



9.4 BOROUGH OF CALDWELL

This section presents the jurisdictional annex for the Borough of Caldwell. The annex includes a general overview of the Borough; an assessment of the Borough's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to hazards.

9.4.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Caldwell's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.4-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Mark Guiliano, Emergency Management Coordinator Address: 1 Provost Square, Caldwell, NJ 07006 Phone Number: (973)-403-4629 Email: fireofficial@caldwell-nj.com	Name / Title: Brian Maclay, Deputy Emergency Management Coordinator Address: 1 Provost Square, Caldwell, NJ 07006 Phone Number: (973)-403-4629 Email: fireinspector@caldwell-nj.com
NFIP Floodplain Administrator	
Name / Title: Paul Milani, Construction Official/Zoning Officer Address: 1 Provost Square, Caldwell, NJ 07006 Phone Number: (973)-403-4626 Email: mbifalco@caldwell-nj.com	

9.4.2 Jurisdiction Profile

The Caldells were settled in the early 18th Century. The 22nd and 24th President of the United States, Grover Cleveland, was born in Caldwell. In 2010, New Jersey Monthly magazine ranked Caldwell the third best place to live in New Jersey (The Official Website of Caldwell, NJ, 2014).

The Borough of Caldwell operates under the borough form of government which consists of a Mayor and six-member Council. The Council is elected at-large every three years on a staggering basis with two seats coming up for election every year. The Mayor is elected every four years (The Official Website of Caldwell, NJ, 2014).

According to the U.S. Census Bureau, the Borough has a total land area of 1.167 square miles, of which 1.166 square miles is land and 0.001 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of Caldwell was 7,822. The estimated 2017 population was 8,032, a 2.7 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 4.9 percent of the population is 5 years of age or younger and 16.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.4.3 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 9.4-2 summarizes recent and expected future development trends, including major residential/commercial development and



major infrastructure development. Figures 9.4-1 and 9.4-2 at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.4-2. Recent and Expected Future Development

Type of Development	2015	2016	2017	2018	2019 YTD
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family	1	1	2	7	6
Multi-Family	1	0	11	5	0
Other (commercial, mixed-use, etc.)	1	0	0	10	5
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
Recent Major Development and Infrastructure from 2015 to Present					
Water Main Upgrades	Infrastructure Upgrades	-	Throughout the Borough	-	Ongoing Infrastructure Upgrades
The Wilson	Mixed-Use	1	307 Bloomfield Avenue	-	To be completed in 2020.
Grover House	Mixed-Use	1	333 Bloomfield Avenue	-	Completed and occupied by tenants.
Caldwell OEM Emergency Operations Center	Infrastructure	1	-	-	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Multi-Level Parking Garage	Infrastructure	3 or 4 Story Parking Structure	Location Pending	-	Development in planning stages

* Only location-specific hazard zones or vulnerabilities identified.

9.4.4 Capability Assessment

The Borough of Caldwell 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.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Caldwell.



Table 9.4-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local and State	Yes	-	-
Comment: State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14. Administered by the Caldwell Building Department. Chapter 81 Construction Codes, Uniform of the municipal code. Original adoption 1977 with various amendments.					
Zoning Code	Yes	Local and State	Yes	-	-
Comment: Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan. Chapter 250 Zoning of the municipal code. Adopted in 1979.					
Subdivisions	Yes	Local and State	Yes	-	-
Comment: State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. Chapter 210 Subdivision and Site Plan Review of the municipal code. First adopted in 1980 with amendments. Administered by the Borough of Caldwell Planning Board or Board of Adjustment.					
Stormwater Management	Yes	Local	Yes	No	-
Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 206 Stormwater Control of the municipal code. Adopted in March 2006. It is the purpose of this chapter to establish minimum stormwater management requirements and controls for "major development."					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	No	-
Comment: N.J.A.C. 13:45A-29.1; Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.					
Growth Management	No	-	Yes	-	-
Comment: State mandated at local level					
Shoreline Development	No	-	Yes – if coastal community	-	-
Comment: NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone Management Rules N.J.A.C. 7:7E-1 et seq.					
Site Plan Review	Yes	Local	Yes	Yes/No	Yes/No
Comment: Chapter 210 Subdivision and Site Plan Review of the municipal code. First adopted in 1980 with amendments. Administered by the Borough of Caldwell Planning Board or Board of Adjustment.					
Environmental Protection	No	-	Yes	-	-
Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.					
Flood Damage Prevention	Yes	Local	No	No	-
Comment: Chapter 110 Flood Damage Prevention (adopted June 2007, establishes the Caldwell Construction Official as the floodplain administrator) and Chapter 111 Floodplain Management (adopted in February 2000, Borough Clerk responsible for administering) in the municipal code.					



