



## 9.46 Suffolk County Water Authority

This section presents the jurisdictional annex for the Suffolk County Water Authority. It includes resources and information to assist public and private sectors to reduce losses from future hazard events. This annex is not guidance of what to do when a disaster occurs. Rather, this annex concentrates on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. This annex includes a general overview of the Suffolk County Water Authority and who in the Water Authority participated in the planning process; an assessment of the Suffolk County Water Authority’s risk and vulnerability; the different capabilities utilized in the Water Authority; and an action plan that will be implemented to achieve a more resilient community.

### 9.46.1 Hazard Mitigation Planning Team

The following individuals have been identified as the Suffolk County Water Authority’s hazard mitigation plan primary and alternate points of contact.

**Table 9.46-1. Hazard Mitigation Planning Team**

Primary Point of Contact	Alternate Point of Contact
Name/Title: Rich Bova, Deputy Director of Strategic Initiatives Address: 4060 Sunrise Highway Oakdale, NY 11769 Phone Number: 631-563-0379 Email: rbova@scwa.com	Name/Title: Katelyn Cassagne, GIS, Strategic Initiatives Tech Address: 4060 Sunrise Highway Oakdale, NY 11769 Phone Number: 631-563-0263 Email: Katelyn.cassagne@scwa.com

### 9.46.2 District Profile

The Suffolk County Water Authority is an independent public-benefit corporation operating under the authority of the Public Authorities Law of the State of New York. The Authority, which was founded in 1951, operates without taxing power on a not-for-profit basis. During the calendar year 2019, the Authority produced 68.58 billion gallons of water for 402,893 customers providing water to approximately 1.3 million people in Suffolk County. The Suffolk County Water Authority is the largest supplier in the nation based entirely upon groundwater and it operates the largest groundwater testing facility in the United States.

#### Land Area Served:

- SCWA ~599.25 square miles
- Stony Brook Water Company ~2.1 square miles
- Smithtown Water Company ~6.7 square miles
- Saint James Water Company ~4.4 square miles

#### Population Served:

1.3 million people

#### Land Area Owned:

Total land area for SCWA owned properties only (ex. lease, easement, etc.) is 69,675,930 square feet or ~2.51 square miles.





**List of Critical Infrastructure/Equipment:**

- 632 Wells
- 66 Storage Tanks
- Approx. 6,100 Miles of Water Main
- Approx. 36,000 Hydrants
- 29 Iron Removal
- 148 Pairs Granular Activated Carbon Units
- 2 Nitrate Filtration Unit
- 134 inter-zone valves
- 132 standby power units

**Value of Critical Infrastructure/Equipment:**

Asset Class	May 2019
Compressors/Backhoes	\$5,053,085.17
Computer Equipment	\$30,855,943.34
Equipment	\$33,891,566.24
Fleet	\$21,102,329.52
Hydrants	\$50,349,599.68
Land	\$27,027,185.23
Mains	\$791,189,860.27
Meters	\$89,436,654.76
Pumping and purification equipment	\$164,891,245.37
Radio Communications	\$1,036,481.74
Services	\$258,241,566.44
Structures Administration	\$3,036,647.01
Structures Operating	\$185,690,618.35
Tanks, Wells, Pump Stations	\$170,607,301.57
Total	\$1,832,410,084.69

**List of Critical Facilities (owned by District):**

- 241 Pump Stations
- 63 Booster Stations

**Value of Critical Facilities:**

- Land - \$27,027,185





### 9.46.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction’s overall risk to its hazards of concern. Table 9.46-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development, where available. The recent and anticipated development depicted on these figures excludes the Suffolk County wastewater upgrades; refer to Section 4 (County Profile) for additional information on this development.

**Table 9.46-2. Recent and Expected Future Development**

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
<b>Recent Major Development and Infrastructure from 2015 to Present</b>					
Deerfield Road	Well Field & Pump Station	N/A	In between 2527 and 2361 Deerfield Road	N/A	New Well Field
Stephen Hands Path	Well Field & Pump Station	N/A	Across from Learned Hands Ct	N/A	New Well Field
Main Street Yaphank	Well Field & Pump Station	N/A	N/S/O Main Street, Approximately 550' E/O Everett Drive (School Street)	N/A	New Well Field
Fresh Pond Road	Well Field & Pump Station	N/A	114 Fresh Pond Road, Amagansett	Landslide high susceptibility, Wildfire Intermix	New Well Field
<b>Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years</b>					
None anticipated					

SFHA Special Flood Hazard Area (1% flood event)

\* Only location-specific hazard zones or vulnerabilities identified.

### 9.46.4 Capability Assessment

The Suffolk County Water Authority performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- An assessment of legal and regulatory capabilities.
- Development and permitting capabilities.
- An assessment of fiscal capabilities.
- An assessment of education and outreach capabilities.
- Information on National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community’s adaptive capacity for the impacts of climate change.



For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized in Capability Assessment (Section 9.46.4). The Suffolk County Water Authority identified specific integration activities that will be incorporated into municipal procedures are included in the updated mitigation strategy. Appendix G provides the results of the planning/policy document review and the answers to integration survey questions.

### Planning, Legal, and Regulatory Capability

The table below summarizes the regulatory tools that are available to the Suffolk County Water Authority and where hazard mitigation has been integrated.

**Table 9.46-3. Planning, Legal, and Regulatory Capability**

	Do you have this? (Yes/No)	Code Citation and Date (code chapter, name of plan, date of plan)	Authority (local, county, state, federal)	Department / Agency Responsible	State Mandated	Has this been integrated?	
						If no - can it be a mitigation action? If yes, add Mitigation Action #.	(Tetra Tech to complete)
<b>Planning Documents</b>							
Comprehensive Plan	Yes	Strategic Plan 2025	Local	SCWA	No	Yes	-
Comment: Strategic Plan 2025 is a coordinated effort to ensure that the Suffolk County Water Authority is prepared to meet the challenges of the next decade. Developed by key personnel throughout the Authority, the plan provides a blueprint of our top priorities for the coming years, highlighted by the 10 comprehensive initiatives listed below that will position the Authority to maintain its place at the forefront of the public water supply industry for decades to come. The progress of each initiative will be monitored through quarterly updates. If changing circumstances necessitate adjustments to any of the initiatives underway, the necessary changes will be made.							
Capital Improvement Plan	Yes	Strategic Plan 2025	Local	SCWA	No	Yes	-
Comment: Financial Strategy 7 Rates chapter of the Strategic Plan 2025. The Authority will take various proactive measures such as assessing the feasibility of creating alternative rates and fee structures to fund the vital projects contained within this plan and assessing the feasibility of creating an infrastructure reserve to accelerate the pace of water main replacement.							
Disaster Debris Management Plan	N/A	-	-	-	-	-	-
Comment:							
Floodplain or Watershed Plan	N/A	-	-	-	-	-	-
Comment:							
Stormwater Plan	N/A	-	-	-	-	-	-
Comment:							
Open Space Plan	N/A	-	-	-	-	-	-
Comment:							
Urban Water Management Plan	N/A	-	-	-	-	-	-
Comment:							
Habitat Conservation Plan	Yes	Conservation Plan	Local	SCWA	-	Yes	-
Comment: The Conservation Plan was updated in April 2020.							
Economic Development Plan	N/A	-	-	-	-	-	-
Comment:							
Shoreline Management Plan	N/A	-	-	-	-	-	-
Comment:							
Community Wildfire Protection Plan	N/A	-	-	-	-	-	-
Comment:							
Forest Management Plan	N/A	-	-	-	-	-	-



