Discovery Report

Burlington County, New Jersey
Task Order HSFE02-12-J-0065

(HUC 02040201, 02040202, 02040301)

August 16, 2013

FEMA

Communities in the Project Area

Community Name
BASS RIVER, TOWNSHIP OF
BEVERLY, CITY OF
BORDENTOWN, CITY OF
BORDENTOWN, TOWNSHIP OF
BURLINGTON, CITY OF
BURLINGTON, TOWNSHIP OF
CHESTERFIELD, TOWNSHIP OF
CINNAMINSON, TOWNSHIP OF
DELANCO, TOWNSHIP OF
DELRAN, TOWNSHIP OF
EASTAMPTON, TOWNSHIP OF
EDGEWATER PARK, TOWNSHIP OF
EVESHAM, TOWNSHIP OF
FIELDSBORO, BOROUGH OF
FLORENCE , TOWNSHIP OF
HAINESPORT, TOWNSHIP OF
LUMBERTON, TOWNSHIP OF
MANSFIELD, TOWNSHIP OF
MAPLE SHADE, TOWNSHIP OF
MEDFORD, TOWNSHIP OF

Community Name
MEDFORD LAKES, BOROUGH OF
MOORESTOWN, TOWNSHIP OF
MOUNT HOLLY, TOWNSHIP OF
MOUNT LAUREL, TOWNSHIP OF
NEW HANOVER, TOWNSHIP OF
NORTH HANOVER, TOWNSHIP OF
PALMYRA, BOROUGH OF
PEMBERTON, BOROUGH OF
PEMBERTON, TOWNSHIP OF
RIVERSIDE, TOWNSHIP OF
RIVERTON, BOROUGH OF
SHAMONG, TOWNSHIP OF
SOUTHAMPTON, TOWNSHIP OF
SPRINGFIELD, TOWNSHIP OF
TABERNACLE, TOWNSHIP OF
WASHINGTON, TOWNSHIP OF
WESTHAMPTON, TOWNSHIP OF
WILLINGBORO, TOWNSHIP OF
WOODLAND, TOWNSHIP OF
WRIGHTSTOWN, BOROUGH OF

This list includes all communities within the Burlington County, New Jersey, project area that are under consideration for new Flood Insurance Studies (FISs) and Flood Insurance Rate Maps (FIRMs). Not all communities listed here will receive a new/updated Federal Emergency Management Agency FIS or FIRM.

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List of Abbreviations

AAL	Average Annualized Loss
CAV	Community Assistance Visit
CLOMR	Conditional Letter of Map Revision
CNMS	Coordinated Needs Management Strategy
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information System
HUC	Hydrologic Unit Code
Hazus-MH	Multi-Hazard Risk Assessment and Loss Estimation Software Program
LiDAR	Light Detection and Ranging
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on fill
LOMR-FW	Letter of Map Revision-Floodway
MIP	Mapping Information Platform
MLI	Midterm Levee Inventory
MSC	Map Service Center
N/A	Not Applicable
NAIP	National Agriculture Imagery Program
NED	National Elevation Dataset
NFIP	National Flood Insurance Program
NHD	National Hydrography Dataset
NJGIN	New Jersey Geographic Information Network
PASDA	Pennsylvania Spatial Data Access
Risk MAP	Risk Mapping, Assessment, and Planning
RL	Repetitive loss
SFHA	Special Flood Hazard Area
SRL	Severe repetitive loss
USDA	U.S. Department of Agriculture
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1 Background

A key goal of the Federal Emergency Management Agency's (FEMA's) Risk Mapping, Assessment, and Planning (Risk MAP) program is to provide communities with a more complete picture of flood risk. Unlike FEMA's past mapping programs, where flood hazards were studied within the bounds of a single community or county, Risk MAP examines the flood hazards of an entire watershed to provide tools that enhance mitigation plans and better protect citizens. An important goal of Risk MAP is to promote early and frequent communication with project partners (including all affected communities) to improve risk assessment and mitigation planning at county or watershed levels.

Discovery is a new FEMA initiative that involves identifying and collecting available data, and analyzing it for use in flood studies. Discovery is the first step in achieving the goals of the Risk Map program: building hazard resilient communities, assessing risk, and mitigation planning. In the fall of 2012, FEMA Region II initiated a Risk MAP project, including Discovery, for Burlington County, New Jersey. This report is a summary of the Discovery process tasks and results.

The Burlington County, New Jersey, Discovery process collected extensive data for all communities from Federal, State and County sources, as well as information gathered through the Kick-off meeting, Risk MAP Coordination Meeting, telephone conversations, and email correspondence (Section 3 lists the types of data that the project team collected for the watershed). The Discovery process culminated in the finalization of study recommendations based on the data and information gathered during the process. FEMA will continue to work with representatives of the communities within Burlington County throughout the Risk MAP project study process.

Burlington County is in south-central New Jersey, and borders on Pennsylvania. The county stretches across three HUC-8 watersheds: The Crosswicks-Neshaminy (02040201), the Lower Delaware (02040202), and the Mullica-Toms (02040301). Burlington County is the largest county in New Jersey with an area of 827 square miles. It stretches from the Delaware River across the state to Great Bay.

Burlington County is fairly flat, consisting of coastal and alluvial plains. The highest point in the county is Arney's Mount at 260 feet above sea level. Temperatures are fairly moderate with average lows around 22° F in the winter and highs around 87° F in the summer. Average precipitation is around 4 inches per month with more precipitation occurring in the summer than in the winter.

There are 40 incorporated communities within the county, with the largest community being the Township of Evesham (population in 2010 of 45,348). The county seat is in Mount Holly (population in 2010 of 9,536). The northeastern part of the county also plays host to military Joint Base McGuire-Dix-Lakehurst.

Major Streams in the Crosswicks-Neshaminy (02040201) watershed include the Delaware River and Crosswicks Creek, which form the northern boundary of the watershed. Other major streams are Assiscunk Creek, Blacks Creek, and Crafts Creek, all of which drain northwestward into the Delaware River.

Most of Burlington County within the Lower Delaware (02040202) watershed is drained by Rancocas Creek and its numerous tributaries. These streams generally run northward into

Rancocas Creek, which then drains into the Delaware River. Other important streams include Pennsauken Creek, Pompeston Creek, and Swede Run.

The southern half of the county is within the Mullica-Toms (02040301) watershed along the Atlantic Ocean coast. Important streams within the southern half of Burlington County include the Mullica River, which forms the western boundary of the county, and the Batsto, Wading, and Bass Rivers. This portion of the county is the least populated.

The Discovery process focused on Burlington County. New Flood Insurance Studies (FISs) and Flood Insurance Rate Map (FIRM) projects are currently underway for the county. The 40 communities within Burlington County will received a Flood Risk Report, Map, and Database that includes Average Annualized Loss (AAL) for flooding at the census block level. Figure 1: Burlington County New Jersey Area Map shows the location of the county in relation to the surrounding New Jersey and Pennsylvania counties, as well as the county's relationship to the three HUC 8 watersheds.