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Wellhead Protection	No	-	-	-	-
Comment:					
Emergency Management	Yes	Local	No	-	-
Comment: Yes, Ordinances establishing OEM/Deputy Coordinator (Annual Ordinance) 3 Year Term. Chapter 23 Fire Department and Chapter 41 Police Department of the municipal code.					
Climate Change	No	-	-	-	-
Comment:					
Disaster Recovery Ordinance	No	-	-	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	-	-	-
Comment:					
Other	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
Comment: Borough of Caldwell Master Plan Re-Examination Report 2017. Previous reports: Re-examination Report in 2005 and original Master Plan in 1998. The 2017 Reexamination report includes mapping of Greenways, land use natural features.					
Capital Improvement Plan	No	-	Allowed	-	-
Comment: Per NJSA 40:55D-29 the governing body is authorized to direct the planning board to prepare a CIP with at least a six year planning horizon.					
Disaster Debris Management Plan	No	-	No	-	-
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local and State	Yes	-	-
Comment: Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s).					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	-	-
Comment:					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:-					



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Shoreline Management Plan	No	-	No	No	-
Comment:					
Community Wildfire Protection Plan	No	-	No	No	-
Comment:					
Community Forest Management Plan	No	-	No	No	-
Comment:					
Transportation Plan	No	-	No	No	-
Comment:					
Agriculture Plan	No	-	No	No	-
Comment:					
Climate Action Plan	No	-	No	No	-
Comment:					
Tourism Plan	No	-	No	No	-
Comment:					
Business Development Plan	No	-	No	No	-
Comment:					
Other	-	-	-	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
Comment: Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years.					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	No	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	No	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	-	Yes/No	-	-
Comment:					
Other	No	-	-	No	-
Comment:					



Table 9.4-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes
- If no, who does? If yes, which department?	
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No, jurisdiction is fully built out

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Caldwell.

Table 9.4-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	Yes	Open Space Trust Committee
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Code Red / Nixle
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Surrounding Communities, County, State (for continuity of operations, HazMat (Nutley))
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning / Zoning Boards
Engineers or professionals trained in building or infrastructure construction practices	Yes	Planning / Zoning Boards; Construction Official
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer
Staff with training in benefit/cost analysis	Yes	Finance; Chief Financial Officer and Borough Administrator analyze costs
Surveyors	No	-
Personnel skilled or trained in GIS applications	Yes	Licensed water operator; Borough engineer; Borough has purchased GIS software
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator
Grant writers	No	Grant applications are currently written by staff
Resilience Officer	No	-
Other	Yes	Contractors to assist with Debris Management; Paul Milani Building Inspector/Code Enforcement; IT



Staff/Personnel Resource	Available?	Department/Agency/Position
		Director (Consultant); Communication Officer

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of Caldwell.

Table 9.4-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Borough Administrator
Capital Improvements Project Funding	Yes – Administration/Finance
Authority to Levy Taxes for Specific Purposes	Yes – Mayor and Council
User Fees for Water, Sewer, Gas or Electric Service	Yes - Sewer (Mayor and Council)
Incur Debt through General Obligation Bonds	Yes - Mayor and Council
Incur Debt through Special Tax Bonds	Yes – Mayor and Council
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Borough of Caldwell.

Table 9.4-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes; Council
Do you have personnel skilled or trained in website development?	No
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	Yes; Links to FEMA/NJOEM/NFPA
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Facebook, Twitter, Website
Do you have any citizen boards or commissions that address issues related to hazard mitigation? • If yes, briefly describe.	Yes; Environmental Commission
Do you have any other programs already in place that could be used to communicate hazard-related information? • If yes, briefly describe.	Yes; Nixle / Code Red / Reverse911 / Social Media
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes; Air Raid Sirens, PA System (Police)

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of Caldwell.



Table 9.4-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	NP	_____	Date
Building Code Effectiveness Grading Schedule (BCEGS)	NP	_____	Date
Public Protection (Fire ISO Protection Class)	Yes	5	2016
Storm Ready Certification	NP	_____	Date
Firewise Community Classification	NP	_____	Date

NP = Not participating

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 climate change and the jurisdiction’s rating.

Table 9.4-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Medium
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)	Medium
Drought	Medium
Earthquake	Medium
Extreme Temperature	Medium
Flood (riverine / flash flood, SLR)	Medium
Geological Hazards (landslides and subsidence/sinkholes)	Medium
Severe Weather (high wind, tornado, TSTM, and hail)	Medium
Severe Winter Weather (heavy snow, blizzards, and ice storms)	Medium
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	Medium
Disease Outbreak	Medium
Economic Collapse	Medium
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure	Medium

Notes:

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.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

**Table 9.4-10. National Flood Insurance Program Compliance**

Criterion	Response
What local department is responsible for floodplain management?	Building Department
Who is your floodplain administrator? (name, department/position)	Paul Milani, Building/ Zoning Official
Are any certified floodplain managers on staff in your jurisdiction?	Yes/No
What is the date that your flood damage prevention ordinance was last amended?	12/06/2007
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	CAC: 02/21/2002
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? • If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? • If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? • If no, state why.	No High intensity storms are causing increased flooding throughout the Borough in areas which previously did not flood. This is not represented
Does your floodplain management staff need any assistance or training to support its floodplain management program?	Yes Any additional technical assistance or training would be utilized by the Borough
<input type="checkbox"/> If so, what type of assistance/training is needed?	Floodplain Management, National Flood Insurance Program Training, Technical Assistance on Mitigation
Does your jurisdiction participate in the Community Rating System (CRS)? • If yes, is your jurisdiction interested in improving its CRS Classification? • If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?*	Flood insurance policies: 3 Insurance in force: \$555,000 Premium in force: \$2,416
How many total loss claims have been filed in your jurisdiction?*	Total loss claims: 1 Claims still open or were closed without payment: 1 Total payments for losses: \$4617.45
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

*According to FEMA statistics as of 03/31/2019

9.4.5 Integration with Other Planning Initiatives

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, each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures, which are indicated in this subsection and the mitigation strategy, where appropriate.

