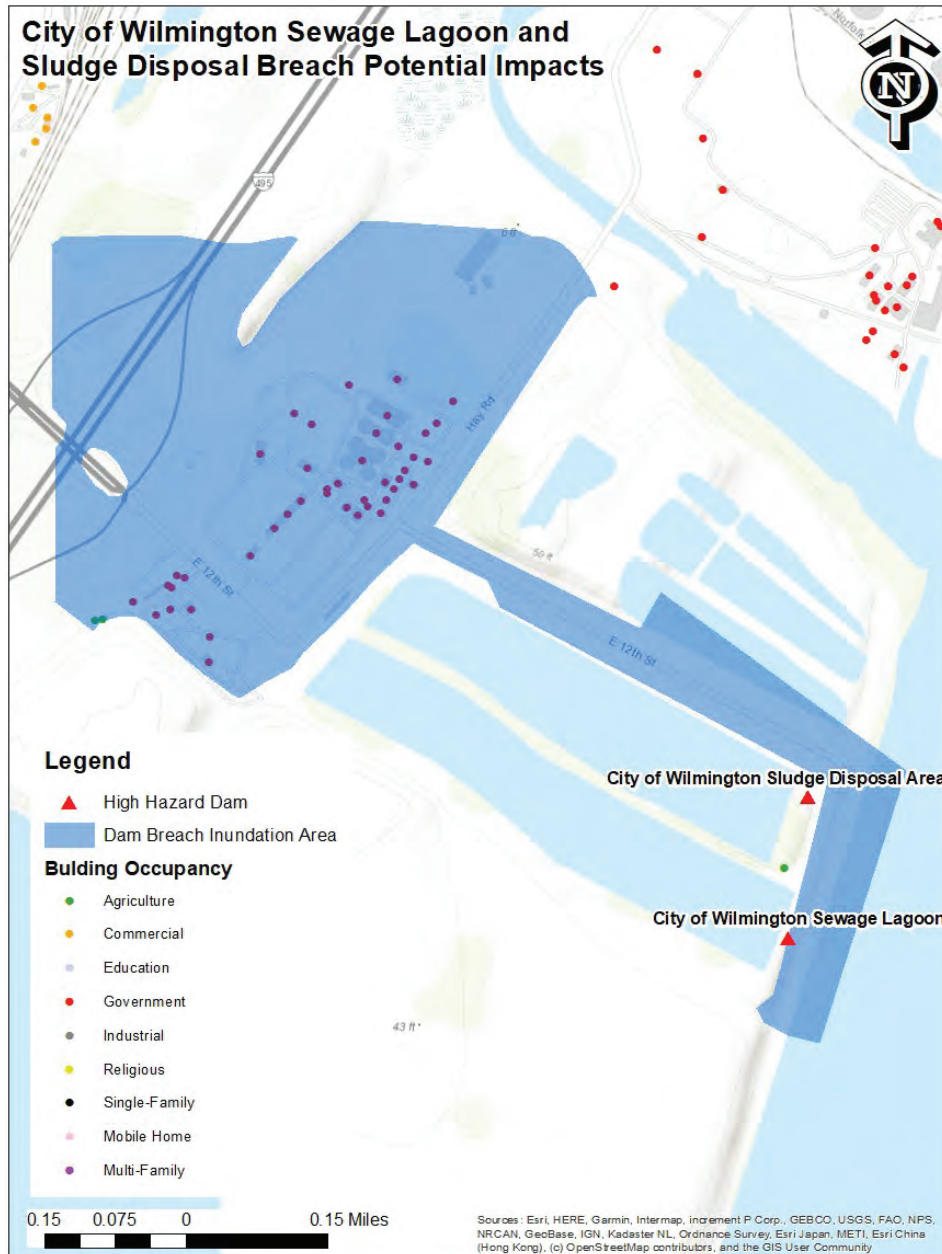


## City of Wilmington Sewage Lagoon and Sludge Disposal Breach Impacts



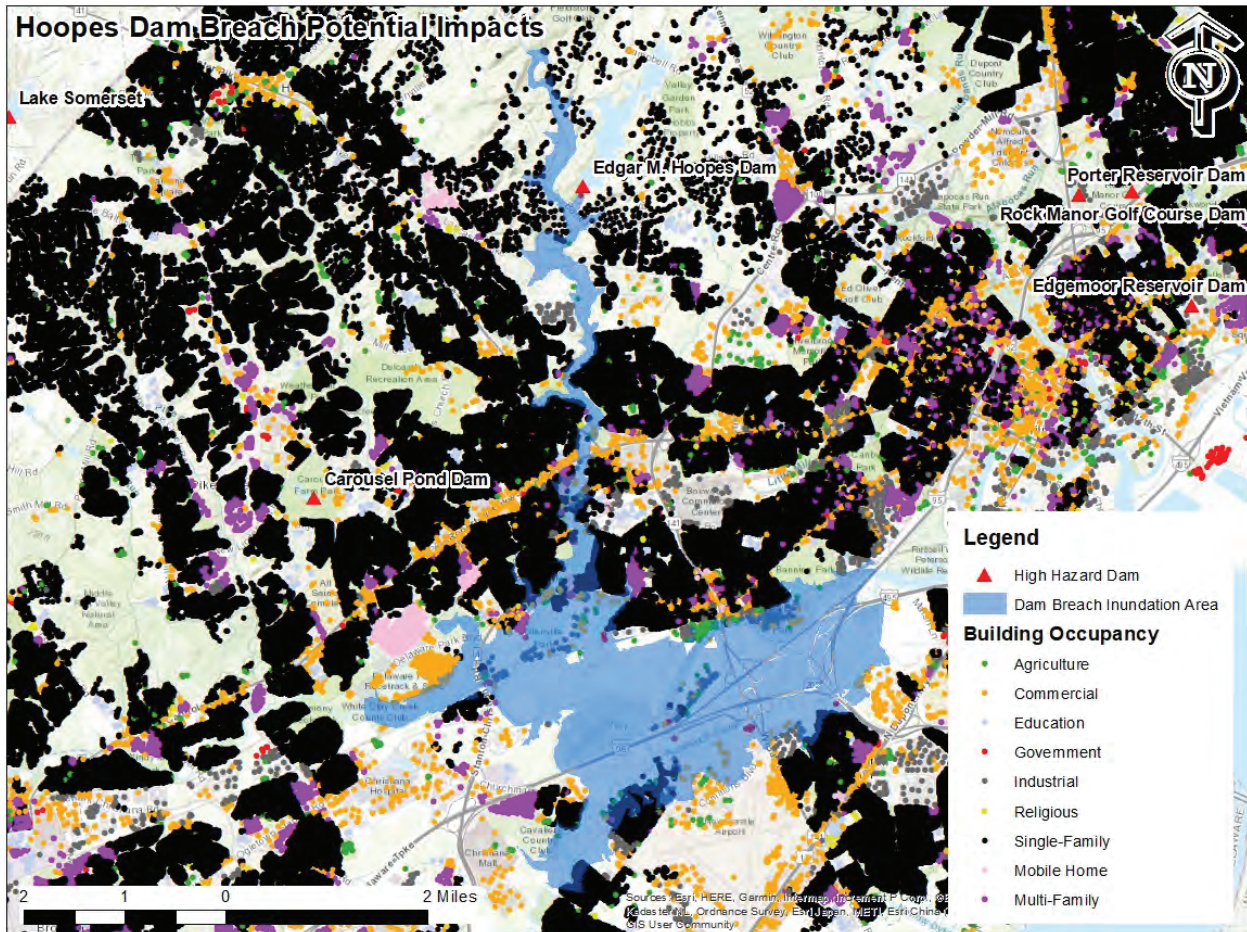
Estimated population at risk from Wilmington Sewage Lagoon and Sludge Disposal: 423

**City of Wilmington Sewage Lagoon and Sludge Disposal**

**Municipality: Wilmington**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Agriculture	2	\$234,993	\$234,993	\$469,985
Government	43	\$27,264,406	\$27,264,406	\$54,528,812

Hoopes Dam Breach Impacts



Estimated population at risk from Hoopes Dam: 7,014

**Hoopes Dam Losses**

**Municipality: Unincorporated**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	861	\$137,246,588	\$137,246,588	\$274,493,175
Mobile Home	83	\$4,268,238	\$2,134,119	\$6,402,357



