

9. Appendices

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Union County 2020 Hazard Mitigation Plan Update

- 1) Association of Bay Area Governments (ABAG). Modified Mercalli Intensity Scale. Retrieved at: <http://www.abag.ca.gov/bayarea/eqmaps/doc/mmi.html>
- 2) Cornell University. Northeast Regional Climate Center. 2019. Pennsylvania Drought Periods. Retrieved at: <http://www.nrcc.cornell.edu/regional/drought/drought.html>
- 3) Daily Item. 2016. "After five years, water from Lee receded, but memories remain." Retrieved at: https://www.dailyitem.com/news/after-years-water-from-lee-receded-but-memories-remain/article_ea9198f2-7441-11e6-aad3-fbb1214509aa.html
- 4) Daily Item. 2019. "Storm flattens Lewisburg-area forest, Union County EMA seeks tornado evidence." Retrieved at: https://www.dailyitem.com/news/local_news/storm-flattens-lewisburg-area-forest-union-county-ema-seeks-tornado/article_12dfd6cd-92e5-5083-9cbf-10614adfad0a.html
- 5) Federal Emergency Management Agency (FEMA). 2001. *Understanding Your Risks: Identifying Hazards and Estimating Losses FEMA 386-2*. Retrieved at: <http://www.fema.gov/library/viewRecord.do?id=1880>
- 6) Federal Emergency Management Agency (FEMA). 2014a. Community Status Book Report. Retrieved at: <http://www.fema.gov/cis/PA.pdf>
- 7) Federal Emergency Management Agency (FEMA). 2014. Community Rating System. Retrieved at: <http://www.fema.gov/library/viewRecord.do?id=3629>
- 8) Federal Emergency Management Agency (FEMA). 2014. "Disaster Declarations for Pennsylvania." Retrieved at: https://www.fema.gov/disasters/grid/state-tribal-government/44?field_disaster_type_term_tid_1=All
- 9) Federal Emergency Management Agency (FEMA). 2019. Flood Insurance Guide for Community Associations. Retrieved at: https://breadysd.gov/docs/FI_Guide_Community_Associations.pdf
- 10) Hazards & Vulnerability Research Institute. 2009. The Spatial Hazard Events and Losses Database for the United States, Version 7.0 [Online Database]. Columbia, SC: University of South Carolina. Retrieved at: <http://www.sheldus.org>
- 11) Lewisburg Neighbors Corporation. 2016. Bull Run Greenway Plan. Retrieved at: <https://lewisburgneighborhoods.org/about/bull-run-greenway-planning-project/bull-run-greenway-final-plan/>
- 12) National Drought Mitigation Center. 2014. University of Nebraska, Lincoln. Historical Maps of the Palmer Drought Index. Retrieved at: <http://droughtmonitor.unl.edu/>
- 13) National Fire Protection Association. 2007. *NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs*. Retrieved at: <http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=1600>
- 14) National Hurricane Center (NHC). 2009. The Saffir-Simpson Hurricane Wind Scale (Experimental). Retrieved at: <http://www.nhc.noaa.gov/aboutsshs.shtml>
- 15) National Integrated Drought Information Systems (NIDIS). 2010. Map and Data Viewer: Palmer Drought Indices. Retrieved at: <http://gis.ncdc.noaa.gov/map/drought/US.html>

Union County 2020 Hazard Mitigation Plan Update

- 16) National Oceanic and Atmospheric Administration (NOAA). Enhanced Fujita Scale for Tornado Damage. Retrieved at: <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>
- 17) National Oceanic and Atmospheric Administration (NOAA). 2014. Flood and Flash Flood Events – Annual Summaries for Union County. Retrieved at: <http://www.ncdc.noaa.gov/cdo-web/search>
- 18) National Oceanic and Atmospheric Administration (NOAA). Historical Hurricane Tracks. Retrieved at: <http://csc.noaa.gov/hurricanes/#>
- 19) National Oceanic and Atmospheric Administration (NOAA). 2014. Snowfall: Average Total in Inches Annual Summaries for Union County. Retrieved at: <http://www.ncdc.noaa.gov/cdo-web/search>
- 20) National Oceanic and Atmospheric Administration (NOAA). 2014. Tornado – Annual Summaries for Union County. Retrieved at: <http://www.ncdc.noaa.gov/cdo-web/search>
- 21) Pennsylvania Department of Conservation and Natural Resources (DCNR). Areas of Pennsylvania Susceptible to Landslides. Retrieved at: <http://www.dcnr.state.pa.us/topogeo/hazards/landslides/slideareas/index.htm>
- 22) Pennsylvania Department of Conservation and Natural Resources (DCNR). Earthquakes in Pennsylvania. Retrieved at: <http://www.dcnr.state.pa.us/topogeo/hazards/earthquakes/index.htm>
- 23) Pennsylvania Department of Conservation and Natural Resources (DCNR). 2018. Wildfires in Pennsylvania. Retrieved at: <https://www.dcnr.pa.gov/Communities/Wildfire/Pages/default.aspx>
- 24) Pennsylvania Ground Water Information Systems (PaGWIS). 2019. Domestic Well Inventory. Retrieved at <https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx>
- 25) Pennsylvania Department of Conservation and Natural Resources (DCNR). 2014. Sinkhole Inventory and Online Database. Retrieved at: <http://www.gis.dcnr.state.pa.us/maps/index.html?geology=true>
- 26) Pennsylvania Department of Environmental Protection (DEP). 2005. The Effects of Subsidence Resulting from Underground Bituminous Coal Mining. Retrieved at: http://www.dep.state.pa.us/dep/deputate/minres/bmr/act54_2004_report/Act%2054%20Report%20004/Executive%20Summary/Executive%20Summary%203.pdf
- 27) Pennsylvania Department of Environmental Protection (DEP). 2014. Historical [Drought] Maps. Retrieved at http://www.portal.state.pa.us/portal/server.pt/community/historical_maps/21268
- 28) Pennsylvania Department of Environmental Protection (DEP). Mine Subsidence Insurance. Retrieved at: <http://www.pamsi.org/>
- 29) Pennsylvania Department of Transportation (PennDOT). 2018. Highway Statistics Report. Retrieved at: <http://www.dot.state.pa.us/public/pubsforms/Publications/PUB%20600.pdf>
- 30) Pennsylvania Department of Transportation (PennDOT). 2019. Traffic Volume Maps. Retrieved at: <https://www.penndot.gov/ProjectAndPrograms/Planning/Maps/Pages/Traffic-Volume.aspx>

Union County 2020 Hazard Mitigation Plan Update

- 31) Pennsylvania Emergency Management Agency (PEMA). 2014. *Governor's Proclamations*. Retrieved at: http://www.portal.state.pa.us/portal/server.pt/community/governors_proclamations/4725.
- 32) Pennsylvania Emergency Management Agency (PEMA). 2013. *Pennsylvania Standard State All-Hazard Mitigation Plan*. Retrieved at: <http://www.pemahmp.com/Resource-Center>
- 33) Pennsylvania Emergency Management Agency (PEMA). 2013. *Commonwealth of Pennsylvania's All-Hazard Mitigation Planning Standard Operating Guide*. Retrieved at: <http://www.pemahmp.com/Resource-Center>
- 34) Pipeline and Hazardous Materials Safety Administration. 2019. Incident Statistics. Retrieved at: <https://www.phmsa.dot.gov/hazmat-program-management-data-and-statistics/data-operations/incident-statistics>
- 35) Susquehanna Economic Development Association and Council of Government (SEDA-COG). 2016. Long Range Transportation Plan, 2016-2040. Retrieved at: [http://www.seda-cog.org/transportation/Documents/SEDACOG%20MPO_LRTP%20Report%20\(2016-07-15\)%20FINAL_ALL.pdf](http://www.seda-cog.org/transportation/Documents/SEDACOG%20MPO_LRTP%20Report%20(2016-07-15)%20FINAL_ALL.pdf)
- 36) Susquehanna River Basin Commission. 2006. Major Watersheds in Union County. Retrieved at: <http://www.srbc.net>
- 37) The Center for Rural Pennsylvania. 2013. County Profiles. Retrieved at: http://www.ruralpa2.org/county_profiles.cfm
- 38) U.S. Census Bureau, 2017. American Community Survey 2017 Five-Year Estimates. Retrieved at: <http://www.census.gov/acs/www/>
- 39) U.S. Census Bureau. 2010. Population, Housing Units, Area, and Density: 2010. Retrieved at: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_3YR_NP_01&prodType=narrative_profile
- 40) U.S. Department of Agriculture (USDA). 2010. National Agricultural Statistical Service. Retrieved at: http://www.nass.usda.gov/Statistics_by_State/Pennsylvania/index.asp
- 41) U.S. Department of Agriculture (USDA). 2017a. 2017 Census of Agriculture. County Summary Highlights. Retrieved at: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1_Chapter_2_County_Level/Pennsylvania/st42_2_0001_0001.pdf
- 42) U.S. Department of Agriculture (USDA). 2017b. 2017 Census of Agriculture. Market Value of Agricultural Products Sold. Retrieved at: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1_Chapter_2_County_Level/Pennsylvania/st42_2_0002_0002.pdf
- 43) U.S. Department of the Interior, U.S. Geological Survey (USGS). 2000. Land Subsidence in the United States, Circular 1182. Retrieved at: <http://water.usgs.gov/ogw/pubs/fs00165/>

Union County 2020 Hazard Mitigation Plan Update

- 44) U.S. Department of the Interior, U.S. Geological Survey (USGS). 2014. National Hydrography Dataset (NHD). U.S. State Information on Drought. Retrieved at: <http://waterwatch.usgs.gov/?m=dryw>
- 45) U.S. Department of the Interior, U.S. Geological Survey (USGS). Pennsylvania Earthquake History. Retrieved at: <http://earthquake.usgs.gov/earthquakes/states/pennsylvania/history.php>
- 46) U.S. Department of the Interior, U.S. Geological Survey (USGS). Seismic Hazard Map of Pennsylvania. Retrieved at: <http://www.earthquake.usgs.gov/earthquakes/states/pennsylvania/hazards.php>
- 47) Union County Geographic Information Systems (GIS). 2014. Retrieved from Union County GIS Staff. <http://www.unioncogis.org>
- 48) Union County Planning Department. 2009. *Cultivating Community: A Plan for Union County's Future*. Retrieved at: <http://www.cultivatingcommunity.net/draft-plan.html>
- 49) Union County Planning Commission. 2018. Annual Report Retrieved at: <https://www.unioncountypa.org/data/uploads/contentblock/Planning/Annual%20Reports/2018%20Annual%20Report.pdf>
- 50) Union County. 2012. U.S. 15 Smart Transportation Corridor Improvement Plan. Retrieved at: <https://www.unioncountypa.org/data/uploads/contentblock/Planning/Chapter%201%20US%2015%20Summary%20Report.pdf>
- 51) Union County. 2017a. Greenway and Open Space Plan. Retrieved at: <https://www.unioncountypa.org/departments/greenway/greenway-and-open-space-plan/page.aspx?id=1576>
- 52) Union County. 2017b. Union County Housing Study. Retrieved at: <https://www.unioncountypa.org/data/uploads/contentblock/Planning/Union%20County%20Housing%20Plan%206.21.2017.pdf>
- 53) Union County Planning Department. 2011. Subdivision & Land Development Ordinance. Retrieved at: <http://www.unioncountypa.org/residents/government/land/planning/ordinance.asp>
- 54) WNEP. 2018. "Friends help woman repair sinkhole." Retrieved at: <https://wnep.com/2018/09/25/friends-help-woman-repair-sinkhole/>

Appendix B Local Mitigation Plan Review Tool

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LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA’s evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan’s strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Union County	Title of Plan: Union County Hazard Mitigation Plan Update 2020	Date of Plan:
Local Point of Contact:		Address:
Title:		
Agency:		
Phone Number:		
		E-Mail:

State Reviewer: Ernie Szabo	Title: State Planner	Date:
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FEMA Reviewer: Matt McCullough	Title: Community Planner	Date:
Date Received in FEMA Region (insert #)		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

**SECTION 1:
REGULATION CHECKLIST**

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been ‘Met’ or ‘Not Met.’ The ‘Required Revisions’ summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is ‘Not Met.’ Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Pg. 20-25	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Appendix C- emailed invitation	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Pg. 24-25 & Appendix C	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Pg. 15-16 & Appendix A	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Pg. 201	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Pg. 199-201	X	

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
<u>ELEMENT A: REQUIRED REVISIONS</u>				
A3.) Question: Were there any public comments received via the website? No public comments were received via the website. Section 3.3, Page 24 has been updated to note this.				
A6.) Kudos: Comprehensive listing of evaluation criteria.				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 4.3 Appendix D	X		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 4.3	X		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 4.3 & 4.4 Appendix D, E, F	X		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Pg. 54-62	X		
<u>ELEMENT B: REQUIRED REVISIONS</u>				
B3.) Discussion: How was mapping information provided in Appendix D, HAZUS results Appendix E and Critical Facilities risk matrix in Appendix F, used to engage participating communities and stakeholders in the development of the risk assessment?				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Pg. 141-154	X		
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Pg. 145-147 Appendix C			X
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Pg. 169-171	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Pg. 170-191	X		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Pg. 157-158, 192			X
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Pg. 152-154	X		
ELEMENT C: REQUIRED REVISIONS				
<p>C2.) Required Revision: Pg. 414-419: Appendix C has only two NFIP Survey responses from Buffalo Twp and East Buffalo Twp. Please include all other responses from participating communities. The NFIP section of the Capability Assessment (Section 5.2.1.2, Page 144-147) contains detailed information about how communities implement the NFIP and administer local floodplain ordinances. Early in the planning process, we asked communities to complete NFIP surveys and review information from the 2014 HMP Update to verify whether it was still accurate. We received two updated NFIP Surveys and gathered additional information about NFIP administration at meetings, including regarding the role of Central Keystone Council of Governments (CKCOG) in providing technical assistance, overseeing building code enforcement throughout the county, and serving as Zoning Administrator for several communities.</p> <p>To address this required revision, we revised Section 5.2.1.2, Page 146-147 to clarify that we requested communities verify existing information in the 2014 HMP, include additional details about NFIP implementation for several communities, and add a description of CKCOG’s role in administering the NFIP.</p>				
<p>C4.) Recommended Revision/Discussion: Pg. 181- Union Township is not listed under the Action No. 22. Is this omission an oversight or do they not want to be included in this action type? This may affect grant eligibility going forward. Other actions also don’t have consensus participation for those with applicable flood risk. Ie....Action 20, 24 We followed up with Union Township Supervisor to communicate the benefit of keeping these actions in the HMP. He confirmed this omission was not an oversight and indicated that Union Township’s Council mutually agreed to remove this action as most homes in the flood zone are seasonal. As a result, we kept plan as is.</p>				
<p>C5.) Required Revision: Pg. 157- Please include language that state a “cost-benefit review” will be part of the prioritization. We added language stating that the mitigation action prioritization process included a cost-benefit review on pages 157, 173, and 189.</p>				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Pg. 9-14, 135-136	X		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Pg. 158-169	X		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Pg. 129-131, 154-157, 192-198	X		
<u>ELEMENT D: REQUIRED REVISIONS</u>				
Recommended Revision: For the next plan update, research could be performed using hazard maps overlaid on land use mapping to analyze future risk, as it relates to the current population and housing trends.				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	N/A			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	N/A			
<u>ELEMENT E: REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

Appendix C Meeting and Other Participation Documentation

Due to size, this appendix has not been printed. A digital copy is available on the enclosed CD.