	Do you have this? (Yes/No)	Code Citation and Date (code chapter, name of plan, date of plan)	Authority (local, county, state, federal)	Department / Agency Responsible	State Mandated	Has this been integrated?	
						If no - can it be a mitigation action? If yes, add Mitigation Action #. (Tetra Tech to complete)	
Comment:							
Transportation Plan	N/A	-	-	-	-	-	-
Comment:							
Agriculture Plan	N/A	-	-	-	-	-	-
Comment:							
Aquifer Plan	Yes	State of the Aquifer 2019 Update	Regional	Long Island Commission for Aquifer Protection	No	Yes	-
Comment: The 2019 update is an annual update to the original 2016 State of the Aquifer report and covers threats based on water quality in the Long Island aquifer. The 2016 update focuses on contamination caused by the synthetic organic chemical 1,4-dioxane. The chemical has been detected in approximately 70% of Long Island's public supply wells.							
<b>Response/Recovery Planning</b>							
Comprehensive Emergency Management Plan	Yes	Emergency Response Plan 2019	Local	SCWA	Yes	Yes	-
Comment: Original plan from 2017. Update planned for 2020. The Authority has in place a comprehensive emergency preparedness plan that encompasses threats to Authority operations. The plan includes initiatives to conduct facility vulnerability assessments of various facilities and the distribution system, improve emergency communications and conduct emergency drills and tabletop exercises. Employees will also be trained to prepare for emergencies.							
Strategic Recovery Planning Report	No	-	-	-	No	-	-
Comment:							
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Risk & Resilience Assessment, 2020, Vulnerability Assessment 2020	Local	SCWA	Yes	Yes	-
Comment: Risk & Resilience Assessment submitted to EPA.							
Post-Disaster Recovery Plan	No	-	-	-	No	-	-
Comment:							
Continuity of Operations Plan	Yes	Standard Response Plans 2019	Local	SCWA	No	Yes	-
Comment:							
Public Health Plan	No	-	-	-	No	-	-
Comment:							
Other	No	-	-	-	No	-	-
Comment:							

**Table 9.46-4. Development and Permitting Capability**

Not applicable

**Administrative and Technical Capability**

The table below summarizes potential staff and personnel resources available to the Suffolk County Water Authority.





**Table 9.46-5. Administrative and Technical Capabilities**

Resources	Available? (Yes or No)	Department/ Agency/Position
<b>Administrative Capability</b>		
Planning Board	N/A	-
Mitigation Planning Committee	N/A	-
Environmental Board/Commission	N/A	-
Open Space Board/Committee	N/A	-
Economic Development Commission/Committee	N/A	-
Warning Systems / Services (reverse 911, outdoor warning signals)	N/A	-
Maintenance programs to reduce risk	Yes	Water main replacement.
Mutual aid agreements	Yes	WARN
<b>Technical/Staffing Capability</b>		
Planners or engineers with knowledge of land development and land management practices	Yes	Operations Department
Engineers or professionals trained in building or infrastructure construction practices	Yes	Operations Department
Planners or engineers with an understanding of natural hazards	Yes	OEM Department
Staff with expertise or training in benefit/cost analysis	Yes	OEM Department
Professionals trained in conducting damage assessments	Yes	Operations Department
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	Yes	GIS, Strategic Initiatives
Scientist familiar with natural hazards	Yes	Department of Water Quality & Laboratory Services
NFIP Floodplain Administrator (FPA)	N/A	-
Surveyor(s)	Yes	Operations Department
Emergency Manager	Yes	OEM Department
Grant writer(s)		Financial Department, Strategic Initiatives
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	Yes	Various Departments

**Fiscal Capability**

The table below summarizes financial resources available to the Suffolk County Water Authority.

**Table 9.46-6. Fiscal Capabilities**

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community development Block Grants (CDBG, CDBG-DR)	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	No
User fees for water, sewer, gas or electric service	Yes
Impact fees for homebuyers or developers of new development/homes	N/A
Stormwater utility fee	N/A
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	N/A



Financial Resources	Accessible or Eligible to Use (Yes/No)
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state Funding Programs	Yes
Open Space Acquisition funding programs	No
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	Yes

### Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Suffolk County Water Authority.

**Table 9.46-7. Education and Outreach Capabilities**

Indicate if your jurisdiction has the following resources	Yes/No; Please describe
Public information officer or communications office?	Yes, Education Center
Personnel skilled or trained in website development?	Yes
Hazard mitigation information available on your website; if yes, describe	Yes, drought, groundwater contamination
Social media for hazard mitigation education and outreach; if yes, briefly describe.	Yes, Twitter, Facebook, YouTube
Citizen boards or commissions that address issues related to hazard mitigation; if yes, briefly describe.	No
Other programs already in place that could be used to communicate hazard-related information; if yes, briefly describe.	Tours of Facilities
Warning systems for hazard events; if yes, briefly describe.	No
Natural disaster/safety programs in place for schools; if yes, briefly describe.	No
Other	Waterwise program. Supported by Cornell University Cooperative Extension of Suffolk County; Long Island Aquifer Commission; Groundwater Guardians Program

### Community Classifications

Not applicable.

### Adaptive Capacity

Adaptive capacity is defined as “the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences” (IPCC 2014). In other words, it describes a jurisdiction’s current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction’s rating.

**Table 9.46-8. Adaptive Capacity**

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low*
Coastal Erosion	Medium
Cyber Security	Medium
Disease Outbreak	Medium



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low*
Drought	Medium
Earthquake	Medium
Expansive Soils	N/A
Extreme Temperature	Medium
Flood	Medium
Groundwater Contamination	Medium
Hurricane	Medium
Infestation and Invasive Species	N/A
Nor'Easter	Medium
Severe Storm	Medium
Severe Winter Storm	High
Shallow Groundwater	N/A
Wildfire	High

\*High Capacity exists and is in use  
 Medium Capacity may exist; but is not used or could use some improvement  
 Low Capacity does not exist or could use substantial improvement  
 Unsure Not enough information is known to assign a rating

The Suffolk County Water Authority has access to resources to determine the possible impacts of climate change upon the Suffolk County Water Authority and is supportive of integrating climate change in policies or actions. Climate change is already being integrated into current policies/plans or actions (projects/monitoring) within the Suffolk County Water Authority through the Long Island Commission for Aquifer Protection (LICAP) and State of the Aquifer report

### 9.46.5 National Flood Insurance Program

Not applicable.

### 9.46.6 Integration with Other Planning Initiatives

As this HMP update is implemented, the Suffolk County Water Authority will use information from the plan as the best available science and data for natural hazards. The capability assessment presented in this annex identifies codes, plans, and programs that provide opportunities for integration. The Suffolk County and local action plans developed for this HMP update actions related to plan integration, as well as progress on these actions, will be reported through the progress reporting process described in Volume I. New opportunities for integration also will be identified as part of the annual progress report.