Figure 1: Burlington County New Jersey Area Map
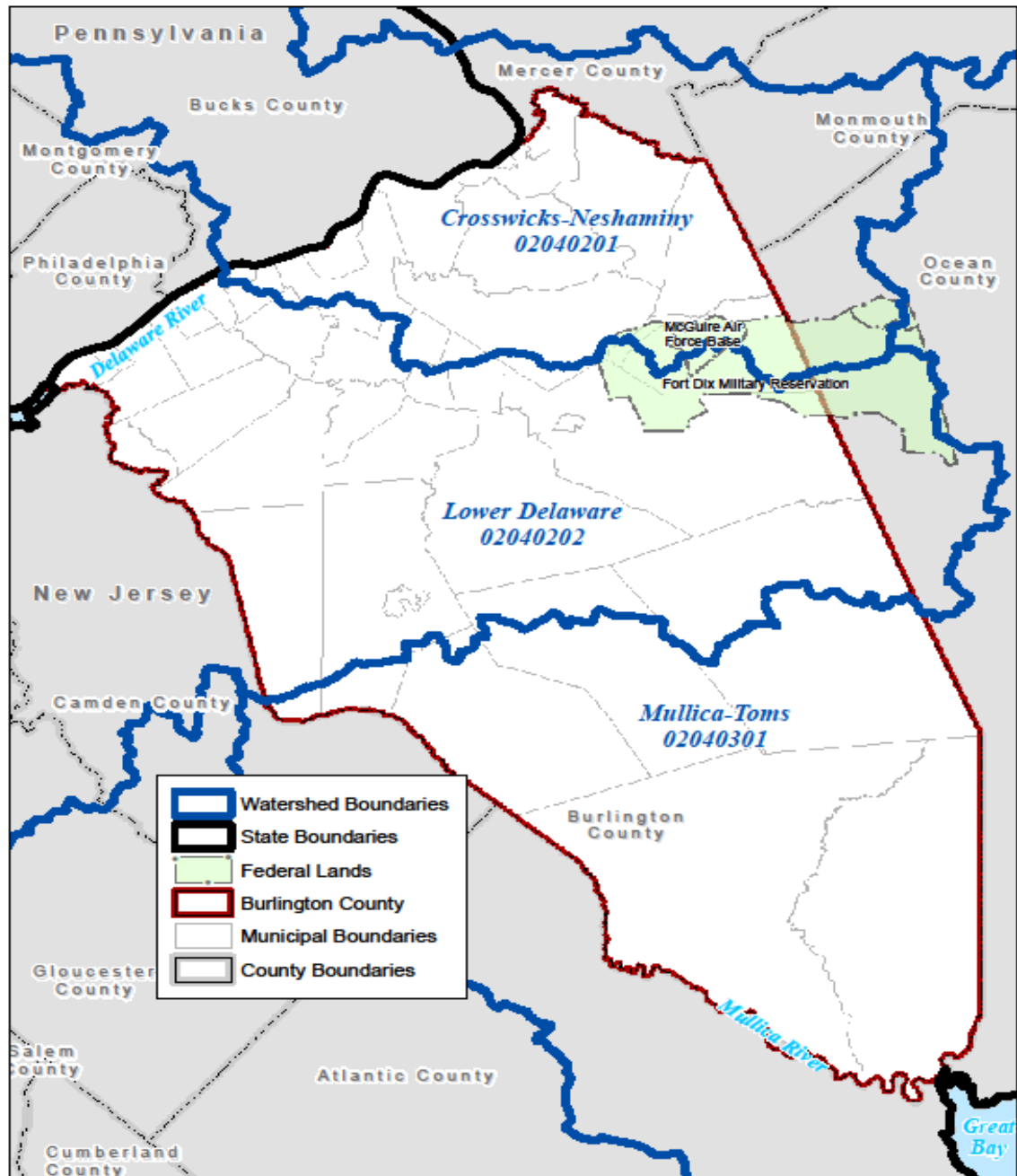
For the final phase of the Discovery effort, FEMA Region II *reviewed* the data and information collected and discussed at the meetings, and *will follow up* with stakeholders and contributors through telephone calls, e-mail, and additional meetings; as needed.

The Discovery Maps are an integral part of the Discovery Report. The Discovery Report documents the results of data collection, map content, and information obtained from local stakeholders.

Table 1 provides an overview of proposed study types, and stream miles to be studied. Table 2 lists the proposed scope of study within Burlington County by stream name and study type, followed by explanations of study types and related actions mentioned in the table. The affected streams are also shown on Discovery Map 1. The Borough of Palmyra is the only community in Burlington County that is not affected by the proposed scope.

Table 1: Overview of Proposed Scope of Study as of November 30, 2012

Study Type	Miles
Approximate	688
Redelineation	266.1
Digital Lift Up	34.1
Coastal	39.0*

*FEMA Region II is expected to conduct 39 miles of coastal shoreline study. Streams shown as Coastal in Tables 1 and 2 are expected to be influenced by coastal surges up the Delaware River or from the Atlantic Ocean. The miles for streams affected by coastal flooding are not shown.

Explanation of Study Types

Approximate: Includes a study of hydrology using the National Elevation Dataset (NED) and 2006 U.S. Geological Survey (USGS) regression equations. Hydrology is the study of the effects of water on the earth's surface. In the case of a flood study, hydrology refers to assessing the flow of surface water over the ground. Hydraulics analysis and mapping are carried out using updated topographic data and the U.S. Army Corps of Engineers (USACE) HEC-RAS models. The Preliminary Zone A floodplains, in Burlington County, are often connected at the basin boundaries between flood sources, indicating the presence of multi-directional flow during major flood events. The hydraulic analysis, for Burlington County, will include the use of two-dimensional modeling through the program FLO-2D, using steady state peak flows calculated through regression and weighted gage analysis. Information on the NED can be found online at http://ned.usgs.gov/. Information on USGS regression equations is available at http://water.usgs.gov/osw/programs/nffp.html.

Redelineation: FEMA updates current effective floodplains and associated detailed flood elevations utilizing new Light Detection and Ranging (LiDAR) topographic data. LiDAR is an advanced technology that uses light, and in some instances lasers, to measure ground elevations or topography.

Digital Lift Up: FEMA converts the current flood hazard data into a digital format while updating the vertical datum from National Geodetic Vertical Datum of 1929 to North American Vertical Datum of 1988, preserving the original engineering analysis and flood hazard areas. This allows the new data to be easily overlaid on other types of maps.

Coastal: FEMA will update coastal storm surge and wave modeling to update the coastal flood hazard analysis in Burlington County.

Table 2: Proposed Scope of Study by Steam as of November 30, 2012

Stream Name	Study Type	Miles	Stream Name	Study Type	Miles
Ballinger Creek and various tributaries	Coastal	N/A	Cranberry Branch	Redelineation	1.9
Bass River and various tributaries	Coastal	N/A	Cropwell Brook	Redelineation	1.9
Batsto River	Coastal	N/A	Crystal Lake	Redelineation	0.6
Delaware River and various tributaries	Coastal	N/A	Dans Bridge Branch	Redelineation	0.5
Mullica River and various tributaries	Coastal	N/A	Delaware River	Redelineation	2.7
Pennsauken Creek and various tributaries	Coastal	N/A	Delaware River	Redelineation	2.2
Pompeston Creek	Coastal	N/A	East Branch Bass River	Redelineation	1.3
Rancocas Creek and various tributaries	Coastal	N/A	Friendship Creek	Redelineation	4.4
Swede Run	Coastal	N/A	Friendship Creek Branch	Redelineation	0.2
Wading River and various tributaries	Coastal	N/A	Goldys Run	Redelineation	0.2
Barton Run Tributary 3	Digital Lift Up	1.3	Grubbs Run	Redelineation	0.3
Beaverdam Creek	Digital Lift Up	1.6	Hartford Road Tributary	Redelineation	0.6
Budds Run	Digital Lift Up	0.8	Haynes Creek	Redelineation	6.3
Bustleton Creek	Digital Lift Up	0.4	Hooten Road Tributary	Redelineation	0.7
Crafts Creek	Digital Lift Up	0.6	Indian Mills Brook	Redelineation	5
Barton Run Tributary 2	Digital Lift Up	0.6	Indian Run	Redelineation	0.4
Crosswicks Creek	Digital Lift Up	14.8	Ives Branch	Redelineation	0.8
Evesboro Tributary	Digital Lift Up	1.4	Jacks Run	Redelineation	0.6
Jade Run	Digital Lift Up	1.9	Kendles Run	Redelineation	1.1
Lake Mishe-Mokwa Run	Digital Lift Up	0.5	Kenilworth Lake	Redelineation	0.2
Mill Creek South Branch	Digital Lift Up	1.2	Kettle Run	Redelineation	2.8
Mill Creek Tributary 1	Digital Lift Up	0.3	Lake Kawesea	Redelineation	0.1
Ong Run	Digital Lift Up	0.8	Lake Meesehaway	Redelineation	0.1
Sharps Run	Digital Lift Up	2.6	Lake Migazee	Redelineation	0.1
Springer Brook	Digital Lift Up	5.3	Lake Minonok	Redelineation	0.1
Various unnamed streams throughout county	Redelineation	50	Lake Mishe-Mokwa	Redelineation	0.5
Arnold Branch	Redelineation	1.7	Lake Mushkooasa	Redelineation	0.1
Assiscunk Creek	Redelineation	1.9	Lake Pesheekee	Redelineation	0.2
Assiscunk Creek Tributary	Redelineation	0.5	Lake Sioux	Redelineation	0.1
Baffin Brook	Redelineation	1.2	Lake Siquitise	Redelineation	0.2
Ballinger Run	Redelineation	4.3	Lake Siquitise	Redelineation	0
Ballinger Run Tributary	Redelineation	0.2	Lake Stockwell	Redelineation	0.4
Barkers Brook	Redelineation	6.6	Lake Wabissi	Redelineation	0.1
Barkers Brook Unnamed Tributary	Redelineation	1.4	Lake Wagush	Redelineation	0.1
Bartletts Branch	Redelineation	0.5	Lake Wauwauskashf	Redelineation	0.1
Barton Run	Redelineation	7.1	Laurel Run	Redelineation	0.6
Barton Run Tributary 1	Redelineation	1.2	Little Creek	Redelineation	5.7
Barton Run Tributary 3A	Redelineation	0.6	Mason's Creek	Redelineation	5
Bass River	Redelineation	0	Mill Creek	Redelineation	6.1
Bears Swamp River	Redelineation	0.1	Mill Creek Tributary	Redelineation	0.7
Beaver Branch	Redelineation	0.2	Mill Race	Redelineation	0.8
Birch Run	Redelineation	1	Mimosa Lake	Redelineation	0.5
Bisphams Mill Creek	Redelineation	1.6	Mimosa Lake Run	Redelineation	0.5
Black Run	Redelineation	2.6	Mirror Lake	Redelineation	5
Black Run Tributary	Redelineation	1.4	Mirror Lake No 1	Redelineation	0.1
Blacks Creek	Redelineation	2	Mirror Lake No 3	Redelineation	0.3
Blue Lake Run	Redelineation	0.08	Mount Holly By-pass Channel	Redelineation	0.2
Bobbys Run	Redelineation	1.6	Mount Misery Creek	Redelineation	3.9
Braddocks Millpond	Redelineation	0.8	Muskingum Brook	Redelineation	2.4
Bread and Cheese Run	Redelineation	2	Parkers Creek	Redelineation	3.2
Buck Run	Redelineation	1.3	Pau Puk Keewis Lagoon	Redelineation	0.2
Bucks Cove Run	Redelineation	0.2	Pennsauken Creek North Branch	Redelineation	7.6
Burrs Mill Brook	Redelineation	1.7	Pennsauken Creek South Branch Tributary 1	Redelineation	0.1
Buttonwood Run	Redelineation	0.5	Pennsauken Creek South Branch Tributary 2	Redelineation	0.2

