Summary of the Guam Nonpoint Source Pollution Management Plan

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Nonpoint source pollution is....

pollution from human activities

small scale

mostly unnoticeable by itself

harmful mostly when it accumulates

manageable

capable of ruining our economy

inexpensive to manage

prevented with good housekeeping

easy to understand

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Introduction

As a Government of Guam decision maker, you understand the various pressures that can be placed on the island, its people, and its resources. This document will explain how one of the major by-products of our rapid growth--an issue with significant consequences to our economy and way of life--can and is being anticipated, planned for, and managed.

Nonpoint pollutants are very ordinary. Unlike leaking chemical drums, fuel tanks, failed sewage outfalls, or industrial plant discharges, nonpoint pollutants are the result of every day human activity. Parking your car, walking your pets, or building an addition to your house can free some very benign pollutants so they can be transported by storm water into our coastal waters, where they add up to a major cause of damage to our reefs and marine life. By contaminating the water in this way, we risk the loss one of our major tourism assets.

Note that the problem of nonpoint pollution has several elements. The pollutants, such as soil, bacteria, viruses, nutrients, pesticides, chemicals, fuels, and the like, are one part. Another is the storm water flowing across Guam. Storm water collects and carries these pollutants to Guam's coast, where these polluted waters mix untreated into coastal waters. The impact of these pollutants is significant. The soil collected by a single storm results in a thick layer of sediment covering our reefs, sealing oxygen and sunlight out. This results in the suffocation of coral and other marine organisms, and reduces the food supply, and indirectly, the fish populations in our coastal areas.

Perhaps we can put some perspective on the severity of the problem. If each residence on Guam were to lose two tablespoons of soil, about an ounce in a storm event, then we can expect one ton of soil to be accumulated on the reefs. If we consider that many sites on Guam contribute much more than an ounce of soil--in fact, there are sites contributing over 160 tons of soil per year-- we can see that each year we collectively allow the equivalent of many truck loads of irreplaceable soil to migrate to the reefs, where it can no longer benefit us, and indeed causes us harm. When you see a plume of soil entering our coastal waters from a storm drain, you are seeing a concentrated pollutant.

And soil is not the only problem. Storm water acts to carry chemicals of all types, including pesticides and fuels, into our waters. These we tend to accept as pollutants with immediate potential for harm. Storm water is untreated, so a large part of the bacteria and virus content of our coastal waters comes from these pathogens carried from the land.

Let's review some important points:

- Nonpoint pollutants come from everyday activities.

- Nonpoint pollutants move to our waters through the action of storm water.

- Nonpoint pollutants are rarely harmful on individual sites; only when they move to a common gathering point and concentrate are their impacts obvious.

Nonpoint pollutants can be managed in two ways: control of the contributions, and management of storm water. Control of fuels, pesticides and fertilizers, maintenance of individual wastewater treatment systems, and management of construction and marina activities would keep the pollutants in one place, and preferably entirely out of the environment. Properly planned development, performance standards for developers, and storm water management activities by individual land owners take away the "legs" that carry the pollutants to the coast. Erosion control practices provide both effects. Good erosion control practices cut down pollutants by retaining soil and extracting pollutants from storm water, as well as slowing flow rates and increasing the amount of filtered storm water that gets absorbed into the ground.

The **Guam Nonpoint Source Pollution Management Plan** is a major effort to coordinate and consolidate the regulatory and legislative management of nonpoint source pollution for Guam. Existing management practices and measures were located in our current laws, rules, and regulations. Gaps in coverage were compared to proposed regulations, notably the I Tano'ta Land Use Plan's performance standards, and recommendations were made for administrative changes and possible additional rule making. Where possible, realizing potential for coordinated effort was considered a priority. By harmonizing and consolidating these management requirements, the public receives a direct benefit in the form of simpler regulatory dealings, and the indirectly delivered benefits of a healthy environment for themselves, their children, and their children's children.