Estimated population at risk from Newark Reservoir Dam: 3,248

**Newark Reservoir Dam Losses**

**Municipality: Unincorporated**

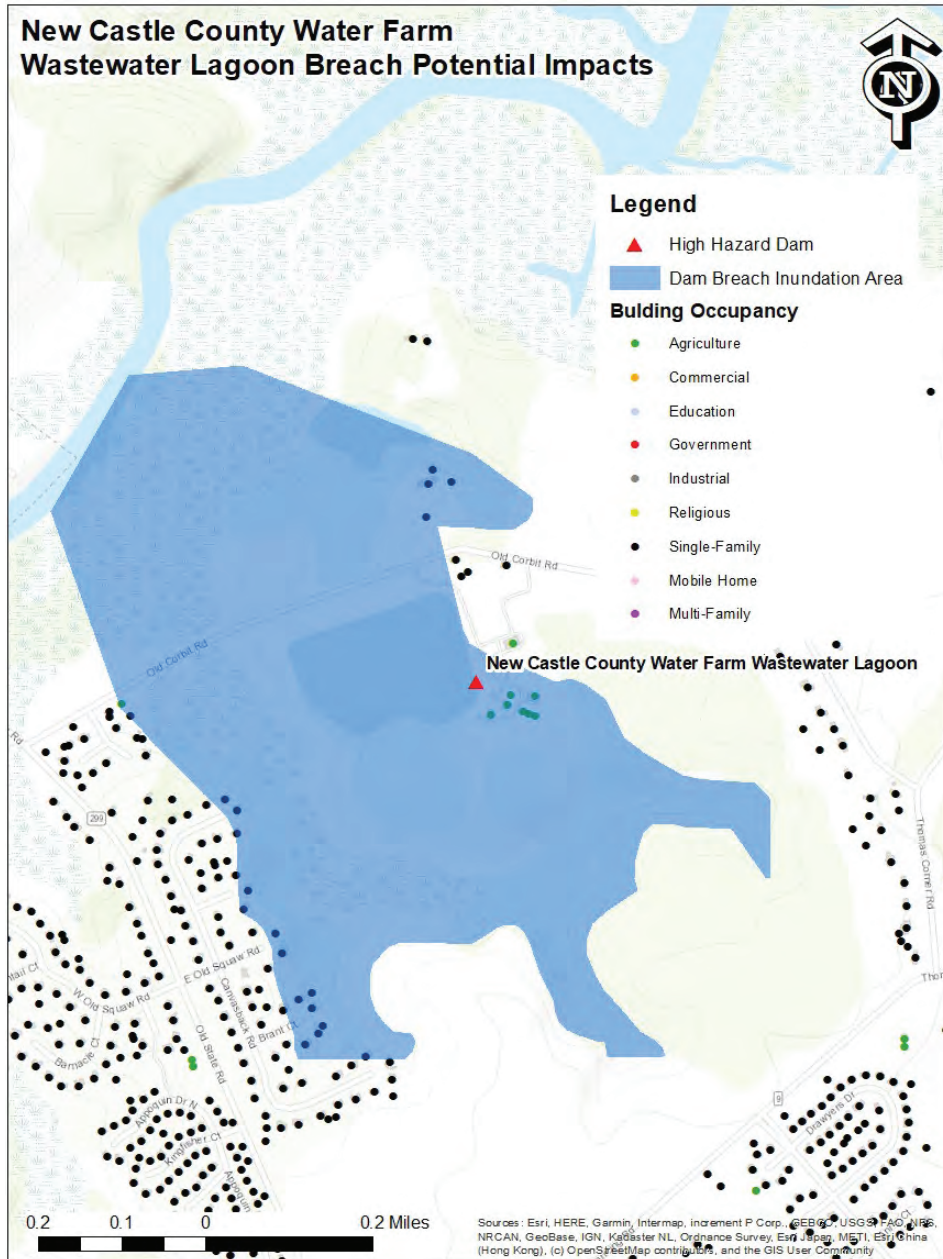
Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	106	\$14,898,121	\$14,898,121	\$29,796,243
Multi Family	106	\$14,024,319	\$19,259,157	\$33,283,476
Agriculture	1	\$30,625	\$30,625	\$61,250
Commercial	22	\$8,900,017	\$8,900,017	\$17,800,034
Government	2	\$27,796,893	\$27,796,893	\$55,593,785
Industrial	8	\$11,066,721	\$16,600,082	\$27,666,803