EXISTING INTEGRATION

In the performance period since adoption of the 2015 HMP, the Borough of Caldwell made progress on integrating hazard mitigation into other initiatives. The following plans and programs currently integrate components of the HMP and strategy:



- **Caldwell Sewer Utility:** The Caldwell Wastewater Treatment Plant, located off of Passaic Avenue in West Caldwell, New Jersey, and the sewerage system constructed by and owned by the Borough of Caldwell located in Caldwell and West Caldwell, New Jersey, and the services rendered through the employment of said property are designated as the "Caldwell Sewerage Utility."
- **Caldwell municipal webpage:** The Caldwell municipal website (<http://www.caldwell-nj.com/content/79/default.aspx>) includes information for various departments, codes, and more. The website includes links to social media and provides links and instructions to sign up for emergency alerts and the special needs registry.
- **Office of Emergency Management:** The Borough of Caldwell Office of Emergency Management coordinates the plans and operations of the various components of the emergency management system - police and fire, emergency medical service, public works, volunteers and other groups contributing to the management of emergencies. The Emergency Management Coordinators are the point people responsible for implementing the Emergency Management Plan and directing the emergency response.
- **Board of Health:** The Caldwell Board of Health is responsible for the day to day function of the Health Department which includes the administering of retail food and pet licenses, handling complaints, and Vital Statistics, which includes the recording of all births, deaths, marriages, and civil unions that occur within a municipality.
- **Sustainable Essex Alliance:** The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.
- **Sustainable Jersey:** Caldwell is a Sustainable Jersey certified community--one of only 198 in the state. Caldwell achieved Sustainable Jersey certification at the bronze level. Certified towns are an outstanding group of municipalities that are making important contributions toward the long-term goal of a sustainable New Jersey and world.

OPPORTUNITIES FOR FUTURE INTEGRATION

As this HMP update is implemented, the Borough of Caldwell 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 Essex 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. The capability assessment identified the following plans and programs that do not currently integrate goals or recommendations of the HMP but provide opportunities for future implementation:

- The Flood Damage Prevention Ordinance (Chapter 110 of the municipal code) lacks the state mandated 1-foot freeboard requirement. The borough can update the ordinance to include this requirement.
- The Master Plan could be updated to reference the hazard mitigation plan and cover hazard related topics.



9.4.6 Hazard Event History Specific to the Jurisdiction

Essex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.4 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Borough of Caldwell's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.4-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. Information provided in the table below is based on reference material or local sources.

Table 9.4-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Hudson County Designated?	Summary of Event	Summary of Local Damages and Losses
March 14, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	Plowing/Clearing of Snow, Snow Removal, Salting/Sanding, Towing, Emergency Evacuation, Sheltering, Emergency Repairs, Sandbagging. \$19,680k of labor costs for downtown snow removal, Total cost is approximately \$40k, Reimbursed \$13k
May 1, 2018	Severe Storm	N/A	A severe storm brought strong winds.	Downed trees, downed wires, school was closed. Substantial labor costs, debris storage, \$35,000 for tub grinder.
March 7, 2018	Winter Storm Quinn	N/A	The storm brought heavy wet snow, strong gusty winds, and even some thundersnow across northeast New Jersey. Snowfall rates ranged from 1 to 3 inches per hour at times in the heaviest snow bands. Trained spotters and the public reported 1 to 2 feet of snow. 23.0 inches was reported in North Caldwell and 19.7 inches in Roseland. The heavy wet snow and strong winds also brought down trees and some power lines.	Downed trees, damage street signs, downed wires. Approx. \$80k of reimbursements for DPW, Fire, Police, Health
March 21, 2018	Winter Storm Toby	N/A	Winter storm brought wind and snow.	Power outages (opened up warming center). Declared State of Emergency for Winter Storm.
November 8, 2018	Flood	N/A	Heavy rainfall.	Damaged Culverts, Parking Deck (Municipal), Retaining Walls, Retaining Walls, Sidewalks, Steep Slopes, Landscaping, Library (1st Flood Inundated). Approximately > \$400k, Still assessing damages.



9.4.7 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. The following summarizes the hazards of greatest concern and risk to the Borough of Caldwell.

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.

REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Caldwell.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Note: The number of SRL properties excludes RL properties.

Policies and Claims from <https://bsa.nfipstat.fema.gov/reports/1011.htm> and <https://bsa.nfipstat.fema.gov/reports/1040.htm> as of 09/30/2018

RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).

CRITICAL FACILITIES

No identified critical facilities or lifelines in the community are located in the 1-percent and 0.2-percent floodplain.

