Section Five is divided into the following seven subsections:

- 5.1 IFR Requirement for Mitigation Strategy
- 5.2 Summary of the Risk and Capability Assessment
- 5.3 Analysis of Mitigation Strategy
- 5.4 Goals and Objectives
- 5.5 Identification of Mitigation Actions
- 5.6 Evaluation and Prioritization of Mitigation Actions
- 5.7 Implementation of Actions

5.1 IFR REQUIREMENT FOR MITIGATION STRATEGY

Section §201.4(c)(3) of the IFR states that "[to be effective, the plan must include] the State's blueprint for reducing the losses identified in the risk assessment."

The IFR includes three specific requirements that relate to the development of a Mitigation Strategy for the US Virgin Islands:

- **Hazard Mitigation Goals per Requirement §201.4(c)(3)(i):** "[The State shall include a] description of State goals to guide the selection of activities to mitigate and reduce potential losses."
- **Mitigation Actions** per **Requirement §201.4(c)(3)(iii): "**[State plans shall include an] identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy."
- **Funding Sources** per **Requirement §201.4(c)(3)(iv): "**[The State mitigation strategy shall include an] identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities."

5.2 SUMMARY OF THE RISK AND CAPABILITY ASSESSMENT

5.2.1 SUMMARY OF RISK ASSESSMENT

The overall risk assessment methodology utilized in this Plan Update is the same that as was utilized in the 2011 Plan. It is consistent with the process and steps presented in FEMA Publication 386-2, "State and Local Mitigation Planning How-To Guide, Understanding Your Risks—Identifying Hazards and Estimating Losses" (FEMA 2001) and utilizes a risk assessment methodology similar to HAZUS-MH.

The results of the hazard identification process and discussions with VITEMA, which held a series of meetings with the Island Hazard Mitigation Committees prior to the consultant team being contracted to develop the plan, indicated that there were not any new hazards that needed to be considered in this Plan Update. Therefore, the hazards addressed in the 2014 plan Update are the same that were addressed in the 2011 Plan. It should be noted that data sets for conducting vulnerability assessments for all of the hazards were not readily available (frequency of occurrence; magnitude and damages associated with historical events) so that the losses were estimated in a deterministic manner so as to arrive at the worst case scenario loss estimates for wildfire, landslide and drought.

Similar to the 2011 plan, the lack of accurate historical data prevented the CIPA consultant team from conducting a detailed and verifiable assessment for these hazards and necessitated using different estimation techniques. Hazard overlays were performed to identify the number of buildings in hazard susceptibility zones identified on newly created maps for these hazards. Hence, the vulnerability assessments for the new hazards provide only a rough estimate of the built environment that is exposed to these hazards.

A summary of the findings of the Risk Assessment for the 2014 Plan Update were presented to VITEMA at a meeting on May 13, 2014 and subsequently to the Island Hazard Mitigation Committees on May 13, 14, and 15, 2014. The risk assessment served as a foundation for the deliberations of the Committees in formulating a mitigation strategy for this Plan Update.

As a result of variation in values of Real Property over the past three years the Estimated Losses that would occur as a result of natural hazard events also fluctuated. To illustrate the impact that the reevaluation of the property values has upon the Loss Estimates the following matrix is provided. Table 5.1 demonstrates the differences in the Loss Estimates between the 2011 Plan and the 2014 Plan Update. A summary is provided for each major island in the Territory. The values presented in this matrix are painted in broad strokes with the intent to furnish a synopsis only of the changes in estimated losses included in this Plan Update.

TABLE 5.1 ***Hazard-by-Hazard Comparison of Loss Estimates of 2011 Plan and 2014 Plan Update***

	2011 Plan Update	2014 Plan Update	Difference (+ / -)
St. Thomas			
Drought	N/A	1.058M	1.058M
Earthquake	5.7B	6.4B	.7B
Riverine Flooding	1.1B	1.2B	419.1M
Coastal Flooding	203M	228M	25M
Hurricane	3.5B	3.9B	.4B
Rain-Induced Landslide	1.3B	1.9M	-1.2B
Tsunami	1.3B	1.5B	.2B
Wildfire	637M	.5M	-636M
St. Croix			
Drought	N/A	1.058M	1.058M
Earthquake	4.8B	4.9B	.1B
Riverine Flooding	818M	829M	11M
Coastal Flooding	92M	95M	3M
Hurricane	2.1B	2.2B	.1B
Rain-Induced Landslide	208M	20.9M	-187M
Tsunami	959M	984M	25M
Wildfire	146M	.5M	-145M
St. John			
Drought	N/A	1.058M	1.058M

Earthquake	562.4M	583M	21M
Riverine Flooding	65.3M	75M	9.7M
Coastal Flooding	71.5M	80M	8.5M
Hurricane	255.3M	269M	14M
Rain-Induced Landslide	123.2M	21M	-121M
Tsunami	144.7M	154.1M	6.4M
Wildfire	71M	.5M	-70M

The estimated losses presented above consider all vulnerable properties of the Territory, residential, commercial, and governmental critical facilities. The hazard mitigation strategy developed by the Island Mitigation Committees are congruent with the assessment of risk as detailed in Section Four of the this Plan Update. The Territorial Mitigation Strategy addresses the vulnerability of the building stock and critical facilities and infrastructure. The section of the Plan Update focuses on the potential risk of the Territory and presents a strategy for mitigating possible loss due to a hazard event as offered in the Risk Assessment providing a strong congruency between the two in this Plan Update.

5.2.2 CLIMATE CHANGE AND CLIMATE VARIABILITY

The implications of climate change variability on the small island states in the Caribbean will need to be thoroughly addressed in future Plan Updates. Some of those implications are discussed in a qualitative manner for specific hazards evaluated in Section 4 Risk Assessment. The challenge for the Territory is to integrate those findings into the hazard identification and risk assessment and make them relevant to the US Virgin Islands. Each island has its own climate, geology, topography, industries, and culture; particularly important are the differences between St. Thomas/St. John and the lower lying, less mountainous terrain on St. Croix. Still, some impacts of climate change could bring similar challenges to all three island communities of the USVI.