This appendix contains the following documentation of the Union County 2020 Hazard Mitigation Plan Update.

Update planning process:

Kickoff Meeting – June 13, 2019

- Invitations (Municipalities)
- Invitations (Stakeholders)
- Agenda
- Presentation
- Sign-In Sheet
- Meeting Minutes

Risk Assessment and Mitigation Solutions Workshop – August 28, 2019

- Invitations
- Website Announcement
- Agenda
- Presentation
- Sign-In Sheet
- Meeting Minutes

Draft Plan Review – October 8, 2019

- Invitations
- Public Notice
- Public Notice Affidavit of Publication
- Website Announcement
- Agenda
- Presentation
- Sign-In Sheet
- Meeting Minutes

Completed Participation Forms

- Capability Assessment Survey
- Hazard-Risk Evaluation Worksheets
- New Mitigation Action Form
- Mitigation Action Progress Form
- NFIP Survey

Other Participation Documentation

- General Comments
- Draft Plan Website Posting

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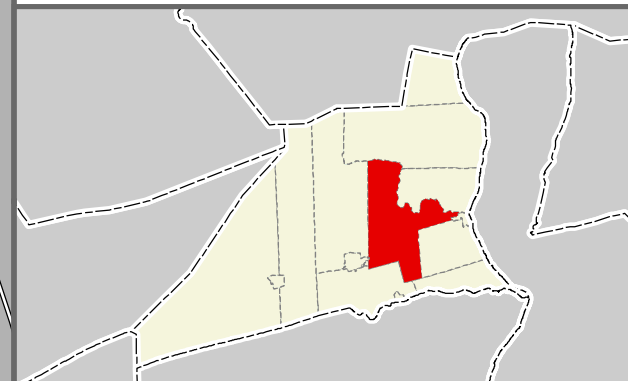
Appendix D Local Municipality Flood Vulnerability Maps

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BUFFALO TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE



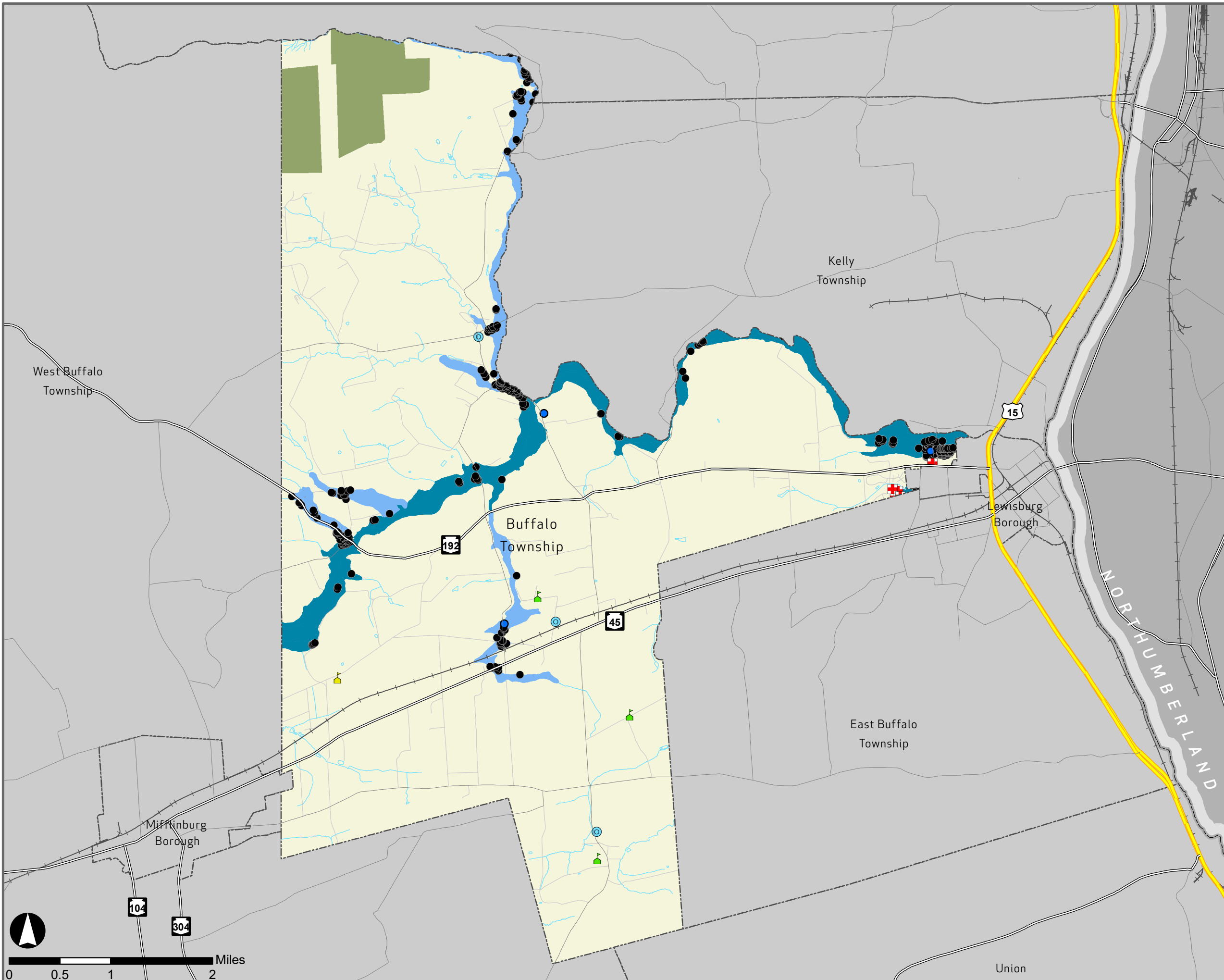
UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

















Map Date: 12/11/2019

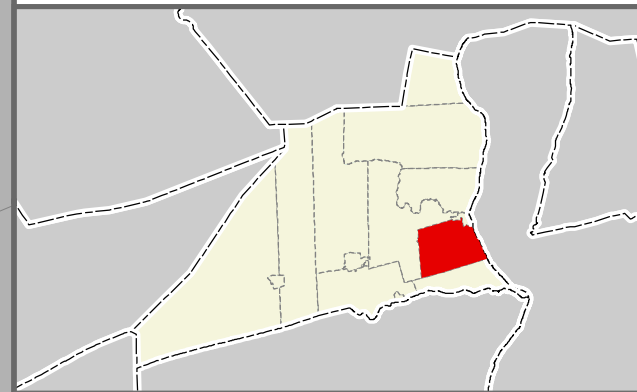
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EAST BUFFALO TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

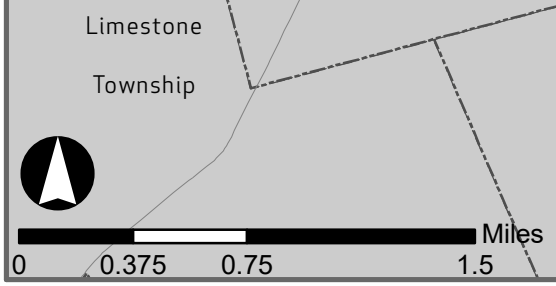
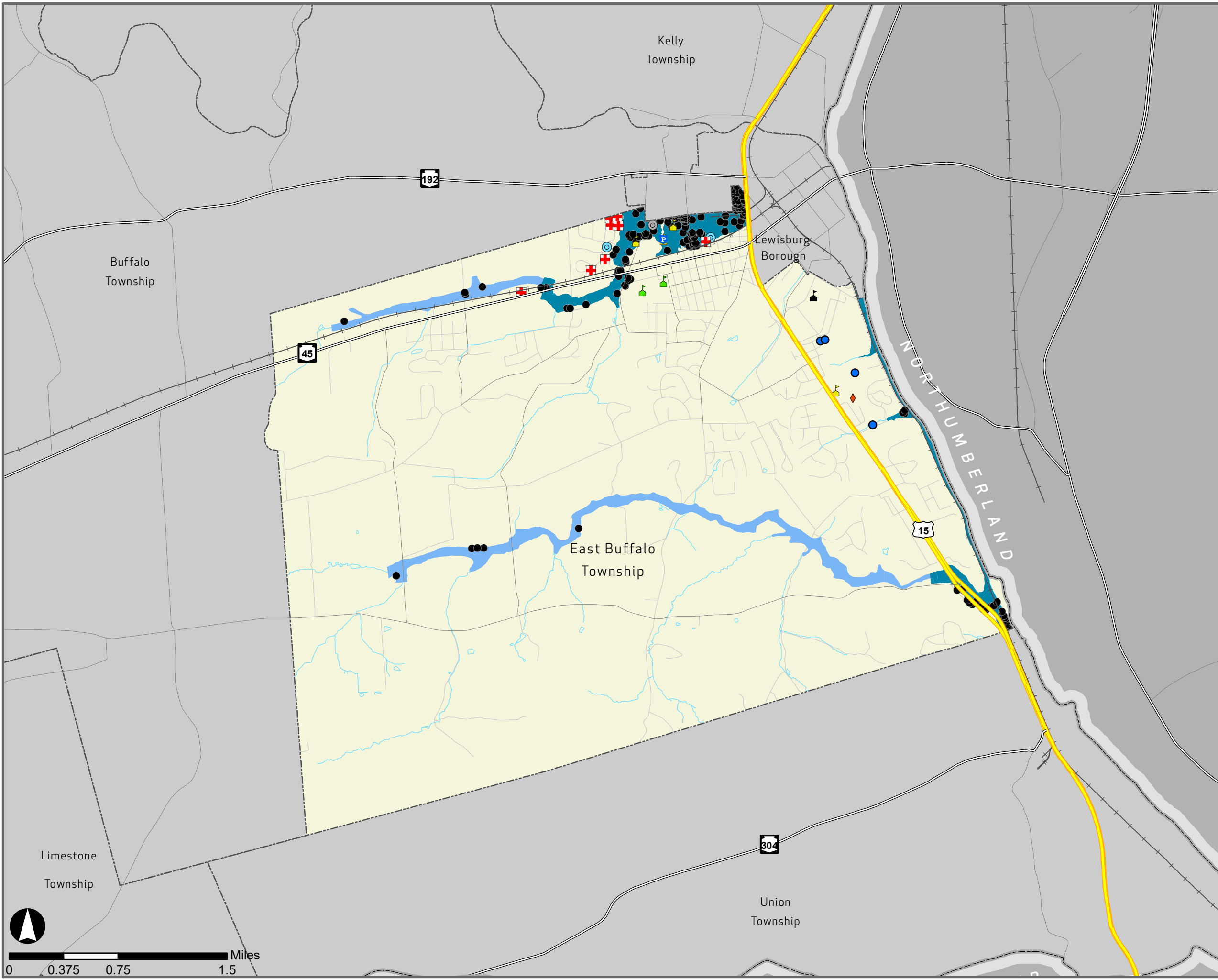


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

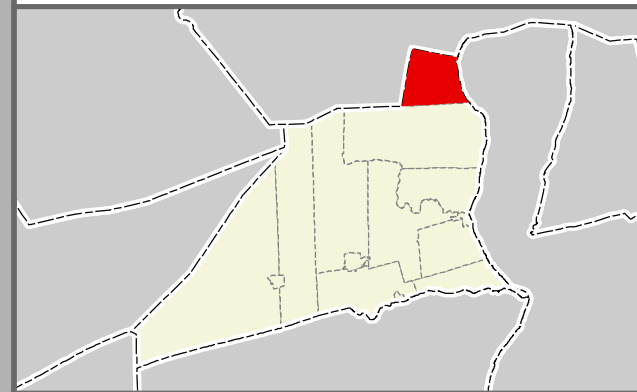
Map Date: 12/11/2019



GREGG TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE



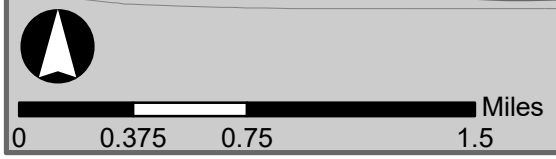
UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019

Projection: NAD83 PA State Plane North Zone

Map Date: 12/11/2019

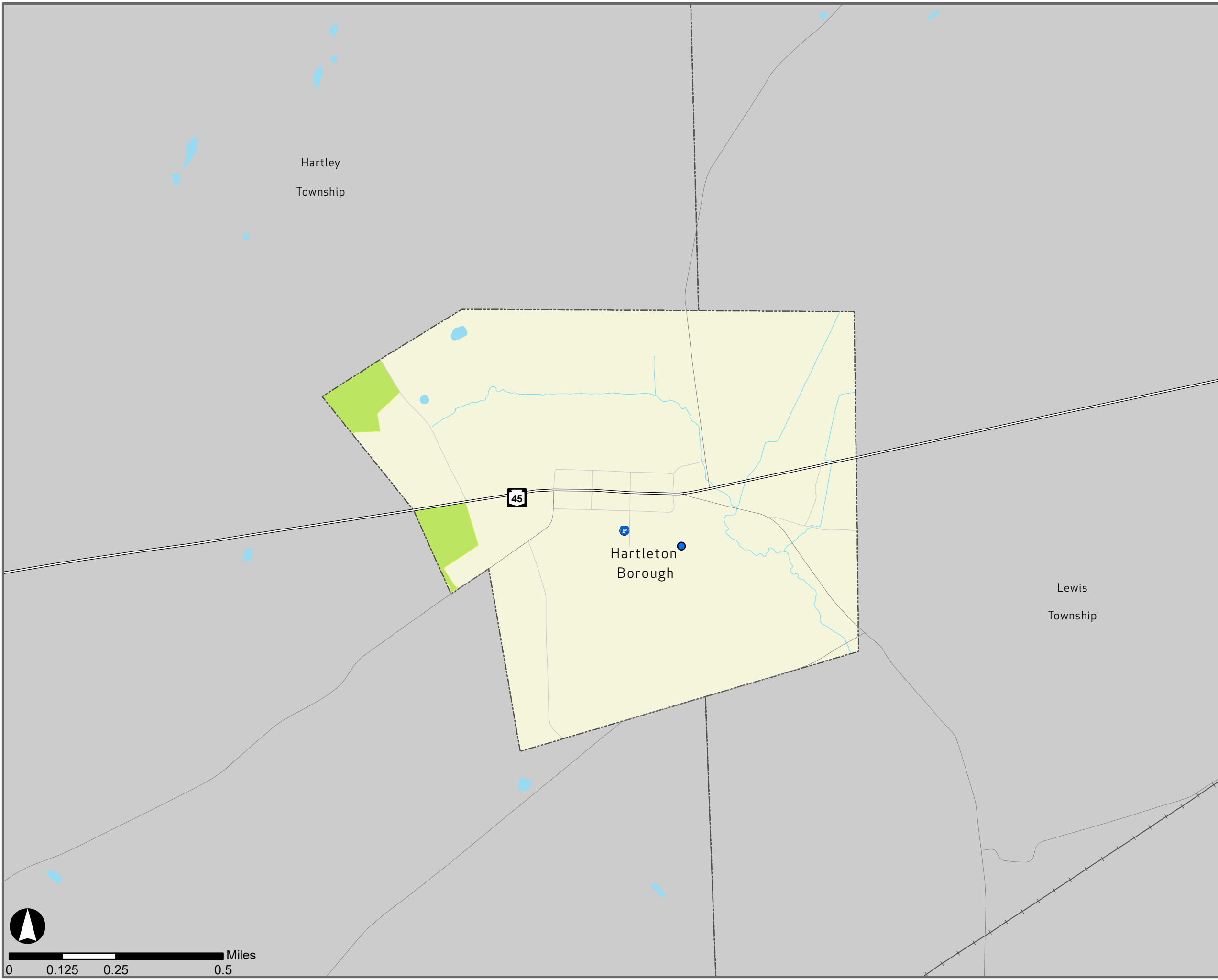
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HARTLETON BOROUGH COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE

