita basin within the stated budget of \$11 million.	Non-Concur	These options would not fully mitigate flooding and would cost more than the Bay Outlet or providing a single expanded detention area. Numerous strategies should be included but a substantial solution is also required.



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134	Public Meeting		3/31/2015	J. Duenas			As an adjunct to the flood mitigation project scope of work or as a separate project altogether, develop and promulgate design and construction guidelines, standards and regulations that would-be Tumon Basin developers must use to assure proper drainage of their developments. Initial design and construction will be regulated by the building permit system and subsequent operation and maintenance by an annual or bi-annual permitting system.	Concur	Comment Noted. This would need to be developed through DPW, not GEDA, but could improve offline design and maintenance.
135	Meeting	2/26/2015	3/20/2015	D. Ada	GVB		Who will manage the space when construction is completed? Consider cost and schedule.	Concur	Maintenance is important and is being reviewed by GEDA to help establish an effective and sustainable maintenance plan.
136	Meeting	2/26/2015	3/20/2015	M. Baldyga	GVB		Consider options to include maintenance in the bid as an add on.	Concur	Will consider during development of bid documents
137	Meeting	2/26/2015	3/20/2015	M. Baldyga	GVB		Regarding DPW maintenance of the ponding basins, speak with the Director (G. Leon Guerrero).	Concur	Maintenance is important and is being reviewed by GEDA to help establish an effective and sustainable maintenance plan.
138	Meeting (Renderings)	2/26/2015	3/20/2015	J. DeNight	GVB		If a canopy will be installed, consider high winds from storms, vandalism and theft.	Concur	Will review in detailed design
139	Meeting (DWGs)	2/26/2015	3/20/2015	M. Baldyga	GVB		Can sheet flow on San Vitores Road be captured?	Concur	Additional inlets will be installed along San Vitores Road to capture sheet flow.
140	Meeting	2/26/2015	3/20/2015	J. DeNight	GVB		Happy Landing Road and other side streets do not have storm water inlets (or other ways of capturing storm water).	Concur	Given the steepness of these roads would be difficult to capture stormwater, additional inlets are being added where these roads meet San Vitores Road.
141	Meeting	2/26/2015	3/20/2015	M. Baldyga	GVB		Consider reducing the amount of storm water entering Tumon by adding speed bumps along roads that connect (lower) Tumon to Marine Corps Drive.	Non-Concur	The relative volume of stormwater entering the system from Marine Corps Drive is small but trench drains at the intersection of San Vitores road are being reviewed.
142	Meeting	2/26/2015	3/20/2015	M. Baldyga	GVB		Consider adding other curb inlets further up SVR	FIO	As discussed will look at adding 2 to 3 more inlets near the Westin
143	Meeting	3/12/2015	3/20/2015		GPD		Construction operations should consider the peak and low periods of traffic flow.	Concur	
144	Meeting	3/12/2015	3/20/2015		GPD		Construction operations cannot obstruct the parking area reserved for GPD officer's personal vehicles. o GPD may need to discuss the impact to parking internally, and consider having officers and other personnel park in the nearest government parking area, or make an arrangement with the owner of the shopping area next door.	Concur	Construction will not impact police station but will impact parking along Fujita Raod. Have shifted work limits to allow for parking maneuverability.
145	Meeting	3/12/2015	3/20/2015		GPD		Parking for GPD office vehicles on the northeast side of the building needs to allow for officers to reverse their vehicle in.	Concur	Stanley Consultants will move the work limits boundary of the pond the allow for parking maneuverability.
146	Meeting	3/12/2015	3/20/2015		GPD		Construction operations cannot block the access in San Vitores road for GPD.	Concur	GPD and Stanley Consultants will schedule a walk through of the Tumon precinct property.
147	Meeting	3/12/2015	3/20/2015		GPD		On-going communication during construction with GPD on traffic control is encouraged.	Concur	
148	General	3/11/2015	3/23/2015	M. McDonald	GWA		All existing sanitary sewer manholes and gate valve frames and covers should have the same elevations as new road elevations. Please provide details on the plans.	Concur	GWA to provide details
149	General	3/11/2015	3/23/2015	M. McDonald	GWA		Provide water and sewer details and material specifications.	Concur	GWA to review material callouts once Stanley provides. Stanley will generally use Hawaii standards



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150	General	3/11/2015	3/23/2015	M. McDonald	GWA		Indicate property lot numbers/utility easement boundaries on the plans.	Concur	
151	General	3/11/2015	3/23/2015	M. McDonald	GWA		Describe how utility service to existing structures will be maintained during construction.	Concur	Contractor is required to provide temporary service or will construct new sanitary and water, transfer service over, then remove old service.
152	DWG	3/11/2015	3/23/2015	M. McDonald	GWA	C08 to C10	At Station 1+80, the end of the proposed 12" water line should terminate in a manner that allows for adequate flushing, such as a fire hydrant.	Concur	Will review and provide adequate termination
153	DWG	3/11/2015	3/23/2015	M. McDonald	GWA	C08 to C10	At Station 2+20, provide an 8" gate valve instead of 12" gate valve for the water line connection along Chamorrita Drive.	Concur	Will revise
154	DWG	3/11/2015	3/23/2015	M. McDonald	GWA	C08 to C10	A private developer is responsible for a project to retrofit the Fujita Pump Station influent line from Station 11+00 to 13+00. This project has stalled. Discussion about the project's timing is warranted.	Concur	Stanley/GWA to continue coordination to see if projects have similar timing of construction
155	DWG	3/11/2015	3/23/2015	M. McDonald	GWA	C08 to C10	The plans shows a 6' horizontal distance separation between water and sewer lines. The typical separation distances are 10' horizontally and 18" vertically. Confirm the minimum horizontal distance between the utility pipes throughout the project's extent. Considerations to address utility conflicts may	FIO	Discussed with GWA at 3/24 and resolved that design is OK as shown. The 6 foot horizontal is being used due to limited space within project area, but there is several feet of vertical clearance. All utility crossings will be reviewed as detailed design progresses. Details of crossings provided as needed.
156	DWG	3/11/2015	3/23/2015	M. McDonald	GWA	C08 to C10	Provide the length and type of materials to be used on the plans and profiles. Also, identify pipes and "new" or "proposed".	Concur	
157	DWG	3/11/2015	3/23/2015	M. McDonald	GWA	C21 to C27	GWA utility lines should be field verified in construction areas to identify potential conflicts.	Concur	Contractor to field verify
158	Meeting	3/11/2015	3/23/2015		GWA		GWA requested Contractor submit a utility staging plan to show their proposed plan for maintaining utility services during construction.	Concur	
159	Meeting	3/11/2015	3/23/2015		GWA		GWA requested notes on drawings for GWA to be involved in coordinating any water and/or sanitary utility conflicts encountered by the contractor during construction.	Concur	Stanley Consultants to continue coordination with GWA as design progresses.
160		3/11/2015	3/23/2015	E. Cruz	GPA		Provide a relocation plan for GPA utilities you are intending to remove	Concur	
161		3/11/2015	3/23/2015	E. Cruz	GPA		All relocation work shall be done and paid for by the developer/contractor.	Concur	
162	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		GPA is flexible with location of mainline but wants to keep mainline separated from branch lines	Concur	
163	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		GPA would like to maintain current location of transformers	Concur	Will review and notify GPA of any potential relocations required
164	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		If line is located within roadway, manholes area required, if outside of traffic area, handholes allowable.	Concur	Will adjust proposed access per location
165	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		GPA suggests constructing new line first, transferring service, then removing old line.	FIO	Will be contractor's decision, but they will be required to sustain service during construction
166	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		Typical line is (2) 6" conduits, 3' deep, encased in concrete	Concur	
167	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		GPA to provide construction details/standards, via email	Concur	GPA has provided
168	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		Typically maintain 12" separation between electric and telecom	Concur	
169	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		GPA advised that streetlights are owned by DPW, maintain existing meter.	Concur	
170	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		GPA should be included in inspections and review of contractor submittals	Concur	Will keep GPA informed/involved



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171	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		Power outages were discussed, maximum 6-hours every other day during, only between 8-4 on weekdays. With commercial business also located in area may need to further minimize.	Concur	Will try to minimize due to number of businesses in this area
172	Meeting	3/11/2015	3/23/2015	E. Cruz	GPA		Stanley Consultants to coordinate with GPA as design progresses.	Concur	
173	Meeting (EIA)	2/26/2015	3/24/2015		GEPA		GEPA requested discussion on the Tumon Bay TMDL for bacteria in the EIA. Tumon Bay is currently impaired for bacteria and the EIA should include discussion of this. Stanley/EA agreed the EIA should be revised.	Concur	A discussion of the Guam Northern Watershed Bacteria TMDL assessment has been added to Section 2.7.4 of the EIA.
174	Meeting (EIA)	2/26/2015	3/24/2015		GEPA		GEPA commented that when the MS-4 being developed by DPW is approved/adopted, this outfall will fall under its jurisdiction.	Concur	Comment Noted.
175	Meeting (EIA)	2/26/2015	3/24/2015		GEPA		GEPA requested that the potential impact on coral and a discussion of freshwater inflow volume to the bay should be included in the EIA. Stanley/EA to include.	Concur	Will add discussion to EIA
176	Meeting	2/26/2015	3/24/2015		GEPA		GEPA requested that GWA be included in discussion of an operation and maintenance plan for the plan. Specifically GEPA would like GWA to develop an emergency plan for pump station failure.	Concur	Will discuss with GWA
177	Meeting	2/26/2015	3/24/2015		GEPA		GEPA requested that a division of operation/maintenance responsibility be defined for the proposed system.	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design.
178	Meeting	2/26/2015	3/24/2015		GEPA		Monitoring of the pond water quality. Stanley/EA had collected and tested water quality samples of the pond during wet and dry periods last January. Both GEPA and Stanley/EA agreed water quality monitoring similarly timed with beach monitoring may be beneficial for monitoring bacteria in pond and bay.	Concur	Will include discussion in EIA
179	Letter	2/26/2015	4/21/2015		GEPA		Improve the outlet structure cofferdam to reduce run-off velocity to minimize soil erosion at receiving sandy area.	Concur	There will be no outflow during construction as the Fujita Pond cofferdam will provide protection above the pond overflow elevation and the downstream end will also be protected by a sheetpile cofferdam. The outlet structure design is being reviewed to incorporate articulated blocks and vegetation to provide greater roughness along outlet structure upstream of beach to keep velocities down.
180	Letter	2/26/2015	4/21/2015		GEPA		The TMDL for bacteria should include the potential sources of contamination and address corrective measures to prevent contamination.	Concur	Will include discussion in EIA.
181	Letter	2/26/2015	4/21/2015		GEPA		The impact of fresh water inflow to coral reef must be investigated and address in the EIA. Include in the design of the outfall any measures necessary to minimize impact to coral reef at the receiving water.	FIO	Will include additional discussion in the EIA. A water quality monitoring plan is also being developed to assess potential project impacts.
182	Letter	2/26/2015	4/21/2015		GEPA		Include in the design of the new storm drainage system to contain storm water run-off of the existing storm drainage system that will be remove and/or abandoned along Fujita Road.	Concur	There are currently no storm sewer inlets along Fujita Road, There appears to be an abandoned 24" storm sewer line with no outlet. Design will include better capture of drainage along Fujita Road and discharge to Fujita Pond.



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Comment Number	Document	Date Received	Date Reviewed	Reviewer	Organization	Reference Sheet Number	Review Comment	Concur, Nonconcur, For Information Only (FIO)	Response
183	Letter	2/26/2015	4/21/2015		GEPA		All existing sewer laterals that are affected by removal of sewer lines along Fujita road must be verified to insure laterals are within invert elevation of the new sewer line.	Concur	Have approximate locations of laterals noted on drawings which will be connected following replacement of sanitary sewer line. New sanitary sewer line will be installed at same profile as existing and the culvert for most of Fujita Road is above this line. This is being coordinated with GWA
184	Letter	2/26/2015	4/21/2015		GEPA		All existing water service lines and meters that are affected by the removal of waterlines along Fujita road must be verified.	Concur	This is being coordinated with GWA
185	Letter	2/26/2015	4/21/2015		GEPA		All existing water lines, sewer lines and appurtenances to be remove/abandoned must be identified to insure that proper removal is applied. If Asbestos Pipes are encountered, an abatement plan must be submitted to Guam EPA for approval prior to removal. This requirement must be incorporated in the technical specification.	Concur	Will incorporate in technical specifications
186	Letter	2/26/2015	4/21/2015		GEPA		A certified Wastewater Collection Level II operator is required to supervise the removal of the existing pipes and during the tapping of the existing to the new sewer lines.	Concur	Will require in project documents
187	Letter	2/26/2015	4/21/2015		GEPA		A certified Water Distribution Level II operator is required to supervised the disinfection and swabbing during the tapping of the new water system and appurtenances to the existing water main.	Concur	Will require in project documents
188	Letter	2/26/2015	4/21/2015		GEPA		Include in your specs the requirements of disinfection method and procedure for the new water lines and method of cleaning and removal of the existing sewer and water lines	Concur	Will coordinate with GWA and require in project documents.
189	Letter	2/26/2015	4/21/2015		GEPA		Submit the Basis of Design and Hydraulic Calculation for review and comment.	Concur	Task 1 report , section 2, which is included as an appendix to the EIA provides basis of design and Section 4 provides a summary of hydraulic calculations for computing capacity of system and inlets. Will include computations in permit submittal
190	Letter	2/26/2015	4/21/2015		GEPA		Submit the Hydraulic Design Criteria.	Concur	Task 1 report , section 2, which is included as an appendix to the EIA provides basis of design and Section 4 provides a summary of hydraulic calculations for computing capacity of system and inlets. Will include computations in permit submittal
191	Letter	2/26/2015	4/21/2015		GEPA		Submit copy of water quality analysis taken at the existing Fujita Pond. Historical data of the water quality of the pond must be use for reference when evaluating the water quality.	Concur	This is included in the Task 1 report, but additional discussion will be brought into the EIA.
192	Letter	2/26/2015	4/21/2015		GEPA		Submit a technical specification during the design phase for review by this Agency.	Concur	Will submit



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193	Letter	2/26/2015	4/22/2015		NOAA		Freshwater input alone from the proposed outfall could have significant impacts on corals, resulting in bleaching or mortality from reduced salinity, particularly if the discharge occurs during low tide.	Non-Concur	This system would overflow following rainfall events greater than roughly 3 inches. Under the existing condition freshwater is already entering the bay, a large freshwater input via rainfall, groundwater seepage, and untreated/uncontrolled stormwater near Outrigger, Matapang Park and other locations. Discharges associated with this project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent.
194	Letter	2/26/2015	4/22/2015		NOAA		Freshwater and pollutants associated with stormwater may also decrease these species' growth rates, reproduction, and resistance to disease and bleaching. This in turn can cause shifts in coral cover and community structure	Non-Concur	This system would overflow following rainfall events greater than roughly 3 inches. Under the existing condition freshwater is already entering the bay, a large freshwater input via rainfall, groundwater seepage, and untreated/uncontrolled stormwater near Outrigger, Matapang Park and other locations. Discharges associated with this project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent.
195	Letter	2/26/2015	4/22/2015		NOAA		The nutrients, bacteria, sediment, and other pollutants contained in stormwater will have additional impacts on the coral reef ecosystem, exacerbating algal blooms and coral disease outbreaks, as well as impacting the health of human users of the bay. The "pre-treatment" provided by the settling pond will not reduce EC levels, pollutants, nutrients, or fine sediment in the stormwater.	FIO	This project is an overflow, the initial inflow with the greatest concentrations will have time to settle, but settlement times will be reduced as the pond fills up to its overflow elevation. The project will include a water quality monitoring program to assess potential impacts.
196	Letter	2/26/2015	4/22/2015		NOAA		The impacts from a point discharge of stormwater into the bay will threaten these important economic benefits provided by the Bay.	FIO	Flooding is also impacting economics. This project is an overflow, so discharge is infrequent and of short duration. A water quality monitoring plan is being included in this project to assess potential impacts.