The vulnerability of the small island states in the Caribbean relate to their relative isolation, small land mass, concentrations of population and infrastructure in coastal areas and limited economic base with a reliance on tourism and natural resources. This vulnerability led to collaboration between regional academic and governmental institutions in 2004 with the creation of the Caribbean Community Climate Change (CCCCC) initiative. The research effort used global climate change models and down-scaled the analysis to create a regional climate change model for the Caribbean. The regional model (PRECIS) simulations suggest a significant reduction of mean annual rainfall (10 to 50 percent) by the end of the Century (Bulletin of the American Meteorological Society). Climate change will likely affect the availability of potable water on the Virgin Islands in the future. This finding will have implications not only for water availability but also to drought and wildfire hazards.

In the Caribbean, coral reefs provide annual benefits of more than $3 billon (USGCRP 2009). Coral reef systems already face serious impacts from sedimentation and water pollution; warmer, more acidic coastal waters would cause further stress to coral reefs. The loss and inundation of other coastal habitats from sea level rise and storm surge could endanger species that use these habitats for nesting, nursing, and feeding. Impacts to coastal resources would have serious implications to tourism, a key economic driver in the Virgin

Islands. An analysis of the need to address global warming predicted that the cost of not taking action would reduce the GDP 6.7 percent by 2025 and 14.2 percent by 2050 (Stockholm Environment Institue 2008).

The most recent report of the Intergovernmental Panel on Climate Change focuses on mitigation and adaptation strategies to reduce the impacts of climate change (IPCC 2014). While recent efforts in the USVI to increase the use of solar energy are a positive step in mitigation, as a small island state, adaptation to climate change variability is the only realistic path for the Territory. Clearly, the USVI Territory will need to incorporate climate change adaptation in its long range public policy, land use planning, and infrastructure capital projects. With respect to hazard mitigation planning, the Mitigation Strategy acknowledges the need to incorporate climate change variability at both a programmatic level and in developing island-specific mitigation actions going forward.

5.2.3 Summary of the Capability Assessment

Having experienced several devastating natural hazard events, the Government of the US Virgin Islands is cognizant of the magnitude of damage that can be inflicted on property and also the loss of life from natural hazards. It is, therefore, the desire of the Government and its agencies to prepare for, and mitigate, the potential damage that could be caused by these hazard events.

However, the Capability Assessment demonstrates that even though committed to hazard mitigation, the full implementation of the hazard mitigation strategy as presented in the 2011 Plan is not possible. Very few of the programmatic and island specific mitigation actions have been implemented over the past three years and a more realistic strategy will be required for the 2014 Plan Update.

Under the present and anticipated near term financial conditions for the US Virgin Islands Government, adequate operating budgets to implement hazard mitigation actions will be severely constrained. In the case of retrofitting critical facilities or undertaking structural mitigation projects, the financial reality over the next three years, implies a heavy reliance on Federal funding sources. VITEMA, DPNR and DPW are the key governmental agencies that have the primary responsibility for the implementation of Hazard Mitigation in the Territory. Each agency presently has numerous unfilled positions making full compliance with program mandates untenable. The lack of essential personnel and insufficient experience exacerbates compliance and enforcement of existing programs and regulatory requirements. Given the budgetary constraints of the Territorial government and the uncertainty of future general revenues, each of these agencies has a need for additional staffing to be able to address the range of goals, objectives and actions included in this Plan Update. In summary, both human resource capacity issues and limited funding for both programmatic and hazard mitigation projects over the next few years will severely constrain broad implementation of the Territorial hazard mitigation strategy.

Several important changes in FEMA's hazard mitigation guidance since the last Plan Update should be emphasized here, particularly given the uncertainty of future general revenues over the next 3 years:

- Implementing flood mitigation measures for severe repetitive loss properties would be funded by FEMA at 100 percent; and, funding for implementation of flood mitigation measures for repetitive loss properties would be funded at 90 percent. Prioritizing efforts to reduce repetitive losses should be emphasized wherever possible in the mitigation strategy.

- The Territory intends to request consideration from FEMA for the Advance Assistance option for expedited HMGP scoping and project development funding following a Presidential Declared Disaster. Staffing and capability issues anticipated in steady-state and immediately following

disaster events argue that utilizing a percentage of HMGP funding to quickly analyze the situation post-disaster, to obtain data to prioritize, select, and develop complete HMGP applications.

- VITEMA intends to take full advantage of the Five Percent Initiative, whereby FEMA is willing to reserve up to 5 percent of the total HMGP funds that can be used by the Grantee to pay for a range of activities that are difficult to evaluate against traditional cost effectiveness criteria. This option is very important to the Territory because of the problems associated with the lack of a historical database of disaster-related damages, necessary to effectively conduct benefit/cost analysis for hard mitigation actions.

- VITEMA will pursue all opportunities with FEMA where the cost share can be minimized or eliminated, including planning and hard mitigation projects, and where the cost share could possibly be waived or justification provided as an extraordinary circumstances.

5.3 ANALYSIS OF MITIGATION STRATEGY IN 2011 PLAN

5.3.1 REVIEW OF GOALS AND OBJECTIVES

The process of reviewing Mitigation Goals and Objectives involved all members of the Hazard Mitigation Steering Committee and three Island Hazard Mitigation Committees. The review of the Goals and Objectives was made with a realistic understanding of the limited existing, and anticipated technical and financial capacity of VITEMA to implement the hazard mitigation strategy over the next Plan implementation cycle.

The Committees came to consensus that the Goals and Objectives of the 2011 Plan continued to be a viable overall framework for the Territory's mitigation strategy. The Committees revised Objective 1 of Goal 1 to **prioritize hazard mitigation actions that would lead to a reduction of repetitive loss properties throughout the Territory.** The emphasis on reducing repetitive properties is also reflected in a number of programmatic and island-specific actions in the 2014 Plan Update. In addition it has been revised and integrated into this Plan Update as a revised Appendix C Repetitive Loss Strategy.

5.3.2 REVIEW OF MITIGATION ACTIONS

The programmatic mitigation actions from the 2011 Plan Update were reviewed and then discussed at the May 13, 14, and 15, 2014 meetings held on St. Thomas, St. John and St. Croix with the respective Hazard Mitigation, Monitoring and Evaluation Committees. The consensus of the participants was to add 8 programmatic actions and to add 17 island specific actions for the Territory which are reflected in Section 5.5.3.1, 5.5.3.2, and 5.5.3.3.

As noted in Sections 5.3.1 and 5.2.2 above, the mitigation strategy reflects a realistic assessment by VITEMA and the islands Hazard Mitigation Committees limited technical and financial capacity as well as the findings of the risk assessment.