Table 9.4-12. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Potential Loss from 1% Flood Event	
		1% Event	0.2% Event	Percent Structure Damage	Percent Content Damage
None					



Table 9.4-13. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion: CEHA	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind	Category 1:	0	Category 1:	0	100-year Wind Loss:	\$585,788	High
		Category 2:	0	Category 2:	0			
	Category 1 through Category 4 SLOSH	Category 3:	0	Category 3:	0	500-year Wind Loss:	\$4,486,911	
		Category 4:	0	Category 4:	0			
Drought	Drought event	Majority of the County is serviced by water supplies who get water from surface water.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500-Year Mean Return Period Event	NEHRP D&E:	4,808	NEHRP D&E:	1,002	100-year Loss:	\$0	High
		Liquefaction Class 4:	0	Liquefaction Class 4:	0	500-year Loss:	\$1,229,842	
						2,500-year Loss:	\$18,524,023	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	1,338	Physical impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or power failures.		Low
		Population Below Poverty Level:	583					
Flood	100- and 500-Year Mean Return Period Event	100-year	5	100-year	1	100-year Loss:	\$460,358	High
		500-year	5	500-year	545			
Geological	High Landslide Susceptibility Areas	Class A:	0	Class A:	0	Class A:	0	Moderate
		Class B:	43	Class B:	8	Class B:	\$4,937,770	



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Severe Weather	Severe Weather Event	Entire population exposed; The degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter Weather Event	Entire population exposed; The degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	One of the following: West Nile Virus, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis, Lyme Disease, Influenza, Ebola Virus	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.		Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.		The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.		Low



Hazard of Concern	Hazard/ Scenario Area Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Hazardous Substances	Port Newark is in Essex County (3 rd largest port in the U.S.) Major highways/rail Pipelines 10 NPL Sites in County	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.	The degree of damages to a building depends on the scale of the incident.	The degree of damages depends on the scale of the incident.	Low
Utility Interruption	Disruption of power or water supply caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low



ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following vulnerabilities within their community:

- Lack of training in response to earthquake.
- Large trees and old infrastructure results in utility failures.
- Runoff from White Rock/Ferndale causes increased flow and flooding.
- The Pine Brook along Bloomfield Avenue is obstructed by vegetation and debris and leads to flooding along Bloomfield Ave Corridor.
- More frequent high intensity, short duration rainfall events are causing stormwater flooding along the Bloomfield Avenue Corridor and due to lack of stormwater drainage.
- Recent flooding events in conjunction with increased stormwater runoff has left the Borough of Caldwell susceptible to stormwater flooding.
- A significant portion of the Borough of Caldwell does not fall within a FEMA Delineated Special Flood Hazard Area (SFHA), but high intensity, short duration rainfall events cause significant flooding in conjunction with stormwater runoff due to Borough being built out has led to flood damages sustained to commercial and residential structures.
- The August 2018 flooding as a result of high intensity, short duration rainfall flooded the Caldwell Municipal Library and resulted in approximately \$700,000 worth of damage
- The August 2018 flooding as a result of high intensity, short duration rainfall flooded causing a significant amount of damage along the Bloomfield Avenue Corridor to residential, commercial, and municipal buildings.
- Caldwell Public Library lacks backup power.
- Lincoln Elementary School lacks backup power.
- Urban Flooding in Downtown/Municipal Complex along Bloomfield Ave, Personette Street, Hatfield, Brookside, Westville.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of Caldwell that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Caldwell has significant exposure; Figures 9.4-1 and 9.4-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties within the municipality.

HAZARD RANKING

This section includes 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 4 of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; and 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 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Essex County as a whole. Therefore, each jurisdiction 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 Borough of Caldwell. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any



other changes needed. The Borough of Caldwell has reviewed the Essex County hazard ranking table, as well as its individual results, to reflect the relative risk of the hazards of concern to the community.

During the review of the hazard ranking, the Borough indicated the following:

- The Borough changed the hazard ranking for flood from low to high.
- The Borough changed the hazard ranking for wildfire from low to medium.
- The Borough changed the hazard ranking for cyber attack from low to medium.
- The Borough changed the hazard ranking for terrorism from low to medium.

Table 9.4-14. Borough of Caldwell Hazard Ranking Input

Coastal Erosion and Sea Level Rise	Coastal Storm		Drought	Earthquake	Extreme Temperature	Flood
Low	Low		Medium	High	Medium	High

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Low	High	High	Medium	Low	Medium

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Interruption	Terrorism	Transportation Failure
Low	Medium	Low	High	Medium	Low

9.4.8 Mitigation Strategy and Prioritization

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

PAST MITIGATION INITIATIVE STATUS

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.4-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Caldwell-1: Caldwell CVFD and Caldwell Community Center generator.	Borough Administrator	Completed	-	-



2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
Caldwell-2: Caldwell Pine Brook flood control/bank stabilization project.	Borough Engineering	In Progress - Issues with Private Land Ownership	X	2020-Caldwell-001
Caldwell-3: Conduct a Water, Sewer, and Stormwater Study and includes video inspection of Stormwater and Sewer lines	Borough Engineering	In Progress	X	2020-Caldwell-007
Caldwell-4: Conduct Flood Studies of the Calamus and Grover Brook to include Mountain Avenue Flooding	Borough Engineering	In Progress - Issues with Jurisdiction	X	2020-Caldwell-008
Caldwell-5: Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in the way of mitigation and preparedness.	Borough Administrator	Discontinue - Ongoing Capability	-	-
Caldwell-6: Create/Enhance/Maintain Mutual Aid agreements with neighboring communities for continuity of operations	Borough Administrator	Discontinue - Ongoing Capability	-	-
Caldwell-7: The HMP will be used as a guide when the Borough reviews/updates their ordinances.	Borough Administrator	Discontinue - Ongoing Capability	-	-

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of Caldwell participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Caldwell participated in a mitigation action workshop in October 2019 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; and 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). Section 6 (Mitigation Strategy) and Appendix H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.4-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Caldwell would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four (4) FEMA mitigation action categories and the six (6) 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), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. Table 9.4-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.4-18 summarizes the actions by type across hazards of concern..