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197	Letter	2/26/2015	4/22/2015		NOAA		The project will cause erosion on the beach between the outfall structure and the water. The level of erosion may be significant, and according to Stanley Consultants staff, will require repair after each major overflow event. The DEIA does not identify the extent of this beach erosion or how it will be repaired. This would likely require heavy equipment on the beach, and possibly movement of sand in both the nearshore and intertidal areas. This would likely lead to additional impacts on EFH in Tumon Bay	Non-Concur	Scour potential is discussed on page 3-5 of the Task 2 report included as an appendix to the EIA. Less than 18 inches for most storm events that cause overflow. Up to 2-3 feet for storms exceeding the 10-year storm (i.e. 10 inches). Repairing the beach for most overflow events would not require heavy equipment, a small crew with rakes could repair. Sand will fall out within 20-30 feet of shore as seen near the outrigger, so the potential impact area from erosion is relatively small. Maintenance will be required only a few times per year, following heavy rainfall events.



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198	Letter	2/26/2015	4/22/2015		NOAA		The cumulative impacts analysis in the DEIA does not fully evaluate the potential impacts of private construction such as the Dusit Thani hotel and other potential projects within the catchment. It also fails to assess the potential impacts of projected increases in rainfall associated with global climate change that could exacerbate the impacts of the proposed outfall, and the projected increases in sea level that may impact the outfall's ability to function as designed. Further, the analysis did not consider the impacts of ocean acidification, including recent research that found corals exposed to high nutrients and acidic conditions experience significantly higher rates of macrobioerosion	Non-Concur	This project is an overflow. Discharge events are infrequent, short duration, and accompany larger rainfall events. It's outflow is at elevation 4 feet, 1.8 feet above the Mean Higher High Water. The system has capacity to discharge a 10-year storm with a tide level above 5 feet so 3 feet higher than the Mean Higher High Water. The system has sufficient capacity to accommodate increases in sea level. It also will function and provide reduction in flooding for increased rainfall. Private construction areas are required to infiltrate their own stormwater so have runoff rates similar to undeveloped area. Within the scientific community, climate change is a well-established trend. However, at this point predicting the specific magnitude of impacts, such as changes to precipitation, sea temperature, etc. cannot be done with accuracy. The range and timing of potential climate change and development scenarios is too wide to provide quantitative discussion in the EIA. Impacts are discussed relative to the current condition which is a known scenario.
199	Letter	2/26/2015	4/22/2015		NOAA		Discharge of stormwater into Tumon Bay Marine Preserve should be avoided to the fullest extent practicable. GEDA should re-evaluate other options to include, but not limited to:	FIO	The project was discussed at GovGuam agency meetings in July/August 2015. The decision was made to proceed with the project but include a water quality monitoring plan to assess impacts and some additional enhancements to improve water quality.
200	Letter	2/26/2015	4/22/2015		NOAA		a. Seek additional funding to expand the Fujita Pond to a sufficient size to handle the stormwater. Initial report from Stanley Consultants suggested that this was a practical alternative, but slightly outside of the allotted budget.	FIO	This was the preferred option but was \$19M relative to the \$11.5M allotted for the project.
201	Letter	2/26/2015	4/22/2015		NOAA		b. Fund Low Impact Design retrofits to existing developments throughout the Fujita Pond catchment area to reduce the amount of stormwater reaching the Fujita Pond. This could include installing rain gardens, water catchment systems for irrigation, small infiltration chambers or settling ponds on private properties.	Concur	This will help, but not solve the flooding issue. Solving flooding requires a substantial solution. GEDA is reviewing potential smaller strategies, but there will still need to be an outlet or large infiltration area to handle the large volume of stormwater. Rain gardens are very effective at improving water quality and reducing runoff for normal rain events but not for handling extreme rain events. For example, over 28 acres of rain gardens (38 miles of roadway median) would be required to infiltrate 10 inches of rain in the project area. Any infiltration helps though, so these could be part of a solution and are being reviewed for inclusion in project construction.



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202	Letter	2/26/2015	4/22/2015		NOAA		c. Provide assistance to landowners with existing stormwater systems that are not being properly maintained.	Concur	This will help, but not solve the flooding issue. Solving flooding requires a substantial solution. GEDA is reviewing potential smaller strategies, but there will still need to be an outlet or large infiltration area to handle the large volume of stormwater. Stanley Consultants analyzed the impact if every developed property had "perfect capture" of all rainfall "Perfect capture" would reduce the discharge rate during an overflow event by roughly 30% but there is still enough stormwater volume to cause flooding for even 4 inches of rain. Keeping more water onsite will only help the flooding issue so improved maintenance should be part of a solution and a monitoring/inpsection program is being discussed with GEPA.
203	Letter	2/26/2015	4/22/2015		NOAA		GEDA should analyze the long term maintenance requirements for this project and potential environmental impacts associated with maintenance. At a minimum , GEDA should develop a maintenance plan that outlines the maintenance required including the cost of maintenance and the permits necessary to repair damage to the beach in the intertidal zone. Please note that these activities are likely to trigger a number of local and federal environmental permits as they will take place within the intertidal zone and the boundary of the Marine Preserve. The plan should clearly identify the agency or organization responsible for maintenance of the system and ensure that there is sufficient funding to maintain it over its expected lifespan.	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design, prior to final permitting.
204	Letter	2/26/2015	4/22/2015		NOAA		If the preferred alternative is implemented, include additional features in the final design to slow the velocity of water exiting the culverts onto the beach to avoid and minimize beach erosion. The planters may serve to increase velocity by channelizing the flow rather than slowing it. Vegetation such as beach morning glory (Ipomoea) or other plants, may provide a buffer between the outflow and the bay	Concur	The proposed planters help spread flow, which reduces depth, but do not necessarily slow velocity. Incorporation of vegetated groundcover without planters is being reviewed for the outlet design to provide greater roughness and reduction in velocity.
205	Letter	2/26/2015	4/22/2015		NOAA		If GEDA moves forward with the preferred alternative, GEDA should ensure that the contractors implement measures to avoid potential impacts associated with construction activities:	Concur	A SWPPP will be defined for the project during detailed design. As shown in the draft drawings, the plan to minimize erosion/sedimentation is to construct sheetpile cofferdams at the upstream and downstream end which will isolate the major construction area from Fujita Pond and the Bay. The Contractor will be required to pump all stormwater back into Fujita Pond, so no construction stormwater will enter marine waters. The top of cofferdam will be set above the overflow elevation of Fujita Pond.



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206	Letter	2/26/2015	4/22/2015		NOAA		a. Implement appropriate sediment control BMPs during shoreside work to ensure that sedimentation is avoided and the debris are not allowed to fall in the water. Water displaced by the construction of the outflow should not be directly discharged into marine waters.	Concur	A SWPPP will be defined for the project during detailed design. As shown in the draft drawings, the plan to minimize erosion/sedimentation is to construct sheetpile cofferdams at the upstream and downstream end which will isolate the major construction area from Fujita Pond and the Bay. The Contractor will be required to pump all stormwater back into Fujita Pond, so no construction stormwater will enter marine waters. The top of cofferdam will be set above the overflow elevation of Fujita Pond.
207	Letter	2/26/2015	4/22/2015		NOAA		b. Cease any activities that may result in sediment/pollutant discharges during the primary hard coral spawning events each year. The applicant may contact NMFS PIRO HCD Guam Field Office for more information including spawning dates.	Non-Concur	With adequate erosion control measures which will be required as part of construction, construction can occur without discharging sediments into the Bay.
208	Letter	2/26/2015	4/22/2015		NOAA		c. Develop and implement a stormwater management plan to avoid all freshwater discharges and potential sediment and pollutant transport into the waters of the Tumon Bay during construction.	Concur	A SWPPP will be defined for the project during detailed design. As shown in the draft drawings, the plan to minimize erosion/sedimentation is to construct sheetpile cofferdams at the upstream and downstream end which will isolate the major construction area from Fujita Pond and the Bay. The Contractor will be required to pump all stormwater back into Fujita Pond, so no construction stormwater will enter marine waters. The top of cofferdam will be set above the overflow elevation of Fujita Pond.
209	Letter	2/26/2015	4/22/2015		NOAA		Due to the unavoidable impacts to EFH associated with the construction and implementation phases of this project, GEDA should fund projects to mitigate the loss of this ecological function. Should GEDA decide to pursue the preferred alternative described in the DEIA, NMFS can provide guidance on assessing impacts and scaling potential mitigation options to offset this loss.	FIO	This project is an overflow. Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent. GEDA will keep NOAA in the discussion as the project moves forward.
210	Letter	2/26/2015	4/22/2015		NOAA		NMFS determines that adverse affect to EFH will occur as a result of this project. We strongly encourage GEDA to consider other options to address the stormwater impacts discussed in the DEIA. We have offered conservation recommendations that may minimize the effects of the proposed project, but they will not prevent t impacts to EFH and other marine resources. The information provided in the DEIA suggests that there will be significant impacts to marine resources, particularly EFH, associated with this action as currently described .	FIO	Additional options has been reviewed and it has been determined that this is the most feasible option. A substantial solution is required to solve this problem. This project is an overflow. Discharges associated with the project would be short term in duration and are expected to occur approximately one to three times per year. It is expected that any shifts in habitat use associated with a discharge event would likely be minor and short term in extent. GEDA will keep NOAA in the discussion as the project moves forward.
211	Letter	2/26/2015	6/9/2015		USFWS		A qualified biologist should survey the project site daily, prior to conducting work to determine if ESA listed species are in the area.	FIO	Steps to manage ESA will be developed during detailed design to avoid or minimize impacts leading up to and during construction. Will coordinate with USFWS and DAWR.



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212	Letter	2/26/2015	6/9/2015		USFWS		Work should be postponed or halted if ESA-listed species are observed within the project area and will only resume after the animal has voluntarily departed the area.	Concur	Steps to manage ESA will be developed during detailed design to avoid or minimize impacts leading up to and during construction. Will coordinate with USFWS and DAWR.
213	Letter	2/26/2015	6/9/2015		USFWS		All on-site personnel should receive instruction regarding ESA-listed species and what to do when listed species are present within the project area.	Concur	Steps to manage ESA will be developed during detailed design to avoid or minimize impacts leading up to and during construction. Will coordinate with USFWS and DAWR. This will include communication with contractor.
214	Letter	2/26/2015	6/9/2015		USFWS		A litter control program should be implemented at the project site. All equipment, materials, debris, and vegetation clippings should be removed upon completion of work.	Concur	A SWPPP is being developed for this project which includes steps for debris/trash management and disposal.
215	Letter	2/26/2015	6/9/2015		USFWS		Margins of the ponding basin should be regularly maintained by removing vegetation when morrhens are not present to prevent recolonization of the area by moorhens	Concur	DPW maintains on a periodic basis, more frequent mowing is being considered leading up to construction, after site is reviewed for moorhens, to discourage recolonization.
216	Letter	2/26/2015	6/9/2015		USFWS		Margins of the ponding basin should be regularly maintained by removing vegetation when morrhens are not present to prevent recolonization of the area by moorhens	Concur	GEDA is currently reviewing maintenance responsibility of the proposed system which will be defined during detailed design. More frequent maintenance of vegetation would be beneficial and will be considered.
217	Letter	2/26/2015	6/9/2015		USFWS		The Service recommends ensuring migratory birds are not within the project area during construction and maintenance and that measures are taken to avoid any impacts to migratory birds, especially if nesting is detected.	Concur	As stated in the EIA, actions will be taken to avoid adverse effects to the nest in compliance with the MBTA.
218	Letter	2/26/2015	6/9/2015		USFWS		The Service recommends investigating alternatives that would minimize impacts to the protected marine communities in Tumon Bay	FIO	GEDA is planning to discuss with GEDA/NOAA and other regulatory agencies
219	Letter	2/26/2015	6/9/2015		USFWS		The Service recommends consulting with DAWR and GEDA on the project's potential impacts to the marine community	FIO	GEDA is planning to discuss with GEDA/NOAA and other regulatory agencies

Summary of meetings conducted by Stanley Consultants Inc. and EA Engineering, Science and Technology, Inc. (EA) with Regulatory Agencies during the week of 10 November 2014 for the Guam Economic Development Authority (GEDA) San Vitores Road Flood Mitigation Project.

Purpose: Discuss project and upcoming regulatory process for permitting of San Vitores Road flood mitigation project.

Notes by

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Monday 11/10/14 at 9:00 am

Meeting with the State Historic Preservation Office (SHPO) at the Department of Parks and Recreation in Agana Heights.

Agency Role in the Project:

Compliance with the National Historic Preservation Act and Guam historic preservation requirements associated with the project.

Meeting Attendees:

Richard Olmo (Guam Archaeologist), Alfred Masga (Guam Archaeological Technician II), Andrew Judd (Stanley Consultants, Inc.), Craig Johnson (Stanley Consultants, Inc.), Aja Reyes (Stanley Consultants, Inc.) and Shannon Cauley (EA Engineering Science and Technology, Inc. [EA])

Summary:

A. Judd provided a summary of the project and considered alternatives.

R. Olmo concurred that the two channel alternatives would have a much greater potential for discovery or impacts to cultural resources.

R. Olmo requested to see a Monitoring Plan for the proposed disturbance activities. His main concern for the Fujita Road alignment is the expansion of the existing pond and potential excavation of any areas that have not been previously disturbed. He wants testing to be done on the east side of the pond where the expansion would occur to determine if the area has been previously disturbed. A. Judd said that there are buried stormwater vaults where the expansion would occur. R. Olmo said he would like to see testing done in areas adjacent to the vaults that would need to be disturbed to access the vaults for removal.