A more extensive process was followed for the development of island specific mitigation actions for this Plan. Recommendations for hazard mitigation actions was one of the important outcomes of public information workshops held on St. Thomas, St. John, St. Croix, on May 13, 14, and 15, 2014, respectively.

These workshops provided valuable insight into the desires and concerns of the public relating to existing hazard mitigation actions which were identified previously by the island hazard mitigation committees.

VITEMA presented a prioritized listing of mitigation actions to the island Hazard Mitigation Committees via email correspondence on May 16, 2014 so that representatives of the three committees could concur on the priority of hazard mitigation action items. Committee members were asked to prioritize each mitigation action on the basis of the action's potential for loss reduction and to consider all the evaluation criteria included in the STAPLEE criteria. These considerations include:

- S for socially acceptable
- T for technically feasible
- A for administrative (having the capability and capacity to undertake the action)
- P for politically acceptable
- L for legal (having the legal authority to implement the action)
- E for economic (stressing adequate funding to implement the action)
- E for environment (understanding positive and adverse impacts of the action)

The resultant communication from the island hazard mitigation committees provided the basis for the consultant team, along with VITEMA, to review and evaluate actions and facilitated a final ranking process using a simple ranking protocol of high, moderate or low priority to rank each remaining or newly proposed mitigation action.

It is important to note that there has been some, albeit limited, progress in the implementation of past plan actions. Having public sector representation in all three Island Hazard Mitigation Committees was vital in determining which of the mitigation actions from the 2011 Plan had been fully or partially implemented. The major successes to report include:

- STT-2 -Pursue road reconstruction and drainage improvements to resolve recurrent flooding on Commandant Gade Gut (Garden Street) from Bunker Hill to Veterans Drive that affect businesses and emergency access.
- STT-3 -Pursue road reconstruction and drainage improvements to resolve recurrent shallow flooding on Radets Gade from Main Street to Veterans Drive that affect businesses.
- STT-4 -Pursue road reconstruction and drainage improvements to resolve recurrent shallow flooding on Storre Tvaer Gade from Main Street to Veterans Drive that affect businesses.
- STT-23 - Installation of High Impact Hurricane windows at the Department of Public Works (HMGP-1807).
- STT-22 - Installation of High Impact Hurricane windows at the Department of Property and Procurement (HMGP-1807).

- STT-24 - Installation of High Impact Hurricane windows at the Department of Education (HMGP-1807).
- STT-25 - Installation of High Impact Hurricane windows at the Department of Human Services (HMGP-1807).
- STT-11 - Pursue the acquisition of land for the relocation of the Downtown Fire Station that is susceptible to storm surges and tsunami.
- STX-17 - Install storm shutters at the American Red Cross (HMGP-1807).
- STX-18 - Install storm shutters Emile Henderson, Sr. Fire Station (HMGP-1807).
- STX-19 - Install Roll-Up Doors at the Rencelier I. Gibbs Fire Station (HMGP-1807). Note: roll-up windows were installed instead.
- STX 21 - Install Fabric Shutter system at Henry E. Rohlsen Airport (HMGP-1807).
- STJ-10 - Install Storm shutters at the DeCastro Health Clinic (HMGP 1807).
- STJ -12 - Clean Gut at Westin Hotel.

For further discussion as to specific actions that were completed, deleted or deferred, please refer to Section 6.6 of the Plan Update and to Appendix D. Appendix D presents a matrix that provides an overview of all mitigation actions included in the 2011 Plan that were either completed, removed or remain valid.

5.4 GOALS AND OBJECTIVES

The Mitigation Strategy includes a series of proposed mitigation actions based on goals and objectives established as part of an overarching hazard mitigation framework for the US Virgin Islands. As used in this Plan, these key terms are defined as follows:

- **Goals:** Broad policy statements, to be achieved through the implementation of specific objectives. They served as the framework for obtaining the desired results over the long-term planning horizon.
- **Objectives:** Specific steps to support, correspond and define a path on how to attain the desired goals and lead to their implementation.
- **Actions:** Efforts that seek to reduce or eliminate risk (see Appendix F). Actions can be grouped into two broad categories:
  - ✓ Programmatic or "soft" mitigation actions implemented through legislation, regulations or programs that operate on a Territory-wide level. One good example of programmatic actions is strengthening engineering specifications that address hazard risk reduction in the design and construction of public and private roads.
  - ✓ Projects that are designed and constructed to eliminate or reduce future disaster damages. Projects can include personal property and natural resource protection.

5.4.1 IDENTIFICATION OF GOALS AND OBJECTIVES

The Strategy for the Plan Update has not fundamentally changed since the 2005 and 2008 plans. In 2004 and 2005, VITEMA identified four (4) goals and several related objectives based on the risk assessment and capability assessment. Both the findings of the risk assessment and capability assessment have not changed significantly in the past three years. Therefore, it was not considered necessary to develop new goals and objectives.

It is important to note that the process of developing the goals and objectives in the previous Plan also involved a review of multi-hazard and hazard specific mitigation plans previously prepared for the US Virgin Islands, including:

- Phase 4 Report, Earthquake Hazards Reduction Plan, Geoscience Associates, for VITEMA, funded by FEMA grant EMA-K-86-0055 (1987);
- Natural Hazard Mitigation Plan for the US Virgin Islands, David Brower, Esq. and Timothy Beatley, Ph.D., for VITEMA (1988),
- Mitigating the Impacts of Natural Hazards in the US Virgin Islands, Island Resources Foundation, for VITEMA (1995);
- Mitigating the Impacts of Natural Hazards in the US Virgin Islands, Island Resources Foundation, for OMB (1999); and

- Virgin Islands Flood Hazard Mitigation Plan, Island Resources Foundation for VITEMA, funded by FEMA FMA grant (2000).

These plans provided, and continue to provide, a sound set of guiding principles for developing and implementing hazard mitigation actions in the US Virgin Islands.

GOAL 1: REDUCE THE NEGATIVE IMPACTS OF NATURAL HAZARDS ON RESIDENTS AND PROPERTY

Background

A fundamental guiding principle of the Territory that is indicated consistently in the past planning efforts is to eliminate or reduce human loss and suffering, and property losses resulting from natural disasters. This protection extends to both residents of, and visitors to, the Islands. As demonstrated in Section Four, much of the existing development in the US Virgin Islands is already at substantial risk to natural disasters:

- Developments are located in high-hazard prone areas;
- Structures have been constructed in natural drainage guts; and
- Many buildings have been constructed in hillside areas without adequate attention to the potential for severe earthquake damages.