#### Existing Integration

- SCWA website:** The SCWA website (<https://www.scwa.com/>) includes news, education material, and other various information regarding the services of the SCWA, potential hazards, and upcoming updates.
- Groundwater Guardian Program:** The Groundwater Guardian program is an international effort by the Groundwater Foundation to educate the public about the nature and value of groundwater, and is run locally by a group of dedicated individuals representing government, the business community, and education, agriculture, and Suffolk citizens. Some Suffolk county team members of the Groundwater Guardian program include The Suffolk County Water Authority, Citizens Campaign for the Environment, The Long Island Farm Bureau, Stony Brook University, and The Scotts Miracle-Gro Company. Team activities can include awareness campaigns, such as school poster contests, pollution prevention, conservation, public policy initiatives, waterway cleanups and best management practices





**Opportunities for Future Integration**

- **Establishment of Generator Servicing Program (2020-SCWA-007):** SCWA will establish guidelines for the regular maintenance of diesel generators to regularly polish fuel and prevent buildup of bacteria. Generators will be maintained to be in a state of continual operational readiness.
- **Emergency Equipment Standardization (2020-SCWA-005):** The SCWA will review purchasing and procurement procedures in an attempt to standardize the SCWA’s equipment to allow for greater cost efficiency and redundancies to be established for emergency response.

**9.46.7 Evacuation, Sheltering, Temporary Housing, and Permanent Housing**

Not applicable.

**9.46.8 Hazard Event History Specific to the Suffolk County Water Authority**

Suffolk County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the County and its municipalities. The Suffolk County Water Authority’s history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Suffolk County. Table 9.46-9 provides details regarding municipal-specific loss and damages the Water Authority experienced during hazard events. Information provided in the table below is based on reference material or local sources. For details of these and additional events, refer to Volume I, Section 5.0 of this plan.

**Table 9.46-9. Hazard Event History**

Dates of Event	Event Type (Disaster Declaration if applicable)	County Designated?	Summary of Event	Summary of Damages and Losses
February 8 – 9, 2013	Severe Winter Storm and Snowstorm (FEMA DR-4111)	Yes	Low pressure that formed along the northern Gulf coast by the morning of Thursday, February 7, 2013 moved northeast to near Cape Hatteras by the morning of Friday, February 8, 2013. The low then rapidly intensified while moving northeast to a position east of Cape Cod by the morning of Saturday, February 9, 2013, producing very heavy snowfall and blizzard conditions across central and eastern Long Island on February 8th and 9th, and winter storm conditions across the rest of southeast New York.	Although the county was impacted, the Water Authority did not report damages.
March 14 – 15, 2017	Severe Winter Storm and Snowstorm (FEMA DR-4322)	Yes	On Tuesday, March 14th, rapidly deepening low pressure tracked up the eastern seaboard resulting in damaging winds in Suffolk County.	Although the county was impacted, the Water Authority did not report damages.

Notes:

- EM Emergency Declaration (FEMA)
- FEMA Federal Emergency Management Agency
- DR Major Disaster Declaration (FEMA)
- N/A Not applicable



### 9.46.9 Hazard Ranking and Jurisdiction-Specific Vulnerabilities

The hazard profiles in Section 5 (Risk Assessment) of this plan have detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes critical facility and community lifeline flood exposure, and the hazards of greatest concern and risk to the Suffolk County Water Authority. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.

A gradient of certainty was developed to summarize the confidence level regarding the input used to populate the hazard ranking. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and create increased understanding of the data used to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

#### Critical Facilities

New York Department of Environmental Conservation (DEC) Statute 6 CRR-NY 502.4 sets forth floodplain management criteria for State projects located in flood hazard areas. The law states that no such projects related to critical facilities shall be undertaken in a Special Flood Hazard Area (SFHA) unless constructed according to specific mitigation specifications, including being raised 2’ above the Base Flood Elevation (BFE). This statute is outlined at <http://tinyurl.com/6-CRR-NY-502-4>. While all vulnerabilities should be assessed and documented, the State places a high priority on exposure to flooding. Critical facilities located in an SFHA, or having ever sustained previous flooding, must be protected to the 500-year flood event, or worst damage scenario. For those that do not meet these criteria, the jurisdiction must identify an action to achieve this level of protection (NYS DHSES 2017).

The table below identifies critical facilities and community lifelines located in the 1-percent and 0.2-percent floodplain. It also summarizes if the facility is already mitigated in compliance with NYS standards (i.e., to the 0.2-percent annual chance event or worse-case scenario), or if a new mitigation action is proposed in the plan update.

**Table 9.46-10. Potential Flood Losses to Critical Facilities**

Name	Type	Exposure			Complies with NYS Standards	Addressed by Proposed Action
		1% Event		0.2% Event		
		A-Zone	V-Zone			
Harbor Well Field & Pump Station*	SCWA	-	X	X	TBD	2020-SCWA-009
Meeting House Road Well Field, Pump Station & Elevated Tank*	SCWA	X	-	X	TBD	2020-SCWA-009
Dune Road Future Well Field Site*	SCWA	-	X	X	TBD	2020-SCWA-009
Dune Road Future Well Field Site*	SCWA	X	-	X	TBD	2020-SCWA-009
Dune Road North Well Field Site*	SCWA	X	-	X	TBD	2020-SCWA-009



Name	Type	Exposure			Complies with NYS Standards	Addressed by Proposed Action
		1% Event		0.2% Event		
		A-Zone	V-Zone			
Dune Road South Well Field & Pump Station*	SCWA	-	X	X	TBD	2020-SCWA-009
Waterworks Road Well Field, Pump Station, and Elevated Tank*	SCWA	X	-	X	TBD	2020-SCWA-009
Waterworks Road Well Field, Pump Station, and Elevated Tank*	SCWA	X	-	X	TBD	2020-SCWA-009
East Walk Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Fisherman's Path Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Harbor Walk Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Bay View Walk Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Point O'Woods Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Central Roadway Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Sandy Walk Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Bay Walk Well Field & Pump Station*	SCWA	-	X	X	TBD	2020-SCWA-009
Robbins Walk Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Central Walk (Cranberry Walk) Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Cedar Court Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Cedar Court Well Field & Pump* Station	SCWA	X	-	X	TBD	2020-SCWA-009
Watch Hill Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009
Ocean Bay Park (Traffic Walk) Well Field & Pump Station*	SCWA	X	-	X	TBD	2020-SCWA-009

Source: Suffolk County 2020; FEMA 2009

Notes: x = Facility is located in the floodplain boundary.

\*Community Lifeline





### Hazard Ranking

This section provides the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 5 (Risk Assessment) of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy as well as community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with highest level of concern.