**Newark Reservoir Dam Losses**

**Municipality: Newark**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	19	\$9,595,873	\$9,595,873	\$19,191,745
Multi Family	7	\$10,469,675	\$5,234,837	\$15,704,512
Commercial	7	\$19,041,708	\$19,041,708	\$38,083,416
Government	2	\$144,832	\$144,832	\$289,665

## New Castle County Water Farm Wastewater Lagoon Breach Impacts



Estimated population at risk from NCC Water Farm Wastewater Lagoon: 462

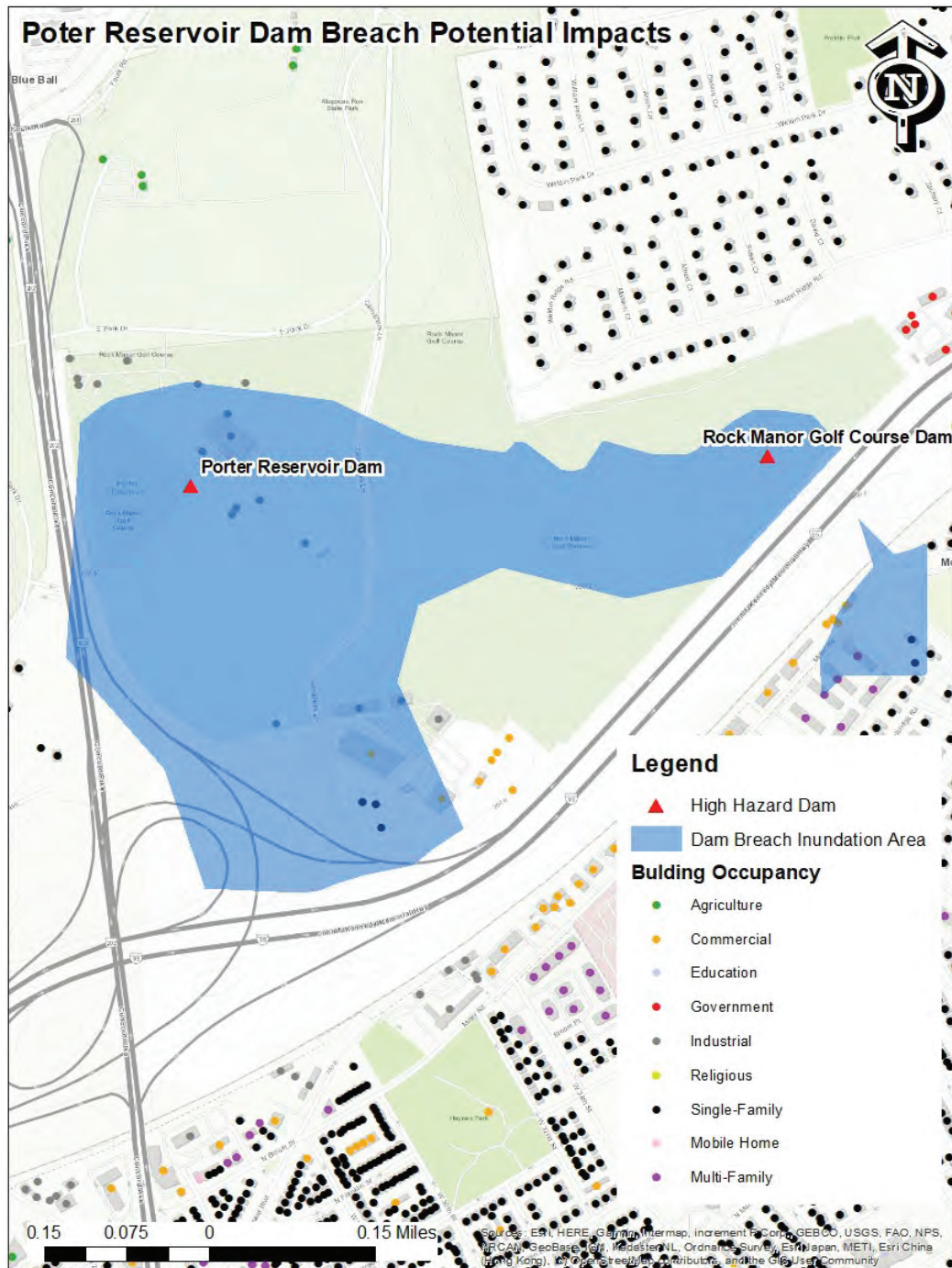
**New Castle County Water Farm Wastewater Lagoon Dam Losses**  
**Municipality: Unincorporated**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
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Single Family	19	\$5,461,023	\$5,461,023	\$10,922,046
Agriculture	8	\$2,265,989	\$2,265,989	\$4,531,979