Executive Summary

This document describes the **Guam Nonpoint Source Pollution Management Plan**. This plan coordinates existing legislation, regulations, and programs to ensure that nonpoint pollution is managed effectively. Nonpoint pollutants are those pollutants delivered to coastal waters by the movement of storm water across the island. In moving across the island, storm water will pick up soil, chemicals, petroleum products, bacteria, and nutrients, which are deposited in coastal, surface, and ground water. These depositions are harmful because of the damage they cause when accumulated. Individual contributions of these pollutants appear to be insignificant, but when the total of the contributions made by individuals in the course of daily living activities is considered, the impact is significantly negative.

These pollutants pose a recognized risk to the health, economy, and environment of Guam, and **the Guam Nonpoint Source Pollution Management Plan** was developed to address these risks in response to requirements of §6217 of the **Coastal Zone Act Reauthorization Amendments** of 1990 (**CZARA**). In this plan, the **Guam Environmental Protection Agency**, the lead water quality agency for the Territory of Guam, and the **Guam Coastal Management Program, Bureau of Planning** have evaluated the major categories of nonpoint pollutants and have recommended practices that are suited to Guam's unique character. These practices will implement most of the management measures specified in the document ***Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters***. This document, mandated by §6217(g) of **CZARA**, defined the problems to be managed and a universe of practices that supported measures for managing these problems.

The Plan document addresses Guam's NPS problems, and exemptions were requested from requirements for managing forestry, grazing areas, and erosion from recreational boating activities.

With most of the management practices it can be seen that the existing body of laws, rules and regulations provide legally enforceable mechanisms for managing nonpoint pollutants. Some new laws may be required, but many changes will be minor and simple. Where possible, individual burdens will be limited to the introduction of good housekeeping practices into existing activities and permit requirements. In the case of development, performance standards shall be developed that reflect Guam's commitment to preservation of water quality while not unduly hindering growth.

The result of implementing this plan will be a more coordinated effort at reducing these pollutants and preservation of the coastal waters which are the center of Guam's culture and economy.

The Problem of Nonpoint Pollution

Significant coastal degradation issues.

Sedimentation: Significant sediment plumes are seen during every storm event. Sediment has been cited as a major cause of decreased spawning of corals.

Pathogens: While bacteria counts have been decreasing, there is still evidence of bacterial contamination, including contamination sufficient to merit the closure of beaches for recreational purposes.

Pesticides: Research conducted by the University of Guam Marine Laboratory cites the sensitivity of coral to spawning cues as being impaired by low levels of pesticides in coastal waters.

Nutrients: Increasing algal activity is serving as an indicator of increased nutrients in the water.

Generators of Nonpoint Pollutants

Soil: Soil is the most common of the nonpoint pollutants. Losses due to erosion are estimated at up to 160 tons per acre per year in some areas, and even greater concentrations from some watersheds in Southern Guam. In an undeveloped area, the soil is normally held in place by native vegetation, which provides both physical anchorage and protection from rain fall. Where the natural protective cover is removed, the soil is subject to the full force of direct rain fall, and the undamped movement of storm water runoff across the soil. Soil is virtually irreplaceable, and the clayey soils of Guam tend to be fragile and easily eroded.

The natural protective cover for soil can be damaged or lost through cleaning and grading related to development. Changes to our current erosion and sediment control regulations to require more effective control practices will be needed. Equally important is the construction and post construction control of storm water.

With the expansion of large scale development, the increase in paved land (impervious surface) significantly alters the concentration, flow and power of storm water runoff, thereby greatly increasing the effects of soil "stripping" of the land. This effect is easily seen in the brown plumes washing onto our reefs with each storm. These are the visible impacts of poor development practices. It is impractical to ignore the disposal of storm water, particularly in highly urban settings, therefore performance of storm water management by developers is to be addressed in some of the standards to be implemented or improved under this plan.

Pathogens: Pathogens are disease organisms. Storm water is not treated as it is introduced into our coastal waters, therefore most of the disease organisms found in these waters originated on land. Pathogens are introduced into storm water as the animal waste and carcasses, septic and sewer system leakage, and other contaminated organic waste picked up in the storm water flow.