R. Olmo wants archaeological monitoring to occur during the drilling of the Geotech borings. A. Judd said this will occur. R. Olmo said the boring should be monitored until undisturbed ground is reached in

the borings. He said that the caliche horizon is an indicator of the bottom limit of artifacts or other cultural resources found at sites on Guam.

R. Olmo said that any area adjacent to a beach has a high potential for the occurrence of cultural resources. He said several old estates occurred in the Fujita area and that some burial locations had been found. He feels that the proposed test borings are too far apart (200 foot spacing) to adequately evaluate whether there are undisturbed areas along the proposed Fujita Road alignment. He would like to see closer spacing of excavations for archaeological reconnaissance along the project alignment. He said that SHPO typically recommend the use of a backhoe to place trenches for reconnaissance.

S. Cauley asked if borings could be used to determine if the area was previously disturbed due to the amount of disturbance that trenching would cause along Fujita Road. R. Olmo said borings (split spoon) could be used to determine previous disturbance, but he would like to see them placed closer than 200 feet apart. He said they should be a couple of meters deep and to an approximate depth of two meters. A. Judd said they will review the archaeological and soil boring scope and potentially add more borings.

The meeting ended approximately 9:45 am.

Action Items:

- Stanley Consultants will provide a Monitoring Plan to the State Historic Preservation Office prior to initiating land disturbance (Geotech borings and borings to determine previous disturbance).

Monday 11/10/14 at 2:00 pm

Meeting with the U.S. Army Corps of Engineers (USACE) at the Fujita Pond in Tumon.

Agency Role in the Project:

The USACE is responsible for Clean Water Act (CWA) Section 404 permitting requirements that could apply to the project.

Meeting Attendees:

Ryan Winn (USACE), Andrew Judd, Craig Johnson, Aja Reyes and Shannon Cauley

Summary:

A. Judd provided R. Winn with a summary of the project.

S. Cauley asked R. Winn if he felt that the pond would be regulated under Section 404 of the Clean Water Act. R. Winn said that if it was strictly a stormwater pond that was constructed for that purpose, and if it was not associated with any natural drainage features (i.e. stream), then it would not be jurisdictional under Section 404. He asked if there were any natural drainages directing flow to the pond. R. Winn said that he would review data back at his office regarding drainage to help determine the status of the pond. A. Judd said that a drainage study had been done and he could provide the data to R. Winn.

R. Winn said that it might be more efficient if we agreed to a determination of Preliminary Jurisdiction for the pond. He said that dredging and widening the pond would not require a permit, but a permit would be required if fill is placed into the pond. The placement of the footing of the weir within the

boundary of the pond would constitute placement of fill. He said the permit would be straight forward with minimal, if any, requirements for mitigation. He said the action might fall under Nationwide Permit 35, but he would review the action to see what permit would be most applicable. He said he would provide us with the appropriate permit application.

The meeting team looked at the outfall location at the end of Fujita Road. R. Winn said that as long as the disturbance associated with the outfall structure was above the mean higher high water line (MHHW) that a Section 404 permit would not be required for the outfall. A. Judd asked R. Winn what datum should be used for the outfall location since the closest tidal gage is in Apra Harbor. R. Winn said that we should make a determination on what data to use for the MHHW and he would review.

S. Cauley asked R. Winn if he had concerns from a permitting perspective regarding beach maintenance following a discharge event. He said it shouldn't be a problem as long as heavy equipment was not used.

R. Winn said he would review information on the project area and would provide us with his input on the best way to move forward with respect to the Section 404 status of the pond and related permit requirements.

The meeting ended at 3:00 pm.

Action Items:

- Stanley Consultants will provide R. Winn with drainage area information.
- R. Winn will provide Stanley Consultants with options for moving forward regarding the existing pond and associated permitting options.
- R. Winn will provide Stanley Consultants the appropriate permit application form.

Wednesday 11/12/14 at 9:00 am

Meeting with the Guam Department of Agriculture, Division of Aquatic & Wildlife Resources (DAWR) in Mangilao.

Agency Role in the Project:

DAWR is the equivalent of a State Fish and Game Agency. They provide input regarding territory and federally listed species that might be affected by the project and recommend actions that could be implemented to reduce the potential for impacts. The DAWR is also responsible for Guam wetland permitting requirements associated with a project. The Guam wetland permitting requirements are consistent with the USACE Section 404 permitting requirements.

Meeting Attendees:

Tino Aguon (Chief of the Division of Aquatic and Wildlife Resources), Jeff Quitugua (Wildlife Biologist), Andrew Judd, Craig Johnson, Aja Reyes and Shannon Cauley

Summary:

A. Judd provided a summary of the project and considered alternatives.

J. Quitugua said there should be a study of the sources of water for Fujita Pond and that adding catch basins along San Vitores Road should be considered. A. Judd said that a study regarding the sources of water had been conducted as a part of the initial project assessment.

T. Aguon said that it would be good to get Brent Tibbatts (DAWR Biologist) from his office involved regarding the Marine Protected Area in Tumon Bay. Brent was not able to attend the meeting. T. Aguon said he would get Brent in the loop.

S. Cauley asked for input on concerns regarding the Mariana common moorhen (*Gallinula chloropus guami*). T. Aguon said if you have ponded water, you will have moorhens at some point. T. Aguon said that his office cannot authorize take. He said it would have to come from the U.S. Fish and Wildlife Service (USFWS). S. Cauley asked if conducting a pre-construction survey to see if moorhens are using the pond would be sufficient. If moorhens are in the pond then activities would be postponed until the moorhen(s) leaves. T. Aguon said that if nesting was occurring, then activities would need to be postponed until the chicks had fledged the nest and left. It is possible that a take permit could be obtained from USFWS. J. Quitugua said that the breeding season is typically from August to March and then it takes 28 to 60 days for chicks to fledge. T. Aguon said that the area of the pond that was considered most suitable for moorhens in the past is the area where the weir would be placed. This is because of the occurrence of emergent vegetation in the area in the past.

T. Aguon also agreed that the Fujita Road culvert alternative would have the least impact to flora and fauna. He said that the Guam tree snail (*Partula radiolata*), which is a candidate species for listing under the Endangered Species Act (ESA), has been found in the forest in the area of the two channel alternatives.

S. Cauley asked if there were concerns regarding the Guam Endangered Micronesian starling (*Aplonis opaca guami*). T. Aguon said he did not think there would be any issues.

T. Aguon said that his office would review the project summary handout and provide a letter with their input on the project. S. Cauley told T. Aguon to let him know if his office needed any additional input on the project for their review.

The meeting ended at 10:15am.

Action Items:

- T. Aguon will inform Brent Tibbatts of the project and get his input regarding the Marine Protected Area in Tumon Bay.
- T. Aguon will provide Stanley Consultants with a letter presenting their input and recommendations on the project.

Wednesday 11/12/14 at 10:30 am

Meeting with the Guam Department of Environmental Protection (GEPA).

Agency Role in the Project:

GEPA is responsible for permitting associated with CWA Section 401 Water Quality Certification requirements and Section 402 National Pollutant Discharge Elimination System (NPDES) permitting requirements. A Section 401 Water Quality Certification would be required for any Section 404 permit associated with the project. A Water Quality Certification is also required for operation of facilities which might result in a discharge into Waters of the United States. A construction General Permit under Section 402 would also be required for the project. GEPA also requires preparation of an Environmental Impact Assessment (EIA), or EIA Short Form to evaluate potential impacts of the project on resource areas including noise, land use, air quality, safety, geological resources, water resources, biological resources, socioeconomic resources and environmental justice, infrastructure, and hazardous materials and wastes.

Meeting Attendees:

Eric Palacios (GEPA Administrator), Angel Marquez (GEPA Safe Drinking Water Program Engineering Supervisor), Edgardo Ibay (EHS GEPA), Ray Calvo (Water Division Planner GEPA), Jesse Cruz (Environmental Monitoring and Surveillance [EMAS] Administrator GEPA), Andrew Judd, Craig Johnson, Aja Reyes and Shannon Cauley

Summary:

C. Johnson provided GEPA with a summary of the project and alternatives.

A. Marquez said he had concerns regarding total suspended solids (TSS) and sediments associated with discharges from the pond. He said there needs to be design to minimize transport of sediments from the pond. A. Marquez said the project design should follow the guidelines in the 2006 CNMI/Guam Stormwater Management Manual. He said there needs to be a sediment analysis and turbidity needs to be measured during a storm event. A. Judd said that a water quality analysis of the pond had been conducted.

R. Calvo asked if sand erosion was expected during discharge events. C. Johnson said that there would be erosion of the beach during high flow events. R. Calvo said he did not have concerns if there was only one outfall, but did if there would be several outfall locations along Tumon Bay.

A. Judd said that the project will include placement of additional inlet structures in the Fujita Pond drainage area to better collect and direct flows to the pond. J. Cruz requested a copy of the inlet structure design for review and to consider in their separate monitoring studies.

R. Calvo mentioned the stormwater runoff channeling down the road adjacent to the Outrigger and there is subsequent channel erosion and discharge into the bay at that location. A. Judd said that the placement of additional inlet structures would help to minimize the uncontrolled runoff at that location and others in the drainage area.

J. Cruz said that the project should help to address Total Maximum Daily Load (TMDL) concerns by abating nonpoint source runoff in the drainage area which could result in water quality improvements. The project should also reduce inflow into the sanitary system.

E. Palacios thanked the team for providing the informational meeting on the project.

S. Cauley asked R. Calvo if he felt there would be a NPDES permit requirement for the outfall discharge. EPA Region 9 has said that there is no permit for the stormwater discharge. R. Calvo said that he did not know of a NPDES permit for the discharge, but would inquire with GEPA's NPDES advisor.

The meeting ended at approximately 11:30 am.

Action Items:

- R. Calvo will follow up with S. Cauley regarding the NPDES permitting question.

Wednesday 11/12/14 at 2:00 pm

Meeting with Guam Bureau of Statistics and Plans regarding the Guam Coastal Management Program and Federal Consistency.

Agency Role in the Project:

The Guam Bureau of Statistics and Plans is responsible for implementing the Guam Coastal Management Program under the Coastal Zone Management Act. Projects are evaluated to determine if they are consistent with the policies and procedures of Guam's Coastal Management Program.

Meeting Attendees:

Edwin Reyes (Guam Coastal Program Administrator), Brenda Atalig (Planner I), Esther Taitague (Planner), Christine Fejeren (Watershed Coordinator) Andrew Judd , Craig Johnson, Aja Reyes and Shannon Cauley

A. Judd and S. Cauley provided a summary of the project and alternatives.

E. Reyes asked what the Federal compliance nexus would be for the project given that the project is not federally funded. S. Cauley said that there would be a nexus if the project requires a Section 404 permit for placement of the weir in the pond. S. Cauley said that the purpose of the meeting was to inform the GCMP group of the project and to get their input or any concerns. The Coastal Zone Management Program Consistency Determination would be submitted if determined to be necessary.

E. Reyes said that he had just moved into his position and that he was still getting up to speed. He appreciated our meeting with his office to discuss the project.

The meeting ended at approximately 2:30 pm.

Wednesday 11/12/14 at 4:00 pm

Meeting with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) in Hagatna.

Agency Role in the Project:

The NMFS is responsible for implementing requirements of Section 7 and Section 10 of the Endangered Species Act for marine species. Consultation with the NMFS is required if the project has potential to result in impacts to marine species that are listed under the Endangered Species Act.

Meeting Attendees:

Valerie Brown (Fishery Biologist NOAA), Andrew Judd, Craig Johnson, Aja Reyes and Shannon Cauley

Summary:

A. Judd provided V. Brown with a summary of the project.

V. Brown asked about flow volumes associated with overflow events. C. Johnson said that there would be erosion associated with large storm flow events.

V. Brown said that there are four coral species (*Acropora globiceps*, *A. retusa*, *Pavona diffluens*, and *Seriatopora aculeata*) recently listed as threatened under the ESA that are known to occur on Guam threatened for Guam. One species could occur in association with the outer reef of Tumon Bay. She said that discharges associated with the project would probably not result in direct impacts to the coral, but they are a concern.

V. Brown said she had concerns regarding potential impacts to fish associated with salinity and nutrient inputs during overflow discharge events. A. Judd said that freshwater input to the bay also occurs as a result of rainfall and spring discharge during discharge events. He said that the input could be calculated on average. V. Brown said that stormwater outfalls have resulted in the relocation of fish habitat in the past. She asked if there would be any stormwater treatment. A. Judd said that the pond would provide a degree of stormwater treatment during discharge events. A. Reyes said that Dr. Matson at the University of Guam has conducted studies on nutrients and associated eutrophication in Guam coastal waters.

V. Brown said her concerns are energy dissipation, the amount of freshwater input associated with a discharge, and effects on sensitive habitats in the bay. She said that the potential for impacts to federally threatened scalloped hammerheads (*Sphyrna lewini*) in Tumon Bay is low. V. Brown said she would contact Donald Hubner with NOAA in Honolulu regarding potential impacts to listed corals in Tumon Bay. She said that impacts to the federally threatened green sea turtles (*Chelonia mydas*) should not be an issue.

V. Brown asked if she could get an electronic version of the project summary handout to send to Donald Hubner. A. Judd said he would send a copy to her.

V. Brown will check into potential Essential Fish Habitat (EFH) concerns associated with the outfall. She will check into whether the Fish and Wildlife Coordination Act applies to the project and determine if there are triggers that will require surveys or additional consultation with NOAA.

The meeting ended at approximately 5:15 pm.

Action Items:

- An electronic copy of the project summary handout was provided to V. Brown.
- V. Brown will contact Donald Hubner at NOAA in Honolulu regarding potential impacts to ESA listed corals in Tumon Bay.
- V. Brown will check into potential EFH concerns regarding outfall discharges to Tumon Bay.

- V. Brown will check into whether the Fish and Wildlife Coordination Act applies to the project and determine if there are triggers that will require surveys or additional consultation with NOAA.

Wednesday 11/26/14 at 9:00 am

Meeting with United States Fish and Wildlife Service (USFWS).

Agency Role in the Project:

The USFWS is responsible for implementing requirements of Section 7 and Section 10 of the Endangered Species Act for terrestrial species. Consultation with the USFWS is required if the project has potential to result in impacts to terrestrial species that are listed under the Endangered Species Act.

Meeting Attendees:

Ann Marie Gawel (USFWS), Lelani Takano (USFWS), Aja Reyes and Shannon Cauley

Summary:

S. Cauley and A. Reyes provided a summary of the project.

L. Takano said that USFWS's main concern for the project is potential impacts to the Mariana common moorhen (moorhen). She said that there is a pair of moorhens that visit the pond a few times a year. She said that the moorhens are year round breeders and their patterns of movement between the wet and dry season are not well known. L. Takano said she has not conducted surveys at Fugita Pond and does not know the pattern of moorhen use at the pond. S. Cauley said that he goes by the pond a couple times a week and has not observed moorhens.