Critical Facility Exposed: Wastewater Treatment Plant

### Porter Reservoir Dam Breach Impacts



Estimated population at risk from Porter Reservoir Dam: 523

**Porter Reservoir Dam Losses**

**Municipality: Wilmington**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	2	\$302,125	\$302,125	\$604,249
Multi Family	3	\$7,044,467	\$3,522,234	\$10,566,701

**Porter Reservoir Dam Losses**

**Municipality: Unincorporated**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	3	\$341,094	\$341,094	\$682,187
Commercial	4	\$12,597,838	\$12,597,838	\$25,195,676
Industrial	12	\$6,177,814	\$9,266,721	\$15,444,535

## Rock Manor Golf Course Dam Breach Impacts



Estimated population at risk from Rock Manor Golf Course Dam: 1,242

### Rock Manor Golf Course Dam Losses

**Municipality: Wilmington**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	241	\$49,090,904	\$49,090,904	\$98,181,809
Multi Family	10	\$15,616,791	\$7,808,396	\$23,425,187
Commercial	6	\$12,060,183	\$13,335,180	\$25,395,363
Education	1	\$4,280,798	\$4,280,798	\$8,561,596
Industrial	1	\$420,208	\$630,311	\$1,050,519

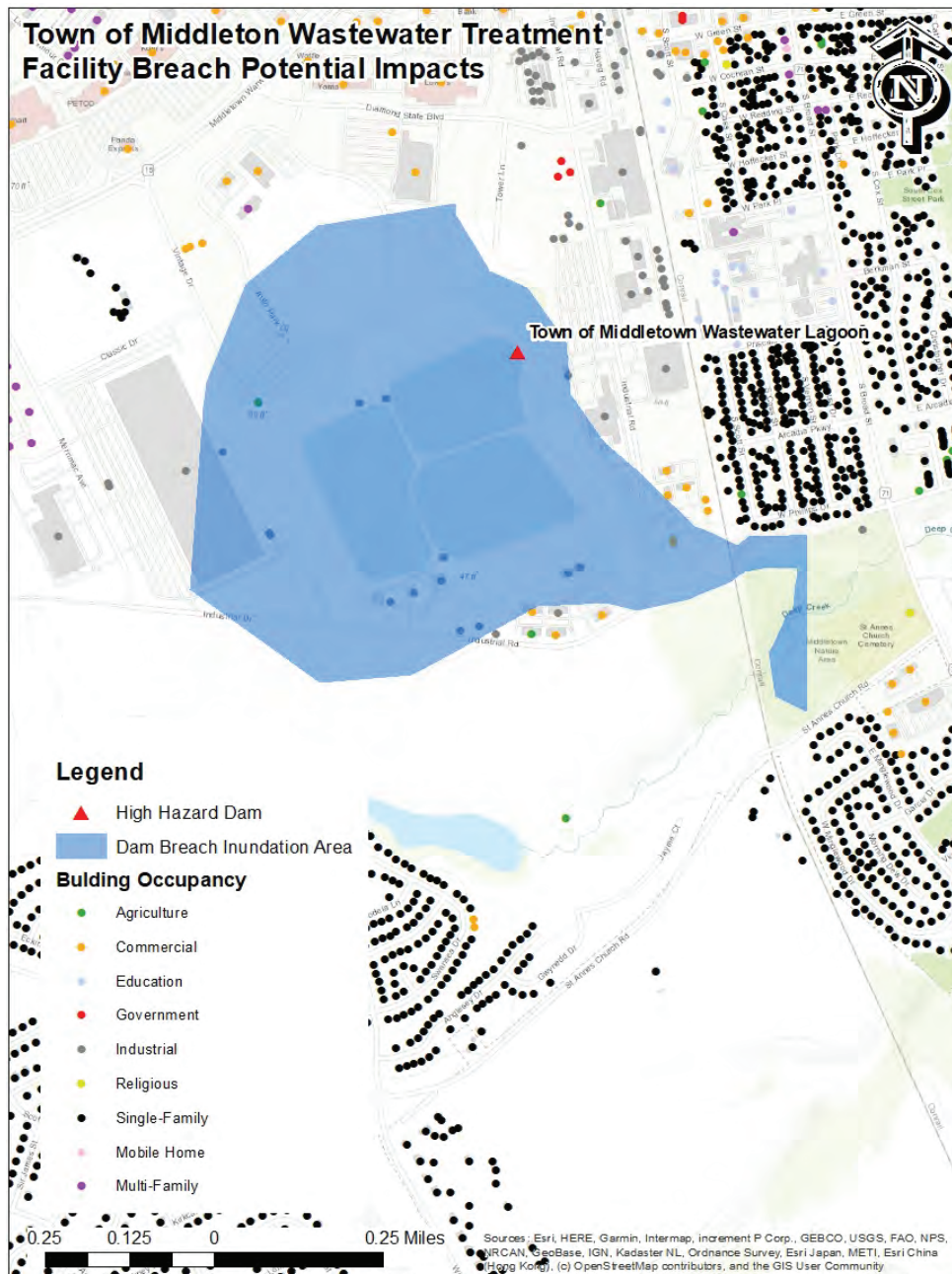
Religious	2	\$7,788,273	\$7,788,273	\$15,576,547
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**Rock Manor Golf Course Dam Losses**