However, development pressures in recent years have substantially damaged many important elements of the natural environment. This activity further threatens continued destruction in the future, particularly during hazard events. Preserving ecological integrity involves limiting the degradation of the environment and natural systems such as wetlands, floodplains, coral reefs, sea grass beds, and mangrove swamps. Protection of the natural environment of the US Virgin Islands is important and consistent with hazard mitigation.

So is the protection of properties, particularly those that are repetitive and severe repetitive loss properties. This goal is clearly consistent with FEMA's HMA grant program requirements. Specific actions in highlighted under Objective 1.1, focus on "hard" or "structural" actions that focus on minimizing repetitive losses, while the programmatic actions highlighted under Objective 1.2 and 1.3 focus on educational outreach in which the repetitive loss program is included.

Under this Goal and the pursuant objectives, the USVI has identified specific actions in the Plan Update for mitigating repetitive losses. These specific actions, as outlined in territory-wide and island-specific actions, contribute to the Territory's seeking an increased percentage of Federal grant funds.

Objectives

1.1 Protect existing development from future hazard events with the priority given to projects that would reduce the number of repetitive loss properties

1.2 Increase the awareness and understanding of residents and the private sector to the principles of hazard mitigation

1.3 Preserve, enhance, and restore features of the natural environment that have hazard mitigation benefits

GOAL 2: INTEGRATE HAZARD MITIGATION AND SUSTAINABLE DEVELOPMENT PRINCIPLES INTO ONGOING GOVERNMENT OPERATIONS AND LONG TERM PLANNING INITIATIVES TO REDUCE THE VULNERABILITY OF FUTURE DEVELOPMENT

Background

There is a direct correlation between hazardous development patterns and the post-disaster emergency and recovery expenses that must be assumed by the public sector. If buildings and infrastructure were not located in a hazardous area, there would be little or no need to expend public funds to rebuild and restore them. The expense of sheltering, rescue and other emergency response functions would be greatly reduced if people and development were kept out of harm's way in the first place. Future growth and development in the Islands is inevitable and may provide short term benefits for a localized economy, but it need not occur in ways that place people and property at risk and burden all the resources of the Territory. US Virgin Islands, like many of the small, island nations in the Lesser Antilles, must create a more sustainable future that addresses environmental, social and economic health.

Another of the guiding principles of the Territory is that the most cost effective way to implement hazard mitigation throughout the US Virgin Islands is to better integrate hazard mitigation in the subdivision and development review and the land use planning processes. The intent is that all new development be carefully managed and planned so that natural hazards are avoided – or where they cannot be avoided - their impacts are minimized. While it can be quite costly to correct past mistakes with respect to development in hazardous locations, there exists a broad range of opportunities to prevent future development from occurring in ways that make it vulnerable to natural hazards.

Environmentally sensitive areas are frequently subject to the effects of natural hazards. Thus, by limiting development in these locations, environmental protection and risk reduction objectives are achieved simultaneously. It is also important to note that tourism is a key element of the local economy. A healthy tourism economy cannot thrive and grow unless prospective tourists perceive the Islands as a safe place in which to visit and vacation. However, continued viability of the tourist economy also depends on the ability of the Territory to preserve the beauty and natural features that attract people in the first place. Obvious elements of this attraction include the beaches, green vegetated hills, the blue waters, and coral reefs.

No mitigation actions are being proposed for Goal 2 in the 2014 Plan Update owing to VITEMA's capacity issues, including both human and financial resources, to undertake actions that will require extensive inter-agency coordination over the next three years. However, the objectives listed below and the goal of integrating hazard mitigation into land and coastal zone planning to build a more sustainable future is valid and should be revisited during the next Update to determine whether Territorial resources are adequate to re-engage in this important initiative.

Objectives

2.1 Ensure that hazard mitigation principles are incorporated into the development review process

2.2 Include hazard mitigation as a key element in long range planning efforts that address comprehensive land use, natural resource management, and socio-economic issues

2.3 Ensure that hazard mitigation design criteria are incorporated into the planning and engineering design for future infrastructure improvements and major public sector investment projects

GOAL 3: RAPIDLY RESTORE ESSENTIAL INFRASTRUCTURE, WITH UNINTERRUPTED OPERATION OF CRITICAL FACILITIES AND CONTINUITY OF GOVERNMENT SERVICES FOLLOWING A NATURAL HAZARD EVENT

Background

Just as private development is subject to damage and destruction from natural hazards, so are public investments such as: schools, government buildings (whether owned or leased), public roads and streets, airports, port facilities, and other public infrastructure such as electrical power generation and distribution, and water and wastewater treatment plants.

These investments can be located, designed and constructed in ways that minimize their vulnerability. Public roads can be located outside of the floodplains, be designed to minimize impacts to the floodplain, or be elevated above predicted flood levels. Drainage systems can be designed to safely pass floodwaters downstream. Efforts can also be made to correct for past mistakes, for example, retrofitting critical public facilities so that they will better withstand high wind or earthquake events.

Objectives

3.1 Enhance capabilities of public agencies to ensure the continuity of government services following a natural hazard event

3.2 Reduce the vulnerability of essential infrastructure and critical facilities

GOAL 4: ENHANCE THE CAPABILITIES OF VITEMA AND THE GAR'S OFFICE TO EFFECTIVELY ADMINISTER FEMA MITIGATION PROGRAMS

Background

A broad range of enhancements are possible in terms of increasing the Territorial capabilities to address hazard mitigation. These recommendations have been cited in Section Three. The following objectives are based on these recommendations. However, recognizing that limited resources must be prioritized, these objectives focus on the areas where increased capabilities will have the most immediate effect during the three year horizon for this Plan.

Many of the programmatic actions in this Plan Update focus on developing capabilities of VITEMA. The identified actions focus on developing capabilities to gather data and implement management systems, particular as they relate to increasing a repository of hazard data and repetitive loss properties.

VITEMA already has access, through FEMA, to some information concerning repetitive loss properties. It also has access to information concerning property ownership and valuation. It is necessary to note that some data, which may be considered confidential or sensitive may prove critical for the effective implementation of actions that pertain to the implementation of actions that require substantial economic resources such as those identified for acquisition.