Stream Name	Study Type	Miles	Stream Name	Study Type	Miles
Cooper Branch	Redelineation	0.2	Pheasant Run	Redelineation	0.2
Country Lake Tributary	Redelineation	1.3	Pole Bridge Branch	Redelineation	2.8
Crafts Creek Tributary	Redelineation	0.2	Pole Bridge Branch Tributary	Redelineation	0.5
Pompeston Creek	Redelineation	5.6	Blue Lake Run	Approximate	1.2
Pompeston Creek East Branch	Redelineation	1.2	Bobbys Run	Approximate	1.5
Pompeston Creek Southeast Branch	Redelineation	0.1	Boundary Creek	Approximate	0.4
Popes Run	Redelineation	0.6	Bread and Cheese Run	Approximate	1.1
Powell Run	Redelineation	1.6	Breeches Branch	Approximate	1.4
Ramblewood Tributary	Redelineation	0.5	Buck Run	Approximate	0.7
Rancocas Creek	Redelineation	0.4	Bucks Cove Run	Approximate	2.2
Rancocas Creek North Branch	Redelineation	23.6	Budds Run	Approximate	2.3
Rancocas Creek South Branch	Redelineation	16.6	Bull Creek	Approximate	3.7
Rancocas Creek South Branch Tributary	Redelineation	2.6	Bulls Branch	Approximate	2.4
Ranconcas Creek North Branch Tributary	Redelineation	1	Burnt Bridge Spring	Approximate	2.4
Reeds Branch	Redelineation	0.3	Burrs Mill Brook	Approximate	9.0
Shinns Branch	Redelineation	0.6	Bustleton Creek	Approximate	1.3
Skeet Run	Redelineation	1.2	Buttonwood Lake	Approximate	0.1
Southwest Branch Rancocas Creek	Redelineation	12.4	Cedar Run	Approximate	3.4
Southwest Branch Rancocas Creek Tributary 1	Redelineation	0.2	Coares Run	Approximate	1.8
Southwest Branch Rancocas Creek Tributary 2	Redelineation	0.4	Cold Water Run	Approximate	1.6
Strawbridge Lake	Redelineation	1.9	Colliers Pond	Approximate	0.6
Swede Run	Redelineation	3.6	Crafts Creek	Approximate	9.2
Swede Run	Redelineation	2.6	Crafts Creek Tributary	Approximate	1.6
Swede Run Tributary	Redelineation	0.4	Crosswicks Creek	Approximate	0.5
Taunton Lake Tributary	Redelineation	0.4	Crystal Lake	Approximate	2.3
Thorton Creek	Redelineation	0.2	Crystal Lake Tributary 1	Approximate	0.4
Tommys Branch	Redelineation	1.1	Crystal Lake Tributary 2	Approximate	0.3
Tributary 1	Redelineation	0	Dans Bridge Branch	Approximate	2.4
Tributary 2	Redelineation	0	East Branch Bass River	Approximate	2.0
Tub Mill Branch	Redelineation	1.4	Featherbed Branch	Approximate	1.3
Unnamed Tributary	Redelineation	0.1	Friendship Creek	Approximate	4.6
Unnamed Tributary	Redelineation	0.3	Friendship Creek Branch	Approximate	0.0
West Branch Bass River	Redelineation	1.4	Goodwater Run	Approximate	2.2
West Branch Wading River	Redelineation	4.3	Grubbs Run	Approximate	0.9
Unnamed Stream	Approximate	370.9	Gum Spring	Approximate	4.1
Adler Run	Approximate	1.9	Hockamik Creek	Approximate	0.8
Annaricken Brook	Approximate	2.2	Horse Pond Stream	Approximate	2.5
Arnold Branch	Approximate	1.2	Hospitality Brook	Approximate	2.2
Assiscunk Branch	Approximate	0.8	Indian Run	Approximate	3.3
Assiscunk Creek	Approximate	14.2	Indian Run Tributary	Approximate	3.4
Assiscunk Creek Tributary	Approximate	4.7	Ives Branch	Approximate	3.0
Bacons Run	Approximate	3.6	Jade Run	Approximate	5.5
Baffin Brook	Approximate	0.0	Jobs Creek	Approximate	1.4
Ballinger Run	Approximate	1.1	Kendles Run	Approximate	0.3
Ballinger Run Tributary	Approximate	0.5	Lake Absegami	Approximate	1.1
Bard Branch	Approximate	0.0	Lake Sioux	Approximate	0.2
Barkers Brook	Approximate	0.8	Lake Stockwell	Approximate	0.0
Barkers Brook Unnamed Tributary	Approximate	1.3	Laurel Run	Approximate	0.3
Bartletts Branch	Approximate	1.7	Little Creek	Approximate	0.6
Barton Run Tributary 1	Approximate	1.0	Little Haukin Run	Approximate	0.6
Barton Run Tributary 2	Approximate	0.8	Mason's Creek	Approximate	0.4
Barton Run Tributary 3A	Approximate	1.0	McDonalds Branch	Approximate	1.0
Bass River	Approximate	0.0	Mile Run	Approximate	1.5
Basto River	Approximate	2.7	Mill Creek	Approximate	1.9
Batstro River	Approximate	3.3	Mill Creek South Branch	Approximate	1.3
Bear Swamp River	Approximate	5.4	Mill Creek Tributary 1	Approximate	0.7
Beaver Branch	Approximate	3.9	Mimosa Lake	Approximate	0.6
Beaver Run	Approximate	1.2	Mimosa Lake Run	Approximate	0.3
Beaverdam Creek	Approximate	1.8	Mirror Lake	Approximate	0.0
Biddle Branch	Approximate	1.9	Mirror Lake No 1	Approximate	0.1
Bisphams Mill Creek	Approximate	4.0	Mirror Lake No 2	Approximate	0.1