L. Takano said that proactive maintenance of the pond should be conducted to limit attractiveness to moorhens. She said that well established vegetation in the pond, or on its banks, is attractive to the birds because it provides refuge and nesting habitat. S. Cauley said that the vegetation on the banks of the pond had been recently mowed and that there is short (<4 inch) emergent vegetation in the pond.

L. Takano said that pond design should also take into consideration attractiveness to moorhens. She said that she has examples of best management practices that can be used to reduce attractiveness. She will provide what she has.

L. Takano said that formal consultation under the ESA would be required if construction or maintenance of the pond were to occur while moorhens were present. S. Cauley asked if formal consultation could be avoided if construction and maintenance activities were scheduled, or phased, to avoid times when moorhens are using the pond. L. Takano said that informal consultation would be sufficient if construction and maintenance were scheduled for times when the moorhens were not at the pond.

L. Takano said that a Section 404 USACE permit for the pond would trigger consultation between USFWS and USACE under Section 7 of the ESA. If there is no Section 404 permit, and impacts to moorhens cannot be avoided (i.e. construction and maintenance are conducted when moorhens are using the pond), then consultation under Section 10 of the ESA would be required. Preparation of a Habitat Conservation Plan would be required for impacts associated with a non-Federal activity.

S. Cauley asked if there were concerns regarding green sea turtles. A. Gawel said that turtle nesting on the beach is not likely and that any in water impacts would be a NMFS concern.

A. Gawel asked if future development in the area would increase flows to the pond. A. Reyes said yes, but that new development would be required to address associated increased impervious surfaces.

L. Takano asked who is responsible for maintaining the pond. A. Reyes said it is the Department of Public Works (DPW). L. Takano said that she thinks that DPW probably coordinates with DAWR regarding avoidance of impacts to moorhens during maintenance activities.

L. Takano offered to review the pond design and make recommendation to minimize attractiveness to moorhens.

The meeting ended at 10:00 am.

Action Items:

- L. Takano will provide examples of best management practices to reduce attractiveness of ponds to moorhens.



EA Engineering, Science, and Technology, Inc. PBC

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January 13, 2015

Subject: Summary of meeting to discuss NPDES requirements and any additional Guam EPA permitting requirements.

Attendees: Shannon Cauley (EA), Bob Shambach (EA), Angel Marquez (Guam EPA Safe Drinking Water Program Engineering Supervisor), Edgardo Ibay (Guam EPA)

Date and Time: January 8, 2014 at 10:30 AM

Meeting Summary: B. Shambach briefly reviewed past meetings with Guam EPA where NPDES and other permitting requirements were discussed in association with the San Vitores Road Flood Mitigation Project. He said there had been some questions raised regarding NPDES permitting associated with discharges from the outfall structure. B. Shambach said that it was our understanding that the only NPDES for stormwater outfalls was tied to the MS4 permit and since there was no MS4 in place there was no NPDES permit requirement. The Fujita Pond outfall would be covered under the MS4 once it was in place. B. Shambach turned the discussion over to S. Cauley. S. Cauley said that the purpose for meeting with Guam EPA was to clarify if there were any Guam EPA NPDES requirements and to identify any other permits that would be required.

A. Marquez said that there is no Guam EPA NPDES permit requirement associated with the Fujita Pond stormwater discharge. He said that a USEPA NPDES permit requirement would apply to the MS4 permit when it is completed. That would be during operation and would be Guam DPW's responsibility. At this point with no MS4, there is no NPDES that would apply to the outfall. He said that the NPDES for the MS4 would be for the entire MS4, not just the Fujita Pond outfall.

A. Marquez said there might be a requirement for additional stormwater treatment if it was determined during operation that discharges from the outfall were resulting in a reduction in water quality in Tumon Bay to below Guam EPA's baseline values.

A. Marquez said there is no Section 401 permit associated with the stormwater discharge at the outfall unless there is a Section 404 permit. He said there would be a Section 401 permit associated with Fujita Pond, if there is a Section 404 permit, but it would just be a formality (no issues). He indicated the pond is designed with a stormwater treatment function, so the 401 Water Quality Certification would not be an issue.

S. Cauley asked if there were any other Guam EPA permit requirements associated with the project. A. Marquez said just the Environmental Protection Plan and an Erosion Control Plan associated with construction activities.

S. Cauley asked if the Environmental Impact Assessment was the only thing that we needed to present to Guam EPA at this point. A. Marquez indicated that this is the case. A. Marquez said he would also like to look at more detailed design for the project (30 – 60%) when it is available for review and discussion.

The meeting ended at 11:00 AM.



Eddie B. Calvo
Governor

Ray Tenorio
Lt. Governor

Department of Parks and Recreation
Government of Guam
490 Chalan Palasyo
Agana Heights, Guam 96910
Director's Office: (671) 475-6296/7
Facsimile: (671) 477-0997
Parks Division: (671) 475-6288/9
Guam Historic Resources Division: (671) 475-6294/5
Facsimile: (671) 477-2822



B-39

Raymond F.Y. Blas
Director

William N. Reyes
Deputy Director

In reply refer to:
RC2012-10424

March 12, 2015

John Rios
Administrator
Guam Economic Development Authority
590 South Marine Corps Drive
ITC Building, Suite 511
Tamuning, Guam 96913

Subject: Review of the Draft Environmental Impact Assessment (EIA) for Design of the San Vitores Road Flood Mitigation Project in Tumon

Dear Mr. Rios:

We have read through the EIA referred to above and consulted with our files and Guam Museum archives in order to assess the potential impacts to historic resources associated with implementation of the flood mitigation project. We find that there will be adverse impacts to both known and expected cultural resources from each of the three options described in the EIA. Of the three options presented the culvert option will have the least impact. Our findings and recommendations are discussed, below.

Tumon Storm-water EIA

Several alternatives were proposed and rejected and one alternative was selected that involves a weir outflow on the Fujita Ponding Basin connected with an outfall on the beach of Tumon Bay. Two of the abandoned alternatives would have pumped water from the Fujita Ponding Basin to inland locations (a sink near JFK and an abandoned quarry near the Hilton intersection). With the selection of the Fujita Ponding Basin--Tumon Bay couplet (Gravity Bay Outlet), three options to link them are proposed. One involves a closed concrete culvert under Fujita Road, and two involve an open, earthen channel parallel to Fujita Road to the east on private land. All three of these would have an outflow structure adjacent to the beach, with final flow volumes directed across the existing beach.

The preferred alternative calls for the expansion of Fujita Ponding Basin by recapturing adjoining land currently housing infiltration chambers, and the addition of 25 curbside inlet structures within the 180 acre drainage basin. Since the existing ponding basin is undersized for the volume of runoff currently reaching it, demonstrated by the initiation of this project, it is unclear how the waters expected from the additional 25 inlet structures will affect capacity.

A depth to bedrock of between 15 feet and 30 feet below the surface is stated on Page 3-17. Page 3-21 says that excavation associated with the channel and lagoon could result in impacts to underlying geologic features (bedrock). Given the maximum depth to the water table of 10 feet and the plan to have the channel and the lagoon above this, there should be no adverse impacts to the bedrock.

Page 3-30, statement to the effect that, "overflow from Fujita Pond currently reaches Tumon Bay during high volume storm events". This is unsupported in the document.

Cultural Resources Impacts

Three options for the project are elaborated in the Draft EIA. All involve the Fujita Ponding Basin being connected with Tumon Bay (dubbed, Gravity Bay Outlet) one through an underground double box culvert and the remaining two via a large linear earthen channel. The underground concrete culverts would be emplaced below Fujita Road (in the public right-of-way), while the surface channel would be excavated to the east of, and parallel with Fujita Road (on private property). One of the channel options includes a collection/distribution lagoon at its north end, just inland of the beach. All of the alternatives include a concrete outflow structure on the inland edge of the beach, with the beach surface being the final carrier of the outflow. The proposed box culverts are to be 8 feet wide and 3 feet high and would be placed adjacent to each other. The channel that feeds the lagoon would be 15 feet wide and have 4 feet high banks. The channel option without the lagoon would be 60 feet wide with 2 feet high sloping side walls. All options would have an area of potential effect (APE) greater than the dimensions stated above.

Box Culvert Option

In 1989, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted archaeological work for the expansion of the Fujita Hotel, which occupied property to the west of Fujita Road. Although most of the subsurface investigations took place on portions of the property away from Fujita Road, two backhoe trenches were excavated between 20 meters and 30 meters off of Fujita Road and approximately 240 meters inland from the intersection with Chamorrta Drive. The area surrounding these trenches was mapped as cultural deposits. A date of AD 390-650 was obtained on charcoal recovered from 25 to 35 cm below the surface from one of these trenches (5680E/3880N). This establishes the cultural deposit as Pre-Latte in age (Brown, et al. 1989). A later archaeological project that was conducted by PHRI in 1998-1999 provides data from the footprint of the culvert option. The data remain in their raw form since no report was written for the project. The below images are excerpted from the field forms filled in by PHRI crew during the field effort. They specifically refer to deposits and features found along the Fujita (Road) Lateral. In addition, Test Trench 4 encountered human remains at ~45 cm below the surface. Test Trench 4 was located just west of Fujita Road approximately 152 meters inland from the intersection of Fujita Road and Chamorrta Drive.

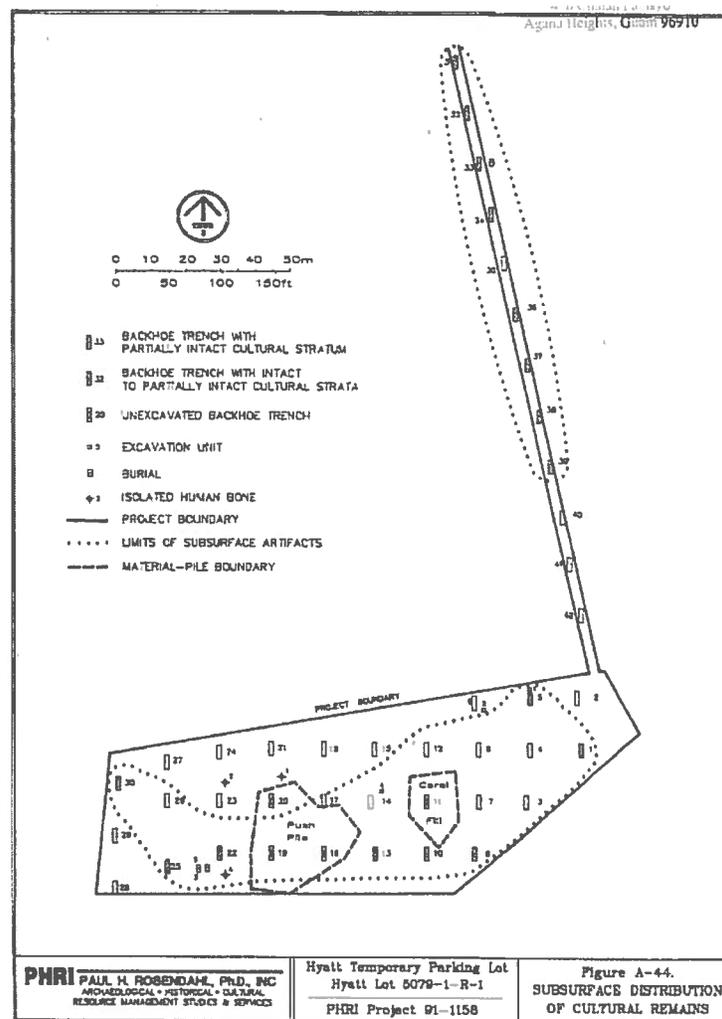
33	Fujita Lateral	5	3						60	40	All Sample			MIK	Feature 5 of Trench 1 were located with Feature 6 on same level
34	Fujita Lateral								40	60	column sample #1			MIK	
35	Fujita Lateral								40	60	column sample #2			MIK	
36	Fujita Lateral								40	70	Human bone 25cm			MIK	
37	Fujita Lateral								40	70	charcoal			MIK	C-14
38	Fujita Lateral								40	80	Screen Sample			MIK	
39	Fujita Lateral								40	100	Charcoal			MIK	Buried Human
40	Fujita Lateral								40	60	pottery			MIK	2-3 m C-14 sample A
41	Fujita Lateral								40	60	pottery			MIK	
42	Fujita Lateral								40	60	pottery			MIK	
43	Fujita Lateral								40	60	pottery			MIK	
44	Fujita Lateral								40	60	pottery			MIK	
45	Fujita Lateral								40	60	pottery			MIK	
46	Fujita Lateral								56	78	shell/pottery			MIK	
47	Fujita Lateral								51	54	NHB			MIK	16.6 cm EOC column sample #2
48	Fujita Lateral								50	70	Shell pottery (vertical)			MIK	All pottery in 60 ft. 6093 possibly from same level as 6092

Copies of field notes for Tumon project, PHRI 1998-1999

A review of these archived materials indicates that there are intact deposits below and along the road. The potential for the culvert option to impact these deposits remains high, especially considering the extent of the excavations needed to accommodate the culverts.

Channel Options

A 1993 archaeological project investigated the property the Fujita Ponding Basin currently occupies as well as a corridor extending seaward from it approximately 185 meters long that was parallel to and east of Fujita Road. The corridor appears to have tested the area slated for the channel. However, as with so many of the maps included with PHRI reports they float in space and it is difficult to precisely locate the project on either a topographic map or air photo. See the project map provided below.



The investigators identified three cultural substrata ranging from Pre-Latte through Latte times. Of particular interest for the channel option is that one area of subsurface deposits reached from backhoe trenches 31 through 39. The upper, Latte Period stratum was the most extensive of the three that were documented. It extended to about 60 cm below the surface. Features included, “post moulds, shell middens, and fire related features.” Artifacts included, “ceramics, shell and stone tools, . . . , and *Tridacna* debitage.” Ecofacts included non-human vertebrate remains and marine shell. (Workman and Haun 1993)

The proposed channel options will undoubtedly adversely impact intact prehistoric cultural deposits along their length.

Conclusions and Recommendations

The project as it is described in the EIA will have adverse impacts on cultural historical properties in the Fujita Road area. Both the culvert and channel designs will encounter known sites as described above. Of the three design options, the culvert option potentially will have the least impact because of disturbance from previous utilities sub-Fujita Road. Geo-testing along Fujita Road will provide additional information on subsurface cultural deposits, but the spacing and nature of the borings is not ideal for assessment of the intactness of these deposits.

Based upon the existing site information and the description of the project an archaeological data recovery plan may be indicated. It is definitely needed for the channel options and possibly also for the culvert option. The main references used for this review were:

Brown, Roderick S., Alan E. Haun, Bradley Dilli, and Ingamaj Knuttson
1989 Subsurface Archaeological Inventory Survey Fujita Hotel Expansion Project, Tumon, Tamuning Municipality, Territory of Guam. Report on file with Guam Historic Preservation Office (91-010-AI).