Specific actions that pertain to this goal and objectives focus on gathering information and building program capabilities that are consistent with the goals of FEMA's HMA grant programs and repetitive and severe repetitive loss claim data. The pursuant actions identified in this Plan Update contribute to meeting the USVI priority for reducing repetitive losses, development of action to implement the repetitive loss strategy, and reducing the cost share under HMA program criteria.

Objectives

4.1 Strengthen project implementation capabilities

4.2 Refine program administrative procedures

4.3 Demonstrate improvement in management of FEMA grants through application of established performance standards

5.5 IDENTIFICATION, EVALUATION AND PRIOROITIZATION OF MITIGATION ACTIONS

5.5.1 IDENTIFICATION OF MITIGATION ACTIONS

The mitigation actions focus on actions that VITEMA may take to reduce the impacts of natural hazards in the Territory. The challenge to implement the Plan Update is the lack of technical and financial resources within VITEMA to manage and coordinate the implementation of specific actions/projects – both "soft" projects (education, training, etc.) and 'hard" constructions projects (flood drainage, structural retrofit, etc.) – with a variety of government agencies. A particular priority of VITEMA is to address the significant impact of repetitive loss properties in the US Virgin Islands families, economy and property. A repetitive loss property is a property that is covered by the NFIP insurance policy and are defined as single or multifamily residential properties that have incurred flood –related damage for which four (4) or more claims payments of at least $5,000.00 have been made, and which the cumulative amount of such claims payments exceed $20,000.00. The Territory's repetitive loss strategy is discussed in more detail in Section 6 of this Plan Update.

An evaluation of the cost effectiveness of many of the mitigation actions identified in the Plan Update is difficult to demonstrate and may not be practical for such a "strategic plan". The quantification of costs associated with "soft" actions and/or projects normally require the calculation of the utilization of internal resources, either human and/or budgetary; while the quantification of benefits is more elusive. The identified "hard" actions or projects, on the other hand, specify locations for structural projects (i.e. flood drainage improvements in St. John) and may be quantified; however, the quantification of costs and benefits require an in-depth engineering assessment to be performed. A formal Benefit-Cost Analysis, including the calculation of a benefit/cost ratio, would be performed at a future date for any projects sent forward for funding consideration under Federal programs.

Nevertheless, the potential for risk reduction or the relative cost effectiveness, environmental soundness and technical feasibility and designation of action priorities for implementation were considered for this Plan Update and are highlighted in the Mitigation Action Plan (Appendix G).

The USVI Territorial Hazard Mitigation Plan includes four separate but related Action Plans presented in Appendix G. Below the Programmatic and Island specific mitigation actions are presented:

Programmatic mitigation actions applicable for the entire USVI Territory (numbered as USVI-#);

(1) Prioritized mitigation actions for St. Croix (numbered as STX-#);

(2) Prioritized mitigation actions for St. Thomas (numbered as STT-#);

(3) Prioritized mitigation actions for St. John (numbered as STJ-#).

5.5.2 EVALUATION AND PRIORITIZATION OF MITIGATION ACTIONS

Following the identification of each proposed programmatic and island-specific mitigation actions, VITEMA Steering Committee prepared a preliminary list of mitigation actions for consideration to each of the three Island Hazard Mitigation Committees. The programmatic and island specific committees were reviewed, evaluated and prioritized via email communication that was sent out on May 16, 2014. Each proposed mitigation action was reviewed and, where necessary, amended, deleted from consideration, and in several instances alternative mitigation actions were developed by Committee members.

Each island mitigation action was then further evaluated. Each action was reviewed based on the examination of the available resources versus the potential benefits of each action on reducing risks to the residents and property in the Territory. A simple ranking criterion was utilized for evaluating the potential for loss reduction.

Potential for Loss Reduction

- "H" which represents the highest relative potential for loss reduction;
- "M" which represents moderate relative potential for loss reduction; and
- "L" representing the lowest relative potential for loss reduction.

The programmatic and island specific actions were then prioritized using a simple voting technique. Each member of respective Committees voted on the priority of actions that should be included in the plan. The Voting procedure was based on consensus, which differed from the voting technique utilized in the 2008 Plan Update. The tables below reflect the evaluation of loss reduction potential as well as the prioritization of island specific hazard mitigation actions:

5.6.2 IDENTIFICATION, EVALUATION AND PRIORITIZATION OF PROGRAMMATIC MITIGATION ACTIONS

Following the evaluation and prioritization of island specific mitigation actions, the VITEMA Hazard Mitigation Steering Committee reviewed, evaluated and prioritized the programmatic mitigation actions for the entire Territory. The finalized list of programmatic actions was then discussed with the each Hazard Mitigation Committee via a teleconference meeting that was held on May 12, 13, and 14. Table 5.2 below highlights the results of the Hazard Mitigation Committee evaluation and prioritization.

The importance of the implications of climate change variability on hazard mitigation planning for the USVI was noted previously in the Mitigation Strategy. Several of the programmatic actions identified below acknowledge this need and the lack of empirical data to more effectively address those implications. Most important is USVI-9 which proposes to incorporate climate change in the Risk Assessment. Another programmatic mitigation action (USVI-7) proposes to develop a database to track past and future instances of drought, wildfires and landslides, which also has implications for integrating the impact of climate variability by associating occurrences with rainfall events in the case of landslide or lack of precipitation in the case of drought and wildfire. These three hazards were added in the 2011 Plan Update; however, the lack of empirical data limited the analysis of these hazards. All of these hazards will be affected by climate change variability in the future and a more complete database is necessary.

Some of the assumptions of climate change implications that merit further investigation include:

- Future increases in the intensity of rainfall events;
- Extended periods of drought on the islands and potential impacts on wildfires and availability of potable water supplies;
- Sea level rise and increase in storm surge levels, particularly important for St. Croix;
- Potential changes to Special Flood Hazard Areas (SFHA), if climate variability data is integrated into models used in the development of FEMA flood maps.