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Stream Name	Study Type	Miles	Stream Name	Study Type	Miles
Black Run	Approximate	1.7	Mirror Lake No 3	Approximate	0.1
Black Run Tributary	Approximate	1.0	Mount Misery Brook	Approximate	5.7
Blacks Creek	Approximate	10.0	Mount Misery Brook North Branch	Approximate	1.5
Mount Misery Brook South Branch	Approximate	0.9	Roberts Branch	Approximate	4.2
Mount Misery Creek	Approximate	3.6	Shane Branch	Approximate	3.8
Mullica River	Approximate	0.2	Sharps Run	Approximate	2.1
Muskingum Brook	Approximate	1.5	Shoal Branch	Approximate	7.6
North Run	Approximate	4.6	Shreve Branch	Approximate	2.9
Ong Run	Approximate	0.6	Skit Branch	Approximate	3.6
Ore Spring	Approximate	0.5	Southwest Branch Rancocas Creek	Approximate	1.3
Oswego River	Approximate	17.1	Southwest Branch Rancocas Creek Tributary 1	Approximate	1.1
Papoose Branch	Approximate	5.4	Southwest Branch Rancocas Creek Tributary 2	Approximate	1.2
Parkers Creek	Approximate	2.6	Spring Hill Brook	Approximate	0.1
Pennsauken Creek North Branch	Approximate	1.9	Springer Brook	Approximate	1.5
Pennsauken Creek South Branch Tributary 2	Approximate	0.4	Strawbridge Lake	Approximate	0.7
Plains Branch	Approximate	5.6	Swede Run	Approximate	0.1
Pole Branch	Approximate	2.0	Sykes Branch	Approximate	2.6
Pole Bridge Branch	Approximate	1.5	Taunton Lake Tributary	Approximate	3.8
Pompeston Creek	Approximate	0.1	Thorton Creek	Approximate	1.8
Pompeston Creek Northeast Branch	Approximate	0.4	Tommys Branch	Approximate	0.6
Pompeston Creek Southeast Branch	Approximate	0.5	Tributary 1	Approximate	1.4
Pope Branch	Approximate	2.4	Tributary 2	Approximate	1.0
Popes Run	Approximate	1.0	Tributary B	Approximate	0.2
Powell Run	Approximate	0.9	Tub Mill Branch	Approximate	0.8
Powells Run	Approximate	1.6	Tulpehocken Creek	Approximate	1.1
Rancocas Creek South Branch	Approximate	5.3	Unnamed Tributary	Approximate	1.4
Rancocas Creek South Branch Tributary	Approximate	1.7	Upper Lake	Approximate	0.1
Rancocas Creek Tributary	Approximate	0.4	Wading River	Approximate	5.8
Ranconcas Creek North Branch Tributary	Approximate	0.1	Wesickaman Creek	Approximate	0.9
Reeds Branch	Approximate	0.5	West Branch Bass River	Approximate	2.0
Riggs Mill Creek	Approximate	1.8	West Branch Wading River	Approximate	11.9
Risley Branch	Approximate	3.1	Woolman Lake	Approximate	0.2

N/A = Not Applicable

2 Watershed Stakeholder Coordination

Because of the size of Burlington County, the distribution of its population in 40 autonomous jurisdictions and numerous groups and government agencies, communication to all potential stakeholders is a critical aspect of the Discovery process. To communicate effectively throughout the life of this Risk MAP project, the use of e-mail, telephone, and letters is essential. FEMA Region II contacted several hundred people in the various communities throughout the watershed to determine the best point of contact for each community or stakeholder. Once these contacts were determined, FEMA Region II established a master list of key stakeholders and sent invitations to the Discovery Meeting to everyone on that list. The names and contact information for the meeting attendees are included as Appendix A; a sample invitation is included as Appendix B; and a list of Burlington County stakeholder contacts is included as Appendix H.

FEMA Region II considers the local government representative of the 40 communities within the Burlington County to be essential stakeholders in the Discovery process, as they represent the interests of the watershed's residents, businesses, and visitors. Additionally, elected officials representing Burlington County were invited to participate in the Discovery Meetings. These county officials often have a breadth of knowledge on local issues, Geographic

Information Systems (GIS), and other technical capabilities, as well as the planning authority to assist FEMA with FIRM revisions and other information, such as mitigation plan status.

Also invited to attend the Discovery Meetings were representatives of:

- Burlington County Emergency Management,
- New Jersey Department of Environmental Protection,

Table 3: Burlington County Communities Invited to Participate

Community	Municipality Type	Community	Municipality Type
Bass River	Township	Medford Lakes	Borough
Beverly	City	Moorestown	Township
Bordentown	City	Mount Holly	Township
Bordentown	Township	Mount Laurel	Township
Burlington	City	New Hanover	Township
Burlington	Township	North Hanover	Township
Chesterfield	Township	Palmyra	Borough
Cinnaminson	Township	Pemberton	Borough
Delanco	Township	Pemberton	Township
Delran	Township	Riverside	Township
Eastampton	Township	Riverton	Borough
Edgewater Park	Township	Shamong	Township
Evesham	Township	Southampton	Township
Fieldsboro	Borough	Springfield	Township
Florence	Township	Tabernacle	Township
Hainesport	Township	Washington	Township
Lumberton	Township	Westhampton	Township
Mansfield	Township	Willingboro	Township
Maple Shade	Township	Woodland	Township
Medford	Township	Wrightstown	Borough

3 Data Analysis

Table 4 lists the types of data collected during the Discovery process; the deliverable or product where data are displayed; and the source of the data. In addition, the discussion of Data Analysis is divided into two sections: the data that can be used for Risk MAP products (regulatory and non-regulatory); and the data and information that helped FEMA Region II better understand the characteristics of Burlington County, New Jersey.

On April 11, 2013, FEMA Region II invited communities in the watershed to a Project Kickoff Meeting. During that meeting, community officials were presented with the Risk MAP Discovery concept and asked to participate in the Discovery process in the months to come.

Table 4: Data Collection for Burlington County

Data Types	Deliverable/Product	Source
Average Annualized Loss Data	Discovery Map Geodatabase	FEMA Region II Office
Boundaries: Community	Discovery Map Geodatabase	NJGIN / PASDA / National Atlas of the United States
Boundaries: County and State	Discovery Map Geodatabase	National Atlas of the United States
Boundaries: Watersheds	Discovery Map Geodatabase	USGS NHD
Census Blocks	Discovery Map Geodatabase	U.S. Census Bureau
Contacts	Table	Local Web Sites, State/FEMA Updates
Community Assistance Visits	Discovery Report	FEMA's Community Information System
Community Rating System	Discovery Report	FEMA's "Community Rating System Communities and Their Classes"
Dams and Levees	Discovery Map Geodatabase	FEMA Mid-term Levee Inventory / USACE
Declared Disasters	Discovery Report	FEMA's "Disaster Declarations Summary"
Demographics	Discovery Report and Map	U.S. Census Bureau
Preliminary SFHAs	Discovery Map Geodatabase	FEMA's Map Service Center and MIP
Stream Gages	Discovery Report and Map Geodatabase	USGS
Hazards Mitigation Plans and Status	Discovery Report	FEMA Region II Office
Flood Insurance Claims	Discovery Map and Report	FEMA Region II Office
LOMCs	Discovery Report and Map	FEMA's MIP
Mitigation Projects: Past, Ongoing, Planned, Desired FEMA/Other Federal Agency/Local Projects	Discovery Report Appendix D	Compiled through Community Interviews
Repetitive Loss	Discovery Report and Map	FEMA Region II Office
Stream Centerlines	Discovery Map and Geodatabase	USGS National Hydrography Dataset
Study Needs: FEMA	Discovery Report, Map and Geodatabase	FEMA's CNMS
Study Requests:	Discovery Report	Compiled through Community Interviews
Transportation: Major Roads	Discovery Map and Geodatabase	NJGIN / PASDA

CNMS = Coordinated Needs Management Strategy
CRS = Community Rating System
FEMA = Federal Emergency Management
LOMCs = Letters of Map Change
MIP = Mapping Information Platform
NHD = National Hydrography Dataset
NJGIN = New Jersey Geographic Information Network
PASDA = Pennsylvania Spatial Data Access
SFHAs = Special Flood Hazard Areas
USACE = U.S. Army Corps of Engineers
USGS = U.S. Geological Survey

3.1 Topographic Data that Can Be Used for Flood Risk Products

FEMA Region II determined that recent elevation data is available for all areas within Burlington County. LiDAR for the Burlington, New Jersey, was collected and processed in 2011 by Risk Assessment Mapping and Planning Partners (RAMPP).

3.2 Community Information

3.2.1 Socioeconomic Profile

In 2010, Burlington County, New Jersey, was home to approximately 448,734 residents throughout its 40 communities. The largest community is the Township of Evesham, with approximately 45,538 residents. The county seat is in Mount Holly with a population of approximately 9,536. The main industry in Burlington County is agriculture; however there is a significant manufacturing sector and a significant service sector supporting the military Joint Base McGuire-Dix-Lakehurst.

3.2.2 Mitigation Plans and Status

Table 5 shows the status of current hazard mitigation plans for Burlington County. Not all communities within the county participate in the countywide (multi-jurisdiction) plan. Table 6 shows communities in Burlington County that participate in the plan and when the community adopted the plan. The current multi-jurisdiction hazard mitigation plan for Burlington County will expire in November 2013, so communities in Burlington County should begin updating their plan.