A common source of animal waste which is controllable results from not cleaning up after pets eliminate in the yard. Leaking septic systems will fill with storm water and overflow with a mix of sewage and storm water, which is then carried off. Animal carcasses, soiled diapers, and improperly disposed food wastes also contribute to the illness-producing bacteria and virus content of storm water.

Pesticides: Pesticides also get accumulated in storm water, and as they for the most part are intended to resist some deterioration by water, they often make the journey into coastal waters intact. While large operations, such as farms and golf courses, would appear to be the largest contributors to these pollutants, in fact, there are many small users of pesticides, unregulated for the most part, on construction sites, residential yards, and small businesses. These also are harmful in their aggregate effect. Existing pesticide management laws do control most legally applied pesticides in larger operations, but the use, storage, and disposal of smaller quantities of pesticides contribute to polluted water significantly. Here, the major control factor for this problem would be increased public education.

Nutrients: Nutrients were perhaps the first nonpoint pollutant to attract the interest of the general public throughout the nation. The increase in unsightly and malodorous algae, especially when it coincided with peak rainfall periods, was something that people could comprehend easily. Nutrients were coming from not only sewage, but also storm-delivered animal waste, fertilizers, septic system failures, and other decomposing organic materials. Historically, farmers on Guam have not used much fertilizer, due to the expense, and have instead used animal manure. If applied in excess, there would be a good quantity of nutrient available for delivery downstream. With larger operators monitored for nutrient contribution as well, it is apparent that much of the excess nutrient being contributed to coastal waters is as a result of individual unawareness or housekeeping problems.

Expected results: In order to effectively deal with nonpoint pollution, the "Education-Engineering-Enforcement" triangle once again becomes the key to success, and that is what the Plan strives for.

Public education is necessary for long-term changes to poor habits or problem ignorance. The causes of nonpoint pollution and solutions are not obvious in many cases. In order to bring about a cooperative and supportive attitude in the public, education efforts need to highlight the chain of events that cause nonpoint pollution. An understanding of the hydrologic cycle, which is taught to the public as a part of water conservation, also applies to nonpoint pollution education.

Engineering, in the form of technical standards for storm water management, site erosion and sedimentation control, post-construction control of storm water and erosion, and pervious surface requirements, can be an important tool. In many cases, the costs of a project with proper controls will be the same or less than an project designed with no regard to environmental impact. Also, sites with proper and environmentally supportive designs are more attractive to investors, command prices that yield additional profits for the savvy developer, and are less likely to generate negative impacts on neighborhood property values.

Enforcement is important to protecting existing development, providing options for future generations, and maintaining good quality of life in the more densely urban environment to which Guam is moving. By ensuring that the law is followed in all phases of development, and the public is aware of the need for compliance, the unpleasant actions related to enforcement are kept to a minimum. Enforcement needs to be objective, fair, and fully supported by the community, for the community will suffer if violations are allowed to go unchallenged. With the economic well being of all of Guam being a primary issue, the social changes in response to urbanization of Guam need to be supported with fair, enforceable laws that protect the environmental progenitors of Guam's economic success.

Plan Design and Development

Design strategy and general approach. In general the Plan was developed with the goal of integrating and unifying existing policies, rules, and regulations and avoiding new bureaucracies. An effort was made to allow the necessary changes to occur at as low an administrative level as possible. For example, internal procedural changes were preferred over modifications to rules and regulations; legislative changes were avoided, where possible, to ensure that the public was not burdened with additional and overlapping laws.

New and revised agency regulations must be either approved by the Guam Legislature or allowed by the Legislature to take effect after an opportunity window for action by Legislature is allowed to close. The **Administrative Adjudication Law (5 GCA 9)**, as amended by **Public Law 22-96**, provides that agency rules must, after public hearings, be submitted to the Legislature in the form of a bill. Adoption of the rules must occur as the result of the approval by statute or, after the bill is accepted by the Legislature, a period of 45 calendar and 7 legislative days has elapsed with no action taken by the Legislature.