As discussed in Section 5.3 (Hazard Ranking), each participating jurisdiction may have differing degrees of risk exposure and vulnerability compared to Suffolk County as a whole. Therefore, the Suffolk County Water Authority ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential hazards for the Suffolk County Water Authority. The Suffolk County Water Authority has reviewed the county hazard risk/vulnerability risk ranking table and provided input to its individual results to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard/vulnerability risk ranking, the Suffolk County Water Authority indicated the following:

- The Water Authority changed the hazard ranking for drought from low to medium.
- The Water Authority changed the hazard ranking for hurricane from high to medium.
- The Water Authority changed the hazard ranking for nor'easter from high to medium.
- The Water Authority changed the hazard ranking for wildfire from medium to high.

**Table 9.46-11. Hazard Ranking**

<b>Coastal Erosion</b>	<b>Cyber Security</b>	<b>Disease Outbreak</b>	<b>Drought</b>	<b>Earthquake</b>	<b>Expansive Soils</b>
Medium	Medium	Medium	Medium	Medium	Low
<b>Extreme Temperature</b>	<b>Flood</b>	<b>Groundwater Contamination</b>	<b>Hurricane</b>	<b>Infestation and Invasive Species</b>	<b>Nor'Easter</b>
Medium	Medium	Medium	Medium	Medium	Medium
	<b>Severe Storm</b>	<b>Severe Winter Storm</b>	<b>Shallow Groundwater</b>	<b>Wildfire</b>	
	Medium	Medium	Medium	High	

### Identified Issues

The Suffolk County Water Authority has identified the following vulnerabilities within their community:

- Cyber Security is a concern.
- Dark sky events. Major power loss for extended periods of time. Generators are designed to run for 3 days but not long term.
- Fuel shortages would limit ability of generators to be powered, cascading impacts on transportation.

#### 9.46.10 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and their prioritization.



### **Past Mitigation Initiative Status**

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The following table indicates progress on the community’s mitigation strategy identified in the 2014 HMP. Actions that are carried forward as part of this plan update are included in the updated mitigation strategy table (Table 9.46-13). Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under ‘Capability Assessment’ presented previously in this annex.



Table 9.46-12. Status of Previous Mitigation Actions

Project #	Project Name	Hazard(s) Addressed	Responsible Party	Brief Summary of the Original Problem and the Solution (Project)	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if complete)		Next Steps  1. Project to be included in 2020 HMP or Discontinue 2. If including action in the 2020 HMP, revise/reword to be more specific (as appropriate). 3. If discontinue, explain why.
						Cost		
SCWA-1	Improvement of EFC Generator Inventory	Hurricane, Nor'Easter, Severe Storm, Severe Winter Storm, Earthquake	SCWA	Need to mitigate against power outages that impact the Suffolk County Water Authority's ability to provide service in a community.	Complete	Cost	\$9-10 million	1. Discontinue  2.  3. Complete
						Level of Protection		
						Damages Avoided; Evidence of Success		
SCWA-2  (Sandy HMGP LOI #: 1887)	Sandy Walk Well Field and Pump Station Back-up Power	Hurricane, Nor'Easter, Severe Storm, Severe Winter Storm, Earthquake	SCWA	Well Field and Pump Station require backup power	Complete	Cost	\$127,450.00	1. Discontinue  2.  3. Complete
						Level of Protection		
						Damages Avoided; Evidence of Success		
SCWA-3	Fairmont Avenue Well Field and Pump Station Back-up Power	Hurricane, Nor'Easter, Severe Storm, Severe Winter	SCWA	Well Field and Pump Station require backup power	Complete	Cost	\$347,733.00	1. Discontinue  2.
						Level of Protection		



Project #	Project Name	Hazard(s) Addressed	Responsible Party	Brief Summary of the Original Problem and the Solution (Project)	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if complete)		Next Steps  1. Project to be included in 2020 HMP or Discontinue 2. If including action in the 2020 HMP, revise/reword to be more specific (as appropriate). 3. If discontinue, explain why.
						Damages Avoided; Evidence of Success	Cost	
(Sandy HMGP LOI #: 1888)		Storm, Earthquake				Damages Avoided; Evidence of Success		3. Complete
SCWA-4  (Sandy HMGP LOI #: 1890)	Portable Generator	Hurricane, Nor'Easter, Severe Storm, Severe Winter Storm, Earthquake	SCWA	Need mobile capability to mitigate against power outages that impact the Suffolk County Water Authority's ability to provide service in a community.	Complete	Cost	\$131,864.00	1. Discontinue
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3. Complete
SCWA-5	Continue to enhance and implement emergency plans	All	SCWA	Emergency Plans need to be kept up to date.	Ongoing Capability	Cost		1. Discontinue
						Level of Protection		2.
						Damages Avoided; Evidence of Success		3. Ongoing capability
			SCWA		Ongoing capability	Cost		1. Discontinue



Project #	Project Name	Hazard(s) Addressed	Responsible Party	Brief Summary of the Original Problem and the Solution (Project)	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if complete)		Next Steps 1. Project to be included in 2020 HMP or Discontinue 2. If including action in the 2020 HMP, revise/reword to be more specific (as appropriate). 3. If discontinue, explain why.
						Level of Protection	Damages Avoided; Evidence of Success	
SCWA-6	Continue to enhance mutual aid agreements	All		Mutual aid agreements need to be kept up to date		Level of Protection		2. 3. Ongoing capability
						Damages Avoided; Evidence of Success		
SCWA-7	Participate in the update of the Suffolk County Mitigation Plan	All	SCWA	Mitigation Plan requires update on a five year basis	Ongoing Capability	Cost		1. Discontinue 2. 3. Ongoing capability
						Level of Protection		
						Damages Avoided; Evidence of Success		
SCWA-8	Support and participate in county led initiatives intended to build local and regional mitigation and risk-reduction capabilities (see Section 9.1), specifically: <ul style="list-style-type: none"> <li>Mitigation Education for Natural Disasters (natural hazard awareness and personal scale risk reduction/mitigation public education and outreach program)</li> <li>Build Local Floodplain Management and Disaster Recovery Capabilities (enhanced floodplain management, and post-disaster assessment and recovery capabilities)</li> <li>County-Wide Debris Management Plan</li> <li>Jurisdictional Knowledge of Mitigation Needs of Property Owners (improved understanding of damages and mitigation interest/activity of private property owners)</li> <li>Create a Multi-Jurisdictional Seismic Safety Committee in Suffolk County (build regional, county and local capabilities to manage seismic risk, both pre- and post-disaster)</li> </ul>					Cost		1. Discontinue 2. 3. Ongoing capability
						Level of Protection		





Project #	Project Name	Hazard(s) Addressed	Responsible Party	Brief Summary of the Original Problem and the Solution (Project)	Status (In Progress, Ongoing, No Progress, Complete)	Evaluation of Success (if complete)		Next Steps
	<ul style="list-style-type: none"> <li>Alignment of Mitigation Initiatives through all levels of Government (effort to build State and Federal level recognition and support of the County and local hazard mitigation planning strategies identified in this plan).</li> </ul>							
	See above	All Hazards	SCWA	Capabilities require continued support	Ongoing capability	Damages Avoided; Evidence of Success		
SCWA-9	Work with County and PSEG (formerly LIPA) to identify roads within the Suffolk County Water Authority that are considered "critical", and to be the first priority for clearing after an event involving downed power lines.	Severe Storm; Severe Winter Storm; Hurricane; Nor'Easter	PSEG, County	Roads must be kept clear of debris and downed power lines	No Progress	Cost		<ol style="list-style-type: none"> <li>1. Include in 2020 HMP</li> <li>2.</li> <li>3.</li> </ol>
						Level of Protection		
						Damages Avoided; Evidence of Success		



### Completed Mitigation Initiatives Not Identified in the Previous Mitigation Strategy

The Suffolk County Water Authority has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2020 HMP:

- The Water Authority is actively working to complete a Critical Infrastructure app. The App will allow for inventory of critical assets, incident reporting, and other information. This information will allow the Water Authority to respond more quickly to hazard events and identify infrastructure needs.
- The Water Authority has mitigated for flood using elevation, underground facilities, and negative pressure.