Table 5: Existing Multi-Jurisdictional Mitigation Plans within Burlington County, New Jersey

County	Mitigation Plan Approval Date	Mitigation Plan Expiration Date	Web site
Burlington	11/10/2008	11/10/2013	http://www.co.burlington.nj.us/pages/ViewDepartment.aspx?did=120

Table 6: Communities participating in Burlington County Multi-Jurisdictional Mitigation Plan

| Community	Mitigation Plan Adoption Date	Status
Beverly, City of	12/23/2008	Approved
Bordentown, City of	12/19/2012	Approved
Burlington, City of	12/23/2008	Approved
Burlington County	11/10/2008	Approved
Burlington, Township of	12/23/2008	Approved
Cinnaminson, Township of	11/10/2009	Approved
Delanco, Township of	11/10/2009	Approved
Delran, Township of	11/10/2009	Approved
Eastampton, Township of	11/10/2009	Approved
Edgewater Park, Township of	12/23/2008	Approved
Evesham, Township of	11/10/2009	Approved
Florence, Township of	11/10/2009	Approved
Hainesport, Township of	11/10/2009	Approved
Lumberton, Township of	12/23/2008	Approved
Mansfield, Township of	11/10/2009	Approved
Medford, Township of	12/23/2008	Approved
Moorestown, Township of	12/23/2008	Approved
Mount Holly, Township of	12/23/2008	Approved
Mount Laurel, Township of	11/10/2008	Approved
New Hanover, Township of		Approved, Pending Adoption
North Hanover, Township of	12/19/2012	Approved
Palmyra, Borough of	11/10/2009	Approved
Pemberton, Borough of	12/19/2012	Approved
Pemberton, Township of	12/23/2008	Approved
Riverside, Township of	11/10/2009	Approved
Shamong, Township of	11/10/2009	Approved
Springfield, Township of	11/10/2009	Approved
Tabernacle, Township of	12/23/2008	Approved
Washington, Township of	12/23/2008	Approved
Westampton, Township of	11/10/2009	Approved
Willingboro, Township of	11/10/2009	Approved
Woodland, Township of	11/10/2009	Approved
Wrightston, Borough of	12/23/2008	Approved

3.2.3 Hazus/Average Annualized Loss

AAL is defined as the average dollar loss that an individual, or individuals, will experience during a given year from exposure to flooding. This AAL dollar value is calculated by using flood hazard data in combination with U.S. Census data. Flood hazard areas are determined for storm events of a given probability of occurrence and are then overlaid on U.S. Census block data. The losses for a given Census block are then calculated for structures and their contents based on the area that has flooded. Total losses for both the structures and their contents are added together to determine the AAL for a given Census block. The AAL for a community can then be determined by adding the AAL together for all its Census blocks. However, AAL data is most commonly organized by Census block and displayed with color intervals based on severity of losses.

The AAL dataset provided with this Discovery Report and shown on the Discovery Map (also displayed in Figure 2) was created using FEMA's Hazards U.S. Multi-Hazard Risk Assessment and Loss Estimation software (Hazus-MH). The Hazus-MH analysis used data sources with only

limited detail shown for flood hazard areas. This type of low-detail Hazus-MH analysis is conducted primarily to correlate the location of residents and infrastructure to the floodplain within a given community, and is not intended to provide a thorough and accurate estimation of yearly losses from flooding.

FEMA Region II will create a complete, Burlington County-wide product during the update to the FIS process and will deliver it through the Risk MAP database to affected communities. FEMA will produce this AAL version using high-resolution elevation and hydrological data, which will provide a more accurate estimate of AAL for each community.

Figure 2: Average Annualized Flood Loss Data for Burlington County

Discovery Report
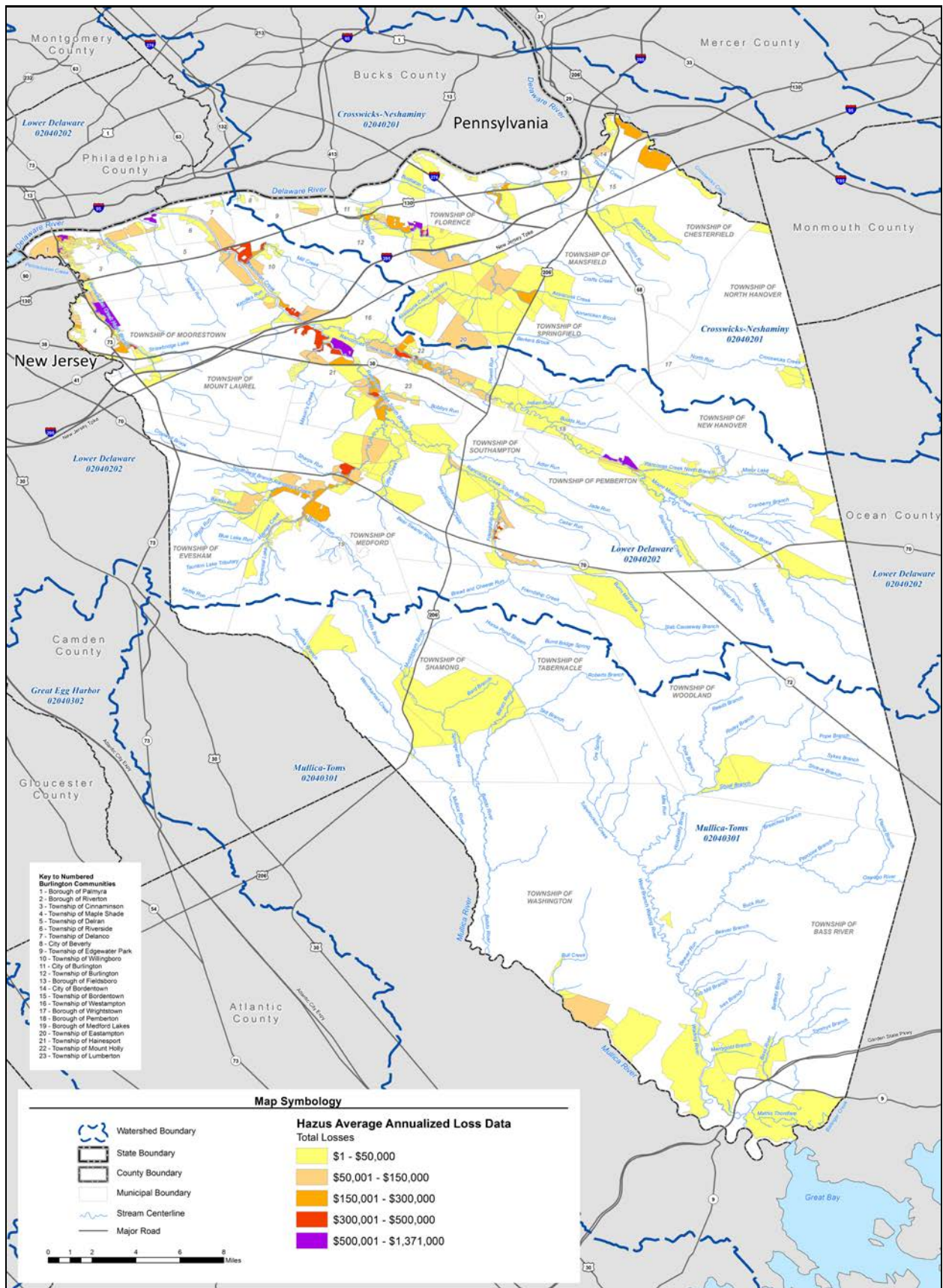
3.2.4 Flood Insurance and Repetitive Loss

The Discovery process also involved gathering data on flood insurance claims in the county through the National Flood Insurance Program (NFIP), particularly areas where repetitive loss structures have been identified. A repetitive loss (RL) structure is defined as an NFIP-insured structure that has had at least two paid flood claims of more than $1,000 each in any 10-year period since 1978. A severe repetitive loss (SRL) structure has had either two separate claims that exceed market value of the building or have had four claims over $5,000 each and the cumulative amount of such claims exceeds $20,000.

Within Burlington County, 1,625 flood insurance claims have been filed since 1978. Communities with a high number of insurance claims (over 100 claims) include the City of Burlington; and the townships of Cinnaminson, Easthampton, Lumberton, Medford, and Southampton. Insurance claims paid since 1978 in Burlington County total almost $19,000,000. FEMA Region II has identified 156 RL structures in Burlington County of which 8 have been identified as being SRL structures.

When FEMA determines whether an area's flood hazards should be restudied, it may consider areas where RL/SRL structures have been identified. However, it is important to note that NFIP claims may be made after events that do not meet or exceed the 1-percent-annual-chance, or 100-year flood. Therefore, previous claims data only represents a single factor to consider when determining mapping needs.

Figure 3 shows areas where RL/SRL structures exist and areas where NFIP claims have been made. Because of guidelines set forth by the Privacy Act of 1974, FEMA Region II will not include detailed repetitive loss data as part of the Discovery deliverables.

3.2.5 Coordinated Needs Management Strategy

During FEMA's Flood Map Modernization program (2003 – 2008) the Agency adhered to Procedure Memorandum No. 56, which states, "Section 575 of the National Flood Insurance Program Reform Act of 1994 mandates that at least once every five years FEMA assess the need to review and update all floodplain areas and flood risk zones identified, delineated, or established under Section 1360 of the National Flood Insurance Act, as amended." This requirement was fulfilled through the Mapping Needs Assessment process. Other mechanisms such as the Mapping Needs Update Support System and scoping reports were used to capture information describing conditions on the FIRMs and determine the need for map updates.