(PHRI)
1998-1999 Archived field notes for the Tumon Project. Guam Museum.

Workman, L. Wade and Alan E. Haun
1993 Archaeological Inventory Survey and Limited Data Recovery, Hyatt Temporary Parking Lot, Tumon, Tamuning Municipality, Territory of Guam. Report on file with Guam Historic Preservation Office (93-030-DR).

If you have any questions or need additional information from our office please do not hesitate to call us.

Sincerely,



Raymond F. Y. Blas
Director



Lynda Bordallo Aguon
State Historic Preservation Officer

MEETING NOTES

Date: 03/18/15

Place: Department of Public Works Permit Department

Project/Purpose: San Vitores Road Flood Mitigation Project

Attendees: Captain Castro - GFD
Andrew Judd - Stanley
Aja Reyes - Stanley

Notes By: Aja Reyes

The following meeting notes set forth our understanding of the discussions and decisions made at this meeting. If no objections, questions, additions, or comments are received within 5 working days from issuance of the meeting notes, we will assume that our understandings are correct. We are proceeding based on the contents of these meeting notes.

The draft design drawings for the San Vitores Road Flood Mitigation Project were discussed with the Guam Fire Department. The following provides a summary of discussion points:

- Maintain clear access to hydrants during construction. *Stanley to include in construction documents.*
- Maintain water pressure to the hydrants or provide fire suppression water tank. *Stanley to include in construction documents.*
- Coordination with the GFD Fire Marshall and GWA (Heidi Ballendorf) needed if construction will temporarily affect water to the hydrants. *Stanley to include in construction documents.*
- Contractor needs to maintain one lane of access along Fujita Road at all times. *Already required in construction documents*
- 12' foot ingress/egress corridor from Fujita Road to the beach is acceptable. No parking/fire line signs should be posted above the corridor. *Will include signage*

Distribution:
Attendees, GEDA

MEETING NOTES

Date: 03/19/15

Place: Guam Police Department

Project/Purpose: San Vitores Road Flood Mitigation Project

Attendees: Chief Bordallo – GPD
Lt. Carbullido - GPD
Andrew Judd - Stanley
Aja Reyes - Stanley

Notes By: Aja Reyes

The following meeting notes set forth our understanding of the discussions and decisions made at this meeting. If no objections, questions, additions, or comments are received within 5 working days from issuance of the meeting notes, we will assume that our understandings are correct. We are proceeding based on the contents of these meeting notes.

The draft design drawings for the San Vitores Road Flood Mitigation Project were discussed with the Guam Police Department. The following provides a summary of discussion points:

- Construction operations should consider the peak and low periods of traffic flow.
- Construction operations cannot obstruct the parking area reserved for GPD officer's personal vehicles.
 - GPD may need to discuss the impact to parking internally, and consider having officers and other personnel park in the nearest government parking area, or make an arrangement with the owner of the shopping area next door.
- Parking for GPD office vehicles on the northeast side of the building needs to allow for officers to reverse their vehicle in.
 - Stanley Consultants will move the work limits boundary of the pond to allow for parking maneuverability.
- Construction operations cannot block the access in San Vitores road for GPD.
- GPD and Stanley Consultants will schedule a walk through of the Tumon precinct property.
- On-going communication during construction with GPD on traffic control is encouraged.

Distribution:
Attendees, GEDA



Department of Agriculture Dipattamenton Agrikottura

163 Dairy Road, Mangilao, Guam 96913



Edward J.B. Calvo
Governor

Raymond S. Tenorio
Lt. Governor

Director's Office
Agricultural Dev. Services
Animal Health
Aquatic & Wildlife Resources
Forestry & Soil Resources
Plant Nursery
Plant Inspection Facility

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300-7965/66; Fax 734-6569
735-3955/56; Fax 734-6570
300-7975/76; Fax 734-6569
300-7974; Fax 734-6569
475-1426/27; Fax 477-9487

Mariquita F. Taitague
Director

Matthew L.G. Sablan
Deputy Director

March 16, 2015

Stanley Consultants Inc.
590 S. Marine Corps Drive
ITC Building Ste. 511
Tamuning, GU 96913

Re: Review of the Draft Environmental Impact Assessment (EIA) San Vitores Road Flood Mitigation Project, Tumon, Guam

Hafa Adai! The following comments are being provided after reviewing the draft EIA for the San Vitores Road flood mitigation project:

Alternative 2, the Channel Lagoon Option, is the preferred alternative, for the following reasons:

1. The original Fujita Road Pond was used by the federally listed Mariana moorhen (*Gallinula chloropus guami*) for nesting, as recently as August 2012. Adults with chicks were photographed and videotaped in the pond at that time. When water hyacinth (*Eichornia crassipes*) that covered approximately 1/3rd of the surface area of the pond was removed, the moorhens relocated. This action negatively affected an endangered species. Partial mitigation for this could be the construction of the pond mentioned in Alternative 2. Water hyacinth can serve a dual purpose in this alternative; both as an introduction to the pond to enhance habitat for moorhens, as well as, water hyacinth can be, and has been used as a natural water cleanser, removing chemicals such as heavy metals from water in treatment plants. The hyacinth can be periodically thinned from the newly constructed pond, removing contaminants from the system.
2. The contractor's preferred alternative, Alternative 1, the culvert alternative, appears to require construction in a plot of land along the north side of Fujita Road known to contain a colony of the locally endangered Guam Tree Snail (*Partula radiolata*). Before any work can begin, a mitigation plan must be developed to address potential impacts on this species. Alternative 2 does require construction in a wooded area. A survey for the tree snails should be conducted before construction can begin.

3. All alternatives proposed will have an indirect impact to the locally listed, Micronesian starling (*Aplonis opaca*), or sãli, in Chamorro. The sãli, has been observed in forested areas within Tumon Bay. In August 2012, two individuals were observed within the proposed site.
4. Migratory birds occur during the wintering months and use the existing Fujita Road Pond. Migratory birds are protected under the *Migratory Bird Treaty Act of 1917*. These birds should not be harmed.
5. The pond should act as a settling area, allowing solids and larger particulate matter to fall from the water column, instead of being carried on to the Tumon Bay Marine Preserved Area (MPA) reef flat. This pond should also allow for some percolation of run off water into underlying limestone before entering the Tumon Bay MPA. These two actions will help increase the quality of water being discharged in to this sensitive environmental area. The alternative also has the benefit of being a more natural appearing alternative than the concrete exit point of alternative 1.
6. The EIA fails to discuss in detail the expected output (discharge) of each proposed Alternatives. Of great concern, is erosion of the output into Tumon MPA. All alternatives construction ends at the Mean Higher High Water (MHHW). It is not define as to what the true value of the MHHW in the EIA.
7. All vegetation cleared from the site will need to be replaced with native tree species. Consult with Department of Agriculture's Forestry & Soil Resources Division to obtain a list of native tree species for the project.
8. The concrete planters should consist of additional smaller planters to help reduce discharge velocity at the outlet slab.
9. All of the alternatives mention the need for periodic maintenance to maintain peak functionality of the drainage system. It is not clear which party is responsible for the maintenance of these systems; DPW, GWA, or GVB, a private contractor? It should be noted that some of the flooding in Tumon could be averted if hotels and businesses performed regular maintenance on existing drainage features. A visit to a site flooded during heavy rains last November revealed every drainage grate in the parking area of a hotel are completely clogged with trash, soil, and sand.
10. Increased focused freshwater input to Tumon has the potential for a variety of problems, both human health and aesthetic. Enteromorpha algae grows in Tumon where freshwater enters at the beach. Heavy growth of Enteromorpha is unsightly, and large amounts of dead algae emits an unpleasant odor. Removal of Enteromorpha can be costly and continuous. It is likely this freshwater input will lead to increased Enteromorpha growth in the vicinity of the outflow. Freshwater input can also lead to increased growth of dynoflagellates, the "San

Vitres Blood" blooms in Tumon Bay. Dynoflagellates can be unsightly, and also cause human health concerns. Large amounts of dynoflagellates in the water can cause skin irritation, and as in red tide events in the U.S. mainland, cause seafood to be unsafe for human consumption.

11. A focused stream of freshwater discharged in to Tumon Bay will effect corals, other marine organisms, and fish habitat in the region of discharge. This can lead to changes in fish populations, coral and invertebrate distribution, and increased algal growth.
12. Increased freshwater input to Tumon will affect the quality of a snorkeling experience. Freshwater is less dense than saltwater, and floats on the surface. The resulting halocline causes blurry vision when looking through the water. The freshwater entering Tumon bay is also colder than the salt water in the bay. A focused discharge of freshwater will create a large area of cooler water, affecting the comfort of snorkelers in the area, and affecting the health of cool intolerant marine organisms in the area.

Thank you for providing the department an opportunity to comment. Should you have any questions, please contact Wildlife Biologist, Mr. Jeffrey S. Quitugua, at 735-3955/56.

Sincerely,



MARIQUITA F. TAITAGUE

cc: Bureau of Statistics & Plans
Guam Environmental Protection Agency



GUAM WATERWORKS AUTHORITY
PRELIMINARY DESIGN REVIEW COMMENTS AND RESPONSES

Project Name: San Vitores Road Flood Mitigation Project, GEDA

Project Number: _____

Reviewers Name: SM, Mauryn McDonald (300-6058)

Submittal: Permit review

Review Date: 3/20/15

Respondents Name: _____

Response Date: _____

Sheet Number	Comment Number	REVIEW: Questions, Comments, Requested Modifications, suggestion	RESPONSE/ACTION: Questions Answered, Comment Modification, or Suggestion Accepted or Not Accepted and Why
GENERAL	1	All existing sanitary sewer manholes and gate valve frames and covers should have the same elevations as new road elevations. Please provide details on the plans.	
	2	Provide water and sewer details and material specifications.	
	3	Indicate property lot numbers/utility easement boundaries on the plans.	
	4	Describe how utility service to existing structures will be maintained during construction.	
C08 to C10	5	At Station 1+80, the end of the proposed 12" water line should terminate in a manner that allows for adequate flushing, such as a fire hydrant.	
	6	At Station 2+20, provide an 8" gate valve instead of 12" gate valve for the water line connection along Chamorrta Drive.	
	7	A private developer is responsible for a project to retrofit the Fujita Pump Station influent line from Station 11+00 to 13+00. This project has stalled. Discussion about the project's timing is warranted.	
	8	The plans shows a 6' horizontal distance separation between water and sewer lines. The typical separation distances are 10' horizontally and 18" vertically. Confirm the minimum horizontal distance between the utility pipes throughout the project's extent. Considerations to address utility conflicts may	

		be required, particularly at utility crossings.	
	9	Provide the length and type of materials to be used on the plans and profiles. Also, identify pipes and "new" or "proposed".	B-49
C21 to C27	10	GWA utility lines should be field-verified in construction areas to identify potential conflicts.	

<input type="checkbox"/>	Approved as submitted	<input checked="" type="checkbox"/>	Re-submit with corrections	Reviewers Initials: _____
<input type="checkbox"/>	Approved as noted – Do not resubmit			

ACKNOWLEDGEMENT OF RECEIPT OF GWA COMMENTS:

I hereby acknowledge receipt of the GWA comments for the above stated construction project generated as part of the permit process for the building permit. I understand the comments will require a response from the design engineer of record and/or revised design documents to be resubmitted to GWA. Failure to provided GWA with a response and/or revise design documents will result in delays in obtaining the permit from GWA. (Provide additional pages for response if required)

_____	_____	_____	_____
Permit Applicant	(Print Name)	Signature	Date
_____	_____	_____	_____
Design Engineer of Record (Firm)	(Print Name)	Signature	Date

No.

Date: 03/23/15

Place: GPA

Project/Purpose: San Vitores Road Flood Mitigation Project

Attendees: Edward Cruz - GPA
Andrew Judd – Stanley
Aja Reyes – Stanley

Notes By: Andrew Judd

The following meeting notes set forth our understanding of the discussions and decisions made at this meeting. If no objections, questions, additions, or comments are received within 5 working days from issuance of the meeting notes, we will assume that our understandings are correct. We are proceeding based on the contents of these meeting notes.

An overview of the status of the San Vitores Road Flood project was given by Stanley Consultants. The purpose of the meeting was to present major design elements of the project and discuss impacts to GPA utilities and GPA comments. A summary of discussion points is provided by the following:

- GPA is flexible with location of mainline but wants to keep mainline separated from branch lines
- GPA would like to maintain current location of transformers
- If line is located within roadway, manholes area required, if outside of traffic area, handholes allowable.
- GPA suggests constructing new line first, transferring service, then removing old line.
- Typical line is (2) 6” conduits, 3’ deep, encased in concrete
- GPA to provide construction details/standards, via email
- Typically maintain 12” separation between electric and telecom
- GPA advised that streetlights are owned by DPW, maintain existing meter.
- GPA should be included in inspections and review of contractor submittals
- Power outages were discussed, maximum 6-hours every other day during, only between 8-4 on weekdays. With commercial business also located in area may need to further minimize.
- Stanley Consultants to coordinate with GPA as design progresses.

Distribution:

Attendees, GEDA

No.

Date: 03/23/15

Place: GWA

Project/Purpose: San Vitores Road Flood Mitigation Project

Attendees: Tom Cruz - GWA
Mauryn McDonald - GWA
Andrew Judd – Stanley
Aja Reyes – Stanley

Notes By: Andrew Judd

The following meeting notes set forth our understanding of the discussions and decisions made at this meeting. If no objections, questions, additions, or comments are received within 5 working days from issuance of the meeting notes, we will assume that our understandings are correct. We are proceeding based on the contents of these meeting notes.

An overview of the status of the San Vitores Road Flood project was given by Stanley Consultants. The purpose of the meeting was to present major design elements of the project and discuss impacts to GWA utilities and GWA comments. A summary of discussion points is provided by the following:

- GWA provided a comment sheet summarizing their comments which was discussed. Comment sheet with responses (as discussed) is attached to this email.
- GWA requested Contractor submit a utility staging plan to show their proposed plan for maintaining utility services during construction.
- GWA requested note on drawings for GWA to be involved in coordinating any water and/or sanitary utility conflicts encountered by the contractor during construction.
- Stanley Consultants to continue coordination with GWA as design progresses.