### Proposed Hazard Mitigation Initiatives for the HMP Update

The Suffolk County Water Authority participated in a mitigation action workshop in June 2020 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.46-13 summarizes the comprehensive-range of specific mitigation initiatives the Suffolk County Water Authority would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), fourteen criteria are used to evaluate and prioritize each proposed mitigation action. A numeric factor is assigned (-1, 0, or 1) to each criterion to provide a relative indication of the opportunities and constraints of each action. A numerical sum of the input provides the basis of the prioritization of actions wherein each action is assigned a category of Low, Medium, or High to indicate an implementation hierarchy. A High priority action indicates the jurisdiction will prioritize its implementation and apply for funding, if needed, as opportunities become available during the plan period of performance. This does not prevent the jurisdiction from implementing other ranked actions; however, this provides a snapshot of implementation priority at the time of this plan update.

Table 9.46-14 provides a summary of the evaluation and prioritization for each proposed mitigation initiative. Refer to the action worksheets at the end of this annex for more details on the high-ranked hazards identified first for implementation.



Table 9.46-13. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
2020-SCWA-001	Diesel fuel supply for generator support	1, 2, 7, 8	All hazards	<p><b>Problem:</b> Generators require fuel supply, specifically during extended power outages from major events. Under a best case scenario, generators can run for three days. Post-Sandy, with just half of the SCWA’s generators running, 100,000 gallons of fuel was consumed. Failure of generators results in depressurization of the system and extensive time periods to re-pressurize. This delays reoccupation after a disaster event. Due to recent state regulatory requirements for contracts with fuel suppliers, the SCWA is limited to one vendor to service the entire County. The vendor is unable to service 36 generators located on the Forks. The size of the County and regulatory issues with bulk storage of fuel prohibits the SCWA from attempting fuel storage and transport independently.</p> <p><b>Solution:</b> Work with NYS DHSES to gain an allowance from the state’s vendor requirements to regain vendor contracts that will allow the SCWA’s generators to be fueled in disaster events.</p>	Yes	None	Within 6 months	SCWA, NYS DHSES	Staff time	Continuity of water service during extended power outages	SCWA budget	High	LPR	PR, ES





Table 9.46-13. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
2020-SCWA-002	Critical roadway access at generator protected facilities	1, 2, 3, 5, 7, 8	Hurricane, Invasive Species, Nor'Easter, Severe Storm, Severe Winter Storm	<p><b>Problem:</b> The SCWA has numerous facilities with backup generators in remote locations. The roadways leading to these locations must be kept clear of debris and downed power lines to allow for fuel delivery to support backup generators during extended power outages.</p> <p><b>Solution:</b> The SCWA will conduct an assessment to determine the facilities which require secure access for fuel support for generators. SCWA will then work to develop an ongoing program for tree clearing/trimming with the jurisdictions responsible for those roadways.</p>	Yes	Tree removal may require permitting	Ongoing once established	SCWA, PSEG LI, local jurisdiction partners	TBD by assessment	Protection of water service during extended power outages	FEMA HMGP, SCWA budget, PSEG LI, local budgets	High	NSP	NR, ES
2020-SCWA-003	Cyber security assessment	1, 2, 7	Cyber Security	<p><b>Problem:</b> Cyber security needs to be assessed to determine necessary upgrades in software and processes to prevent cyber attack on the SCWA water distribution system. DHS did an assessment of the SCWA system in the past but it needs to be revisited.</p> <p><b>Solution:</b> SCWA will support DHS in the running of a full cyber security assessment of the SCWA water distribution system.</p>	Yes	None	Within 1 year	SCWA, DHS	Within	Identification of cyber vulnerabilities and necessary security improvements	DHS, SCWA	High	LPR	PR, ES



Table 9.46-13. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
2020-SCWA-004	Generator Replacement	1, 2, 7	All Hazards	<p><b>Problem:</b> Post-Sandy, the SCWA has upgraded or replaced roughly 50 generators. Since that time, 7 additional generators have been identified that require replacement as identified by testing. These generators are critical to the system as a whole. The generators in need of replacement are all 480V, 3P and are listed below:</p> <ul style="list-style-type: none"> <li>• Jayne</li> <li>• Knight</li> <li>• Fisherman’s Path</li> <li>• Traffic</li> <li>• East Walk</li> <li>• Old Montauk Booster</li> <li>• East Hampton Drive West</li> <li>• Cross Highway</li> </ul> <p><b>Solution:</b> The SCWA will replace the 7 generators and ensure electrical hookup components are functional.</p>	Yes	None	1 year	SCWA Mechanical	\$25,000 per generator	Protection of water service during extended power outages	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	High	SIP	PP
2020-SCWA-005	Emergency Equipment Standardization	1, 2, 7	All Hazards	<p><b>Problem:</b> Generators and other equipment used by SCWA are not standardized in terms of make and model. The lack of standardization has led to issues with servicing and repairing equipment.</p> <p><b>Solution:</b> The SCWA will review purchasing and procurement procedures in an attempt to standardize</p>	No	None	Within 1 year	SCWA	Staff time, potential for more expensive up front costs in purchasing but savings in the long term	Greater cost efficiency in lifespan of equipment. Establishment of redundancies for emergency response.	SCWA budget	High	LPR	PR, ES





Table 9.46-13. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
				the SCWA’s equipment to allow for greater cost efficiency and redundancies to be established for emergency response.										
2020-SCWA-006	Post-Disaster Access for Generator Refueling	1, 2, 7	All Hazards	<p><b>Problem:</b> After disaster events, access to impacted areas is often restricted. The variety of enforcement agencies (National Guard, local police, etc.) can result in different allowances for access for refueling of the SCWA’s generators. Generators require fuel supply, specifically during extended power outages from major events. Under a best case scenario, generators can run for three days. Post-Sandy, with just half of the SCWA’s generators running, 100,000 gallons of fuel was consumed. Failure of generators results in depressurization of the system and extensive time periods to re-pressurize. This delays reoccupation after a disaster event. This situation is most critical and most likely to occur at the critical facilities located in the SFHA.</p> <p><b>Solution:</b> Work with SC FRES to update the post-disaster procedures identified in the CEMP to allow for access of utilities such as SCWA, PSEG,</p>	Yes	No	Within 6 months	SC FRES, SCWA	Staff time	Protection of critical facilities, continuity of operations, post-disaster recovery	SC budget	High	LPR	PR, ES