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
USVI-1	VITEMA collaborates with DPW to prioritize annual budget and action plans to remove built up sediment, debris and maintain natural guts, roadside ditches, drainage channels and storm drains in areas that are designated in this Plan as **Repetitive Loss Strategy (RLS**) designated areas.	Goal 1, Objective 1.1	H	E	1
USVI-2	Seek FMA funding for a planning study to map of **severe repetitive loss and repetitive loss properties**, conduct limited fieldwork, and evaluate hazard mitigation measures that would cost-effectively address clustered repetitive loss properties.	Goal 1, Objective 1.1	H	N	2
USVI-3	Strengthen partnerships with the Office of the Governor and media to disseminate information to the general public on hazard mitigation programs and importance of reducing number of **USVI repetitive loss properties.**	Goal 1, Objective 1.2	M	E	9
USVI-4	Conduct **watershed planning study** based on a hydrological and hydraulic (H&H) model that would provide the quantitative basis for assessing flood mitigation measures on basin and sub-basin level. The H&H modeling can be used to determine best management solutions for **RLS designated areas** and to build resilience in communities and reduce economic losses. This phased project would begin with St. Croix and take advantage of data developed from previous H&H studies.	Goal 1, Objective 1.1	H	N	3
USVI-5	VITEMA will establish relationships in the steady-state (pre-disaster) timeframe with **US HUD and US DOC** and other representatives of primary Federal agency partners of **NDRF Recovery Support Functions** that could facilitate recovery with technical assistance and potential funding in future post-disaster conditions.	Goal 4, Objective 4.2	L	N	4
USVI-6	Construct a database management program and develop procedures to collect information on and to track **repetitive loss** properties in the Territory.	Goal 4, Objective 4.1	M	E	5
USVI-7	Define and implement arrangements for the collection of data on **Landslides, Wildfire, and Drought** that can affect the Territory, including information on location (maps),	Goal 4, Objective 4.1	M	E	6

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
	history, and probability of hazard events.				
USVI-8	Construct a **database management program** and develop procedures to track mitigation project progress and effectiveness from project award to project completion so as to provide a record on the aggregate actual costs avoided of implemented mitigation projects in the territory.	Goal 4, Objective 4.2	M	E	10
USVI-9	Update the multi-hazard risk assessment to incorporate **climate change models** into the hazard and vulnerability analysis.	Goal 3, Objective 3.1	L	N	8
USVI-10	Develop or update Territorial **Debris Management Plan,** including identification of potential satellite locations for collecting and segregating building and woody debris, white goods, and hazardous materials.	Goal 4, Objective 4.1	L	N	7

5.5.3 IDENTIFICATION, EVALUATION AND PRIORITIZATION OF ISLAND MITIGATION ACTIONS

It is necessary to note that the effective implementation of mitigation actions is dependent upon: identifying appropriate agency or department roles, projected timeframes, necessary resources, and determining the prioritization for each action. Lead and supporting agency roles, projected timeframes, and potential funding sources were prepared for each action, along with an assessment of anticipated constraints and opportunities for their implementation.

A brief review of the Island Mitigation Actions for St. Thomas, St. Croix, and St. John reflects that many of mitigation actions proposed in the 2011 Plan Update (noted as E in the three tables below), have not been completed over the past three years. There are a number of reasons for this outcome; however, the major ones include:

- The economy of the USVI Territory has struggled over the past six years;
- The closure of the HOVENSA oil refinery on St. Croix in 2012 has had a severe impact on the Territorial unemployment and tax revenues over the past few years;
- The gap between Territorial revenues and annual budget expenditures has continued since 2011, despite efforts of the Government to constrain budgets for Territorial agencies, including VITEMA;

5.5.3.1 St. Thomas Mitigation Actions

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
STT-1	Construct drainage improvements on Turpentine Run (Brookman Road) to alleviate localized flooding.	Goal 1, Objective 1.1	H	E	5
STT-2	Construct drainage improvements to improve the capacity of the drainage system by Yvonne Bowsky Elementary School (Peace Corp) to alleviate localized flooding.	Goal 1, Objective 1.1	M	E	14
STT-3	Construct drainage improvements to improve the capacity, and clean, the storm water drainage system in Frydenhoj (next to and across from ball field) to alleviate localized flooding and damage of private property.	Goal 1, Objective 1.1	H	E	7
STT-4	Construct drainage improvements on Rt. 30 adjacent to Bolongo Bay to alleviate flooding to residential areas and beach erosion.	Goal 1, Objective 1.1	H	E	9
STT-5	Construct drainage improvements for major drainage channel that conveys flood waters from the surrounding Altona and Anna's Fancy areas to resolve recurrent flooding after heavy rainfall events.	Goal 1, Objective 1.1	H	E	1
STT-6	Construct Lindberg Estates, Phase IV	Goal 1,	H	E	16

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
	Drainage Project north through Kirwin Terrace Public Housing Units.	Objective 1.1			
STT-7	Improve drainage infrastructure along Rt. 30 Estate Hope / Fortuna to eliminate flooding of nearby residences in Fortuna 3C Subdivision.	Goal 1, Objective 1.1	H	E	19
STT-8	Expand and reinforce communication infrastructure that is being implemented by BIT to mitigate damages from hurricanes to ensure rapid recovery and return to normal service.	Goal 3, Objective 3.1	H	E	13
STT-9	Replace and improve drainage infrastructure at Food Center in order to resolve flooding of roads, businesses, while addressing potential secondary impacts to wetlands.	Goal 3, Objective 3.2	H	E	15
STT-10	Conduct hydrologic study of the Smith Bay basin and implement drainage improvements to resolve the flooding problems at Coki Point and Smith Bay Roads, and, improvements to open channels draining through the resort complex into Water Bay to resolve localized flooding problems that periodically close roads, create traffic hazards, prevent emergency vehicle and public access, and cause damage to adjacent businesses and road pavement.	Goal 3, Objective 3.2	H	E	3
STT-11	Construct drainage improvements to secondary road that provides access to Caret Bay West. Improvements could include paving and/or providing proper roadside drainage and properly-sized culverts where appropriate to carry stormwater across the road to minimize erosion of the road surface.	Goal 3, Objective 3.2	M	E	18
STT-12	Complete installation of Hurricane Shutters at main police station in Charlotte Amalie.	Goal 3, Objective 3.2	M	E	20
STT-13	Improve drainage infrastructure along Hospital Gade from Antonio Jarvis School to the Police Station on Verteran's Drive, paying particular attention to the intersection of Hospital and Kongens Gade (Moravian Church and Zoras).	Goal 3, Objective 3.2	M	E	21
STT-14	Replace and improve drainage infrastructure along Rt. 33 (Estate Dorethea).	Goal 3, Objective 3.2	H	E	22
STT-15	Resolve flooding problems at Subbase Entrance. Pursue Phase II drainage	Goal 3, Objective 3.2	H	E	8