Distribution:
Attendees, GEDA



GUAM WATERWORKS AUTHORITY

PRELIMINARY DESIGN REVIEW COMMENTS AND RESPONSES

Project Name: San Vitores Road Flood Mitigation Project, GEDA

Project Number: _____

Reviewers Name: SM, Mauryn McDonald (300-6058)

Submittal: Permit review

Review Date: 3/20/15

Respondents Name: _____

Response Date: _____

Sheet Number	Comment Number	REVIEW: Questions, Comments, Requested Modifications, suggestion	RESPONSE/ACTION: Questions Answered, Comment Modification, or Suggestion Accepted or Not Accepted and Why
GENERAL	1	All existing sanitary sewer manholes and gate valve frames and covers should have the same elevations as new road elevations. Please provide details on the plans.	Accepted – GWA to provide details
	2	Provide water and sewer details and material specifications.	Accepted – GWA to review material callouts once Stanley provides. Stanley will generally use Hawaii standards
	3	Indicate property lot numbers/utility easement boundaries on the plans.	Accepted
	4	Describe how utility service to existing structures will be maintained during construction.	Contractor is required to provide temporary service or will construct new sanitary and water, transfer service over, then remove old service.
C08 to C10	5	At Station 1+80, the end of the proposed 12” water line should terminate in a manner that allows for adequate flushing, such as a fire hydrant.	Will review and provide adequate termination
	6	At Station 2+20, provide an 8” gate valve instead of 12” gate valve for the water line connection along Chamorrita Drive.	Accepted – will revise
	7	A private developer is responsible for a project to retrofit the Fujita Pump Station influent line from Station 11+00 to 13+00. This project has stalled. Discussion about the project’s timing is warranted.	Stanley/GWA to continue coordination to see if projects have similar timing of construction
	8	The plans shows a 6’ horizontal distance separation between water and sewer lines. The typical separation distances are 10’	6 foot horizontal is being used due to limited space within project area, but there is several feet of

		horizontally and 18" vertically. Confirm the minimum horizontal distance between the utility pipes throughout the project's extent. Considerations to address utility conflicts may be required, particularly at utility crossings.	vertical clearance. All utility crossings will be reviewed as detailed design progresses. B-53
	9	Provide the length and type of materials to be used on the plans and profiles. Also, identify pipes and "new" or "proposed".	Accepted
C21 to C27	10	GWA utility lines should be field-verified in construction areas to identify potential conflicts.	Contractor to filed verify.
<input type="checkbox"/>	Approved as submitted		Reviewers Initials: _____
<input type="checkbox"/>	Approved as noted – Do not resubmit		
	<input checked="" type="checkbox"/>	Re-submit with corrections	

ACKNOWLEDGEMENT OF RECEIPT OF GWA COMMENTS:

I hereby acknowledge receipt of the GWA comments for the above stated construction project generated as part of the permit process for the building permit. I understand the comments will require a response from the design engineer of record and/or revised design documents to be resubmitted to GWA. Failure to provided GWA with a response and/or revise design documents will result in delays in obtaining the permit from GWA. (Provide additional pages for response if required)

_____	_____	_____	_____
Permit Applicant	(Print Name)	Signature	Date
_____	_____	_____	_____
Design Engineer of Record (Firm)	(Print Name)	Signature	Date



DIPATTAMENTON MINANEHAN TANO'
(Department of Land Management)
GUBETNAMENTON GUAHAN
(Government of Guam)



Street Address:
590 S. Marine Corps Drive
Suite 733 ITC Building
Tamuning, GU 96913

EDDIE BAZA CALVO
Governor

RAY TENORIO
Lieutenant Governor

MICHAEL J. B. BORJA
Director

DAVID V. CAMACHO
Deputy Director



'MAR 1' 2015

Mailing Address:
P.O. Box 2950
Hagåtña, GU 96932

Website:
<http://dlm.guam.gov>

E-mail Address:
dldm@land.guam.gov

Telephone:
671-649-LAND (5263)

Facsimile:
671-649-5383

Memorandum

To: Administrator, Guam Economic Development Authority

From: Director, Department of Land Management

Subject: Review of the Draft Design Package for the San Vitores Road Flooding Mitigation Project in Tumon.

The Department of Land Management has reviewed the draft design documents for the San Vitores Road Flooding Mitigation Project consisting of the draft Design Plans, the draft Basis of Design Report and the draft Environmental Impact Study and as a result submit the following comments in response to :

1. On page 3-2 of the EIA, line 31-33 of section 3.2.2 (Existing Conditions) where it states ..."the bordering properties are zoned as Commercial." Being that the entire Tumon area is zoned "H" (Hotel-Resort) recommend change to read that the bordering properties are of commercial uses.
2. On Page 3-4 of the EIA, Line 1 of section 3.2.3 (Evaluation Criteria) where it states " The Guam Seashore Reserve is public property on Guam." Considering that the Guam Territorial Seashore Protection Act of 1974 (Chapter 63, Title 21 GCA) defines the Seashore Reserve as both public and private lands. We feel that this statement could be misleading and recommend that the reference to the ownership of the Seashore Reserve is referenced to the project site (Fujita Road), which is a public owned property.

In conclusion of our review of the documents provided, it is our position that the proposed project as an infrastructure improvement project and its design, to be outside the Seashore Reserve. The proposed San Vitores Road Flooding Mitigation Project will not be subjected to the Guam Land Use Commission or the Guam Seashore Protection Commission application process.

Review of the Draft Design Package for
the San Vitores Road Flooding Mitigation
Project in Tumon.
Page 2

It is also our position that, in line with Section 3.11 of the EIA (Coastal Zone) the Department of Land Management supports the issuance of a positive Federal Consistency Certification for the proposed project.

In addition the Department of Land Management, in line with the general provision of the island's Land Use Laws, supports the inclusion of Best Management Practices (BMPs), Section 5.0 of the EIA (Mitigation Measures), to promote the protection of the public's health, safety and general welfare.

Thank you for the opportunity to comment.



MICHAEL J. B. BORJA

FRT/CC


Please note, the due date for all comments is 03/13/15. If not received by this date, the comments will not be included in the design. Please submit this form to Aja Reyes at Reyesaj@stanleygroup.com. This form is also available in Microsoft Excel on the CD that was included with the submittal documents

INSTRUCTIONS

There are many regulators and stakeholders reviewing this project. To stay organized and efficient, this form is being used to document the review process. Please use this form to log your questions and comments. You may attach scans of markups, but comments will only be accepted through the use of this form and within the timeline noted above.

Fill in your information in the REVIEWER TO COMPLETE columns, only. List the "Document" you are reviewing, "Date Received" and "Date Reviewed". Let your name under the "Reviewer" column as well as the organization which you represent in the "Organization" column. Please specify a page number or "Reference Sheet Number". If there is no specific page number, fill in "general". Each comment or question should be recorded separately in subsequent rows.

After the due date, the comment period will be closed. All comments received will be reviewed by Stanley Consultants. Responses will be logged and a comment form containing all comments/responses will be distributed to commenters.

Comment Number	Document	Date Received	Date Reviewed	Reviewer	Organization	Reference Sheet Number	Review Comment	DESIGNER TO COMPLETE		PMO TO COMPLETE	
								Concur, Nonconcur, For Information Only (FIO)	Response	Resolution Date	Action to be Taken
1	Draft Design Package (Draft EIA)	Feb. 26, 2015	Mar. 2 thru the 18, 2015	Frank Tahano & Celine Cruz	DLM-Planning Division	page 3-2, line 31-33 of section 3.2.2	Recommend change to read that the bordering properties are of commercial uses				
2	Draft Design Package (Draft EIA)	Feb. 26, 2015	Mar. 2 thru the 18, 2015	Frank Tahano & Celine Cruz	DLM-Planning Division	page 3-4, line 1 of section 3.2.3	Recommend that the reference to the ownership of the Seashore Reserve is referenced to the project site (Fujiita Road).				
3	Draft Design Package (Draft EIA)	Feb. 26, 2015	Mar. 2 thru the 18, 2015	Frank Tahano & Celine Cruz	DLM-Planning Division	pages 3-54 thru 56, Section 3.11	In line with Section 3.11 the Department of Land Management supports the issuance of a Positive Federal Consistency Certification for the proposed project.				
4	Draft Design Package (Draft EIA)	Feb. 26, 2015	Mar. 2 thru the 18, 2015	Frank Tahano & Celine Cruz	DLM-Planning Division	pages 1 thru 5-4, Section 5.1	The Department of Land Management in line with general provision of the island's Land Use Laws supports the inclusion of BMDs to promote the protection of the public's health, safety and general welfare. Pursuant to Chapter 11.1.03 of the 2009 Land Use Zoning Ordinance (LUZO) and the provisions of the proposed Zone Rules and Regulations, it is DLM's position that the proposed project as an infrastructure improvement project and its design to be outside the Seashore Reserve. The proposed				
5	Draft Design Package	Feb. 26, 2015	Mar. 2 thru the 18, 2015	Frank Tahano & Celine Cruz	DLM-Planning Division	General					
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Date: 03/24/15

Place: DPW Highways

Project/Purpose: San Vitores Road Flood Mitigation Project

Attendees: Felix Benavente- DPW
Phillip Slagel - DPW
Craig Johnson - Stanley
Andrew Judd - Stanley

Notes By: Andrew Judd

The following meeting notes set forth our understanding of the discussions and decisions made at this meeting. If no objections, questions, additions, or comments are received within 5 working days from issuance of the meeting notes, we will assume that our understandings are correct. We are proceeding based on the contents of these meeting notes.

The draft design drawings for the San Vitores Road Flood Mitigation Project were discussed with DPW. The following provides a summary of discussion points:

- DPW requested that the roadway ponding spread width criteria used in design of the additional inlets be included in the project drawing notes. Stanley will include.
- Cover over the culvert was discussed. DPW does not have concerns as long as a 2' minimum cover is maintained.
- DPW requested that the pond design be modified to include an access path, including 12 foot concrete ramp at 4h:1v max. to access the pond for dredging and maintenance. Stanley will revise.
- DPW requested that the project use the DPW standard pavement section, 1" surface course, on 2" base course, on 8" aggregate, on 12" of subbase. DPW indicated that aggregate grade A is difficult/expensive to obtain so to use grade C for all base aggregate. DPW to provide design standard. Stanley to modify design.
- DPW requested that any street lights removed on the project be salvaged to DPW
- DPW requested any exposed metal grating or attachment hardware be reviewed for corrosion resistance. Potentially use stainless steel or resin composite. Stanley to review and determine corrosion resistant materials.
- DPW requested the size of concrete apron around new inlets be reduced and a maximum depression of 3/4" be used to provide better bicycle pathway on roadside. Stanley to revise.
- Maintenance of the proposed system was discussed.
 - DPW requested a summary of recommended maintenance tasks and frequency be included with the project documentation.
 - DPW indicated capacity/equipment to maintain pond and culvert but not the beach.
 - DPW indicated pond maintenance will be included in the DPW maintenance schedule but, given current limitations, it may not get maintained as often as it should be.
 - DPW would have no objections to having GVB consider the option of having maintenance crews from the businesses that will benefit from the pond maintain it and that GVB be given a copy of the pond maintenance requirements.
 - DPW would be amenable to entering into a maintenance agreement that would allow

- GVB to have third parties maintain the pond.
 - DPW recommended beach maintenance be discussed with GVB and Department of Parks and Recreation.
-
- It was agreed that Stanley will stay in communication with DPW on design and modifications.

Distribution:

Attendees, GEDA

COMMENT FORM
SAN VITORES ROAD FLOOD MITIGATION PROJECT
PUBLIC MEETING
TAMUNING SENIOR CITIZENS CENTER
March 25, 2015, 7:00 to 9:00 PM

COMMENT	(OPTIONAL) NAME, CONTACT INFO.
<p>Rainfall is not the problem, the increase in impervious surfaces IS. Look at source rather than just output (stormwater @ Fujita pond)</p>	
<p>Investigate Low Impact Design Retrofits</p> <ul style="list-style-type: none"> - Rainwater Catchment for Reuse - Reducing Impervious Surface - Numerous Smaller Catch Basins (Rain Gardens) 	
<p>High water discharge events can have significant impacts on marine habitat Ex. Tropical Storm Tinging (2004) - the river discharge/rain during low tide severely impacted the reef flat in Pago Bay.</p>	
<p>Because freshwater can also impact coral, fish, invertebrates, algae, etc. in high volumes - this will take many smaller drainages and infiltration areas and discharge it in one place - it will shift habitats.</p>	
<p>Discharge is will increase algae, may include at that dinoflagellates that can irritate skin at that due to lack of mixing in that area.</p>	
<p>One of only a handful of public ^{project} access locations in Tumon - this will decrease water quality and beach contours and aesthetics.</p>	
<p>Don't Do This!!!</p>	

COMMENT FORM
SAN VITORES ROAD FLOOD MITIGATION PROJECT
PUBLIC MEETING
TAMUNING SENIOR CITIZENS CENTER
March 25, 2015, 7:00 to 9:00 PM

COMMENT	(OPTIONAL) NAME, CONTACT INFO.
<p>We're told that the only filtration system is the pond itself, so when heavy rains fall within a short period of time & flows out of this new outlet, the water will not be filtered. So not only sewage may/will be flowing into the ocean but vehicle fluids from the streets as well.</p>	
<p>Has the impact that ^{the} freshwater influx will have on all the fish, invertebrates, algae & any other marine life in</p>	
<p>Turron Bay? What about sedimentation, pollutants, and the thermal change? And if it has, was it tested on all stages of life? (ie larval, reproductive, etc.)</p>	

COMMENT FORM
SAN VITORES ROAD FLOOD MITIGATION PROJECT
PUBLIC MEETING
TAMUNING SENIOR CITIZENS CENTER
March 25, 2015, 7:00 to 9:00 PM

COMMENT	(OPTIONAL) NAME, CONTACT INFO.
Does this project rely on the Fujita Pond remaining a pond? And if so, what is preventing future development of that land?	

COMMENT FORM
SAN VITORES ROAD FLOOD MITIGATION PROJECT
PUBLIC MEETING
TAMUNING SENIOR CITIZENS CENTER
March 25, 2015, 7:00 to 9:00 PM

COMMENT	(OPTIONAL) NAME, CONTACT INFO.
<p>Extra outlets into - Reingardens Toro Patches; Banana Patches (edible landscaping) - worried about 1 outlet into our bay - less access for our people to reach the Beachside - sewer untreated water into beach (trash) - No maintenance Clear Culverts & repair sand wash off</p>	<p>Blaz, Juanita 6884752</p>

COMMENT FORM
SAN VITORES ROAD FLOOD MITIGATION PROJECT
PUBLIC MEETING
TAMUNING SENIOR CITIZENS CENTER
March 25, 2015, 7:00 to 9:00 PM

COMMENT	(OPTIONAL) NAME, CONTACT INFO.