Table 9.4-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Caldwell -001	Caldwell Pine Brook flood control/bank stabilization project	The Pine Brook along Bloomfield Avenue is obstructed by vegetation and debris and leads to flooding along the Bloomfield Avenue Corridor	Caldwell DPW will work in conjunction with Essex County Public Works and Private Property owners to clear debris and vegetation out of stream to promote better flow within the Pine Brook and reduce occurrences of flooding.	N/A	Flood	2	<u>Borough DPW</u> , Borough Administration, Borough Engineer FPA	Federal, State Grants, Municipal Budget	Medium	\$20,000 Annually	Within 18 months	High	NSP, SIP	N, R, SP
2020-Caldwell -002	Stormwater Infrastructure Upgrades	More frequent high intensity, short duration rainfall events are causing stormwater flooding along the Bloomfield	Caldwell Engineering/OEM will work with Essex County Engineering/Public Works to determine if additional stormwater	Existing	Flood, Severe Storm	2	<u>Borough Engineering</u> , Borough OEM, Essex County Public Works	Federal and State Grants, County Budget, Municipal Capital Funding	High	High	Within 5 years	High	SIP	PP



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Avenue Corridor and due to lack of stormwater drainage.	infrastructure can be installed along Bloomfield Avenue. If upgrades can be made, Caldwell Engineering will work with Essex County to improve the existing stormwater infrastructure.											
2020-Caldwell-003	Green Stormwater Infrastructure Public Outreach	Recent flooding events in conjunction with increased stormwater runoff has left the Borough of Caldwell susceptible to stormwater flooding.	Rutgers Cooperative Extension has started a green stormwater infrastructure study along the Bloomfield Avenue Corridor. Caldwell OEM and Municipal Officials will support Rutgers	N/A	Flood, Severe Storm	2, 3	<u>Borough OEM,</u> Borough Administration, Rutgers Cooperative Extension	Federal and State Grants, Municipal Budget	High	\$10,000	Within 1 year of study completion	High	EAP	PI



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
			Cooperative Extension by assisting with public education and outreach for the citizens of Caldwell related to implementation of potential green stormwater infrastructure projects identified as a result of the study.											
2020-Caldwell-004	NFIP Insurance Public Outreach	A significant portion of the Borough of Caldwell does not fall within a FEMA Delineated Special Flood Hazard Area (SFHA), but high	Caldwell OEM will provide additional information regarding National Flood Insurance Program policies to affected residential and commercial	N/A	Flood, Severe Storm	3	<u>Borough OEM</u> , Borough Administration	Federal and State Grants, Municipal Budget	High	Low	Within 1 year	High	EAP	PI



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		intensity, short duration rainfall events cause significant flooding in conjunction with stormwater runoff due to Borough being built out has led to flood damages sustained to commercial and residential structures.	property owners.											
2020-Caldwell-005	Floodproofing Caldwell Municipal Library	The August 2018 flooding as a result of high intensity, short duration rainfall flooded the Caldwell Municipal Library and resulted in approximately	Caldwell DPW will work to install floodproofing measures to mitigate damage sustained from flooding events on Bloomfield Ave.	Existing	Flood, Severe Storm	2	<u>Borough DPW</u> , Borough OEM, Borough Administration	Federal and State Grants, Municipal Budget	High	Medium	Within 18 months	High	SIP	PP



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		\$700,000 worth of damage.												
2020-Caldwell -006	FEMA HMA Phased Project for Bloomfield Ave Corridor Flooding	The August 2018 flooding as a result of high intensity, short duration rainfall flooded causing a significant amount of damage along the Bloomfield Avenue Corridor to residential, commercial, and municipal buildings.	Caldwell will gather data and submit an HMA Grant to request funding to fund a flood study along the corridor and based on the results of the study will implement the best alternative.	N/A	Flood, Severe Storm	2, 6	<u>Borough OEM</u> , Borough Engineer/FPA, Borough Administration	Federal and State Grants, Municipal Capital Improvements, Municipal Budget	High	High	Within 3 years	Medium	SIP	PP
2020-Caldwell -007	Water, Sewer, and Stormwater Study	Caldwell's Aging Infrastructure has led to breakages or inadequate capacity for stormwater drainage leading to	Conduct a Water, Sewer, and Stormwater Study and includes video inspection of Stormwater and Sewer lines	Existing	Flood, Severe Storm	2	<u>Borough Engineer/FPA</u> , Borough Administration	Federal and State Grants	High	Medium	Within 3 years (DOF)	High	SIP	PR



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		flooding during heavy rainfall events.												
2020-Caldwell-008	Flood Studies of the Calamus and Grover Brook	Various streams run through Caldwell and flood during high intensity rain events leading to property damage.	Conduct Flood Studies of the Calamus and Grover Brook to include Mountain Avenue Flooding and implement the best identified alternative.	N/A	Flood	2	Borough Engineering, FPA	Federal and State Grants	High	High	Within 3 years	Medium	LPR, SIP	SP, PR

Notes:

Acronyms and Abbreviations:

CAV	Community Assistance Visit
CRS	Community Rating System
DPW	Department of Public Works
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.