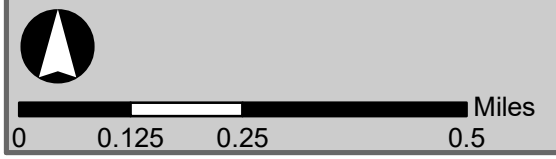


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

















Projection: NAD83 PA State Plane North Zone

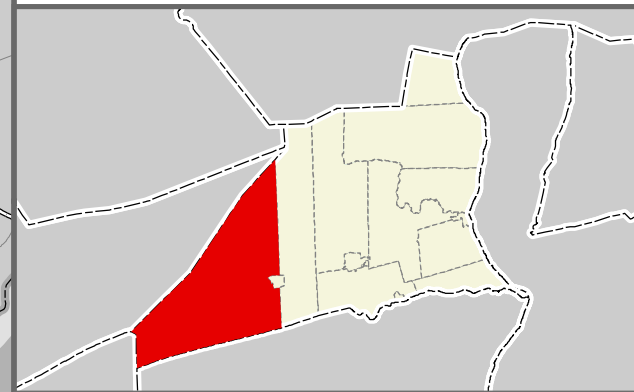
Map Date: 12/11/2019



HARTLEY TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

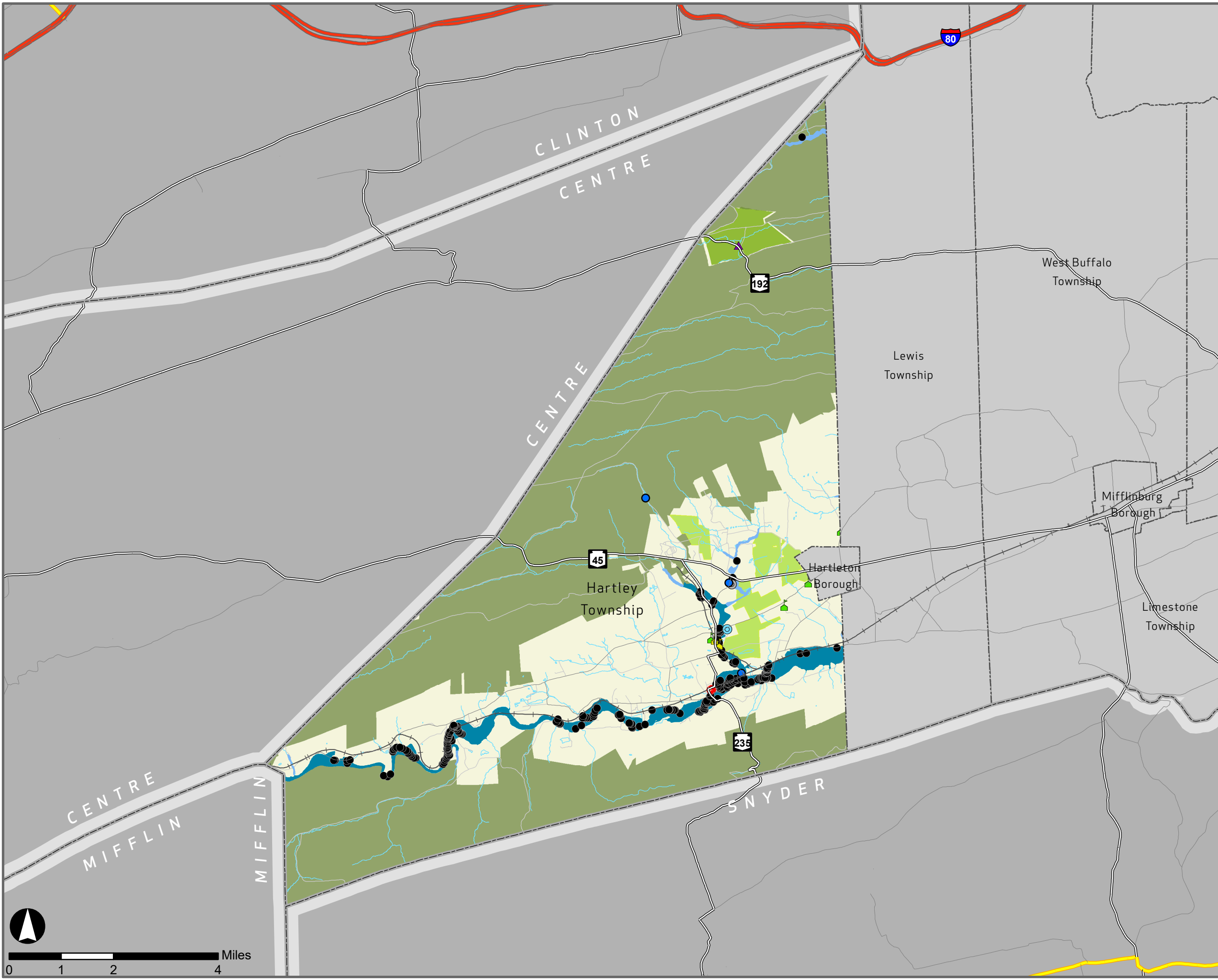


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.








Projection: NAD83 PA State Plane North Zone

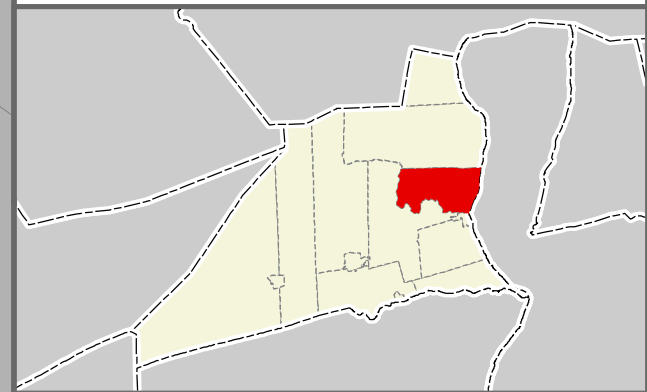
Map Date: 12/11/2019



KELLY TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

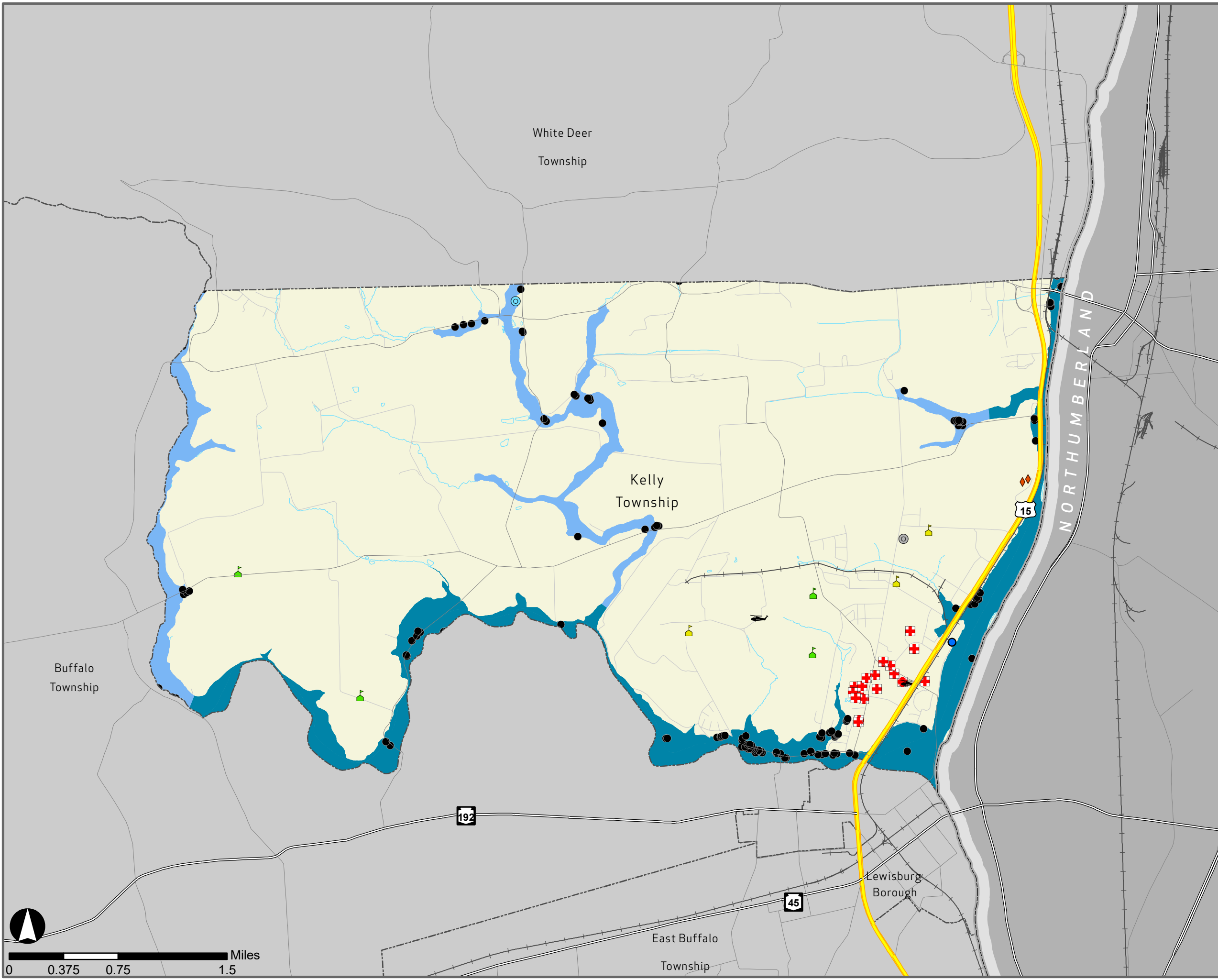


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

















Projection: NAD83 PA State Plane North Zone

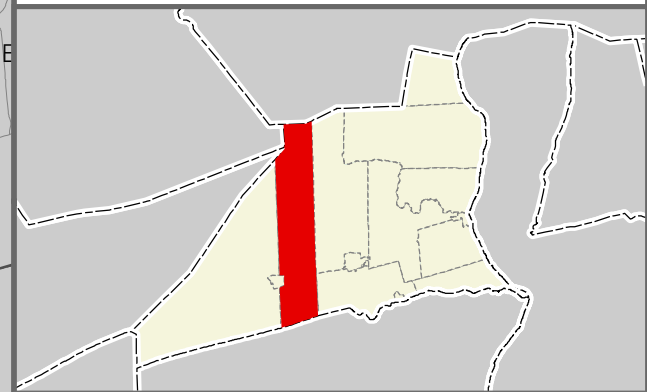
Map Date: 12/11/2019



LEWIS TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

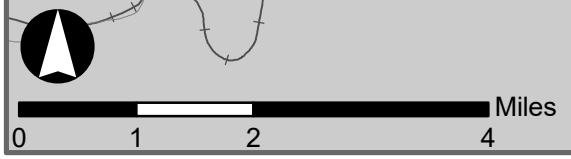


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

Map Date: 12/11/2019



LEWISBURG BOROUGH COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE



UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

















Projection: NAD83 PA State Plane North Zone

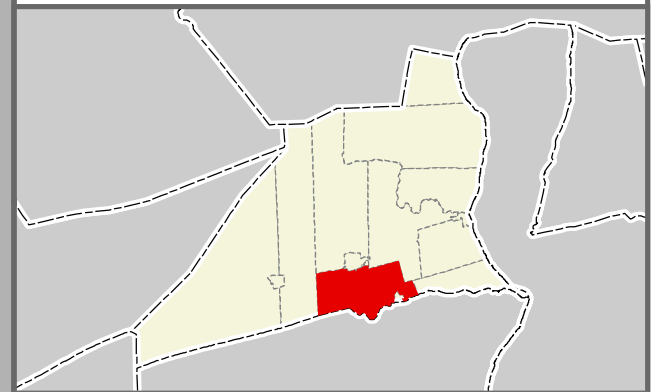
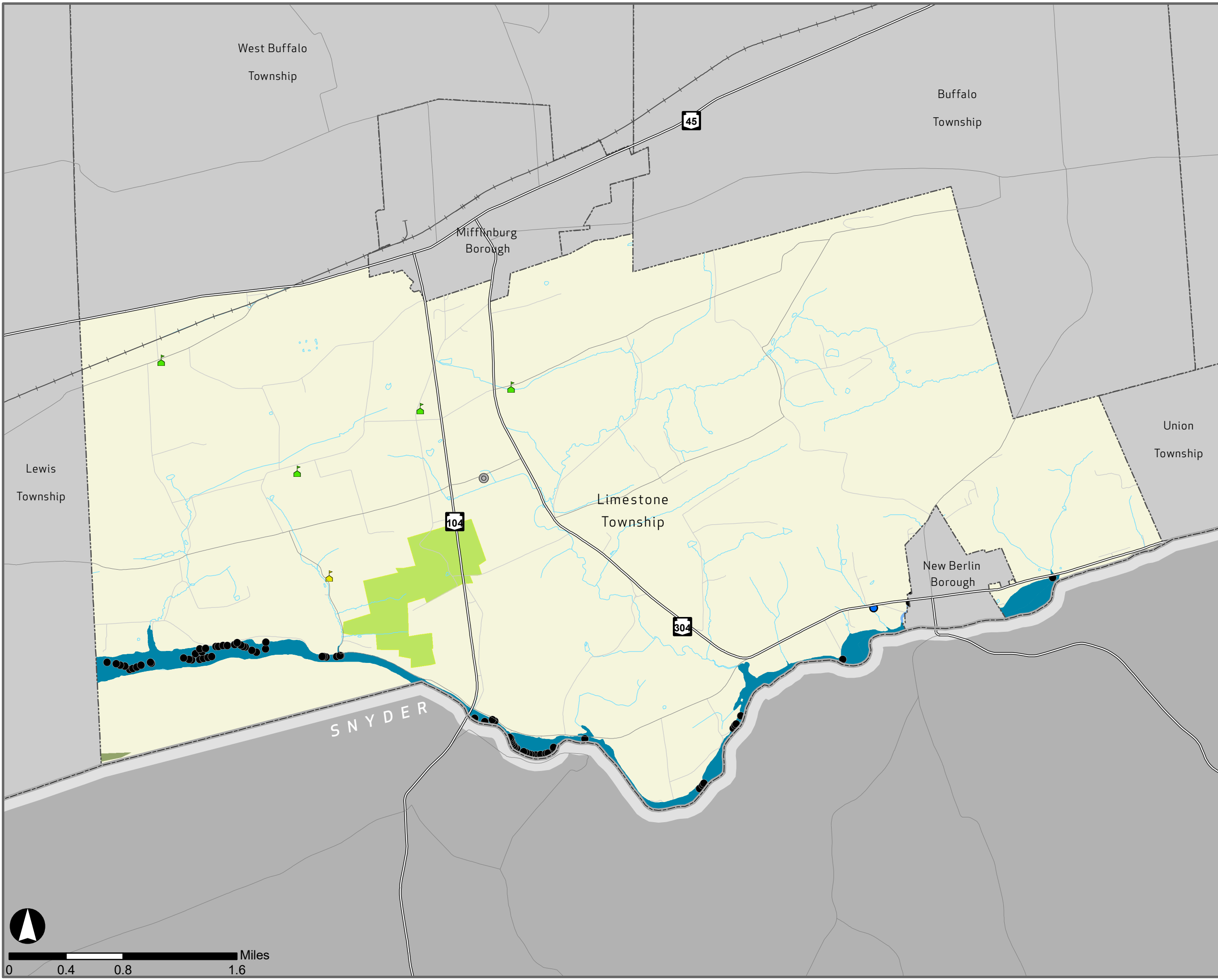
Map Date: 12/11/2019