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
	improvements which include the installation of properly-sized culverts from Bellows across Veterans Drive to connect to Phase I drainage improvements.				
STT-16	Enlarge box culverts, stormdrains, and improvements to open channels from Veterans Drive to the Bay along the east edge of Frenchtown in southwest Charlotte Amalie (Frenchtown Drainage East), in order to resolve flooding, traffic access and business interruption.	Goal 3, Objective 3.2	H	E	10
STT-17	Harden WAPA Substations. Design and construction of hardened switchgear buildings at the East End and Tutu Substations	Goal 3, Objective 3.2	H	E	25
STT-18	Water Island Ferry Dock at "Philips Landing" experiences periodic flooding in the main turn around area. Periodic flooding caused by inadequate drainage at this facility impedes ferry traffic and emergency vehicles	Goal 3, Objective 3.2	M	N	8
STT-19	Honeymoon Beach at Druif Bay, western end of Water Island; flooding caused from inadequate drainage blocks vehicular passage and covers road with as much as 3 feet on the beach road and then takes as much as 3 weeks to drain. Economic impacts by blocking access to two commercial establishments and public health issue from mosquito breeding.	Goal 1, Objective 1.1	H	N	10
STT-20	Pearl and Larsen School structural retrofit of roof.	Goal 1, Objective 1.1	H	N	2
SST-21	Evelyn Williams School hurricane-strength wind mitigation retrofit of structural roof system and roof replacement.	Goal 1, Objective 1.1	H	N	6
SST-22	Resolve flooding problems at Abattoir Estate Nadir (race track) due to inadequate drainage.	Goal 1, Objective 1.1	M	N	23
SST-23	Address inadequate drainage at Tutu Fire Station	Goal 1, Objective 1.1	M	N	12
SST-24	Structural retrofit of following critical facilities used for sheltering (Lockhart School, Bertha Bochulte Middle School, and, Human Services Head Start building).	Goal 3, Objective 3.2	H	N	4
STT-25	Retrofit of electrical system at Blue Water Bible College to enable back-up power for all 3 main buildings from existing generator.	Goal 1, Objective 1.1	L	N	11

5.5.3.2 St. Croix Mitigation Actions

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
STX-1	Resolve flooding problems and improve storm water drainage infrastructure in the "Grove at La Reine".	Goal 1, Objective 1.1	H	E	6
STX-2	Conduct a hydrological study of the St. Croix watersheds with particular attention given to the La Grange, Prosperity, Bethlehem and Salt River watershed basins. Attention should focus on upgrading inadequate drainage systems focused on reducing the impact of flooding (see USVI-4 Mitigation Action).	Goal 1, Objective 1.1	H	E	1
STX-3	Perform assessment of flooding problems within La Grande Princess Estate. Approximately 50 of 250 NFIP-insured losses in St. Croix (one in five repetitive losses) occur in La Grande Princess. Eighty two properties were identified as being in the 100 year flood plain and the potential for acquisition, structural solutions, and nonstructural control measures to reduce repetitive losses to residences should be assessed (see USVI-2 Mitigation Action).	Goal 1, Objective 1.1	H	E	2
STX-4	Improve drainage system to along Melvin H. Evans Highway in the area west of Williams Delight Stop Light and Carlton. Extend drainage system to connect with drainage improvements in Williams Delight Community.	Goal 1, Objective 1.1	M	E	10
STX-5	Conduct a hydrological study of the Christiansted watershed or catchment area with particular attention given to the sub-watersheds of Spring Gut and Water Gut to determine technically feasible and cost effective structural solutions to address the flooding problem in Christiansted.	Goal 1, Objective 1.1	H	E	12
STX-6	Resolve flooding problems and improve stormwater drainage infrastructure for "Spring Gut" all the way to Gallows Bay.	Goal 1, Objective 1.1	H	E	13
STX-7	Resolve flooding problems and improve stormwater drainage infrastructure for Tide Village by implementing a low water crossing to divert surface run-off into the natural gut.	Goal 1, Objective 1.1	H	E	14
STX-8	Pursue Christiansted Gut USACE Section 205 Project. Preliminary feasibility phase	Goal 1, Objective 1.1	H	E	17

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
	currently underway by the Corps to determine whether technically feasible and cost effective solutions exist to reduce flood damages in residential and business areas adjacent to King Cross Street.				
STX-9	Construct a retention pond at the property line of White Bay and the National Park Service reserve within the localized depression.	Goal 1, Objective 1.1	H	E	18
STX-10	Perform assessment of adjacent drainage basins that flow into Estate Williams Delight to identify alternate routing of surface runoff. Evaluate creation of stormwater detention pond below Blue Mountain	Goal 1, Objective 1.1	H	E	21
STX-11	Implement and improve storm water drainage infrastructure to relieve flooding at the Alfredo Andrews School and adjacent low-lying areas.	Goal 3, Objective 3.1	H	N	5
STX-12	Construct drainage improvements at the Ricardo Richards Elementary School at Estate Barren Spot near Melvin H. Evans Highway (Route 66).	Goal 3, Objective 3.1	H	E	19
STX-13	Improve Recovery Hill Water Storage Tanks. Install wind girders to reinforce against hurricane-strength winds.	Goal 3, Objective 3.2	M	E	9
STX-14	Implement and provide emergency power generator units for all wastewater pumping stations on St. Croix.	Goal 3, Objective 3.2.	M	E	11
STX-15	Pursue equipment anchoring program for the Richmond Electrical Generating Plant. Anchor critical equipment in the Plant to mitigate damages caused by earthquake, hurricane-strength winds, tsunami and storm surge.	Goal 3, Objective 3.2	H	E	15
STX-16	Improve Various Water Storage Tanks throughout the island. Install flexible connectors at multiple water storage tanks to permit pipe flexibility during earthquake events and ensure rapid recovery and normal service.	Goal 3, Objective 3.2	M	E	16
STX-17	Lew Muckle School shutter project	Goal 1, Objective 1.1	H	N	23
STX-18	The 30" Coastal Interceptor transports sewage from the La Grande Princess area to the LBJ Pump Station in Christiansted. Shoreline erosion from coastal storms has left the interceptor submerged in the sea approximately 50' from the shore. The mitigation action	Goal 3, Objective 3.2	H	N	4