FEMA's Coordinated Needs Management Strategy (CNMS) was initiated as part of FEMA's Risk MAP program in 2009. Before the Burlington County Discovery Meetings, FEMA added the November 2010 Burlington draft preliminary FIS and FIRM to the CNMS database.

FEMA applies three classifications to FISs shown within the CNMS: Valid, Unverified, and Unknown. New and updated studies performed during FEMA's Map Modernization program were automatically determined to be "Valid," and the remaining studies were put through a 17-point validation process (7 critical and 10 secondary elements). During the validation review, FEMA checks physical, climatological, and environmental factors against the stream studies to determine if the studies are still valid. A stream study has to pass all the critical elements and at least seven secondary elements to be classified as "Valid;" otherwise FEMA classifies the study as "Unverified."

To date, the CNMS has gone through three phases of assessment. Phase 1 (early 2009) created a national map that shows the percentage of new, valid, or updated Special Flood Hazard

Areas (SFHAs) at the county level. An SFHA is an area that would be inundated by the 1-percent-annual-chance, or 100-year flood. Phase 2 (August – November 2009) created a CNMS database and performed bulk validation reviews that automatically determined that new and updated studies performed during the Map Modernization program were valid; while digital conversions and pre-Map Modernization approximate studies were automatically considered invalid, requiring future study. Phase 3 (October 2010 – June 2011) confirmed all bulk validation assignments and put all other stream reaches that were not bulk validated through the 17-element process. Now, in the post Phase 3 stage, FEMA maintains the CNMS database through regular updates and adds new information as new studies are conducted.

FEMA did not process the Burlington County CNMS database through Phase 3 because FEMA had originally scheduled the draft/preliminary release during development of Phase 3 work. As a result, all streams in the county were set to "Unknown".

Although the Burlington County FIS and FIRM published during the countywide Map Modernization project were preliminary documents, FEMA's detailed quality control process was completed. The Burlington County streams that are classified as "Valid" in the CNMS database are 15 detailed study (Zone AE) streams that were re-studied (with new hydrology and hydraulic models) through the preliminary Burlington County FIS. All other streams (detailed and approximate) in Burlington County were left at "Unknown" as they still need to be assessed.

Additionally, while streams without identified flood risk can be featured in the CNMS database, most are not. In the case of Burlington County, these streams were not in the CNMS database, but were stored in a separate dataset. Streams without flood hazard information cannot go through element evaluation because the validation elements rely on study data, which these streams lack.

The CNMS database information was used during the initial Burlington County Discovery effort and served as an important discussion point. Through the Discovery process, FEMA Region II learned of new flood risks and study needs, and incorporated that information into the CNMS.

Table 7 summarizes draft results of the validation analysis obtained from the CNMS. A significant stretch of stream miles in the watershed still has an "Unknown" validation status. The breakdown of stream status is shown in Figure 3.

Table 7: CNMS Miles for Burlington County

Type	Miles
Valid	50.4
Unverified	0.0
Unknown	892.4
Miles in Identified not within CNMS	252.2

It is important to note that the proposed scope of study for Burlington County would update 688 miles of approximate streams making them "Valid." Streams that will be redelineated or digitally uplifted will not result in CNMS revalidation, and these streams will remain as either "Valid" or "Unknown" based on their current CNMS status.

It is important to note that CNMS has not yet captured 252.2 miles of streams in Burlington County that have been identified using sources such as the National Hydrography Dataset and existing FIRMs. Many of these stream miles are not associated with existing SFHAs, however they do have the potential to flood.

Figure 3: CNMS Miles, LOMCs, and Repetitive Loss Claims for the Burlington County
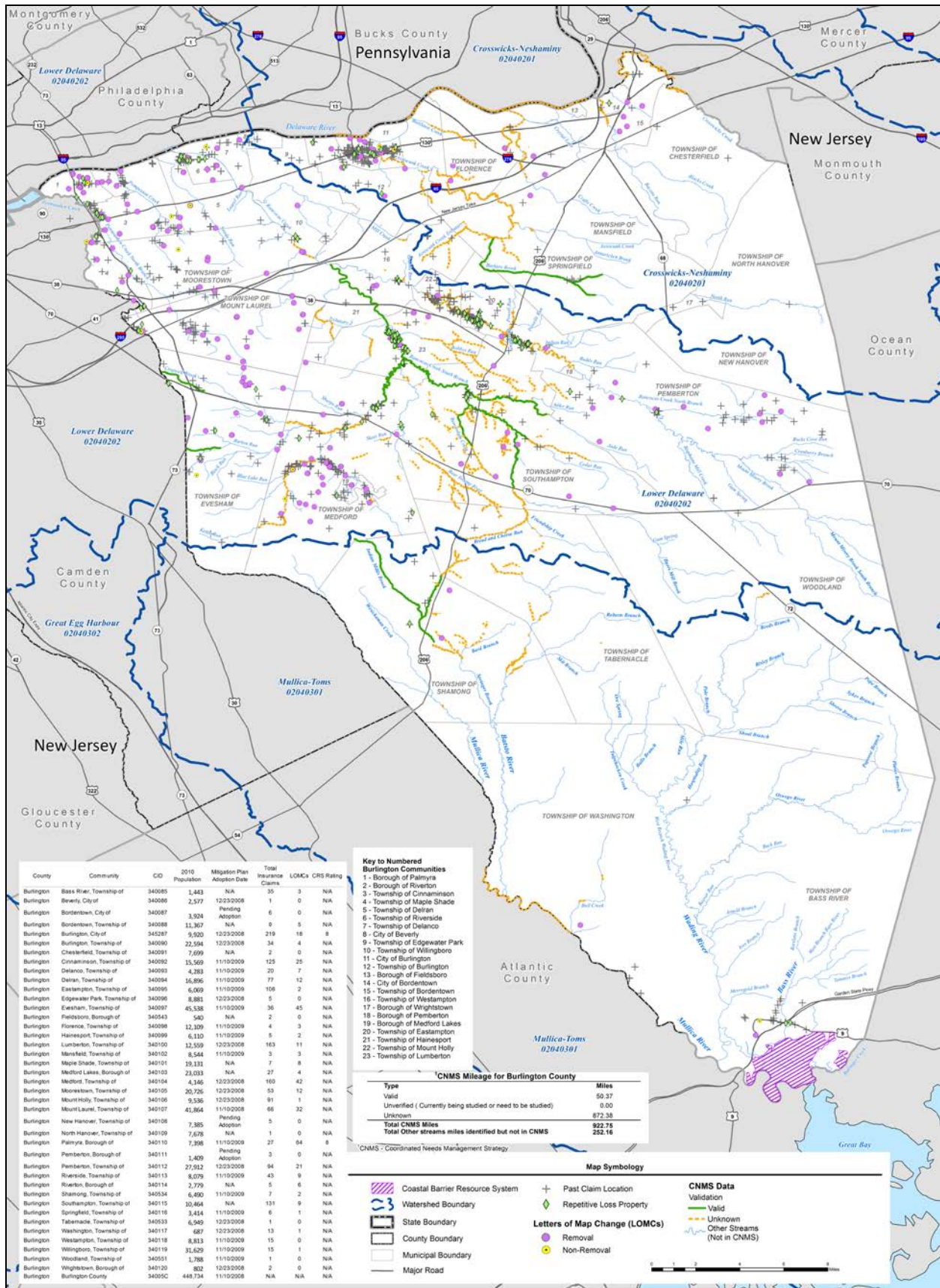
3.2.6 Letters of Map Change

Figure 3 shows the locations of all completed Letters of Map Change (LOMCs) in Burlington County as of December 31, 2012. Table 8 lists the number of LOMCs for each community. FEMA Region II identified LOMCs in Burlington County through the FEMA Map Service Center (MSC), MIP, and the FEMA Engineering Library. LOMCs are categorized by determination type and outcome. The different LOMC types referenced in Figure 3 include: Letter of Map Amendment (LOMA); Letter of Map Revision Based on Fill (LOMR-F); and Letter of Map Revision Floodway (LOMR-FW). In a removal, the SFHA designation was removed from the property in question. In a non-removal, FEMA determined the property to be correctly shown within an SFHA.

For LOMA requests, FEMA compares the ground elevation data at a specific property to the base flood elevation at the property. In some cases, FEMA can determine that a property is outside the SFHA by comparing its location on a certified map, such as a plat or tax assessor's map, to the FIRM. LOMR-Fs result from the same comparisons; however, the placement of fill on the property is the basis of the request. LOMR-FWs are LOMAs for which the subject property is shown inside a regulatory floodway on the FIRM. LOMAs, LOMR-Fs, and LOMR-FWs do not result in a physical change to the FIRM. Each LOMC application results in a determination that a structure or lot has either been removed or not removed from the SFHA. During an FIS project, FEMA evaluates previous LOMC determinations; those that remain valid are officially revalidated once a new FIRM becomes effective.