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 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. 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 preserve or restore the functions of natural systems. 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. 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 9.4-17. Summary of Prioritization of Actions

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Caldwell-001	Caldwell Pine Brook flood control/bank stabilization project	1	1	1	1	0	0	1	1	1	1	0	1	0	0	9	High
2020-Caldwell-002	Stormwater Infrastructure Upgrades	1	1	1	1	0	0	1	1	1	1	0	1	0	0	9	High
2020-Caldwell-003	Green Stormwater Infrastructure Public Outreach	1	1	1	1	1	1	1	1	1	1	1	1	0	0	12	High
2020-Caldwell-004	NFIP Insurance Public Outreach	1	1	1	1	1	1	1	1	1	1	0	1	1	0	12	High
2020-Caldwell-005	Floodproofing Caldwell Municipal Library	1	1	1	1	1	1	1	0	0	1	0	1	0	0	11	High



Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Caldwell-006	FEMA HMA Phased Project for Bloomfield Ave Corridor Flooding	1	1	1	1	0	1	0	1	0	0	0	1	0	0	8	Medium
2020-Caldwell-007	Water, Sewer, and Stormwater Study	1	1	1	1	1	1	1	0	0	1	0	1	0	0	11	High
2020-Caldwell-008	Flood Studies of the Calamus and Grover Brook	1	1	1	1	0	1	0	1	0	0	0	1	0	0	8	Medium

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).



Table 9.4-18. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Coastal Erosion and Sea Level Rise								
Coastal Storms (hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge)								
Drought								
Earthquake								
Extreme Temperature								
Flood (riverine / flash flood, SLR)	2020-Caldwell-008		2020-Caldwell-003, 2020-Caldwell-004, 2020-Caldwell-005	2020-Caldwell-001		2020-Caldwell-007		
Geological Hazards (landslides and subsidence/sinkholes)								
Severe Weather (high wind, tornado, TSTM, and hail)	2020-Caldwell-008		2020-Caldwell-003, 2020-Caldwell-004			2020-Caldwell-005, 2020-Caldwell-006, 2020-Caldwell-007		
Severe Winter Weather (heavy snow, blizzards, and ice storms)								
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption								
Terrorism								
Transportation Failure								

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

9.4.9 Staff and Local Stakeholder Involvement in Annex Development

The Borough of Caldwell followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. 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. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation



Documentation). Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.4-19. Contributors to the Annex

Entity	Title	Method of Participation
Mark Guiliano	Emergency Management Coordinator	Primary POC; attended meetings; provided information requested to update the annex
Brian Maclay	Deputy Emergency Management Coordinator	Alternate POC; provided information requested to update the annex
Mario BiFalco	DPW Director	Attended Annex Meeting; provided information requested to update the annex