**Municipality: Unincorporated**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	2	\$663,518	\$663,518	\$1,327,035
Agriculture	1	\$37,124	\$37,124	\$74,248
Commercial	3	\$805,755	\$805,755	\$1,611,509
Education	1	\$4,563,894	\$4,563,894	\$9,127,789

## Town of Middletown Wastewater Treatment Facility Breach Impacts



Estimated population at risk from Middletown Wastewater Treatment Dam: 272

**Town of Middleton Wastewater Treatment  
Facility Dam Losses  
Municipality: Middleton**

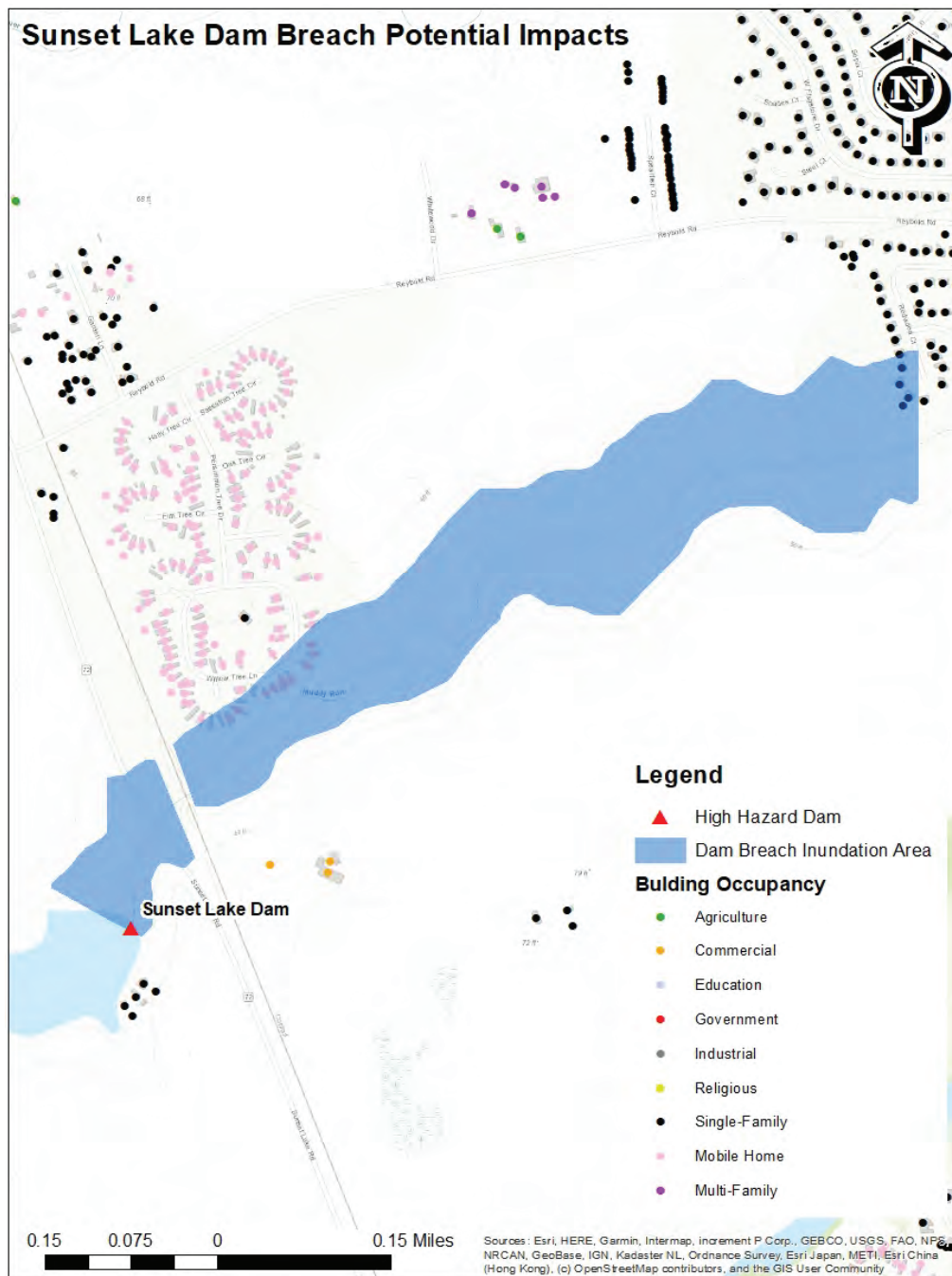
<b>Occupancy</b>	<b>Number of Buildings</b>	<b>Structure Loss (\$)</b>	<b>Content Loss (\$)</b>	<b>Total Loss(\$)</b>
Agriculture	2	\$42,178	\$42,178	\$84,357
Commercial	2	\$42,630	\$42,630	\$85,260
Industrial	14	\$5,745,150	\$8,617,725	\$14,362,876



Single Family	8	\$371,956	\$371,956	\$743,912
Agriculture	1	\$31,165	\$31,165	\$62,330
Commercial	1	\$116,199	\$116,199	\$232,399