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
	would reroute the pipeline inland, replacing approx. 1900' of pipe, construct new lift station and associated improvements.				
STX-19	FEMA Community Rating System (CRS). Initiate a planning project to have STX become a CRS Community by developing a strategy and action plan for improving the flood management program on the Island. The planning study would include an outreach strategy and series of community meetings on the NFIP Program, first living floor and base flood elevation determinations, LOMARS, and other flood insurance questions and concerns.	Goal 4, Objective 4.1	M	N	3
STX-20	LBJ Pump Station flood and storm surge protection. The pump station is located 215' south of an existing gut and 125' from the shoreline. Mitigation action involves improving conveyance from existing gut, regarding and rising existing roadway to site, fabrication of flood prevention brackets to provide protection from floodwaters and storm surge.	Goal 3, Objective 3.2	H	N	7
STX-21	Structural retrofits of Claude Markoe School and St. Croix Educational Complex critical facilities used for sheltering.	Goal 3, Objective 3.2	H	N	8
STX-22	Structural retrofits of Juan Luis Hospital for enhanced protection from hurricane-strength winds and earthquake hazards.	Goal 3, Objective 3.2	H	N	22
STX-23	Storm flows from Tropical Storm Otto collapsed a culvert and road crossing of Gut 5 in Enfield Green that connects the east and west sides of the Estate. Mitigation action involves replacing culvert with a larger diameter and implementing drainage improvements on Gut 5.	Goal 3, Objective 3.2	M	N	20

5.5.3.3 St. John Mitigation Actions

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
STJ-1	Conduct a hydrological study of Coral Bay watershed to propose technically feasible and cost-effective solutions to flooding problems due to storm drain locations, undersized drainage, and lack of consideration of natural drainage guts.	Goal 1, Objective 1.1	M	E	2
STJ-2	Evaluate and construct drainage improvements to eliminate localized flooding at the lower end of "Carolina Gut" at Little Plantation where natural storm flows in the catchment area have been altered by construction and improper siting of structures.	Goal 1, Objective 1.1	H	E	6
ST-3	Construct drainage improvements to eliminate localized flooding at Pond Mouth at intersection of Rt. 102 and Rt. 105.	Goal 1, Objective 1.1	H	E	7
STJ-4	Implementing a slope stabilization program to reduce damage and blockage of roads during wind storm and flooding events. A program establishment of more stable and cut and fill slopes, removal of material that may be subject to landslide and rock fall events, re-vegetation, of disturbed slopes, etc.	Goal 1, Objective 1.1	H	E	8
STJ-5	Evaluate and construct drainage improvements to eliminate localized flooding along Route 20 southbound in Coral Bay (Estate Carolina).	Goal 1, Objective 1.1	H	E	11
STJ-6	Increase fuel capacity of the Myra Keating Health Clinic Emergency power generator unit.	Goal 3, Objective 3.1	H	E	5
STJ-7	Provide an alternate power generation substation for Coral Bay to ensure that there is adequate power source for all public services and critical facilities on the east end of the Island.	Goal 3, Objective 3.2	H	E	4
STJ-8	Construct underground feeders from the St. John substation to various termination points within Cruz Bay to mitigate damages to hurricane winds and ensure rapid recovery and return to normal service.	Goal 3, Objective 3.2	H	E	9
STJ-9	Improve drainage infrastructure (Box Culverts) at WAPA building and treatment plant, while addressing potential secondary impacts to wetlands.	Goal 3, Objective 3.2	H	E	10

Action	Description	Goal/Objective	Potential for Loss Reduction	Existing (E) or New (N)	Priority
STJ-10	Coordinate with the National Park Service for the construction of appropriate drainage system improvements to eliminate localized flooding along Route Rt. 20 in Maho Bay.	Goal 3, Objective 3.2	H	E	12
STJ-11	Resolve flooding concerns from inadequate drainage at Cruz Bay Fire Station.	Goal 3, Objective 3.2	M	N	3
STJ-12	Functional replacement and relocation of the Fire Station in Coral Bay due to multiple coastal hazards and structural issues of this critical facility resulting from subsidence.	Goal 3, Objective 3.2	H	N	1

5.6 IMPLEMENTATION OF ACTIONS

The Hazard Mitigation Steering Committee considered the cost- effectiveness of all island specific and programmatic actions. The Hazard Mitigation Steering Committee further evaluated each of the identified mitigation actions by utilizing the STAPLEE criteria during meetings held on March 30, 2011.

The Hazard Mitigation Steering Committee was introduced to the STAPLEE process for evaluating both programmatic and island specific mitigation actions as recommended by FEMA guidance. The Hazard Mitigation Steering Committee agreed to use this method to further evaluate prioritized mitigation actions. The STAPLEE method provided the Hazard Mitigation Steering Committee with a systematic way of evaluating the opportunities and constraints of implementing particular mitigation actions that were rated for their loss reduction potential and prioritized through a simple voting technique.

The STAPLEE is an acronym for evaluating each action in terms of Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) factors:

- **S** for Social; the mitigation strategy must be socially acceptable.
- **T** for Technical; the proposed action must be technically feasible.
- **A** for Administrative; the community must have the capability to implement the action (for example, the logical lead agency must be capable of carrying out oversight of the project).
- **P** for Political; mitigation actions must be politically acceptable.
- **L** for Legal; the community currently must have the authority to implement the proposed measure.
- **E** for Economic; economic considerations must include the present economic base, projected growth and opportunity costs.
- **E** for Environmental; the impact on the environment must be considered because of statutory considerations and the public's desire for sustainable and environmentally healthy communities.

Appendix G presents the programmatic and island-specific actions in a matrix format that depicts the prioritization and strategic planning conducted necessary to lead to effective implementation. A separate matrix is provided for each programmatic or island-specific action that includes the following information:

- Description of the mitigation action,
- Potential for Loss Reduction Rating,
- Priority ranking,
- The goal and objective that the action is intended to achieve,
- The specific hazard the action is intended to achieve (or all hazard),
- Responsible agency, department or division,
- Projected timeframe - Short term (1-2 years), Medium Term (3-5 years), and Long Term (5-10 years),
- Projected resources,
- Comments on rationale for action, contribution to goal, or other comment, and
- STAPLEE criteria evaluation, by individual criterion and total score.