LIMESTONE TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

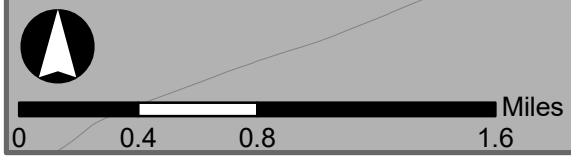


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

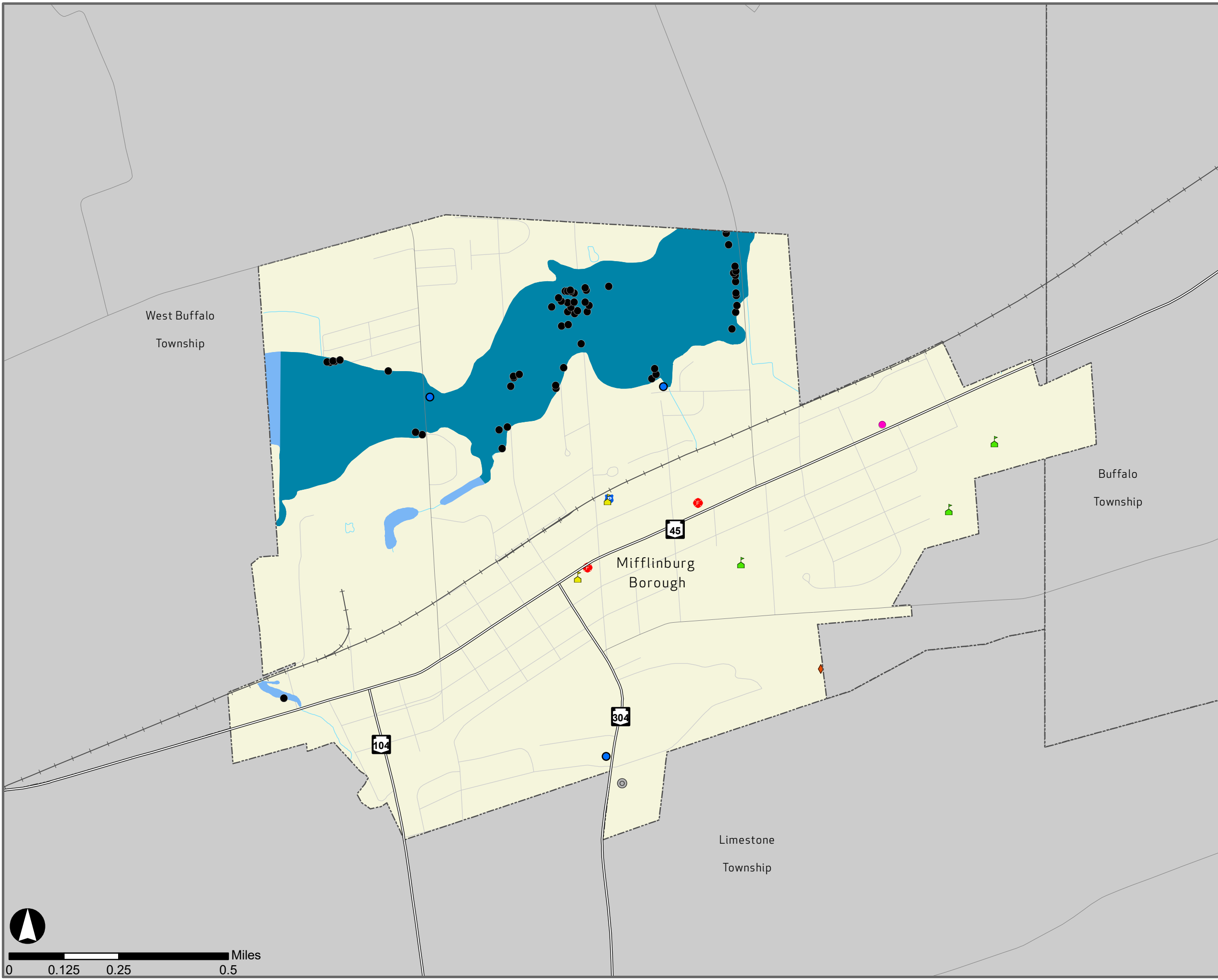
Map Date: 12/11/2019



MIFFLINBURG BOROUGH COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE

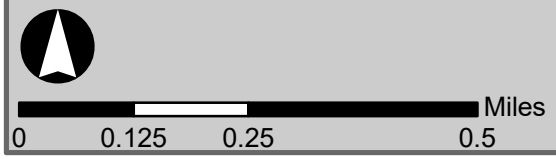


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

Map Date: 12/11/2019



NEW BERLIN BOROUGH COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE



UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

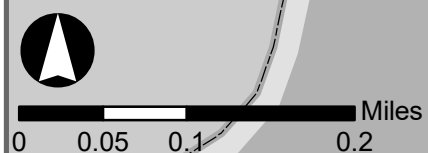
Map Date: 12/11/2019

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Limestone
Township

















New Berlin
Borough

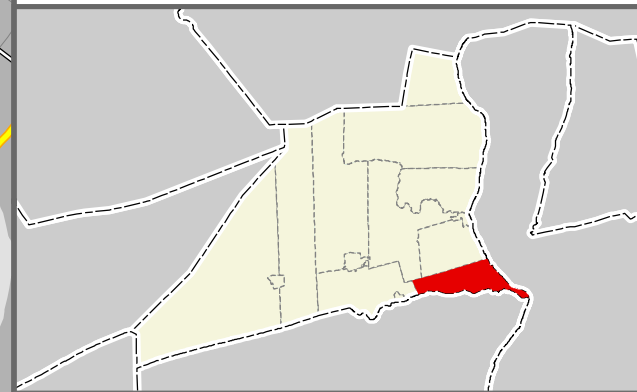
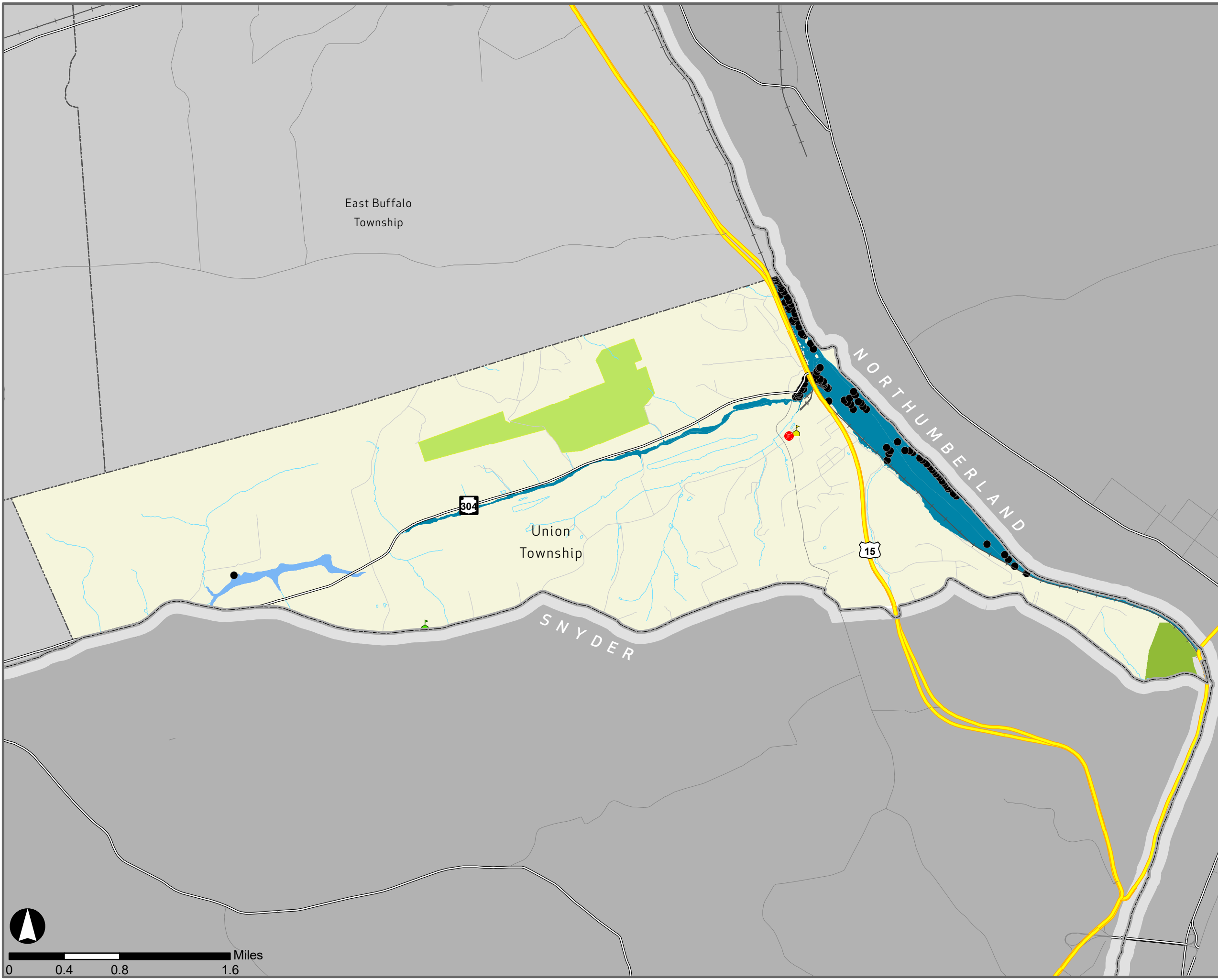
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UNION TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

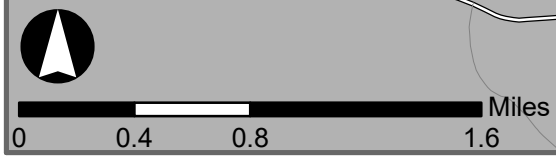


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

















Projection: NAD83 PA State Plane North Zone

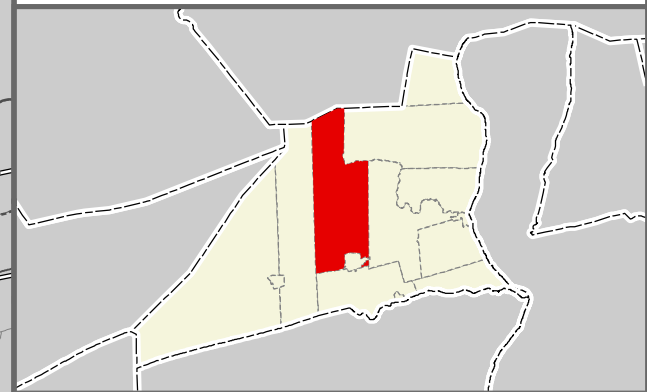
Map Date: 12/11/2019



WEST BUFFALO TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

-  College
-  Communications
-  Community Rec
-  Dam
-  Fire / EMS
-  Government
-  Health / Medical
-  Helicopter
-  Law Enforcement
-  Radio / TV
-  School
-  Substation
-  Water / Wastewater
-  Structures in SFHA
-  Flood Zone A
-  Flood Zone AE

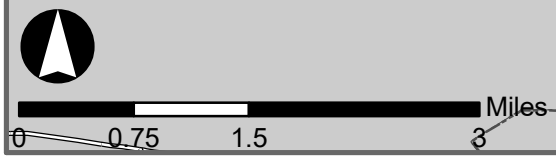
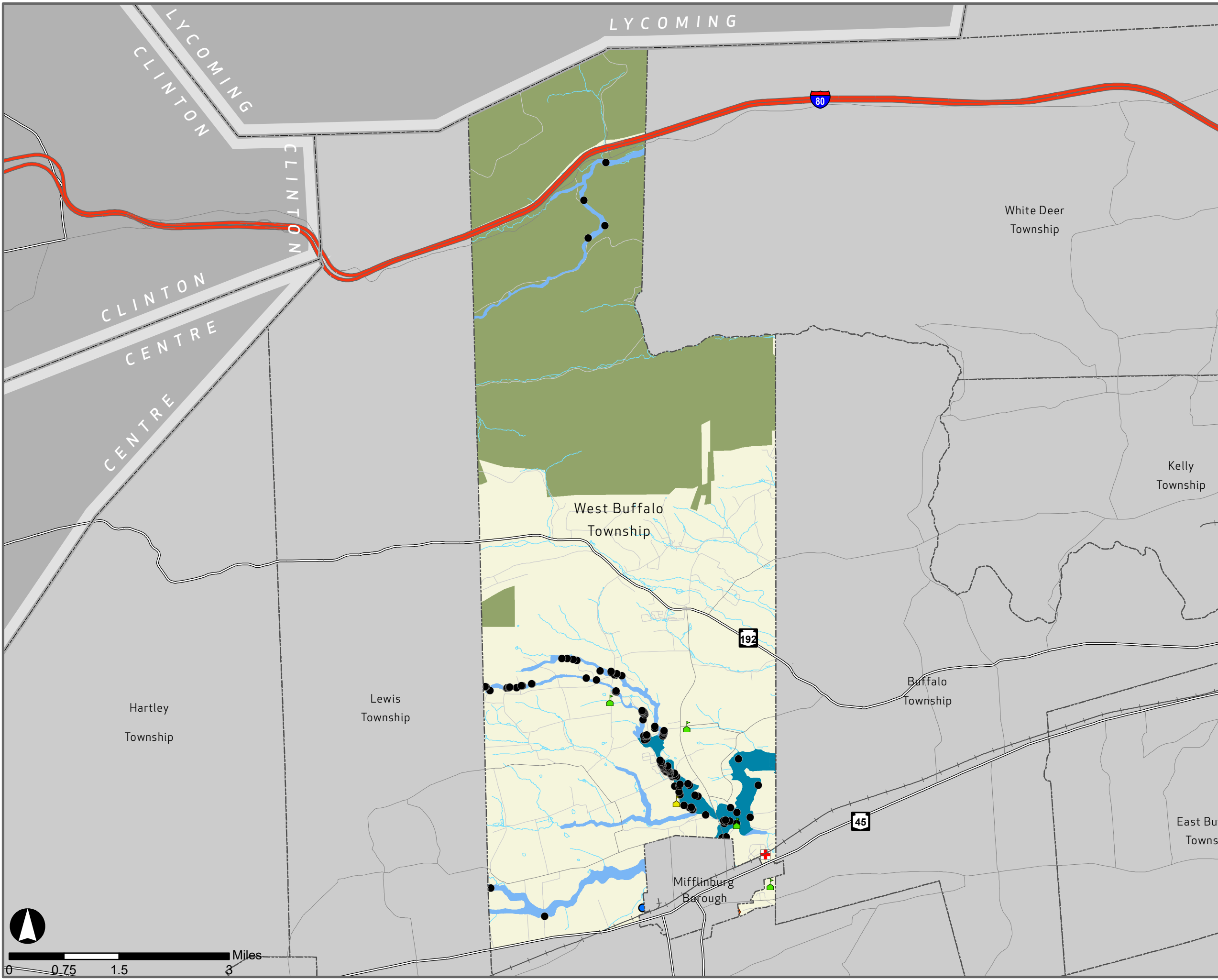


UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019

Projection: NAD83 PA State Plane North Zone

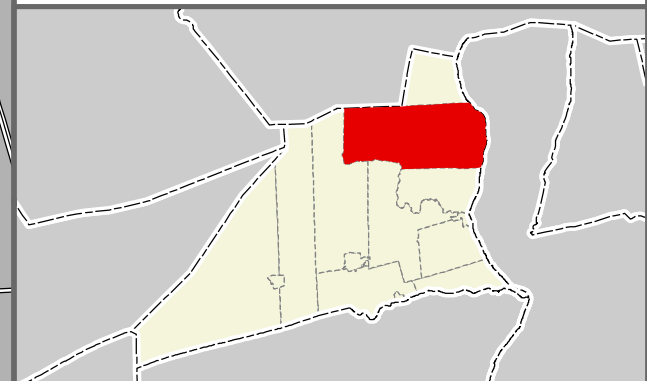
Map Date: 12/11/2019



WHITE DEER TOWNSHIP COMMUNITY FLOOD VULNERABILITY

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater
- Structures in SFHA
- Flood Zone A
- Flood Zone AE



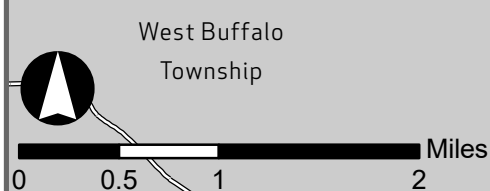
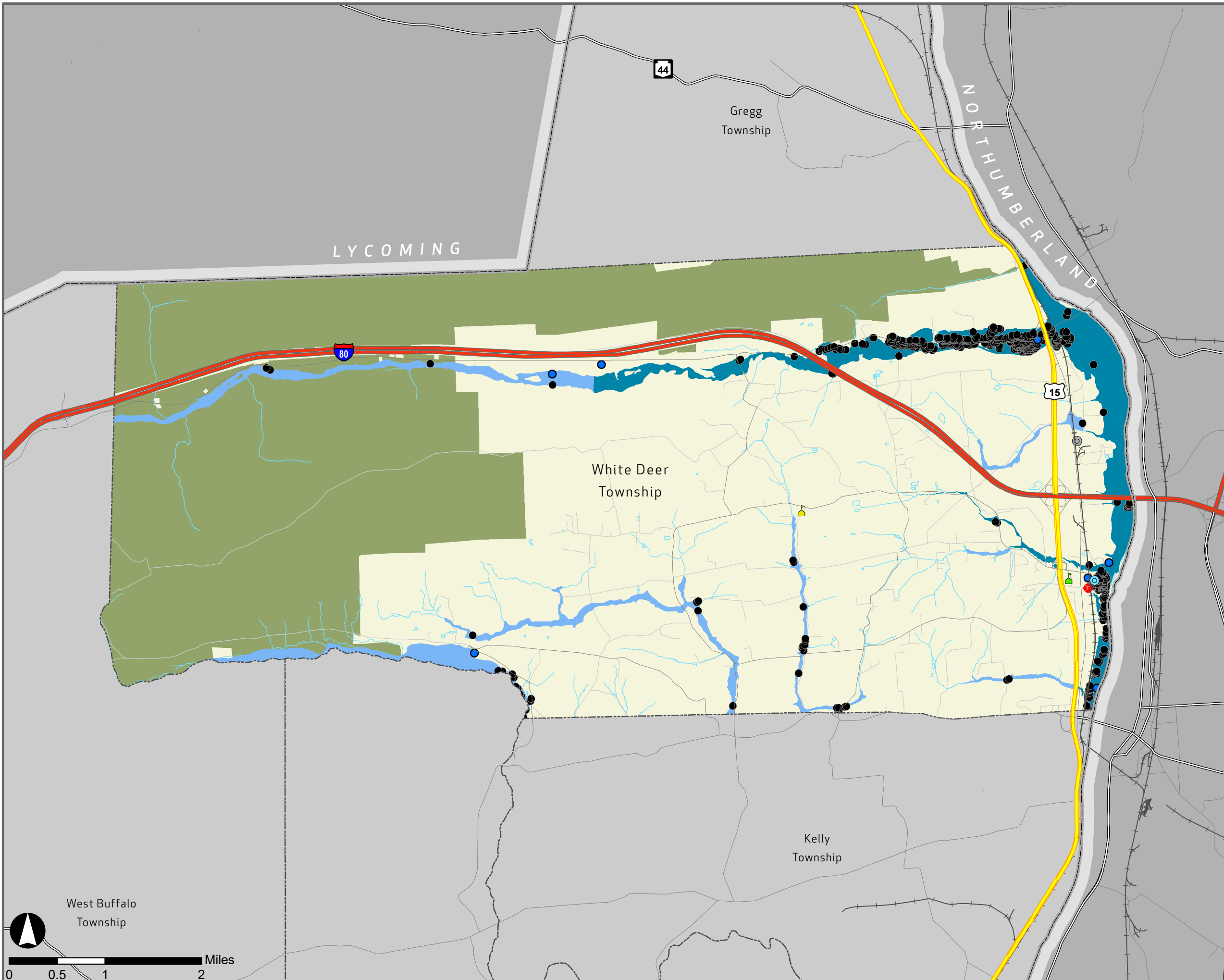
UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014;
Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

Map Date: 12/11/2019

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Union County 2020 Hazard Mitigation Plan Update

Appendix E Critical Facilities

This appendix includes an inventory of all critical facilities in Union County, organized by type and municipality, as well as each facility's vulnerability to hazards. Additionally, this appendix contains a map of the critical facilities in Union County. Detailed maps of critical facilities in each municipality are available in Appendix D – Local Municipality Flood Vulnerability Maps.

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Union County 2020 Hazard Mitigation Plan Update



CRITICAL FACILITIES

LEGEND

- College
- Communications
- Community Rec
- Dam
- Fire / EMS
- Government
- Health / Medical
- Helicopter
- Law Enforcement
- Radio / TV
- School
- Substation
- Water / Wastewater



UNION COUNTY HAZARD MITIGATION PLAN UPDATE

Source of Data: PennDOT, 2014; DCNR, 2014; Union County GIS, 2019.

Projection: NAD83 PA State Plane North Zone

Map Date: 12/11/2019



Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
American Red Cross Facility	American Red Cross	249 Saint Mary St W	East Buffalo Township			Y			Y	Y
College / University	Bucknell University Campus	701 Moore Ave	East Buffalo Township			Y			Y	
Community / Recreation Center	Buffalo Valley Recreation Authority (Formerly Lara)	220 Brookpark Cir Suite 9	East Buffalo Township			Y			Y	Y
Community / Recreation Center	Youth Center	3150 New Berlin Mountain Rd	Buffalo Township							
Community / Recreation Center	Kelly Crossroads Community Center	1925 Fort Titzell Rd	Kelly Township	Y						
Community / Recreation Center	Area Agency On Aging	116 N 2Nd St	Lewisburg Borough			Y			Y	Y
Community / Recreation Center	New Berlin Social Hall / New Berlin Fire Company	416 Liberty St	New Berlin Borough			Y			Y	
Community / Recreation Center	Donald Heiter Community Center	101 S 5Th St	Lewisburg Borough	Y		Y		Y	Y	Y

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Community / Recreation Center	Hartleton Community Building (Formerly Church)	115 Catherine St	Hartleton Borough			Y			Y	
Community / Recreation Center	Laurel Run Activity Complex Youth Center	49 Ball Park Rd	Hartley Township						Y	
Community / Recreation Center	Warrior Run Area Fire Department Social Hall	196 White Deer Ave	Gregg Township					Y	Y	
Community / Recreation Center	Youth Center/Union County Sorting Center	224 Young Rd	Buffalo Township			Y			Y	
Community / Recreation Center	Mazeppa Community Center	3246 Johnson Mill Rd	Buffalo Township							
Community / Recreation Center	New Columbia Civic Building	224 3Rd St	White Deer Township	Y					Y	Y
Community / Recreation Center	Miller Center For Recreation And Wellness	120 Hardwood Dr	East Buffalo Township	Y		Y			Y	Y

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDIENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
County Government Facility	County Building (Former Army Reserve Building)	480 Hefer Rd	Kelly Township						Y	Y
County Government Facility	Mifflinburg Bank Building	343 Chestnut St	Mifflinburg Borough			Y			Y	
County Government Facility	Union County Government Center	155 N 15Th St	East Buffalo Township	Y		Y			Y	Y
Dam	Halfway Dam	17000 Buffalo Rd	Hartley Township						Y	
Fire Station / EMS Station	William Cameron Engine Company	11 Buffalo Rd	Lewisburg Borough	Y		Y		Y	Y	Y
Fire Station / EMS Station	Union County West End Fire Company	3005 State Route 235	Hartley Township						Y	
Fire Station / EMS Station	New Berlin Fire Company #1	415 High St	New Berlin Borough			Y			Y	
Fire Station / EMS Station	Mifflinburg Hose Company	325 Chestnut St	Mifflinburg Borough			Y			Y	
Fire Station / EMS Station	Warrior Run Area Fire Department (Allenwood)	188 White Deer Ave	Gregg Township					Y	Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Fire Station / EMS Station	White Deer Township Fire Department	366 Cemetery St	White Deer Township					Y	Y	Y
Fire Station / EMS Station	Union Township Fire Company	40 Municipal Ln	Union Township						Y	Y
Fire Station / EMS Station	Medic 60	1 Hospital Dr	Kelly Township					Y	Y	Y
Fire Station / EMS Station	Micu 14	104 Chestnut St	Mifflinburg Borough			Y			Y	
Government or Military Facility	Union County Community Services Building	1610 Industrial Blvd	East Buffalo Township	Y		Y			Y	Y
Government or Military Facility	Lewisburg Federal Penitentiary	2400 Robert F Miller Dr	Kelly Township							Y
Government or Military Facility	Allenwood Federal Correctional Institution	Main Access Rd	Gregg Township							
Government or Military Facility	Equalizing Tank	1012 Matthew Brown Rd	Gregg Township					Y	Y	
Government or Military Facility	Fci Warehouse	440 Main Access Rd	Gregg Township					Y	Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Government or Military Facility	US Penitentiary	824 Main Access Rd	Gregg Township							
Government or Military Facility	Federal Correction Institution	1164 Main Access R	Gregg Township							
Government or Military Facility	Fci Power Plant	141 Johnson St	Gregg Township							
Government or Military Facility			Gregg Township						Y	
Government or Military Facility	Fci Trailning Center	226 Main Access Rd	Gregg Township					Y	Y	
Government or Military Facility	Fci, Wit-Sec	1460 Main Access Rd	Gregg Township							
Government or Military Facility			Gregg Township							
Government or Military Facility	Fci Allenwood Unicor Warehouse		Gregg Township					Y	Y	
Government or Military Facility	Low Security Correctional Institution	595 Main Access Rd	Gregg Township							
Health or Medical Facility	Evangelical Community Hospital	1 Hospital Dr	Kelly Township					Y	Y	Y

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Health or Medical Facility	Albright Footcare Center	2330 Reitz Blvd	East Buffalo Township			Y			Y	Y
Health or Medical Facility	Allergy Partners Of Lewisburg	2824 Old Turnpike Rd	East Buffalo Township			Y			Y	Y
Health or Medical Facility	Cancer Care Of Central Pa	75 Medical Park Dr	Kelly Township						Y	Y
Health or Medical Facility	Central Penn Gastroenterology Associates	90 Medical Park Dr	Kelly Township						Y	Y
Health or Medical Facility	Central PA Women's Healthcare Llc	111 Medical Park Dr	Kelly Township						Y	Y
Health or Medical Facility	Geisinger Cardiology	131 Jpm Rd	Kelly Township					Y	Y	Y
Health or Medical Facility	Lewisburg Family Practice Center	131 Jpm Rd	Kelly Township					Y	Y	Y
Health or Medical Facility	North Central Pa Dialysis Clinic	135 Jpm Rd	Kelly Township					Y	Y	Y
Health or Medical Facility	Eye Center Of Central PA	137 Jpm Rd	Kelly Township						Y	Y
Health or Medical Facility	Evan One Day Surgery	210 Jpm Rd	Kelly Township					Y	Y	Y

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Health or Medical Facility	Douglas Spotts, Md Family Medical Care	45 Forestwood Dr	Kelly Township					Y	Y	Y
Health or Medical Facility	Sun Orthopaedic Group	900 Buffalo Rd	Buffalo Township			Y			Y	Y
Health or Medical Facility	Brookpark Family Practice	98 Reitz Blvd	East Buffalo Township			Y			Y	Y
Health or Medical Facility	Limestone Office Building	11 Reitz Blvd	East Buffalo Township			Y			Y	Y
Health or Medical Facility	Brookpark Associates	115 Farley Cir	Buffalo Township			Y			Y	Y
Health or Medical Facility	Susquehanna Valley Imaging	120 Hamm Dr	Kelly Township					Y	Y	
Health or Medical Facility	Medical Park Ent	80 Medical Park Dr	Kelly Township						Y	Y
Health or Medical Facility	PA State Health Center	260 Farley Cir	East Buffalo Township			Y			Y	Y
Health or Medical Facility	Lewisburg Plastic Surgery	135 Walter Dr	Kelly Township					Y	Y	
Health or Medical Facility	Multiple Medical Offices	3 Hospital Dr	Kelly Township					Y	Y	Y
Health or Medical Facility	The Eye Center Of Central Pennsylvania	88 Hardees Dr	West Buffalo Township			Y			Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Health or Medical Facility	Eye Center Of Central PA	66 Enterprise Blvd	Gregg Township			Y		Y	Y	
Health or Medical Facility	Medical Building	25 Lystra Rogers Dr	Kelly Township						Y	Y
Health or Medical Facility	Evangelical Hospice	130 Hospital Dr	Kelly Township					Y	Y	Y
Health or Medical Facility	Dental Office	111 Farley Cir	Buffalo Township			Y			Y	Y
Health or Medical Facility	Dental Office	217 Farley Cir	East Buffalo Township			Y			Y	Y
Health or Medical Facility	Lewisburg Pediatric Dentistry	134 Hospital Dr	Kelly Township						Y	Y
Health or Medical Facility	Dental Divas	222 Jpm Rd	Kelly Township						Y	Y
Health or Medical Facility		112 N 15Th St	East Buffalo Township	Y		Y			Y	Y
Helipad / Heliport / Helispot	Helipad	E Kettle Rd	Hartley Township				Y			
Helipad / Heliport / Helispot	Evangelical Community Hospital Helipad	1 Hospital Dr	Kelly Township					Y	Y	Y