Table 8: Number of LOMCs per Community in Burlington County

County	Community Name	Number of LOMA Removals	Number of LOMA Non-Removals	Number of LOMR-F Removals	Number of LOMR-FW Removals	Total
Burlington	Bass River, Township of	2	1	0	0	3
Burlington	Bordentown, Township of	5	0	0	0	5
Burlington	Burlington, City of	11	5	2	0	18
Burlington	Burlington, Township of	3	1	0	0	4
Burlington	Cinnaminson, Township of	17	4	2	2	25
Burlington	Delanco, Township of	4	1	2	0	7
Burlington	Delran, Township of	8	3	0	1	12
Burlington	Eastampton, Township of	2	0	0	0	2
Burlington	Evesham, Township of	41	2	2	0	45
Burlington	Florence, Township of	3	0	0	0	3
Burlington	Hainesport, Township of	2	0	0	0	2
Burlington	Lumberton, Township of	11	0	0	0	11
Burlington	Mansfield, Township of	3	0	0	0	3
Burlington	Maple Shade, Township of	4	1	2	1	8
Burlington	Medford Lakes, Borough of	4	0	0	0	4
Burlington	Medford, Township of	39	2	1	0	42
Burlington	Moorestown, Township of	9	1	0	2	12
Burlington	Mount Holly, Township of	1	0	0	0	1
Burlington	Mount Laurel, Township of	24	1	3	4	32
Burlington	Palmyra, Borough of	40	2	22	0	64

County	Community Name	Number of LOMA Removals	Number of LOMA Non-Removals	Number of LOMR-F Removals	Number of LOMR-FW Removals	Total
Burlington	Pemberton, Township of	17	1	1	2	21
Burlington	Riverside, Township of	8	1	0	0	9
Burlington	Riverton, Borough of	5	1	0	0	6
Burlington	Shamong, Township of	2	0	0	0	2
Burlington	Southampton, Township of	8	0	1	0	9
Burlington	Springfield, Township of	1	0	0	0	1
Burlington	Washington, Township of	1	0	0	0	1
Burlington	Willingboro, Township of	1	0	0	0	1

Conditional LOMCs are not included in Figure 3 or Table 8 because conditional determinations are based on proposed projects rather than actual as-built conditions. Letters of Map Revision (LOMRs) are also not included because they result in a physical change to the FIRM and will either be incorporated into the new FIRM or superseded by new flood hazard data once the FIS is complete.

The presence or absence of completed LOMCs within a specified location may contribute to the analysis of whether that area needs to be restudied. Knowing the type of LOMC and its respective outcome can provide an additional layer of detail. For example, a high number of LOMA removals in an area may mean that the area may need to be restudied with updated topography, while a high number of LOMA non-removals may indicate that the flood hazard delineation within the area agrees with ground elevations. A high number of LOMR-Fs may not necessarily indicate that an area should be reexamined, but that property owners have cooperated with the local municipality to mitigate flood risks in accordance with local regulations.

3.2.7 Floodplain Management/Community Assistance Visits

Statewide Community Assistance Visits (CAVs) are part of the evaluation and review process that occurs between FEMA and/or State NFIP Coordinator's Offices and local officials. CAV visits are intended to ensure that each community adequately enforces local floodplain management regulations in compliance with NFIP requirements. CAVs are also a way for FEMA to provide technical assistance to communities. Table 9 lists all CAVs that have occurred within Burlington County since January 1, 2000. Representatives of New Jersey performed some of these CAVs on behalf of FEMA.

Table 9: Community Assistance Visits in Burlington County since January 1, 2000

County	Community	Date Performed	Agency
Burlington	Easthampton, Township of	12/20/00	State
Burlington	Palmyra, Borough of	12/22/08	FEMA
Burlington	Washington, Township of	8/14/06	State

3.2.8 National Flood Insurance Program Participation and Community Rating System

All communities in Burlington County participate in the NFIP. The Borough of Fieldsboro, however, has been suspended from the NFIP.

The Community Rating System (CRS) is a voluntary program that provides flood insurance premium discounts to NFIP participating communities that take measures to manage floodplains more rigorously than Federal minimum requirements. A point system is used to determine a CRS rating. As a community takes measures to minimize or eliminate exposure to floods, CRS points are awarded and higher discounts on flood insurance premiums are offered. The discount each community receives (45 percent – 5 percent) is determined by its class rating (1 – 9, respectively).

Table 10 lists the two communities in Burlington County that participate in the CRS. A full list of CRS communities is available on FEMA's Web site at http://www.fema.gov/library/viewRecord.do?id=3629.

Table 10: Communities that Participate in CRS in Burlington County, New Jersey

Name	County	Current Class (1 - 9)	% Discount for SFHA (45% - 5%)	% Discount for Non-SFHA
City of Burlington	Burlington	8	10	5
Borough of Palmyra	Burlington	8	10	5

3.2.9   Regulatory Mapping

A preliminary FIS for Burlington County was issued on November 30, 2010. After the draft preliminary was issued, the countywide FIS was put on hold to allow for additional stream studies and mapping updates throughout the county as new topographic information was becoming available. All 40 communities in Burlington County have effective community based FIRMs dating between 1978 and 1999. Not every community in Burlington County has an effective community FIS.

This information is presented in overview format on Discovery Map 2. It is not meant to replicate the effective FIRM information for Burlington County communities but to provide a general picture of effective SFHAs within the County. Effective and Preliminary SFHA mapping has been reviewed extensively by the Discovery team to better assess the flood hazard mapping needs in Burlington County. The assessment of mapping needs is based on a comparative analysis of risk, including, but not limited to population density, critical facilities, infrastructure and the availability of stream data.

3.2.10   Coastal Barrier Resources System

Coastal barriers are unique land forms that provide protection for distinct aquatic habitats and serve as the mainland's first line of defense against damage from coastal storms and erosion. The Coastal Barrier Resources System defines a coastal barrier as a landform composed of unconsolidated shifting sand or other sedimentary material which is generally long and narrow and entirely or almost entirely surrounded by water. They are sufficiently elevated above normal tides so that they usually have dunes and terrestrial vegetation. To varying degrees, they enclose

and thereby protect other features, such as estuaries, salt marshes, and the mainland from direct wave influence by the open ocean.

Burlington County has designated units of the coastal barriers present along the shoreline of the Mullica River in the Townships of Bass River and Washington. These units are administered by the U.S. Fish and Wildlife Service and are displayed on Discovery Map 2.

3.2.11   Levees and Seawalls

FEMA's Mid-term Levee Inventory contains information on hundreds of levee, floodwall, and closure structures in New Jersey. The information for these flood control structures is gathered from the most recent available data sources, including the National Levee Database, maintained by the USACE. In addition the New Jersey Department of Environmental Protection maintains a shapefile of coastal flood control structures. These datasets only indicate no levees or seawalls within Burlington County.

There is a levee system along Pennsauken Creek and the Delaware River in Camden County, New Jersey. These levees are just across Pennsauken Creek from the Borough of Palmyra and the Township of Cinnaminson. There is also a levee along the Delaware River in the City of Bristol, Pennsylvania. This levee is directly opposite the City of Burlington. These structures are shown on the Discovery Map 1, even though they are not within Burlington County.

3.2.12   Dams

The National Inventory of Dams maintained by the USGS shows 54 dams within Burlington County. Dams within Burlington County shown in the National Inventory of Dams have not classified as to their hazard potential. Neither the New Jersey Geographic Information Network nor the Burlington County GIS Department maintains list of dams available for public download showing hazard potential. These 54 dams are shown on Discovery Map 1.

All dams within Burlington County were reclassified to the following scale to be consistent with *FEMA 333: Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams (2005)*:

- **Class 1-Low Hazard Potential:** Dam failure results in no probable loss of human life and insignificant economic and/or environmental losses.

- **Class 2-Significant Hazard Potential:** Dam failure results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.

- **Class 3-High Hazard Potential:** Failure or mis-operation will likely cause loss of human life.

- **Unclassified Hazard Potential:** Hazard potential undetermined.

3.2.13   Disaster Declarations

Table 11 lists all disaster declarations that have occurred within Burlington County since 1970. Within the County, 7 flood-related disasters have been declared during that time period. FEMA's disaster declaration history for New Jersey is available at http://www.fema.gov/news/disaster_totals_annual.fema.