DRAFT



Figure 9.4-1. Borough of Caldwell Hazard Area Extent and Location Map

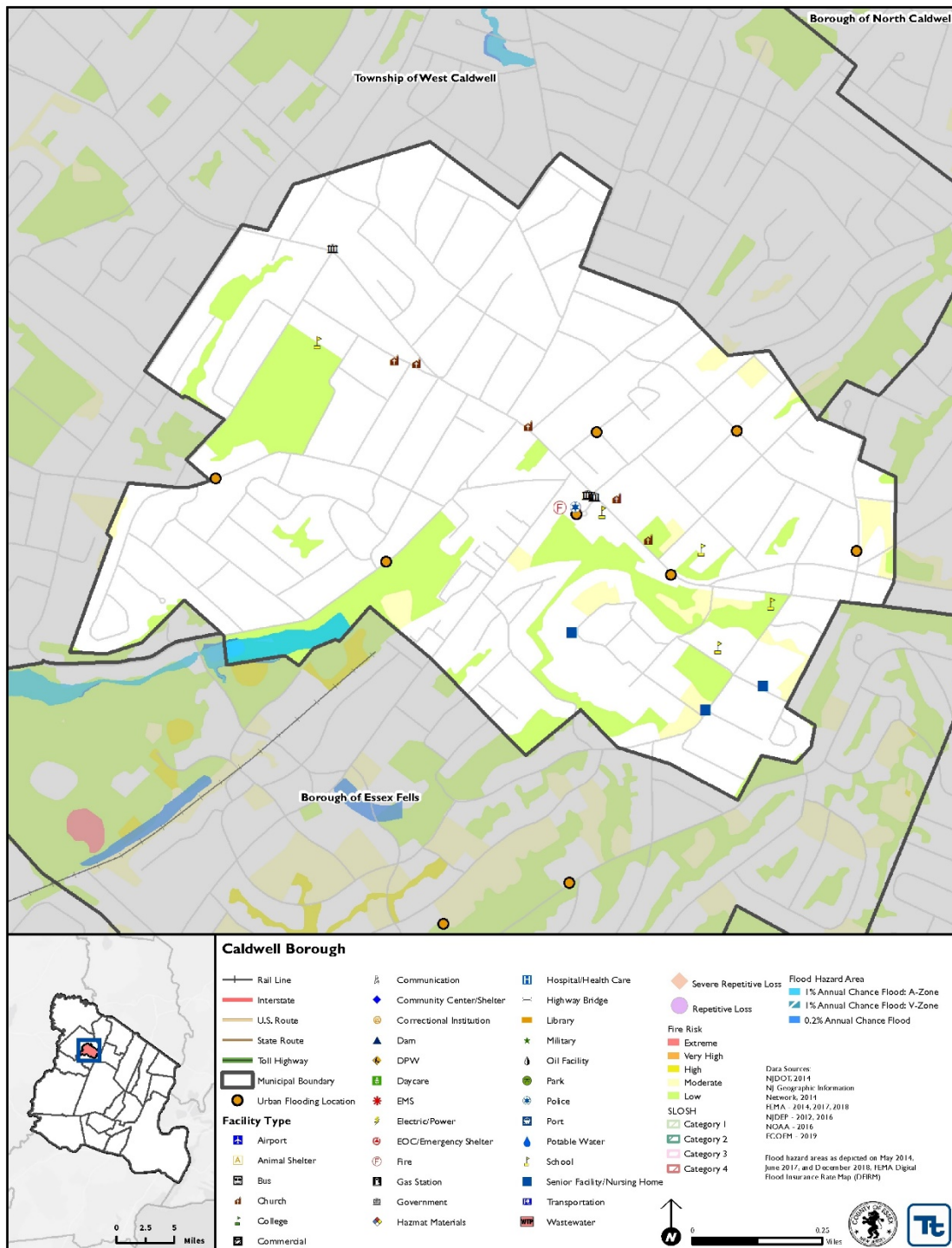
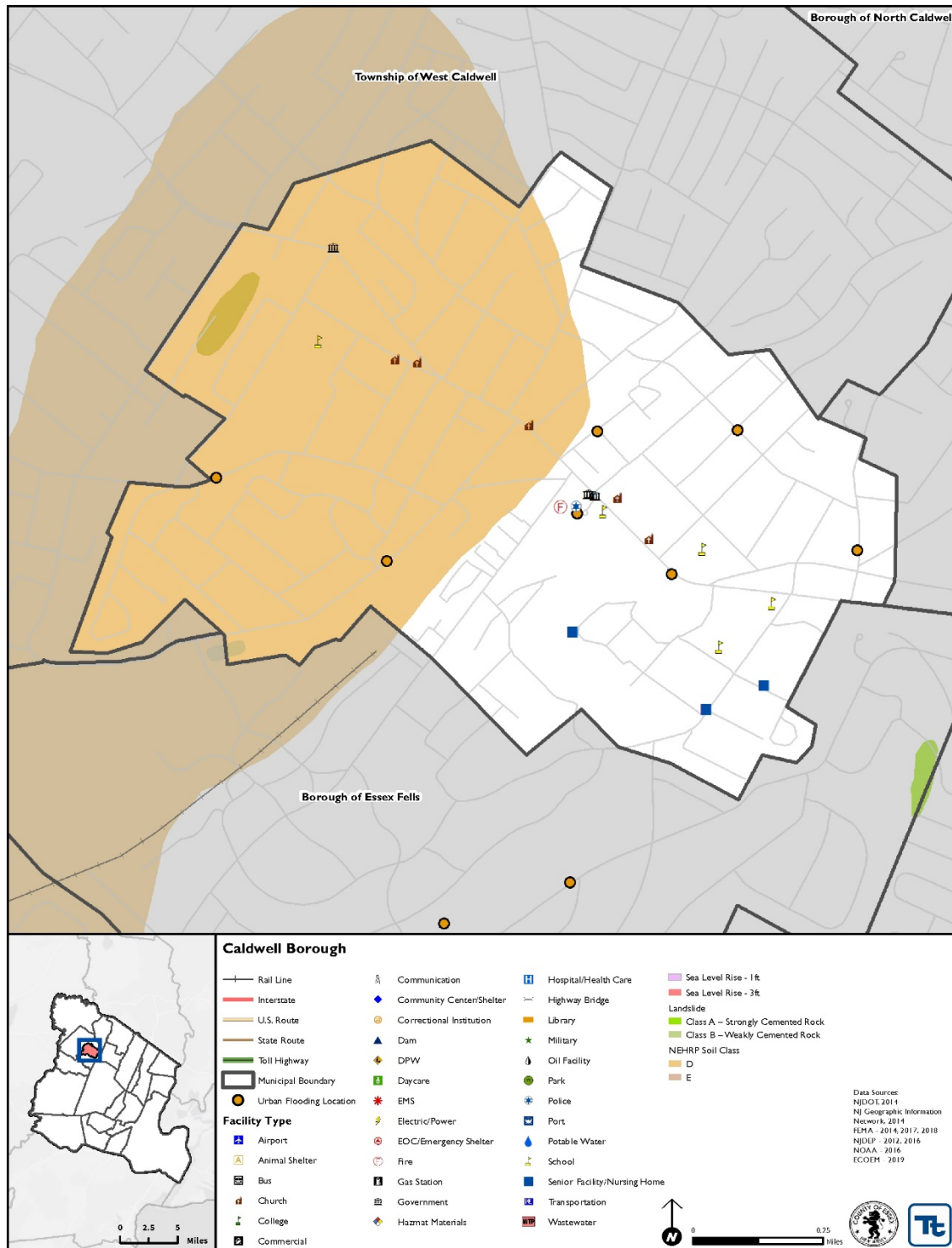