Table 9.46-13. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
				National Grid, Verizon, Cablevision, etc. to ensure that utilities can be maintained to prevent further damage and repairs can take place quickly and allow for reoccupation.										
2020-SCWA-007	Establishment of Generator Servicing Program	1, 2, 7	All hazards	<p><b>Problem:</b> Diesel generators need to be serviced regularly to prevent build up of bacteria. During Sandy, 3 generators failed and the SCWA ran out of replacement fuel filters to keep the generators functioning properly.</p> <p><b>Solution:</b> SCWA will establish guidelines for the regular maintenance of diesel generators to regularly polish fuel and prevent build up of bacteria.</p>	Yes	None	Within 1 year	SCWA	Staff time	Efficient generators, reduced cost in fuel filter replacement	SCWA	High	LPR	PR
2020-SCWA-008	Spare Parts Inventory	1, 2, 7	All hazards	<p><b>Problem:</b> The SCWA does not have an established spare parts inventory to service generators and essential equipment at critical facilities. The wide variety of makes and models of equipment makes finding parts during and after a disaster difficult and risks continuity of service.</p> <p><b>Solution:</b> The SCWA will establish an inventory of spare parts to be housed at regional locations. Parts include fuel filters, O-rings, sock sleeves, etc.</p>	Yes	None	Within 1 year	SCWA	\$200,000	Continuity of service of essential equipment	SCWA, FEMA BRIC	High	LPR, SIP	PR, PP



Table 9.46-13. Proposed Hazard Mitigation Initiatives

Project Number	Project Name	Goals Met	Hazard(s) to be Mitigated	Description of Problem and Solution	Critical Facility (Yes/No)	EHP Issues	Estimated Timeline	Lead Agency	Estimated Costs	Estimated Benefits	Potential Funding Sources	Priority	Mitigation Category	CRS Category
2020-SCWA-009	Critical Facilities Flood Protection	1, 2, 7	Flood	<p><b>Problem:</b> Critical facilities should be protected to the 500-year flood level.</p> <p><b>Solution:</b> The SCWA will conduct a survey of all facilities that are located in the 100-year floodplain and institute mitigation actions to protect them to the 500-year flood level as necessary. Potential mitigation actions include elevation and floodproofing.</p>	Yes 💧	None	Within 5 years	SCWA	High	Critical facilities protected from flooding	SCWA, HMGP, BRIC	High	SIP	PP

Notes:

Not all acronyms and abbreviations defined below are included in the table.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CRS Community Rating System
- DPW Department of Public Works
- EHP Environmental Planning and Historic Preservation
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program

Timeline:

The time required for completion of the project upon implementation

Cost:

The estimated cost for implementation.

Benefits:

A description of the estimated benefits, either quantitative and/or qualitative.

Critical Facility:

Yes 💧 Critical Facility located in 1% floodplain

Mitigation Category:







- *Local Plans and Regulations (LPR)* – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- *Structure and Infrastructure Project (SIP)* - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- *Natural Systems Protection (NSP)* – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- *Education and Awareness Programs (EAP)* – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- *Preventative Measures (PR)* - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- *Property Protection (PP)* - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- *Public Information (PI)* - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- *Natural Resource Protection (NR)* - Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- *Structural Flood Control Projects (SP)* - Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- *Emergency Services (ES)* - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities



**Table 9.46-14. Summary of Prioritization of Actions**

Project Number	Project Name	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2020-SCWA-001	Diesel Fuel Supply for Generator Support	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
2020-SCWA-002	Critical roadway access at generator protected facilities	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
2020-SCWA-003	Cyber security assessment	1	1	0	1	1	1	1	1	1	1	0	1	1	1	12	High
2020-SCWA-004	Generator Replacement	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-SCWA-005	Emergency Equipment Standardization	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-SCWA-006	Post-Disaster Access for Generator Refueling	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
2020-SCWA-007	Establishment of Generator Servicing Program	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-SCWA-008	Spare Parts Inventory	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2020-SCWA-009	Critical Facilities Flood Protection	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).



**9.46.11 Proposed Mitigation Action Types**

The table below indicates the range of proposed mitigation action categories.

**Table 9.46-15. Analysis of Mitigation Actions by Hazard and Category**

Hazard	FEMA				CRS				ES	
	LPR	SIP	NSP	EAP	PR	PP	PI	NR		SP
Coastal Erosion	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006
Cyber Security	2020-SCWA-001, 2020-SCWA-003, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-003, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-003, 2020-SCWA-005, 2020-SCWA-006
Disease Outbreak	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006
Drought	2020-SCWA-001, 2020-	2020-SCWA-004, 2020-			2020-SCWA-001, 2020-	2020-SCWA-004, 2020-				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006





Hazard	FEMA				CRS					
	LPR	SIP	NSP	EAP	PR	PP	PI	NR	SP	ES
	SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	SCWA-008			SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	SCWA-008				
Earthquake	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006
Expansive Soils	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006
Extreme Temperature	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006



Hazard	FEMA				CRS					
	LPR	SIP	NSP	EAP	PR	PP	PI	NR	SP	ES
Flood	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008, 2020-SCWA-009			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008, 2020-SCWA-009				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006
Groundwater Contamination	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006
Hurricane	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008	2020-SCWA-002		2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008		2020-SCWA-002		2020-SCWA-001, 2020-SCWA-002, 2020-SCWA-005, 2020-SCWA-006
Infestation and Invasive Species	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-	2020-SCWA-004, 2020-SCWA-008	2020-SCWA-002		2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-	2020-SCWA-004, 2020-SCWA-008		2020-SCWA-002		2020-SCWA-001, 2020-SCWA-002, 2020-SCWA-005, 2020-SCWA-006



Hazard	FEMA				CRS					
	LPR	SIP	NSP	EAP	PR	PP	PI	NR	SP	ES
	SCWA-008				SCWA-008					
Nor'Easter	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008	2020-SCWA-002		2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008		2020-SCWA-002		2020-SCWA-001, 2020-SCWA-002, 2020-SCWA-005, 2020-SCWA-006
Severe Storm	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008	2020-SCWA-002		2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008		2020-SCWA-002		2020-SCWA-001, 2020-SCWA-002, 2020-SCWA-005, 2020-SCWA-006
Severe Winter Storm	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008	2020-SCWA-002		2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008		2020-SCWA-002		2020-SCWA-001, 2020-SCWA-002, 2020-SCWA-005, 2020-SCWA-006
Shallow Groundwater	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006



Hazard	FEMA				CRS					
	LPR	SIP	NSP	EAP	PR	PP	PI	NR	SP	ES
	SCWA-007, 2020-SCWA-008				SCWA-007, 2020-SCWA-008					
Wildfire	2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008			2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006, 2020-SCWA-007, 2020-SCWA-008	2020-SCWA-004, 2020-SCWA-008				2020-SCWA-001, 2020-SCWA-005, 2020-SCWA-006

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

### 9.46.12 Staff and Local Stakeholder Involvement in Annex Development

The Suffolk County Water Authority followed the planning process described in Section 3 (Planning Process) in Volume I of this plan update. This annex was developed over the course of several months with input from many Water Authority departments, including: GIS Strategic Initiatives, Emergency Management, and Mechanical. The Department of Strategic Initiatives represented the community on the Suffolk County Hazard Mitigation Plan Planning Partnership, Steering Committee, and supported the local planning process requirements by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

The following table summarizes who participated and in what capacity. Additional documentation on the Suffolk County Water Authority’s planning process through Planning Partnership meetings is included in Section 3 (Planning Process) and Appendix C (Meeting Documentation).