Note that this procedure is essentially similar to the law-making process, and allows agency rules to receive more scrutiny than laws if the public hearing process is instituted a second time by the legislature.

The Plan Development Process and Agency Comment. The document was prepared primarily by the Guam Coastal Management Program based upon the information provided by the GCMP networked agencies as participants in an NPS working group. Over a period of two years, Government of Guam agencies including the Department of Agriculture, Department of Public Works, Public Utility Agency of Guam, Guam Police Department, Port Authority of Guam, met with the Bureau of Planning and Guam Environmental Protection Agency for the purpose of information exchange and coordination of effort.

The agencies were also given a period to review the document and provide comments. Timely comments were received from the Guam Police Department. Comments received late, but in sufficient time to be absorbed into the document included oral comment by the **Guam Environmental Protection Agency** and short written comments from the **Public Utility Agency of Guam.**

Public Participation - Plan Development. Enabling the public to participate required early education efforts. Outreach was performed which included:

- Frequent radio appearances on talk programs, including joint appearances with **US EPA Region IX** NPS specialists.

- Informational articles in ***Land, Man, and Sea***, the public outreach publication of the **Guam Coastal Management Program**.

- Inclusion of NPS messages in other **Guam Coastal Management Program** products.

☺ Outreach to several of Guam's larger civil engineering firm, the Soil and Water Conservation Districts, schools, waste hauling contractors, and the military.

☺ Participation in two of the six subcommittees tasked with the drafting of the Guam Farm Bill.

Upon completion of the plan, a thirty day public comment period was opened. This period was announced with advertisements placed ten days and one day prior to the starting date of June 5, 1995 through July 7, 1995. The document was made available in both print and floppy disk form. Of the five requests received for the document, all were met.

Only one set of public comments was received, and one other recipient did acknowledge a desire to comment, but was unable to do so. All five recipients were involved with environmental consulting or civil engineering.

The USDA Natural Resources Conservation Service provided comments statements of concern that voluntary approaches were more appropriate and more workable. Other concerns were that the expertise does not exist within the farm community to allow farmers to develop their own conservation plans where appropriate.

At present, however, we are bound by the requirements of **§6217** to provide **enforceable policies and mechanisms**. While the **U. S. Environmental Protection Agency** and the **Office of Ocean and Coastal Resources Management, NOAA,** have stated that voluntary approaches may be tried and, if found effective, be substituted for enforceable, there have been no modifications to the basic law that support such a grant of permission.

The final comments from NRCS point to the core of the difficulty in §6217 implementation. Nonpoint sources are most compellingly a watershed issue. Watershed management is the topic of one Urban Management Measure. Realistically, it should be the underlying philosophy of the entire program. Prevention and voluntary coordinated effort, reinforced with flexible, properly enforced laws, would be the most reasoned and ultimately successful approach to managing nonpoint pollutants.

Plan Implementation

Applicability. The management practices and measures are applicable throughout Guam.

General Permission for Substitute Practices. The plan document was structured to include the original wording of the Management Measures as described in the ***Guidance Specifying Management Measures*** . . . , and the management practices that were deemed suitable for Guam. In some cases, the wording of the ***Guidance Specifying Management Measures*** . . . was ambiguous or inappropriate, and was edited. In this document, alternative management practices that are demonstrably equally effective may be substituted with the permission of the responsible agency. This permission applies to all of the practices in all categories, although this specific grant of authority may not appear in the appropriate section of the document.

Coordination Mechanisms. Necessary coordination is conducted through the approved Guam Coastal Management Program and executive orders establishing specific bodies such as the Development Review Committee. Memoranda of Understanding may be developed to deal with specific issues.

Modifications to enforceable. Upon the conditional approval of the plan, efforts will begin to bring about the planned changes to the enforceable mechanisms.