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Helipad / Heliport / Helispot	USP Helipad		Kelly Township							Y
Information or Communication Facility		146 E Chestnut St	Mifflinburg Borough			Y			Y	
Law Enforcement	Mifflinburg Borough Police Station	120 N 3Rd St	Mifflinburg Borough			Y			Y	
Law Enforcement	New Berlin Borough Police Department	700 Water St	New Berlin Borough						Y	
Law Enforcement	Buffalo Valley Regional Police Department	1610 Industrial Blvd, Suite 500	East Buffalo Township	Y		Y			Y	Y
Law Enforcement	Hartleton Police Dept	115 Catherine St	Hartleton Borough			Y			Y	
Municipal Government Facility	Lewisburg Borough Offices/Reading Rr Station	55 S 5Th St	Lewisburg Borough			Y			Y	Y
Municipal Government Facility	Hartley Township Municipal Building	1724 State Route 235	Hartley Township						Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Municipal Government Facility	Hartley Township Municipal Building	1845 State Route 235	Hartley Township	Y					Y	
Municipal Government Facility	Lewis Township Municipal Building	116 Center St	Lewis Township			Y				
Municipal Government Facility	Gregg Township Municipal Building	18084 Russell Rd	Gregg Township						Y	
Municipal Government Facility	Union Township Municipal Building	70 Municipal Ln	Union Township						Y	Y
Municipal Government Facility	Buffalo Township Municipal Building	2115 Strickler Rd	Buffalo Township							
Municipal Government Facility	White Deer Township Municipal Building	2191 Creek Rd	White Deer Township							
Municipal Government Facility	East Buffalo Township Municipal Offices	589 Fairground Rd	East Buffalo Township	Y		Y			Y	Y

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Municipal Government Facility	Mifflinburg Borough Offices	120 N 3Rd St	Mifflinburg Borough			Y			Y	
Municipal Government Facility	West Buffalo Township Muncpal Building	577 Johnstown Rd	West Buffalo Township							
Municipal Government Facility	Kelly Township Municipal Building	551 Zeigler Rd	Kelly Township						Y	
Municipal Government Facility	Limestone Township Municipal Building	3840 Wildwood Rd	Limestone Township							
National Guard Armory / Base	Pennsylvania National Gaurd Armory	4700 Westbranch Hwy	East Buffalo Township					Y	Y	
Public Safety Office	Bucknell Public Safety	580 Snake Rd	Lewisburg Borough		Y	Y				
Radio / TV Broadcast Facility	Radio Tower And Satellite Dishes	395 Stoney Acres Rd	Mifflinburg Borough						Y	
Radio / TV Broadcast Facility		8811 Westbranch Hwy	Kelly Township					Y	Y	

Union County 2020 Hazard Mitigation Plan Update

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				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDIENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Radio / TV Broadcast Facility		8811 Westbranch Hwy	Kelly Township		Y			Y	Y	
Radio / TV Broadcast Facility	Wgrc Radio Station Tower	101 Armory Blvd	East Buffalo Township					Y	Y	
School	Donald H Eichhorn Middle School	2057 Wahsington Ave	East Buffalo Township			Y			Y	Y
School	Lewisburg Area High School	815 Market St	Lewisburg Borough			Y		Y	Y	Y
School	Mifflinburg Area Middle School	100 Mabel St	Mifflinburg Borough			Y			Y	
School	Mifflinburg Area Elementary School	115 Shipton St	Mifflinburg Borough			Y			Y	
School	Mifflinburg Area High School	75 Market St	Mifflinburg Borough			Y			Y	
School	Former Laurelton Elementary School	105 Weikert Rd	Hartley Township						Y	
School	Sun Area Career & Technology Center	815 Market St	New Berlin Borough			Y			Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDIENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
School	Linntown Elementary School	1951 Washington Ave	East Buffalo Township			Y			Y	Y
School	Kelly Elementary School	325 Hospital Dr	Kelly Township							Y
School	Beaver Run School	662 Young Rd	Buffalo Township			Y			Y	
School	Shady Grove Christian School	124 Turkey Run Rd	Buffalo Township							
School	Amish School House	6400 County Line Rd	Union Township							
School	Green Grove Parochial School	3935 Ridge Rd	Limestone Township			Y			Y	
School	Morning Star Mennonite School	1835 Mensch Rd	Limestone Township			Y			Y	
School	White Springs School	1655 Beaver Rd	Limestone Township			Y				
School	Limestone Valley School	1095 Swengel Rd	Limestone Township			Y			Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
School	Mountain View School	127 Kaiser Run Rd	Lewis Township			Y			Y	
School	Sunnyside School	747 Cold Run Rd	Lewis Township							
School	Bridgeville School	693 Centennial Rd	West Buffalo Township							
School	Buffalo Creek Christian Day School	1035 Green Ridge Rd	West Buffalo Township	Y						
School	Mifflinburg Intermediate School	250 Mable St	West Buffalo Township			Y			Y	
School	East End Perocial School	3534 Pheasant Ridge Rd	Buffalo Township			Y				
School	Red Bank School: Historic One Room School House	805 Red Bank Rd	West Buffalo Township							
School	White Deer Elementary School	631 New Columbia Rd	White Deer Township					Y	Y	Y
School	Hartleton Mennonite School	420 Laurel Rd	Hartley Township						Y	

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
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				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
School	Ridge View School	150 Hill School Rd	Kelly Township			Y				
School	Buffalo Valley School House	5806 Col John Kelly Rd	Kelly Township							
School	Mountain Laurel School	47 Pollack Rd	Hartley Township							
School	Lewisburg Area High School	545 Newman Rd	Kelly Township							Y
Substation	Electric Substation	26 Stoney Acres Rd	Mifflinburg Borough						Y	
Substation	Electric Substation	165 Fairground Rd	Hartley Township						Y	
Substation	Electric Substation	1772 Saint Mary St	Lewisburg Borough	Y		Y			Y	Y
Substation	Electric Substation	287 Red Ridge Rd	Limestone Township						Y	
Substation	Electric Substation	856 Jpm Rd	Kelly Township							

Union County 2020 Hazard Mitigation Plan Update

CRITICAL FACILITY TYPE	NAME	STREET ADDRESS	MUNICIPALITY	VULNERABILITY TO IDENTIFIED HAZARDS						
				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDIENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Substation	Electric Substation	1739 Saint Mary St	East Buffalo Township	Y		Y			Y	Y
Substation	Electric Substation	2782 Old Route 15	White Deer Township					Y	Y	Y
Wastewater Treatment Plant	Lewis Township Municipal Authority	1599 Millmont Rd	Lewis Township			Y				
Wastewater Treatment Plant	Mifflinburg Wastewater Treatment Plant	200 Gessner Ln	Mifflinburg Borough			Y			Y	
Wastewater Treatment Plant	Mifflinburg Area Water Treatment Plant	101 Watercress Dr	West Buffalo Township			Y			Y	
Wastewater Treatment Plant	New Berlin Wastewater Treatment Plant	710 Water St	New Berlin Borough						Y	
Wastewater Treatment Plant	Lewisburg Area Joint Sewer Authority	697 River Rd	East Buffalo Township					Y	Y	
Wastewater Treatment Plant	Hartleton Borough Wastewater Plant	128 Catherine St	Hartleton Borough						Y	
Wastewater Treatment Plant	Kelly Township Municipal Sewer Authority	405 Winter Farm Ln	Kelly Township					Y	Y	

Union County 2020 Hazard Mitigation Plan Update

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				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Wastewater Treatment Plant	Gregg Township Municipal Authority	16436 Us Route 15	Gregg Township	Y				Y	Y	
Wastewater Treatment Plant	Buffalo Township Municipal Sewer Authority	2188 Johnson Mill Rd	Buffalo Township							
Wastewater Treatment Plant	Hartley Township Municipal Authority	588 Pick Rd	Hartley Township	Y					Y	
Wastewater Treatment Plant	White Deer Township Sewer Authority	10456 River Rd	White Deer Township							Y
Water Pumping Station	Pump Station	130 Fairground Rd	Hartley Township						Y	
Water Pumping Station	West Milton Pump Station	9135 River Rd	White Deer Township	Y				Y	Y	
Water Pumping Station	New Columbia Pump Station	238 4Th St	White Deer Township						Y	Y
Water Pumping Station	College Park Pump Station	659 Hillcrest Ln	East Buffalo Township					Y	Y	
Water Pumping Station	Pump Station	7979 State Route 304	Limestone Township				Y		Y	
Water Pumping Station	White Deer Village Booster Station	545 White Deer Pike	White Deer Township	Y				Y	Y	Y

Union County 2020 Hazard Mitigation Plan Update

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				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Water Pumping Station	Pump Station	437 Airport Rd	Buffalo Township	Y					Y	Y
Water Pumping Station	Pump Station	N 8Th St	Mifflinburg Borough	Y		Y				
Water Pumping Station	Pump Station	1594 Beaver Run Rd	Buffalo Township	Y		Y			Y	
Water Supply or Treatment Facility	Stony Run Reservoir	3455 Stony Run Rd	Hartley Township		Y		Y			
Water Supply or Treatment Facility	Colonial Park Pump Station	125 River Rd	East Buffalo Township		Y			Y	Y	
Water Supply or Treatment Facility	Pennsylvania American Water Facility	5137 White Deer Pike	White Deer Township					Y	Y	
Water Supply or Treatment Facility	Pennsylvania American Water Facility	5643 White Deer Pike	White Deer Township	Y				Y	Y	
Water System Control Facility	PA American Water, Spruce Run Reservoir	3705 Spruce Run Rd	White Deer Township							
Water System Control Facility	Mifflinburg Reservoir	1900 Old Shingle Rd	Lewis Township				Y			

Union County 2020 Hazard Mitigation Plan Update

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				NATURAL				HUMAN-MADE		
				FLOOD, FLASH FLOOD, ICE JAM	LANDSLIDE	SUBSIDENCE AND SINKHOLE	WILDFIRE	TRANSPORTATION ACCIDENTS - HIGHWAY	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES IN TRANSIT	ENVIRONMENTAL HAZARDS - HAZMAT RELEASES AT FIXED FACILITIES
Water Tank	Municipal Water Tanks	400 Old Orchard Ln	Mifflinburg Borough		Y				Y	
Water Tank	Water Tank	659 Hillcrest Ln	East Buffalo Township					Y	Y	
Water Tower	Water Tower	18120 Russell Rd	Gregg Township					Y	Y	

Union County 2020 Hazard Mitigation Plan Update

Appendix F Hazus Reports

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Hazus-MH: Flood Global Risk Report

Region Name: Union_PA_08212019

Flood Scenario: Union_1percent

Print Date: Wednesday, August 21, 2019

Disclaimer:

*This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.*

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.



FEMA

RiskMAP
Increasing Resilience Together

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Pennsylvania

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 0 square miles and contains 2,219 census blocks. The region contains over 15 thousand households and has a total population of 44,947 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 16,505 buildings in the region with a total building replacement value (excluding contents) of 4,099 million dollars (2010 dollars). Approximately 91.72% of the buildings (and 76.86% of the building value) are associated with residential housing.



FEMA

RiskMAP
Increasing Resilience Together

Building Inventory

General Building Stock

Hazus estimates that there are 16,505 buildings in the region which have an aggregate total replacement value of 4,099 million (2014 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	3,150,480	76.9%
Commercial	587,841	14.3%
Industrial	163,395	4.0%
Agricultural	27,284	0.7%
Religion	80,878	2.0%
Government	44,980	1.1%
Education	44,284	1.1%
Total	4,099,142	100.0%

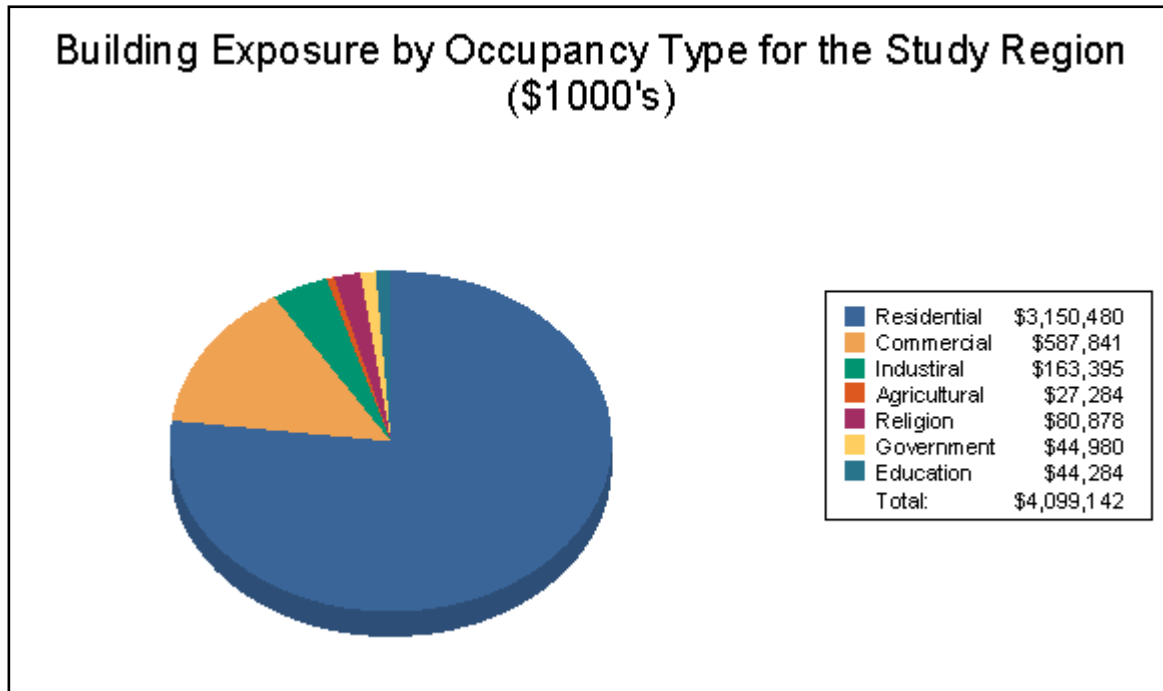
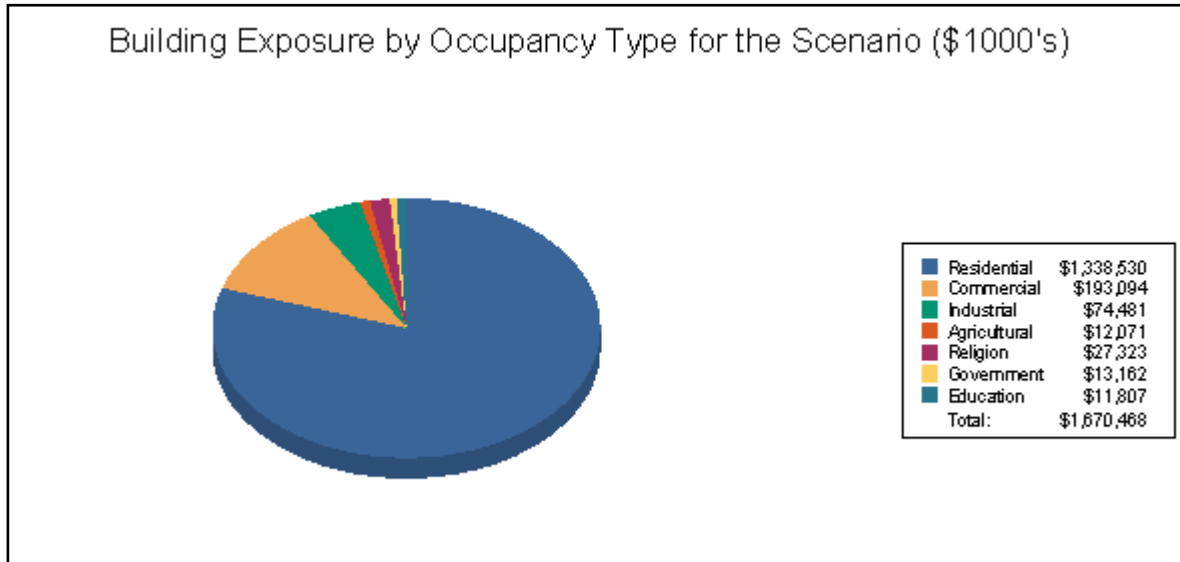


Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	1,338,530	80.1%
Commercial	193,094	11.6%
Industrial	74,481	4.5%
Agricultural	12,071	0.7%
Religion	27,323	1.6%
Government	13,162	0.8%
Education	11,807	0.7%
Total	1,670,468	100.0%



Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 147 beds. There are 26 schools, 7 fire stations, 4 police stations and 1 emergency operation center.