Figure 9.4-2. Borough of Caldwell Hazard Area Extent and Location Map 2





Name and Title Completing Worksheet:

Action Worksheet			
Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	More frequent high intensity, short duration rainfall events are causing stormwater flooding along the Bloomfield Avenue Corridor and due to lack of stormwater drainage.		
Action or Project Intended for Implementation			
Description of the Solution:	Caldwell Engineering/OEM will work with Essex County Engineering/Public Works to determine if additional stormwater infrastructure can be installed along Bloomfield Avenue. If upgrades can be made, Caldwell Engineering will work with Essex County to improve the existing stormwater infrastructure.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD	Estimated Benefits (losses avoided):	Reduction in flood risk in selected areas
Useful Life:	TBD by flood study	Goals Met:	2
Estimated Cost:	TBD by study	Mitigation Action Type:	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	Within 5 years
Estimated Time Required for Project Implementation:	5 years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000	Costly and may not solve problem
	Replace all structural stormwater infrastructure with green stormwater infrastructure	\$2,000,000+	May not solve problem
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name and Title Completing
Worksheet:

Action Worksheet		
Project Name:	Flood study for Park Ridge	
Project Number:	2020-Caldwell-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	0	
Legal	0	Borough would need to work with Essex County to implement project.
Fiscal	1	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts..
Administrative	1	
Multi-Hazard	0	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	9	
Priority (High/Med/Low)	High	

Name and Title Completing
Worksheet:



Action Worksheet			
Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The August 2018 flooding as a result of high intensity, short duration rainfall flooded the Caldwell Municipal Library and resulted in approximately \$700,000 worth of damage.		
Action or Project Intended for Implementation			
Description of the Solution:	Caldwell DPW will work to install floodproofing measures to mitigate damage sustained from flooding events on Bloomfield Ave.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	500-Year	Estimated Benefits (losses avoided):	Reduction in flood risk to Municipal Library
Useful Life:	25	Goals Met:	2
Estimated Cost:	Medium-High	Mitigation Action Type:	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	18 Months
Estimated Time Required for Project Implementation:	18 Months	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Build floodwall around library	\$50,000+	Costly, may not solve problem, increase flood risk in other areas adjacent to flood wall
	Relocate library	\$2,000,000+	Costly and may not solve problem
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name and Title Completing
Worksheet:

Action Worksheet		
Project Name:	Flood study for Park Ridge	
Project Number:	2020-Caldwell-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduction in flood damage to Library
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	1	
Legal	1	Borough would need to work with Essex County to implement project.
Fiscal	1	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts..
Administrative	1	
Multi-Hazard	0	
Timeline	1	
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	



Name and Title Completing
Worksheet:

Action Worksheet			
Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The August 2018 flooding as a result of high intensity, short duration rainfall flooded causing a significant amount of damage along the Bloomfield Avenue Corridor to residential, commercial, and municipal buildings.		
Action or Project Intended for Implementation			
Description of the Solution:	Caldwell will gather data and submit an HMA Grant to request funding to fund a flood study along the corridor and based on the results of the study will implement the best alternative.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD by Study	Estimated Benefits (losses avoided):	Reduction in flood risk to structures along Bloomfield Ave Corridor
Useful Life:	TBD by Study	Goals Met:	2, 6
Estimated Cost:	Medium-High	Mitigation Action Type:	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	3 Years
Estimated Time Required for Project Implementation:	3 Years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering/OEM	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Elevate roadways	\$500,000+	Costly, may not solve problem, increase flood risk in other areas adjacent to roadways
	Install green stormwater infrastructure throughout the entire Bloomfield Avenue Corridor	\$2,000,000+	Costly and may not solve problem
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name and Title Completing
Worksheet:

Action Worksheet		
Project Name:	Flood study for Park Ridge	
Project Number:	2020-Caldwell-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduction in flood risk to structures along Bloomfield Ave corridor
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	0	
Legal	1	
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	0	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	



Name and Title Completing
Worksheet:

Action Worksheet			
Project Name:	Stormwater Infrastructure Upgrades		
Project Number:	2020-Caldwell-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Various streams run through Caldwell and flood during high intensity rain events leading to property damage.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct Flood Studies of the Calamus and Grover Brook to include Mountain Avenue Flooding and implement the best identified alternative.		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Level of Protection:	TBD by Study	Estimated Benefits (losses avoided):	Reduction in flood risk along streams throughout Borough
Useful Life:	TBD by Study	Goals Met:	2
Estimated Cost:	Medium-High	Mitigation Action Type:	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	Desired Timeframe for Implementation:	3 Years
Estimated Time Required for Project Implementation:	3 Years	Potential Funding Sources:	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering/OEM	Local Planning Mechanisms to be Used in Implementation if any:	Hazard mitigation planning, stormwater planning
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation
	No Action	\$0	Current problem continues
	Redirect streams	\$50,000+	Costly, may not solve problem, increase flood risk in other areas adjacent to flood wall
	Install green stormwater infrastructure along these streams	\$2,000,000+	Costly and may not solve problem
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			



Name and Title Completing
Worksheet:

Action Worksheet		
Project Name:	Flood study for Park Ridge	
Project Number:	2020-Caldwell-005	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	Reduction in flood risk to structures along Bloomfield Ave corridor
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	0	
Legal	1	
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	
Administrative	0	
Multi-Hazard	0	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	