COMMENT FORM
SAN VITORES ROAD FLOOD MITIGATION PROJECT
PUBLIC MEETING
TAMUNING SENIOR CITIZENS CENTER
March 25, 2015, 7:00 to 9:00 PM

COMMENT	(OPTIONAL) NAME, CONTACT INFO.
Excess nutrients from the runoff will encourage nuisance algae blooms - especially since Fajita road is @ the part of Tumen w/ the least amount of tidal flow. (NOP)	XXXXXXXXXX XXXXXXXXXX
This point-source pollution will cause blooms that will make Tumen bay lose its pristine appearance weeks of gross water	
has to have a far worse effect on tourism than a single day of ^{occasionally} having having to deal with flooding.	
THANKS	

Eddie Baza Calvo
Governor of Guam

Ray Tenorio
Lieutenant Governor



B-65

Lorilee T. Crisostomo
Director

APR 09 2015

Ms. Aja Reyes
Senior Project Coordinator
Stanley Consultants Inc.
Sunny Plaza, Suites 203/204
125 Tun Jesus Crisostomo Street
Tamuning, Guam 96913

RE: Draft Environmental Impact Assessment San Vitores Road Flood Mitigation Project

Hafa Adai Ms. Reyes,

Thank you for providing the Guam Coastal Management Program (GCMP) of Bureau of Statistics and Plans the draft Environmental Impact Assessment (EIA) with supporting documents for the San Vitores Road Flood Mitigation Project in Tumon submitted on February 26, 2015 by Stanley Consultants, Inc. for the Guam Economic Development Authority.

In accordance with the Coastal Zone Management Act of 1972 (US P.L. 92-583) as amended (P.L. 24-370), the Bureau's GCMP is responsible for conducting federal consistency review for federal agency activities, federal assistance to local governments, and activities requiring a federal license or permit in Guam.

From our discussions with GEDA, other Government of Guam agencies, and with Federal entities including NOAA and US Army Corps of Engineers, we have learned that the project is not funded by federal dollars and the project scope of work will not require a federal license or permit. With that, this proposed mitigation project is not subject to federal consistency review. In the event that the project specifications change requiring a federal permit or the project will consist of federal money to leverage the local cost, then you need to apply for federal consistency review.

Since the flooding in the Tumon area has been a major issue impacting the businesses and residents for many years, we are pleased that steps to mitigate this issue are finally moving forward. We highly recommend that the best management practices including effective maintenance are incorporated from the beginning of construction to a long term effective operational stormwater management system as the Tumon village is Guam's premier tourist spot

Draft EIA San Vitores Road Flood Mitigation Project
Page 2

and Tumon Bay is a protected Marine Preserve Area to fragile marine life. As government officials, it is our primary responsibility to ensure that the construction of infrastructures is in a manner designed to protect the public health, safety and to promote public welfare and convenience. It is the Bureau's intent to ensure maintaining a balance of development with environmentally prudent use of coastal resources for current and future generations.

Please note that our response does not preclude the need to secure locally required clearances, permits, waivers and approvals prior to the start of the project with Government of Guam agencies such as Guam Environmental Protection Agency, Department of Parks and Recreation's Historic Preservation Office, and Department of Land Management.

Should you have any questions regarding this letter, please contact myself, or Mr. Edwin Reyes, Coastal Program Administrator or Ms. Christine C. Fejeran, Planner at 475-9647 or email Edwin.reyes@bsp.guam.gov or Christine.camacho@bsp.guam.gov respectively.

Sincerely,



LORILEE T. CRISOSTOMO
Director

cc: GEPA
DoAg
DPR/GHPO
DLM
DPW
NOAA/A. Loerzel
OAG/J. Toft



GUAM ENVIRONMENTAL PROTECTION AGENCY

B-67

AHENSIAN PRUTEKSION LINA'LA GUAHAN

EDDIE BAZA CALVO
GOVERNOR OF GUAM

RAY TENORIO
LT. GOVERNOR OF GUAM

ERIC M. PALACIOS
ADMINISTRATOR

YVETTE CRUZ
DEPUTY ADMINISTRATOR

P.O. BOX 22439 BARRIGADA, GU 96921

EPA.GUAM.GOV

APR 21 2015

Mr. Craig Johnson
Stanley Consultants Inc.

Ref: San Vitores Road Flood Mitigation Project

Hafa Adai Mr, Johnson

Guam EPA staff reviewed your design submittal of the above reference project and hereby provides you the following comments and recommendation;

I. General

1. The discussion points during the coordination meeting held at GEPA office on March 24, 2015 as an attachment of this letter is an integral part of GEPA's comments and recommendation.
2. Improve the outlet structure cofferdam to reduce run-off velocity to minimize soil erosion at receiving sandy area.
3. The TMDL for bacteria should include the potential sources of contamination and address corrective measures to prevent contamination.
4. The impact of fresh water inflow to coral reef must be investigated and address in the EIA. Include in the design of the outfall any measures necessary to minimize impact to coral reef at the receiving water.

II. Existing and New Utilities

1. Include in the design of the new storm drainage system to contain storm water run-off of the existing storm drainage system that will be remove and/or abandoned along Fujita Road.
2. All existing sewer laterals that are affected by removal of sewer lines along Fujita road must be verified to insure laterals are within invert elevation of the new sewer line.
3. All existing water service lines and meters that are affected by the removal of waterlines along Fujita road must be verified.
4. All existing water lines, sewer lines and appurtenances to be remove/abandoned must be identified to insure that proper removal is applied. If Asbestos Pipes are encountered, an abatement plan must be submitted to Guam EPA for approval prior to removal. This requirement must be incorporated in the technical specification.

III. Certification Requirements

1. A certified Wastewater Collection Level II operator is required to supervise the removal of the existing pipes and during the tapping of the existing to the new sewer lines.
2. A certified Water Distribution Level II operator is required to supervised the disinfection and swabbing during the tapping of the new water system and appurtenances to the existing water main.
3. Include in your specs the requirements of disinfection method and procedure for the new water lines and method of cleaning and removal of the existing sewer and water lines.

IV. Basis of Design and Hydraulic Design Calculation

1. Submit the Basis of Design and Hydraulic Calculation for review and comment.
2. Submit the Hydraulic Design Criteria.

V. Water Quality

1. Submit copy of water quality analysis taken at the existing Fujita Pond. Historical data of the water quality of the pond must be use for reference when evaluating the water quality.

VI. Others

1. Submit a technical specification during the design phase for review by this Agency.

Should you have questions and need additional information please contact at 300-4796.

Si Yu'os Ma'ase,



ANGEL B. MARQUEZ
Acting Chief Engineer

CC: Shannon Cauley, EA
Attachment



MEETING NOTES

No.

Date: 03/24/15

Place: Guam EPA

Project/Purpose: San Vitores Road Flood Mitigation Project

Attendees: Angel Marquez - GEPA
 Jesse Cruz - GEPA
 Ray Calvo - GEPA
 Edgardo Ibay - GEPA
 Shannon Cauley - EA
 Craig Johnson - Stanley
 Andrew Judd – Stanley
 Aja Reyes – Stanley via teleconference

Notes By: Andrew Judd

The following meeting notes set forth our understanding of the discussions and decisions made at this meeting. If no objections, questions, additions, or comments are received within 5 working days from issuance of the meeting notes, we will assume that our understandings are correct. We are proceeding based on the contents of these meeting notes.

An overview of the status of the San Vitores Road Flood project was given by Stanley Consultants. A draft design submittal was recently provided to agencies and stakeholders as a step toward regulatory approval. The purpose of the meeting was to present major design elements of the project and discuss Guam EPA comments. A summary of discussion points is provided by the following:

- GEPA requested discussion on the Tumon Bay TMDL for bacteria in the EIA. Tumon Bay is currently impaired for bacteria and the EIA should include discussion of this. Stanley/EA agreed the EIA should be revised.
 - GEPA commented that when the MS-4 being developed by DPW is approved/adopted, this outfall will fall under its jurisdiction.
 - GEPA requested that the potential impact on coral and a discussion of freshwater inflow volume to the bay should be included in the EIA. Stanley/EA to include.
 - GEPA requested that GWA be included in discussion of an operation and maintenance plan for the plan. Specifically GEPA would like GWA to develop an emergency plan for pump station failure.
 - GEPA requested that a division of operation/maintenance responsibility be defined for the proposed system. Stanley indicated that this is currently being reviewed by GEDA.
 - Monitoring of the pond water quality was discussed. Stanley/EA had collected and tested water quality samples of the pond during wet and dry periods last January. Both GEPA and Stanley/EA agreed water quality monitoring similarly timed with beach monitoring may be beneficial for monitoring bacteria in pond and bay.
 - Stanley's hydrologic design/analysis criteria were discussed. GEPA to review the Task 1 report included as an appendix to the EIA and contact Stanley with additional questions.
 - GEPA requested a full-scale drawing set. Stanley to provide.
 - GEPA is currently assembling comments and will provide to Stanley.
-

Distribution:
 Attendees, GEDA



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
 Pacific Islands Regional Office
 1845 Wasp Blvd., Bldg 176
 Honolulu, Hawaii 96818
 (808) 725-5000 • Fax: (808) 973-2941

Mr. John Rios
 Administrator
 Guam Economic Development Authority
 590 S. Marine Corps Dr.
 ITC Building Suite 511
 Tamuning, GU 96913

April 17, 2015

Dear Mr. Rios:

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) has reviewed the Draft Environmental Impact Assessment for the San Vitores Road Flood Mitigation Project prepared for the Guam Economic Development Authority's (GEDA) Program Management Office. We appreciate the opportunity to provide the following comments in accordance with the Essential Fish Habitat (EFH) provision §305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 USC §1855).

The proposed action includes the construction of a culvert overflow system consisting of a labyrinth weir at its upstream end at Fujita Pond, two 8-foot wide by 3-foot high box culverts running side-by-side underneath Fujita Road and an outlet structure located at the end of Fujita Road, adjacent to Tumon Bay. The outfall structure will include wing walls on either side of the outlet will expand the flow to provide shallower discharge depths and help slow the discharge velocity onto the beach at the end of Fujita Road. The proposed action also includes removal of the buried stormwater infiltration chambers and the widening of Fujita Pond on its eastern side and the addition of approximately 25 inlet structures within the drainage area of Fujita Pond to improve the conveyance of stormwater to the pond during storm events.

The impacts from the proposed project can be divided into two categories: construction and implementation phases. The construction phase includes the modification of the Fujita pond, installation of additional curb inlets, installation of the culverts, paving of Fujita Road, and the construction of the discharge outlet. Once the project is complete, the implementation phase, the project will discharge stormwater directly onto the beach into Tumon Bay Marine Preserve.

NMFS appreciates the efforts to consult with us early on this project, however, consultation occurred after key decisions were made that could minimize the impact of this project on EFH. We determine



that adverse effects to EFH will occur should any of the three alternatives evaluated in the Draft EIA be implemented. As such, we offer the following comments in accordance with the EFH provision of the MSA (50 C.F.R. § 600.905 – 930).

Magnuson-Stevens Act

Pursuant to the MSA, the Secretary of Commerce, through NMFS, is responsible for the conservation and management of fishery resources found off the coasts of the United States. *See* 16 U.S.C. 1801 *et seq.* Section 1855(b)(2) of the MSA requires federal agencies to consult with NMFS, with respect to “any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act.” The statute defines EFH as “those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity.” 16 U.S.C. 1802(10). Adverse effects on EFH are defined further as “any impact that reduces the quality and/or quantity of EFH,” and may include “site-specific or habitat-wide impacts, including individual, cumulative or synergistic consequences of actions.” 50 C.F.R. § 600.810(a). The consultation process allows NMFS to make a determination of the project’s effects on EFH and provide Conservation Recommendations to the lead agency on actions that would adversely affect such habitat. *See* 16 U.S.C. 1855(b)(4)(A).

Essential Fish Habitat

The marine water column and seafloor in Tumon Bay are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council’s Pelagic and Mariana Archipelago Fishery Ecosystem Plans (FEPs). The MUS and life stages found in these waters include: eggs, larvae, juveniles and adults of Coral Reef Ecosystem MUS (CREMUS) and eggs, larvae, juveniles and adults of Crustacean MUS (CMUS). In addition, eggs and larvae of the Pelagic and Bottomfish MUS may also be found in the nearshore waters within the Bay.

Tumon Bay was designated as a territorial Marine Preserve in 1997 and enforced beginning in 2001. The bay was selected as a preserve due to the juvenile CREMUS fish habitat along the reef flat and spawning aggregation sites for CREMUS species along the fore reef. This area serves as an important nursery and spawning grounds for a variety of species and exhibits a high level of abundance and biodiversity for fish and invertebrate species. The marine preserves have some of the most intact coral reef assemblages in Guam’s waters. These areas are key to maintaining and restoring Guam’s reef fish stocks.

Reef Flat

The area adjacent to the proposed outlet was surveyed in 1977 and 1991 (Amesbury et al 1993).¹ During these surveys University of Guam Marine Laboratory faculty characterized the habitat types of Tumon Bay at Fujita Road as:

1. Inner Reef Flat Sand Subzone (0-127 m from shore)

¹ Amesbury, S.S., R.T. Tsuda, R.H. Randall, A.M. Kerr, & B.D. Smith. 1993. Biological communities in Tumon Bay, 1977–1991. 111 pages.

2. Inner Reef Flat Scattered Coral Subzone (127 – 202m)
3. Inner Reef Flat Coral Subzone (202-427m)
4. Outer Reef Flat Zone (427 -500m)

The Fujita road transect had the highest diversity of corals of the three transects surveyed in Tumon Bay in both 1977 and 1991. This area also had the shortest sand subzone with corals starting just 127 meters from shore. A number of the corals species found in these zones, provide important habitat structure for juvenile and adult CREMUS. Some of these corals, such as staghorn *Acropora* species, are particularly susceptible to climate change impacts, such as coral bleaching events caused by elevated sea surface temperatures.

Reef Margin and Reef Slope

The Reef Margin and shallow Reef Slope have the highest coral diversity within the Bay. These areas serve as important habitat for a number of CREMUS and CMUS. The corals in these zones are particularly susceptible to climate change impacts, such as coral bleaching events caused by elevated sea surface temperatures.

The habitat forming species in this zone may include the Endangered Species Act (ESA) listed coral *Acropora globiceps*. The 1991 study documents the presence of *Acropora humilis* which until recently was used to describe both *A. humilis* and *A. globiceps*. *Acropora globiceps* has been documented along a number of shallow reef margins and reef slopes around the island and may be present in Tumon Bay as well. We recommend that you consult with the NOAA Fisheries Protected Resources Division to determine if any permits or surveys are required to address the threat to these resources. You may contact Donald.Hubner@noaa.gov for more information.