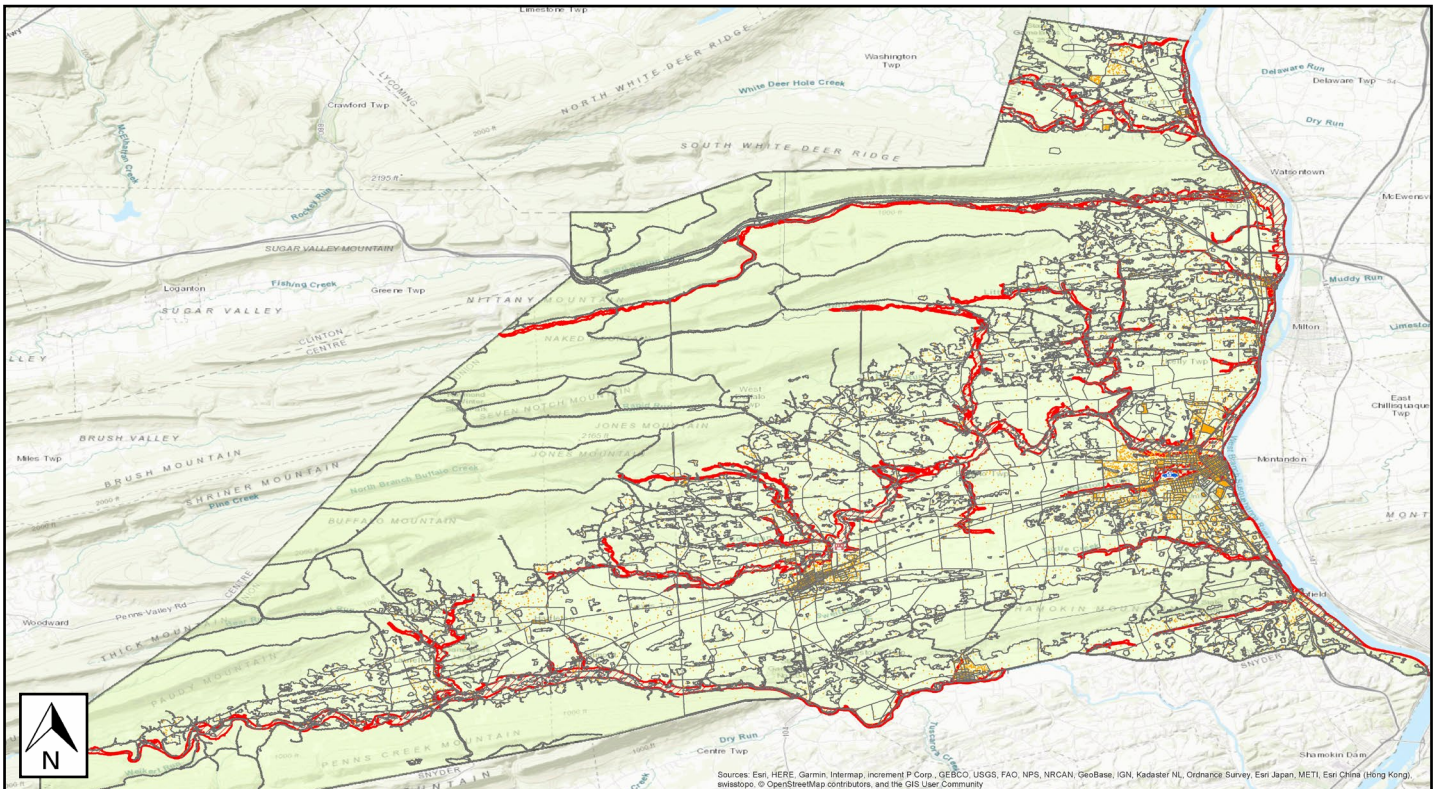
Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

- Study Region Name:** Union_PA_08212019
- Scenario Name:** Union_1percent
- Return Period Analyzed:** 100
- Analysis Options Analyzed:** No What-Ifs

Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



Building Damage

General Building Stock Damage

Hazus estimates that about 365 buildings will be at least moderately damaged. This is over 73% of the total number of buildings in the scenario. There are an estimated 38 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Total Economic Loss (1 dot = \$300K) Overview Map

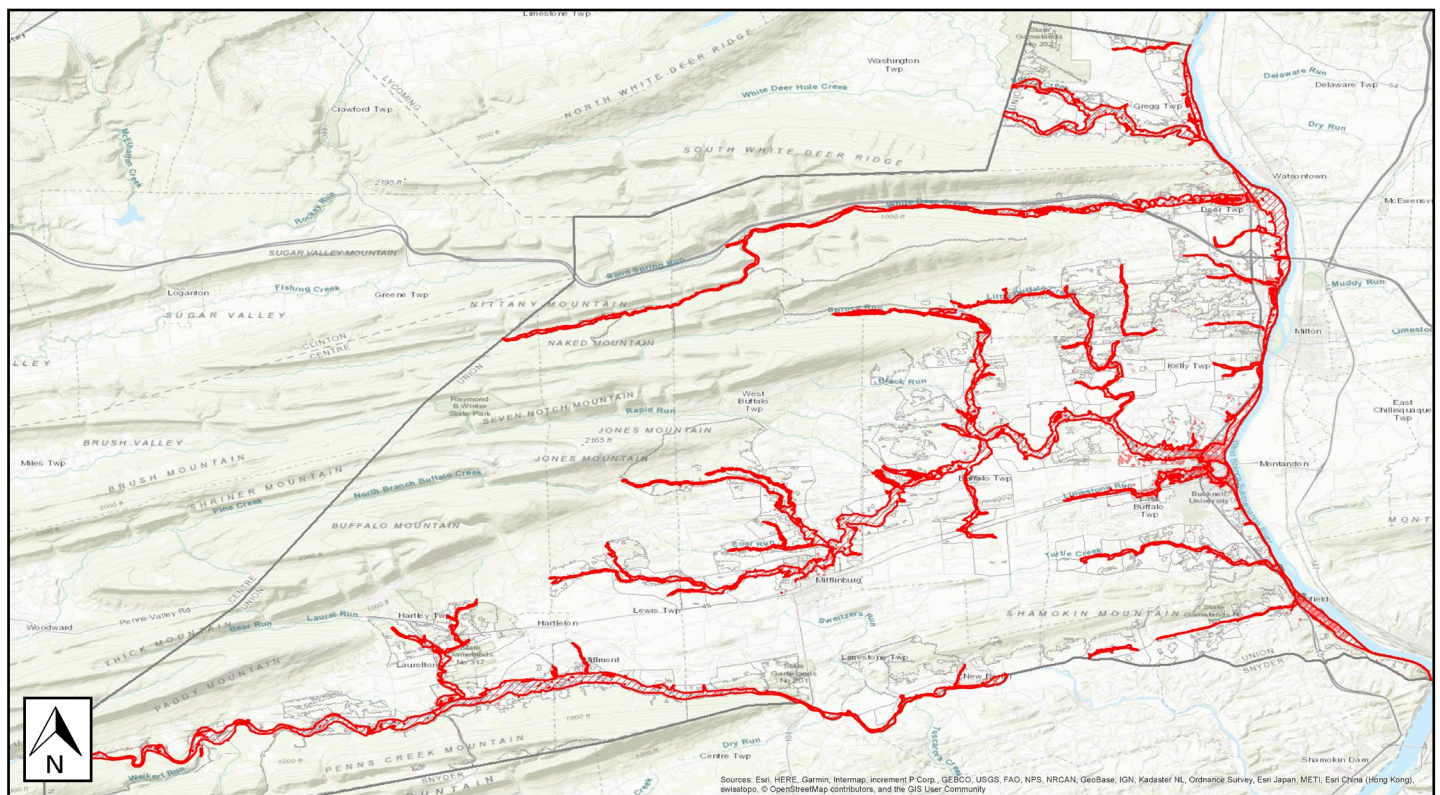


Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	1	12.50	6	75.00	1	12.50	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	111	23.67	177	37.74	88	18.76	38	8.10	17	3.62	38	8.10
Total	112		183		89		38		17		38	

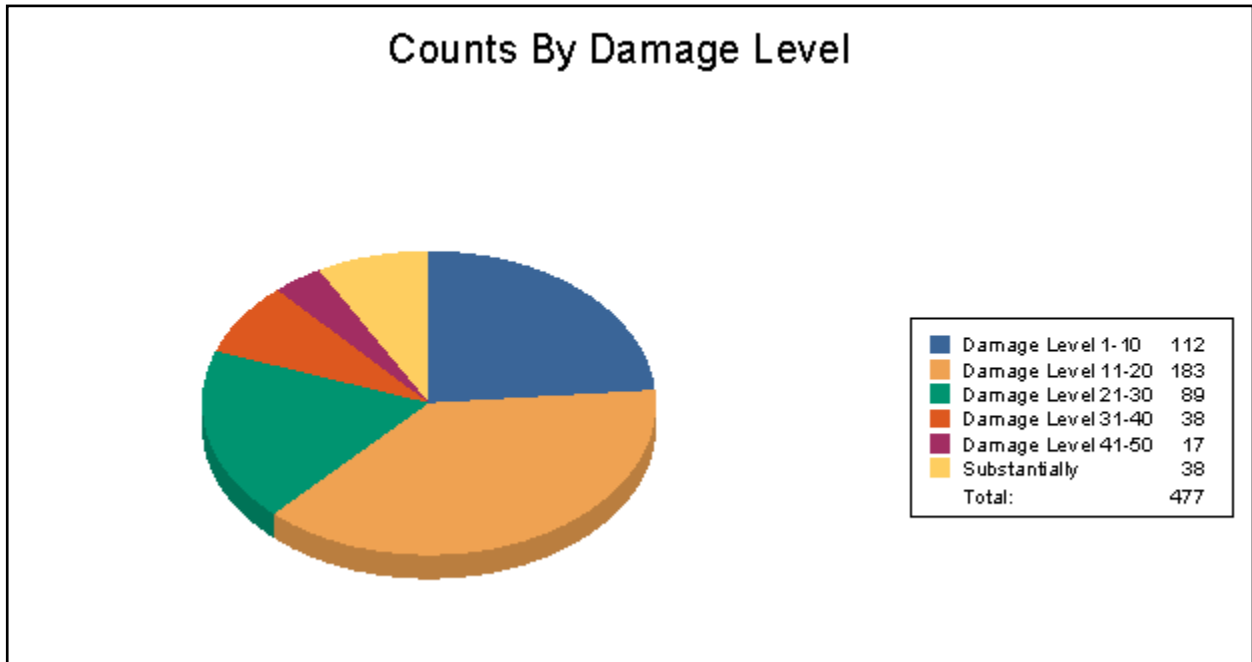


Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0	0	0	0	0	0	0	0	0	0	0
ManufHousing	0	0	0	0	0	0	0	0	0	0	2	100
Masonry	30	26	47	41	17	15	9	8	3	3	8	7
Steel	1	17	4	67	1	17	0	0	0	0	0	0
Wood	80	23	131	37	71	20	29	8	14	4	28	8

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 147 hospital beds available for use. On the day of the scenario flood event, the model estimates that 147 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	4	1	0	1
Schools	26	1	0	1

If this report displays all zeros or is blank, two possibilities can explain this.

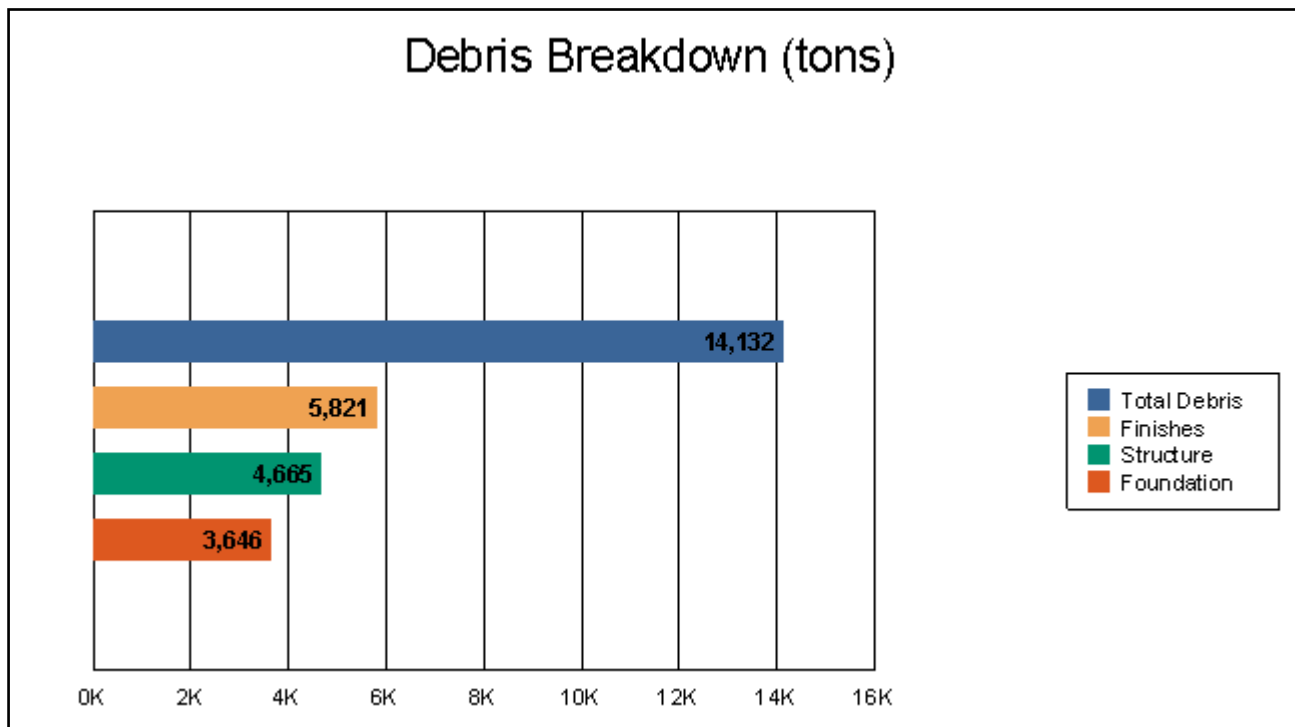
- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.