Table 11: Disaster Declarations in Burlington County

| Disaster Number	Declaration Date	Type	Affected County	Action
DR-4086	October 30, 2012	Hurricane Sandy	Burlington	President's Declaration of Major Disaster
DR-4021	August 31, 2011	Hurricane Irene	Burlington	President's Declaration of Major Disaster
DR-1954	February 4, 2011	Snow	Burlington	President's Declaration of Major Disaster
DR-1897	April 2, 2010	Severe Storms and Flooding	Burlington	President's Declaration of Major Disaster
DR-1889	March 23, 2010	Snow	Burlington	President's Declaration of Major Disaster
DR-1873	February 5, 2010	Snow	Burlington	President's Declaration of Major Disaster
DR-1964	April 26, 2007	Severe Storms and Flooding	Burlington	President's Declaration of Major Disaster
DR-1530	July 16, 2004	Severe Storms and Flooding	Burlington	President's Declaration of Major Disaster
DR-1088	January 13, 1996	Snow	Burlington	President's Declaration of Major Disaster
DR-528	February 8, 1977	Snow and Ice	Burlington	President's Declaration of Major Disaster
DR-477	July 23, 1975	Flood	Burlington	President's Declaration of Major Disaster
DR- 310	September 4, 1971	Flood	Burlington	President's Declaration of Major Disaster

3.2.14 Stream Gages

The USGS National Water Information System Web Interface (http://waterdata.usgs.gov/nwis/rt) provides real-time data for any given USGS sponsored stream gage location. Table 12 shows the gage identification number, location, drainage area, status, and county for all USGS gages relevant to Burlington County with a historical period of record greater than 10 years. Gage locations are also illustrated in Figure 4 and Discover Map 1.

Table 12: USGS Stream Gage Information in Burlington County

Gage Identification Number	Gage Location	Drainage Area (Sq. Mi.)	Gage Status	County
01466900	GREENWOOD BRANCH AT NEW LISBON NJ	77.9	Active	Burlington
01466000	MIDDLE BRANCH MT MISERY BK IN BYRNE STATE FOREST, NJ	2.8	Inactive	Burlington
01465850	SOUTH BRANCH RANCOCAS CREEK AT VINCENTOWN NJ	64.5	Active	Burlington
01409810	WEST BRANCH WADING RIVER NEAR JENKINS, NJ	84.1	Active	Burlington
01410150	EAST BRANCH BASS RIVER NEAR NEW GRETNA, NJ	8.1	Active	Burlington
01467081	SOUTH BRANCH PENNSAUKEN CREEK AT CHERRY HILL, NJ	8.98	Active	Burlington
01466500	MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ	2.4	Active	Burlington

01410000	OSEWGO RIVER AT HARRISVILLE, NJ	72.5	Active	Burlington
01409500	BATSTO RIVER AT BATSTO, NJ	67.8	Inactive	Burlington
01409510	BATSTO RIVER AT PLEASANT MILLS, NJ	73.6	Inactive	Burlington
01467000	NORTH BRANCH RANCOCAS CREEK AT PEMBERTON, NJ	118.0	Active	Burlington

Figure 4: Locations of USGS Stream Gages in Burlington County
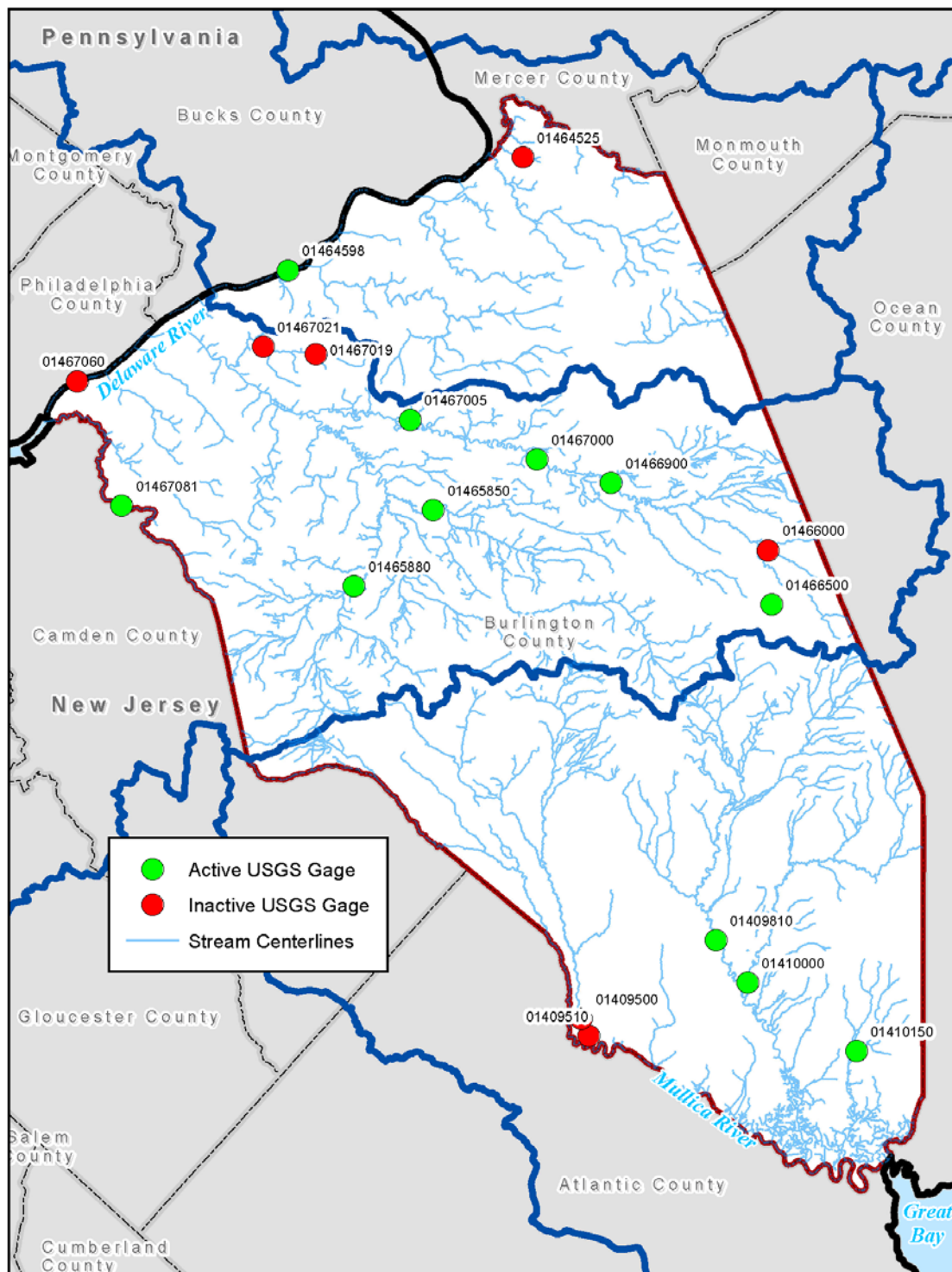
FEMA Region II will employ historical stream flow information from the USGS gages listed in Table 12 for use in hydrological analyses where applicable. Locally owned and operated rainfall gages are present throughout the watershed.

3.2.15   Additional Data Requested

In addition to the data mentioned above, the Discovery team requested a variety of other data that may be useful for the Discovery process and the Burlington County, New Jersey project in general. These requests included building footprints, parcel and tax data, Emergency Action Plans, as-built drawings for bridges and culverts, design books for community dams, watershed plans, land use regulations, flood control structure information, and any hydrologic or hydraulic data that communities may have.

4 Discovery Meeting

Prior to the Discovery Meeting, a "kick-off" webinar was held on Thursday April 11, 2013, at 10:00am. The webinar allowed stakeholders, County, State, and Federal organizations, to prepare for the upcoming Discovery meeting. A slideshow was presented that described the Discovery process and allowed the stakeholders insight to the Burlington County Flood Insurance Study.

The FEMA Discovery teams met with stakeholders from the local communities in Burlington County. County, State, and Federal organizations were represented. During the meeting, community maps displaying geospatial datasets and flood hazard information were reviewed, and interviews were conducted to help identify current flood hazards and risks for each community. Information packets were disseminated to all participants, and an overview of the Risk MAP program was presented.

During the Discovery Meetings, official's referred to local hazard mitigation plans for historical and persisting flooding concerns within Burlington County. The Discovery Meeting took place on Wednesday May 8, 2013 at 1:00 PM at the Burlington County Emergency Services Training Center, 53 Academy Drive, Westampton, NJ 08060.

Two (2) areas of concern have been brought up prior to finalizing the Discovery Report.

Area 1: South Branch Rancocas Creek: floodplain is not correctly displayed on the FIRMS. Stream will be redelineated and reviewed for floodplain mapping.

Area 2: Hartford Road Tributary: floodplain is not correctly displayed on the FIRMS. Stream will be redelineated and reviewed for floodplain mapping.

5 References

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