**Table 9.46-16. Contributors to the Annex**

Name	Title/Entity	Method of Participation
Katelyn Cassagne	GIS Strategic Initiatives Tech.	Alternate Point of Contact, attended plan participant meetings, provided impact data, contributed to mitigation strategy
Richard Bova	Deputy Dir. Strategic initiatives / Emergency Manager	Primary Point of Contact, attended plan participant meetings, provided impact data, contributed to mitigation strategy
Phil Thompson	Mechanical Supervisor/Emergency Manager	Attended plan participant meetings, provided impact data, contributed to mitigation strategy



### **9.46.13 Hazard Area Extent and Location**

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As the Suffolk County Water Authority includes facilities throughout Suffolk County, hazard area extent and location maps at the County level are available in Section 5 (Hazard Profiles).

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Action Worksheet			
<b>Project Name:</b>	Critical roadway access at generator protected facilities		
<b>Project Number:</b>	2020-SCWA-002		
<b>Risk / Vulnerability</b>			
<b>Hazard(s) of Concern:</b>	Hurricane, Invasive Species, Nor'Easter, Severe Storm, Severe Winter Storm		
<b>Description of the Problem:</b>	The SCWA has numerous facilities with backup generators in remote locations. The roadways leading to these locations must be kept clear of debris and downed power lines to allow for fuel delivery to support backup generators during extended power outages. Failure of generators results in depressurization of the system and extensive time periods to re-pressurize. This delays reoccupation after a disaster event.		
<b>Action or Project Intended for Implementation</b>			
<b>Description of the Solution:</b>	The SCWA will conduct an assessment to determine the facilities which require secure access for fuel support for generators. SCWA will then work to develop an ongoing program for tree clearing/trimming with the jurisdictions responsible for those roadways.		
<b>Is this project related to a Critical Facility?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
<b>Is this project related to a Critical Facility located within the 100-year floodplain?</b>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect to the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
<b>Level of Protection:</b>	Roadway access maintained	<b>Estimated Benefits (losses avoided):</b>	Continuity of water service during extended power outages.
<b>Useful Life:</b>	5 years if not maintained.	<b>Goals Met:</b>	1, 2, 3, 5, 7, 8
<b>Estimated Cost:</b>	TBD by assessment	<b>Mitigation Action Type:</b>	Natural Systems Protection
<b>Plan for Implementation</b>			
<b>Prioritization:</b>	High	<b>Desired Timeframe for Implementation:</b>	Within 1 year
<b>Estimated Time Required for Project Implementation:</b>	Ongoing once established	<b>Potential Funding Sources:</b>	FEMA HMGP, SCWA budget, PSEG LI, local budgets
<b>Responsible Organization:</b>	SCWA, PSEG LI, local jurisdiction partners	<b>Local Planning Mechanisms to be Used in Implementation if any:</b>	Hazard mitigation, Emergency planning
<b>Three Alternatives Considered (including No Action)</b>			
<b>Alternatives:</b>	<b>Action</b>	<b>Estimated Cost</b>	<b>Evaluation</b>
	No Action	\$0	Problem continues.
	Install solar panels to replace generators	\$100,000 per facility	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbines to replace generators	\$100,000 per facility	Weather dependent; poses a threat to wildlife; expensive repairs if needed
<b>Progress Report (for plan maintenance)</b>			
<b>Date of Status Report:</b>			
<b>Report of Progress:</b>			
<b>Update Evaluation of the Problem and/or Solution:</b>			



Evaluation and Prioritization		
<b>Project Name:</b>	Critical roadway access at generator protected facilities	
<b>Project Number:</b>	2020-SCWA-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
<b>Life Safety</b>	1	Project will protect water supply for drinking water and fire response in Suffolk County
<b>Property Protection</b>	1	Project will protect SCWA critical facilities from power loss
<b>Cost-Effectiveness</b>	1	
<b>Technical</b>	1	The project is technically feasible
<b>Political</b>	1	There is support for the project
<b>Legal</b>	1	The SCWA has the legal authority to complete the project
<b>Fiscal</b>	0	Project will require funding support
<b>Environmental</b>	0	Project may require permitting for fuel storage
<b>Social</b>	1	
<b>Administrative</b>	1	
<b>Multi-Hazard</b>	1	Hurricane, Invasive Species, Nor'Easter, Severe Storm, Severe Winter Storm
<b>Timeline</b>	1	Within 2 years
<b>Agency Champion</b>	1	SCWA
<b>Other Community Objectives</b>	1	Protects continuity of operations of critical services
<b>Total</b>	12	
<b>Priority (High/Med/Low)</b>	High	