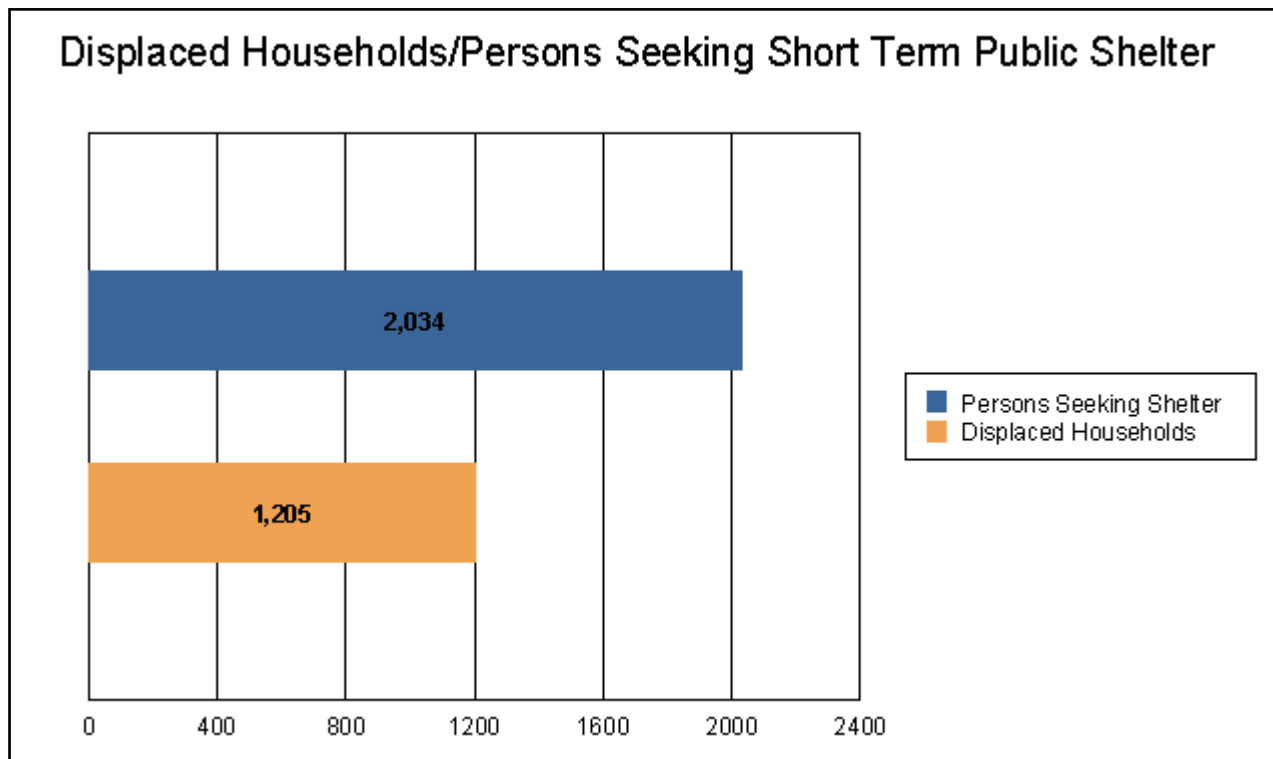
The model estimates that a total of 14,132 tons of debris will be generated. Of the total amount, Finishes comprises 41% of the total, Structure comprises 33% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 565 truckloads (@25 tons/truck) to remove the debris generated by the flood.



Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,205 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 2,034 people (out of a total population of 44,947) will seek temporary shelter in public shelters.



Economic Loss

The total economic loss estimated for the flood is 177.78 million dollars, which represents 10.64 % of the total replacement value of the scenario buildings.

Building-Related Losses

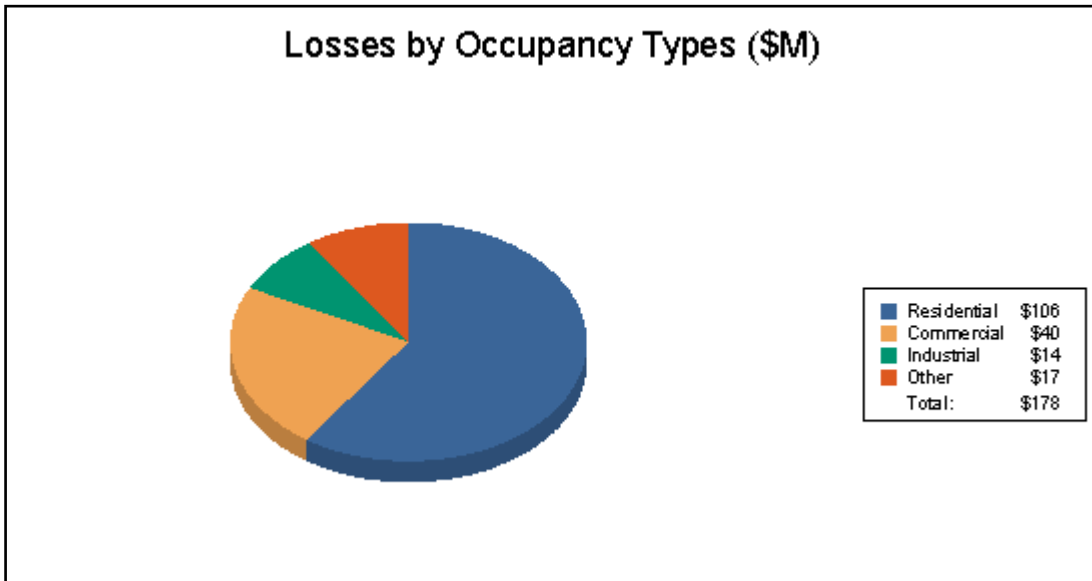
The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 176.37 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 59.77% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	66.48	9.25	4.76	2.84	83.32
	Content	39.66	30.08	8.52	13.09	91.34
	Inventory	0.00	0.60	0.95	0.16	1.71
	Subtotal	106.13	39.92	14.23	16.09	176.37
Business Interruption						
	Income	0.01	0.15	0.00	0.02	0.19
	Relocation	0.05	0.02	0.00	0.01	0.08
	Rental Income	0.04	0.01	0.00	0.00	0.05
	Wage	0.03	0.16	0.00	0.89	1.09
	Subtotal	0.14	0.35	0.00	0.92	1.41
ALL	Total	106.27	40.28	14.23	17.00	177.78





Appendix A: County Listing for the Region

Pennsylvania

- Union



FEMA

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Pennsylvania				
Union	44,947	3,150,480	948,662	4,099,142
Total	44,947	3,150,480	948,662	4,099,142
Total Study Region	44,947	3,150,480	948,662	4,099,142

Appendix G Preliminary Damage Assessment Resources

Union County 2020 Hazard Mitigation Plan Update

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WINDSHIELD SURVEY FORM

Municipality: _____

EMC Name: _____ Date/Time: _____

For Definitions of Reporting Categories, see back of form					
Private Property	Destroyed	Major	Minor	Affected	Inaccessible
Businesses					
Mobile Home					
Multi-Family					
Single Family					

For Definitions of Reporting Categories, see back of form				Directions
Public Property	Destroyed	Affected	Damaged	<p>1) If damage has been sustained by your municipality, document the NUMBER of property types impacted in the appropriate column.</p> <p>2) DO NOT use this form to document monetary estimates of damage, use number of properties only.</p> <p>3) If debris removal or emergency protective measures are in place, be sure to complete the appropriate form and circle "Yes" to the questions listed at the bottom of this form.</p> <p>4) Complete this form and return to Union County EMA within 24 Hours after the passing of the event.</p> <p style="text-align: center;">Union County Emergency Management Agency</p> <p style="text-align: center;">Phone 570.523.3201 Fax 570.524.8808</p> <p style="text-align: center;">ema@unionco.org</p>
Bridges & Culverts				
Fire / EMS Facility				
Hospital				
Nursing Home				
Other				
Park				
Power Supply				
Public Building (City Hall, Etc.)				
Roads				
Sanitary Sewer				
School				
Sewer Treatment				
Storm Sewer				
Water Control Facility				
Water Supply				
Water Treatment				

Are debris removal activities occurring in the municipality?	YES / NO
Are emergency protective measures in place in the municipality?	YES / NO
If "YES" is checked for either or both, complete "Protective Action/Debris Removal Form"	

Non-Flood Damage Category Definitions

Affected	<ul style="list-style-type: none"> - Some shingles and/or siding missing - Ingress / Egress to residence may be hampered - Dwelling is livable without repairs - IE: Stone driveway is washed away due to heavy rains
Damaged	<ul style="list-style-type: none"> - Property is usable, however repairs may be required - Critical components of the facility are inoperable (pumps, electric, etc.) - IE: Sewer Treatment is offline due to inoperable pumps
Destroyed	<ul style="list-style-type: none"> - Property is no longer there - Property is structurally unsafe - All major structural systems are damaged and habitation is not possible - IE: Structures has partially collapsed
Inaccessible	<ul style="list-style-type: none"> - Unable to access property - IE: Bridge out leading to property
Major	<ul style="list-style-type: none"> - Large portions of roof missing - Structures or property cannot be used until repairs are made - IE: Roof blown off due to high winds
Minor	<ul style="list-style-type: none"> - Property is damaged, but usable - Numerous broken windows - Minor structural damage - IE: Roofing shingles blown off due to high winds

Flood Damage Category Definitions

	AFFECTED	MINOR	MAJOR	DESTROYED
HOUSE				
Crawl Space	X			
Basement	Less Than 1'	1' or more	Extensive Found Damage	
First Floor	2" or less	Up to 2" but not affecting electrical outlets	1' or more	Physically Destroyed
Slab House	2" or less	Up to 2" but not affecting electrical outlets	1' or more	Physically Destroyed
Second Floor			X	Physically Destroyed
MOBILE HOME	No water into Belly Board	To Belly Board to 6" on floor	6" or more into mobile home	Physically Destroyed

Quick Guide to Determining Damage Category

Is the Structure usable as it is?

YES

NO

Does it need temporary repairs to be lived in now?

Can it be made useable again with extensive repairs?

Yes – Minor No – Affected

Yes – Major No - Destroyed

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY

PUBLIC ASSISTANCE

PRELIMINARY DAMAGE ASSESSMENT (PDA) - CONSOLIDATED FOR COUNTY

(1) COUNTY _____ (2) DATE _____ PAGE _____ OF _____ PAGES
(3) COUNTY POPULATION _____ (4) COUNTY ANNUAL BUDGET _____ (5) EVENT _____
(6) COUNTY POC (Name/Title) _____ (7) COUNTY POC PHONE # _____ FAX # _____
(8) ASSESSMENT TEAM (Name & Agency) _____ (Name & Agency) _____

APPLICANT OR MUNICIPALITY (9)	A DEBRIS REMOVAL (10)	B EMERG PROTECT MEASURES (11)	C ROADS, BRIDGES (12)	D WATER CONTROL FACILITIES (13)	E BUILDINGS & EQUIP (14)	F PUBLIC UTILITIES (15)	G PARKS REC. OTHER (16)	TOTAL ESTIMATED DAMAGE COST (17)	ESTIMATED INSURANCE COVERAGE DOLLARS (18)	NET ESTIMATED UNINSURED DAMAGES (19)
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
TOTALS	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

ATTACH THE LIST OF DAMAGED SITES, NARRATIVE DESCRIPTION OF DAMAGES, AND FINANCIAL/IMPACT OF DAMAGES (PEMA FORMS DAP-19) FROM THE APPLICANTS

PEMA DAP-19

LOCAL DAMAGE ASSESSMENT
LIST OF DAMAGED SITES & SITE ESTIMATES

DISASTER EVENT _____

MUNICIPALITY/ APPLICANT _____ POPULATION _____ COUNTY _____ DATE ____/____/____

MUNICIPALITY/ APPLICANT ADDRESS _____ APPLICANT PHONE _____

DATE FISCAL YEAR BEGAN ____/____/____ TOTAL ANNUAL BUDGET= \$ _____ UNCOMMITTED BALANCE AS OF ____/____/____ = \$ _____

ANNUAL MAINTENANCE BUDGET= \$ _____ UNCOMMITTED BALANCE AS OF ____/____/____ = \$ _____

POC NAME _____ POC PHONE _____ POC FAX _____ POC E-MAIL _____

POC ADDRESS _____ PDA TEAM MEMBERS _____

Site #	Location (street address, directions from known point, and if available GPS coordinates - provide municipal/township map)	Damage, Description and Dimensions (give facility name, length-width-depth-sf-sy-cy-tons-number of items, etc.)	Local Estimate of Cost \$	Insurance Coverage Y/N \$?	Impact of Damage (public health & safety - Essential / critical facilities- population adversely affected)	Special Considerations (1) (see bottom of continuation sheet)
1			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
2			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
3			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
4			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
5			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
6			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		

Annotate local map to show site numbers above. Use reverse for detailed description of adverse effect on essential / critical facilities such as: Hospitals, Schools, Nursing Homes, Transportation, Communication, Water, Sewer, Emergency vehicle access, and Public Health and Safety

LOCAL DAMAGE ASSESSMENT
LIST OF DAMAGED SITES & SITE ESTIMATES (CONTINUED)

DISASTER EVENT _____

MUNICIPALITY/ APPLICANT _____ COUNTY _____ DATE ____/____/____ PAGE ____ OF ____ PAGES

Site #	Location <small>(street address, directions from known point, and if available GPS coordinates - provide municipal/township map)</small>	Damage, Description and Dimensions <small>(give facility name, length-width-depth-sf-sy-cy-tons-number of items, etc.)</small>	Local Estimate of Cost \$	Insurance Coverage Y/N \$?	Impact of Damage <small>(public health & safety - Essential / critical facilities - population adversely affected)</small>	Special Considerations <small>(1) (see bottom of continuation sheet)</small>
7			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
8			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
9			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
10			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
11			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
12			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		

Special Considerations - Does the site have potential for: **Hazardous Materials (HZ)** - Unidentified drums, asbestos, transformers with PCBs, oil slick, etc.?
Historical Significance (HIST) - Site over 50 years old, located in historical district, plaque on building, etc? **Hazard Mitigation (HM)** - Has site been damaged before, are there cost effective mitigation possibilities, etc?
Environmental Issues (ENV) - Wetlands, endangered species, water supply contamination, sewage spill, etc?
Insurance (INS) - Is structure or contents insured, in 100-year floodplain?

LOCAL DAMAGE ASSESSMENT
LIST OF DAMAGED SITES & SITE ESTIMATES (CONTINUED)

DISASTER EVENT _____

MUNICIPALITY/ APPLICANT _____

COUNTY _____

DATE ____ / ____ / ____ PAGE ____ OF ____ PAGES

Site #	Location <small>(street address, directions from known point, and if available GPS coordinates - provide municipal/township map)</small>	Damage, Description and Dimensions <small>(give facility name, length-width-depth-sf-sy-cy-tons-number of items, etc.)</small>	Local Estimate of Cost \$	Insurance Coverage Y/N \$?	Impact of Damage <small>(public health & safety - Essential / critical facilities - population adversely affected)</small>	Special Considerations <small>(1) (see bottom of continuation sheet)</small>
13			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
14			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
15			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
16			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
17			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		
18			\$	<input type="checkbox"/> YES <input type="checkbox"/> NO		

Special Considerations - Does the site have potential for: **Hazardous Materials (HZ)** - Unidentified drums, asbestos, transformers with PCBs, oil slick, etc.?
Historical Significance (HIST) - Site over 50 years old, located in historical district, plaque on building, etc? **Hazard Mitigation (HM)** - Has site been damaged before, are there cost effective mitigation possibilities, etc?
Insurance (INS) - Is structure or contents insured, in 100-year floodplain? **Environmental Issues (ENV)** - Wetlands, endangered species, water supply contamination, sewage spill, etc?