Stormwater Impacts

The Government of Guam has worked diligently to improve water quality in Tumon Bay and other areas around the Island by reducing stormwater discharges into the bay. Even small amounts of nutrients carried by stormwater can have serious impacts on water quality as algae quickly convert these nutrients into plant biomass. Due to the close proximity of corals to the proposed outlet, water quality impacts in this area may have significant adverse effects on both coral diversity and cover in Tumon Bay, particularly as this area has limited water circulation and a history of dinoflagellate blooms (Matson 1991).² Freshwater input alone from the proposed outfall could have significant impacts on corals, resulting in bleaching or mortality from reduced salinity, particularly if the discharge occurs during low tide³⁴. Freshwater and pollutants associated with stormwater may also decrease these species' growth rates, reproduction, and resistance to disease and bleaching. This in turn can cause shifts in coral cover and community structure.⁵

² Matson, E.A. 1991. Water chemistry and hydrology of the "Blood of San Vitores", a Micronesian red tide. *Micronesica* 24:95–108.

³ Jokiell, P. L., et al. "Ecological impact of a fresh-water "reef kill" in Kaneohe Bay, Oahu, Hawaii." *Coral Reefs* 12.3-4 (1993): 177-184.

⁴ Brent Tibbatts, Val Brown, Jason Biggs (personal communications regarding Pago Bay)

⁵ Fabricius, Katharina E. "Effects of terrestrial runoff on the ecology of corals and coral reefs: review and synthesis." *Marine pollution bulletin* 50.2 (2005): 125-146.

The nutrients, bacteria, sediment, and other pollutants contained in stormwater will have additional impacts on the coral reef ecosystem, exacerbating algal blooms and coral disease outbreaks, as well as impacting the health of human users of the bay. The DEIA notes that water samples from the Fujita Pond had Enterococci Bacteria (EC) levels up to 2,420 Most Probable Number (MPN)/100 ml. The water quality standard for Tumon Bay is 104 MPN/100ml for a single sample and 35 MPN/100ml for five sequential samples. The “pre-treatment” provided by the settling pond will not reduce EC levels, pollutants, nutrients, or fine sediment in the stormwater. This can result in algae blooms along the shoreline and on reef flats (predominantly Enteromorpha and Boodlea) and may also increase the presence of dinoflagellates commonly referred to as the “Blood of San Vitores”. In high densities dinoflagellates can cause skin and eye irritation in humans and may have impacts on reef fish and other marine organisms as well.

The Coral Reef Economic Valuation Study conducted in 2004-2005⁶ found that Guam’s reefs were worth \$127 million to Guam’s economy each year. Much of this value is attributed to the value that the over one million tourist visiting Guam place on the reefs, beaches and clear water available in Guam, as well as fishing, coastal protection, and research values. Tumon Bay harbors one of the most valuable reefs from an economic perspective due to its close proximity to the hotels and other tourism attractions in Tumon as well as fishing access at sites such as Fujita Road. The impacts from a point discharge of stormwater into the bay will threaten these important economic benefits.

Beach Erosion

The project will cause erosion on the beach between the outfall structure and the water. The level of erosion may be significant, and according to Stanley Consultants staff, will require repair after each major overflow event. The DEIA does not identify the extent of this beach erosion or how it will be repaired. This would likely require heavy equipment on the beach, and possibly movement of sand in both the nearshore and intertidal areas. This would likely lead to additional impacts on EFH in Tumon Bay.

Cumulative Impacts

The cumulative impacts analysis in the DEIA does not fully evaluate the potential impacts of private construction such as the Dusit Thani hotel and other potential projects within the catchment. It also fails to assess the potential impacts of projected increases in rainfall associated with global climate change that could exacerbate the impacts of the proposed outfall, and the projected increases in sea level that may impact the outfall’s ability to function as designed. Further, the analysis did not consider the impacts of ocean acidification, including recent research that found corals exposed to high nutrients and acidic conditions experience significantly higher rates of macrobioerosion.⁷

EFH Conservation Recommendations

⁶ van Beukering, P., W. Haider, M. Longland, H. Cesar, J. Sablan, S. Shjegstad, B. Beardmore, Y. Liu, & G.O. Garces. 2007. *The Economic Value of Guam's Coral Reefs*. xviii + 102 pages.

⁷ DeCarlo, Thomas M., et al. "Coral macrobioerosion is accelerated by ocean acidification and nutrients." *Geology* 43.1 (2015): 7-10.

NMFS PIRO finds that this action **Would Adversely Affect EFH**. Both the construction and implementation phases of this project will result in water quality impacts which are likely to adversely affect habitat for MUS in Tumon Bay and adjacent waters.

NMFS PIRO recommends that GEDA and its contractors consider the following Conservation Recommendations for the San Vitores Flood Mitigation Project to ensure that these impacts to coral reef resources and EFH are avoided, minimized and offset:

1. Discharge of stormwater into Tumon Bay Marine Preserve should be avoided to the fullest extent practicable. GEDA should re-evaluate other options to include, but not limited to:
 - a. Seek additional funding to expand the Fujita Pond to a sufficient size to handle the stormwater. Initial report from Stanley Consultants suggested that this was a practical alternative, but slightly outside of the allotted budget.
 - b. Fund Low Impact Design retrofits to existing developments throughout the Fujita Pond catchment area to reduce the amount of stormwater reaching the Fujita Pond. This could include installing rain gardens, water catchment systems for irrigation, small infiltration chambers or settling ponds on private properties.
 - c. Provide assistance to landowners with existing stormwater systems that are not being properly maintained.
2. GEDA should analyze the long term maintenance requirements for this project and potential environmental impacts associated with maintenance. At a minimum, GEDA should develop a maintenance plan that outlines the maintenance required including the cost of maintenance and the permits necessary to repair damage to the beach in the intertidal zone. Please note that these activities are likely to trigger a number of local and federal environmental permits as they will take place within the intertidal zone and the boundary of the Marine Preserve. The plan should clearly identify the agency or organization responsible for maintenance of the system and ensure that there is sufficient funding to maintain it over its expected lifespan.
3. If the preferred alternative is implemented, include additional features in the final design to slow the velocity of water exiting the culverts onto the beach to avoid and minimize beach erosion. The planters may serve to increase velocity by channelizing the flow rather than slowing it. Vegetation such as beach morning glory (*Ipomoea*) or other plants, may provide a buffer between the outflow and the bay.
4. If GEDA moves forward with the preferred alternative, GEDA should ensure that the contractors implement measures to avoid potential impacts associated with construction activities:
 - a. Implement appropriate sediment control BMPs during shoreside work to ensure that sedimentation is avoided and the debris are not allowed to fall in the water. Water displaced by the construction of the outflow should not be directly discharged into marine waters.

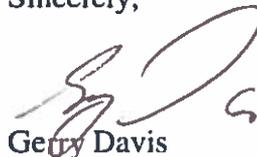
- b. Cease any activities that may result in sediment/pollutant discharges during the primary hard coral spawning events each year. The applicant may contact NMFS PIRO HCD Guam Field Office for more information including spawning dates.
 - c. Develop and implement a stormwater management plan to avoid all freshwater discharges and potential sediment and pollutant transport into the waters of the Tumon Bay during construction.
5. Due to the unavoidable impacts to EFH associated with the construction and implementation phases of this project, GEDA should fund projects to mitigate the loss of this ecological function. Should GEDA decide to pursue the preferred alternative described in the DEIA, NMFS can provide guidance on assessing impacts and scaling potential mitigation options to offset this loss.

Conclusion

In conclusion, NMFS determines that adverse affect to EFH will occur as a result of this project. We strongly encourage GEDA to consider other options to address the stormwater impacts discussed in the DEIA. We have offered conservation recommendations that may minimize the effects of the proposed project, but they will not prevent impacts to EFH and other marine resources. The information provided in the DEIA suggests that there will be significant impacts to marine resources, particularly EFH, associated with this action as currently described.

We greatly appreciate the opportunity to review and comment on this project. Should you have any questions, comments, or require additional technical assistance, please contact Valerie Brown in our Guam Field Office valerie.brown@noaa.gov or 671-646-1904.

Sincerely,



Gerry Davis
Assistant Regional Administrator
Habitat Conservation Division

cc by e-mail:

Aja Reyes, Stanley Consultants
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United States Department of the Interior



B-76

FISH AND WILDLIFE SERVICE
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In Reply Refer To:
01EPIF00-2015-CPA-0035

JUN 09 2015

Shannon Cauley
EA Engineering, Science, and Technology, Inc.
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Barrigada, Guam 96913

Subject: Comments on the Draft Environmental Impact Assessment for the Proposed San Vitores Road Flood Mitigation Project, Guam

Dear Mr. Cauley:

The U.S. Fish and Wildlife Service (Service) has received the Draft Environmental Impact Assessment (EIA) dated February 2015. The Draft EIA briefly describes a number of alternatives that were evaluated and then dismissed due to feasibility and budget. The focus of the document is on the preferred alternative, which includes the expansion of the Fujita Ponding Basin (or Fujita Pond) on San Vitores Road, and the construction of a gravity-based culvert with an outlet above the mean high-tide mark at Fujita Beach in Tumon Bay. As requested in your February 18, 2015, letter, we have reviewed the Draft EIA and provide our comments, pursuant to the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq.*), as amended, and the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), for your consideration.

Project description

The alternative described in the Draft EIA includes the construction of a culvert overflow system consisting of a labyrinth weir overflow structure in the northwest corner of the pond, and two box culverts that will run under Fujita Road and outlet onto Fujita Beach, at the end of Fujita Road. Plans will also include the possible expansion of Fujita Pond to the north and east of the existing pond, depending on agreement from the adjacent landowner. The labyrinth weir is a top discharge feature, so water within Fujita Pond will need to rise approximately 3 feet to start overtopping it and flowing into the culverts. The box culverts will be 8-feet wide by 3-feet high, and will run side-by-side under Fujita Road. The culvert outlet structure includes a viewing plaza and access path.

Mariana common moorhen

The federally endangered Mariana common moorhen (*Gallinula chloropus guami*) (moorhen) is recorded from the project site. The moorhen was listed as endangered by the Service in 1984 (USFWS 1984) and occurs in Guam, Tinian, Rota, and Saipan. Moorhens occur primarily at

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freshwater natural and artificially-created wetlands that are both seasonal and permanent. Occasionally, they are recorded in brackish water wetlands. Wetlands that support about equal amounts of emergent, submergent, and/or floating vegetation and open water are more suitable to moorhens than wetlands that are predominantly open water or that support mostly emergent wetland vegetation. In the Marianas, moorhens have been recorded not just at natural wetlands, but also at golf course wetlands, commercial fish ponds, sewage treatment plants, and wetlands created for the mitigation of wetland loss. Fena Reservoir in southern Guam historically provided habitat for majority of moorhens in Guam, but the population at the reservoir has declined in recent years (USFWS 1992, Takano and Haig 2004, U.S. Navy, unpublished data).

Moorhens are recorded regularly at Fujita Pond, within the proposed project site. In 2012, an adult and three chicks were recorded by Department of Agriculture Division of Aquatic and Wildlife Resources (DAWR) (pers. comm. B. Tibbatts, 2015, DAWR). Since then, at least one record of a breeding pair, and numerous sightings of individual adults have been recorded throughout the year in Fujita Pond (pers. comm. B. Tibbatts, 2015, DAWR). In addition, your contractors recorded one moorhen during a site visit for the Draft EIA on December 8, 2014. The Service recommends consulting with us, under section 10 of the ESA, to avoid or minimize impacts to moorhens at your project site. We recommend considering the following measures, which, upon consultation with our agency under the ESA, can be refined and incorporated into your final project:

1. A qualified biologist should survey the project site daily, prior to conducting work, to determine if ESA-listed species are in the area.
2. Work should be postponed or halted if ESA-listed species are observed within the project area and will only resume after the animal has voluntarily departed the area.
3. All on-site personnel should receive instruction regarding ESA-listed species and what to do when listed species are present within the project area.
4. A litter control program should be implemented at the project site. All equipment, materials, debris, and vegetation clippings should be removed upon completion of work.
5. Margins of the ponding basin should be regularly maintained by removing vegetation when moorhens are not present, to prevent recolonization of the area by moorhens.
6. For the long-term maintenance of the project site, the above listed conservation measures should continue to be implemented.

Migratory birds

The Service has the statutory authority and responsibility for enforcing the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-711) and is the lead Federal agency for managing and conserving migratory birds in the U.S. and its territories. Migratory birds, including the white tern (*Gygis alba*), yellow bittern (*Ixobrychus sinensis*), and Pacific reef heron (*Egretta sacra*) have been recorded within or near the project area. According to the Draft EIA, if active bird nests are found in close proximity to the project site during construction activities, actions will be

Mr. Shannon Cauley

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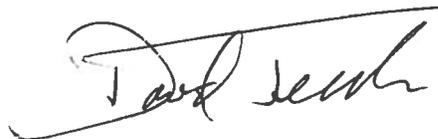
taken to avoid adverse effects to the nest in compliance with the MBTA. The Service recommends ensuring migratory birds are not within the project area during construction and maintenance, and that measures are taken to avoid any impacts to migratory birds, especially if nesting is detected.

Marine communities

In addition to concerns about federally protected species in the area, the project raises concerns about impacts to water quality and marine habitats in Tumon Bay. Diverting overflow stormwater into Tumon Bay, through the proposed culvert system, will release of fresh water and pollutants into Tumon Bay, a territorially designated Marine Preserve. This can cause harmful algal blooms and detrimental effects to coral reef communities and fish populations. The Service recommends investigating alternatives that would minimize impacts to the protected marine communities in Tumon Bay. The Service also recommends consulting with DAWR and Guam Environmental Protection Agency on the project's potential impacts to the marine community.

We appreciate the opportunity to provide comments on the Draft EIA for the proposed San Vitores Road Flood Mitigation Project. If you have questions regarding these comments, please contact Leilani Takano, Fish and Wildlife Biologist (phone: 671-989-6745, email: leilani_takano@fws.gov) or Ann Marie Gawel, Fish and Wildlife Biologist (phone: 671-989-6746, email: annmarie_gawel@fws.gov).

Sincerely,

 DAVID TESSLER, ACTING

Kristi Young
Acting Field Supervisor

cc:

Celestino Aguon, Guam Department of Agriculture, DAWR

John Rios, Guam Economic Development Agency

Eric M. Palacios, Guam Environmental Protection Agency

Mr. Shannon Cauley

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Literature cited

Takano, L.L. and S. Haig. 2004. Distribution and abundance of the Mariana subspecies of the common moorhen. *Waterbirds* 27: 245-250.

U.S. Fish and Wildlife Service [USFWS]. 1984. Endangered and threatened wildlife and plants: determination of endangered status for seven birds and two bats of Guam and the Northern Mariana Islands. CFR Part 17. Federal Register 49 (167): 33881-33885.

USFWS. 1992. Recovery Plan for the Mariana Common Moorhen (= Gallinule), *Gallinula chloropus guami*. U.S. Fish and Wildlife Service, Portland, Oregon. 55 pp.

Personal communication

Tibbatts, B. 2015. Biologist, Guam Department of Agriculture, Division of Aquatic and Wildlife Resources. Electronic mail correspondence June 4, 2015 regarding moorhen sightings.