Action Worksheet																																																																											
<b>Project Name:</b>	Generator Replacement																																																																										
<b>Project Number:</b>	2020-SCWA-004																																																																										
<b>Risk / Vulnerability</b>																																																																											
<b>Hazard(s) of Concern:</b>	All hazards																																																																										
<b>Description of the Problem:</b>	<p>Post-Sandy, the SCWA has upgraded or replaced roughly 50 generators. Since that time, 7 additional generators have been identified that require replacement as identified by testing. These generators are critical to the system as a whole. Failure of generators results in depressurization of the system and extensive time periods to re-pressurize. This delays reoccupation after a disaster event. The generators in need of replacement are all 480V, 3P and are listed below:</p> <ul style="list-style-type: none"> <li>• Jayne</li> <li>• Knight</li> <li>• Fisherman's Path</li> <li>• Traffic</li> <li>• East Walk</li> <li>• Old Montauk Booster</li> <li>• East Hampton Drive West</li> <li>• Cross Highway</li> </ul>																																																																										
<b>Action or Project Intended for Implementation</b>																																																																											
<b>Description of the Solution:</b>	<p>The SCWA will replace the 7 generators and ensure the generator hookups are up to date. Specifics of the generators are as follows:</p> <table border="1"> <thead> <tr> <th>Station Name</th> <th>Voltage</th> <th>Service</th> <th>Exis KW</th> <th>Prop KW</th> <th>2017 Demand</th> <th>2018 Demand</th> <th>2019 Demand</th> </tr> </thead> <tbody> <tr> <td>Jayne</td> <td>480V, 3P</td> <td>1200A</td> <td>350</td> <td></td> <td>371.3</td> <td>379.9</td> <td>379.1</td> </tr> <tr> <td>Knight</td> <td>480V, 3P</td> <td>800A</td> <td>200</td> <td></td> <td>314.5</td> <td>201.1</td> <td>200.8</td> </tr> <tr> <td>Fisherman's Path</td> <td>480V, 3P</td> <td>225A</td> <td>90</td> <td></td> <td>93</td> <td>101</td> <td>59</td> </tr> <tr> <td>Traffic</td> <td>208V, 3P</td> <td>600A</td> <td>175</td> <td></td> <td>56.5</td> <td>59</td> <td>60.5</td> </tr> <tr> <td>East Walk</td> <td>480V, 3P</td> <td>200A</td> <td>90</td> <td></td> <td>40.5</td> <td>80.5</td> <td>58.5</td> </tr> <tr> <td>Old Montauk Booster</td> <td>480V, 3P</td> <td>200</td> <td></td> <td>200</td> <td>90</td> <td>97</td> <td>97</td> </tr> <tr> <td>East Hampton Dr W</td> <td>480V, 3P</td> <td>400A</td> <td></td> <td>150</td> <td>65</td> <td>67</td> <td>68.5</td> </tr> <tr> <td>Cross Hwy</td> <td>480V, 3P</td> <td>800A</td> <td></td> <td>350</td> <td>41</td> <td>87</td> <td>86</td> </tr> </tbody> </table>			Station Name	Voltage	Service	Exis KW	Prop KW	2017 Demand	2018 Demand	2019 Demand	Jayne	480V, 3P	1200A	350		371.3	379.9	379.1	Knight	480V, 3P	800A	200		314.5	201.1	200.8	Fisherman's Path	480V, 3P	225A	90		93	101	59	Traffic	208V, 3P	600A	175		56.5	59	60.5	East Walk	480V, 3P	200A	90		40.5	80.5	58.5	Old Montauk Booster	480V, 3P	200		200	90	97	97	East Hampton Dr W	480V, 3P	400A		150	65	67	68.5	Cross Hwy	480V, 3P	800A		350	41	87	86
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<b>Is this project related to a Critical Facility?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>																																																																									
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<b>Level of Protection:</b>	N/A	<b>Estimated Benefits (losses avoided):</b>	Protection of water service during extended power outages																																																																								
<b>Useful Life:</b>	20 years	<b>Goals Met:</b>	1, 2, 7																																																																								
<b>Estimated Cost:</b>	\$25,000 per generator	<b>Mitigation Action Type:</b>	Structure and Infrastructure Projects (SIP)																																																																								
<b>Plan for Implementation</b>																																																																											
<b>Prioritization:</b>	High	<b>Desired Timeframe for Implementation:</b>	Immediately after funding received																																																																								
<b>Estimated Time Required for Project Implementation:</b>	1 year	<b>Potential Funding Sources:</b>	FEMA HMGP and PDM, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget																																																																								
<b>Responsible Organization:</b>	Town Board, Engineer	<b>Local Planning Mechanisms to be Used in Implementation if any:</b>	Hazard Mitigation, Emergency Management																																																																								
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<b>Alternatives:</b>	<b>Action</b>	<b>Estimated Cost</b>	<b>Evaluation</b>																																																																								



*Section 9.46: Suffolk County Water Authority*

	No Action	\$0	Problem continues.
	Install solar panels	\$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	\$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed
<b>Progress Report (for plan maintenance)</b>			
<b>Date of Status Report:</b>			
<b>Report of Progress:</b>			
<b>Update Evaluation of the Problem and/or Solution:</b>			



Action Worksheet		
<b>Project Name:</b>	Generator Replacement	
<b>Project Number:</b>	2020-SCWA-004	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Project will protect water supply
Property Protection	1	Project will protect critical facilities from power loss
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The SCWA has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	1 year
Agency Champion	1	SCWA Mechanical
Other Community Objectives	1	
<b>Total</b>	13	
<b>Priority (High/Med/Low)</b>	High	



Action Worksheet			
<b>Project Name:</b>	Spare Parts Inventory		
<b>Project Number:</b>	2020-SCWA-008		
<b>Risk / Vulnerability</b>			
<b>Hazard(s) of Concern:</b>	All Hazards		
<b>Description of the Problem:</b>	The SCWA does not have an established spare parts inventory to service generators and essential equipment at critical facilities. The wide variety of makes and models of equipment makes finding parts during and after a disaster difficult and risks continuity of service. Failure of generators results in depressurization of the system and extensive time periods to re-pressurize. This delays reoccupation after a disaster event.		
<b>Action or Project Intended for Implementation</b>			
<b>Description of the Solution:</b>	The SCWA will establish an inventory of spare parts to be housed at regional locations. Parts include fuel filters, O-rings, sock sleeves, etc..		
<b>Is this project related to a Critical Facility?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
<b>Is this project related to a Critical Facility located within the 100-year floodplain?</b>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
(If yes, this project must intend to protect to the 500-year flood event or the actual worse case damage scenario, whichever is greater)			
<b>Level of Protection:</b>	Continuity of service of essential equipment	<b>Estimated Benefits (losses avoided):</b>	Continuity of service of essential equipment for continuity of water service during extended power outages.
<b>Useful Life:</b>	Ongoing once established	<b>Goals Met:</b>	1, 2, 7
<b>Estimated Cost:</b>	\$200,000	<b>Mitigation Action Type:</b>	Local Plans and Regulations, Structure and Infrastructure Project
<b>Plan for Implementation</b>			
<b>Prioritization:</b>	High	<b>Desired Timeframe for Implementation:</b>	Within 1 year
<b>Estimated Time Required for Project Implementation:</b>	Ongoing once established	<b>Potential Funding Sources:</b>	SCWA, FEMA BRIC
<b>Responsible Organization:</b>	SCWA	<b>Local Planning Mechanisms to be Used in Implementation if any:</b>	Hazard mitigation, Emergency planning
<b>Three Alternatives Considered (including No Action)</b>			
<b>Alternatives:</b>	<b>Action</b>	<b>Estimated Cost</b>	<b>Evaluation</b>
	No Action	\$0	Problem continues.
	Install solar panels to replace generators	\$100,000 per facility	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbines to replace generators	\$100,000 per facility	Weather dependent; poses a threat to wildlife; expensive repairs if needed
<b>Progress Report (for plan maintenance)</b>			
<b>Date of Status Report:</b>			
<b>Report of Progress:</b>			
<b>Update Evaluation of the Problem and/or Solution:</b>			



Evaluation and Prioritization		
<b>Project Name:</b>	Spare Parts Inventory	
<b>Project Number:</b>	2020-SCWA-008	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
<b>Life Safety</b>	1	Project will protect water supply for drinking water and fire response in Suffolk County
<b>Property Protection</b>	1	Project will protect SCWA critical facilities from power loss
<b>Cost-Effectiveness</b>	1	
<b>Technical</b>	1	The project is technically feasible
<b>Political</b>	1	There is support for the project
<b>Legal</b>	1	The SCWA has the legal authority to complete the project
<b>Fiscal</b>	0	Project will require funding support
<b>Environmental</b>	1	
<b>Social</b>	1	
<b>Administrative</b>	1	
<b>Multi-Hazard</b>	1	All Hazards
<b>Timeline</b>	1	Within 1 year
<b>Agency Champion</b>	1	SCWA
<b>Other Community Objectives</b>	1	Protects continuity of operations of critical services
<b>Total</b>	13	
<b>Priority (High/Med/Low)</b>	High	