Critical Facility Exposed: Wastewater Treatment Plant

### Sunset Lake Dam Breach Impacts



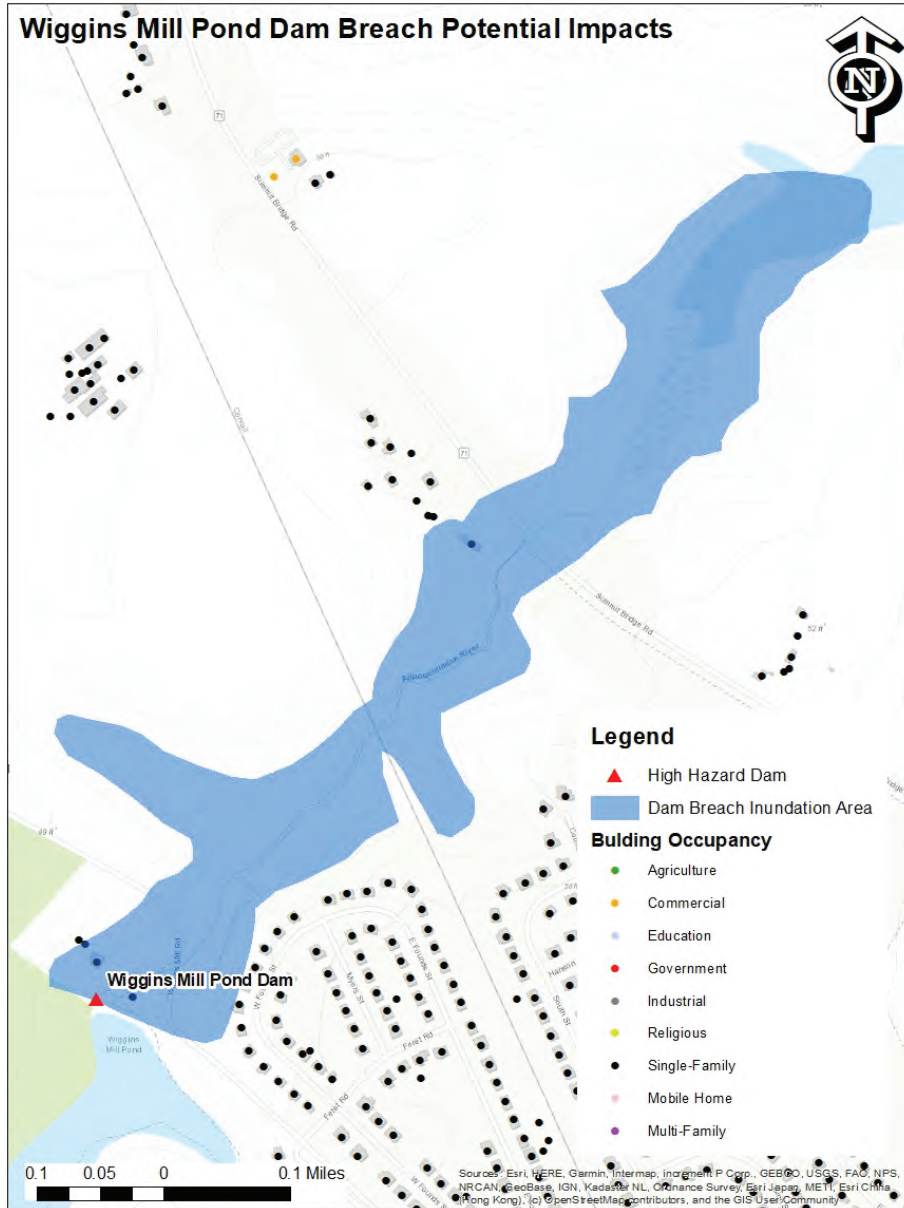
Estimated population at risk from Sunset Lake Dam: 1,329

**Sunset Lake Dam Losses**

**Municipality: Unincorporated**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	5	\$989,612	\$989,612	\$1,979,224
Mobile Home	10	\$537,704	\$268,852	\$806,557

Wiggins Mill Pond Dam Breach Impacts



Estimated population at risk from Wiggins Mill Pond Dam: 24

**Wiggins Mill Pond Dam Losses**

**Municipality: Townsend**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	1	\$108,771	\$108,771	\$217,542

**Wiggins Mill Pond Dam Losses**

**Municipality: Unincorporated**

Occupancy	Number of Buildings	Structure Loss (\$)	Content Loss (\$)	Total Loss(\$)
Single Family	3	\$841,668	\$841,668	\$1,683,337

### Limitations and Deficiencies

A dam safety deficiency is defined as a load capacity limit or other issue that can result in a failure of the dam or appurtenant structure.<sup>41</sup> It is a characteristic or condition that does not meet the applicable minimum regulatory criteria.<sup>42</sup> Dam safety deficiencies are often caused by inadequate dam design, construction methods, or the results of inadequate operation and maintenance that have compromised the structural or operational integrity of the dam.<sup>43</sup> Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.

The County will look to build off of this HHPD Analysis, included attempting to address any gaps in data. During the next plan update, the County will look to address any gaps in data related to the following components: inundation mapping and consequence data; population and receptor exposure; critical facilities and community lifelines; dam condition and structural performance; hydrology and climate stressors; and gaps in Emergency Action planning.

Corrective actions should be in place to address potential HHPD deficiencies in New Castle County. Corrective actions may include preventive maintenance; replacement of parts, systems, or components; and other activities needed to preserve or maintain a dam.<sup>44</sup> Capital improvement corrective actions should be in place, as well, directed towards expanding the capacity of a dam or otherwise upgrading it to serve needs different from, or significantly greater than, its current use.<sup>45</sup>

## HHPD Mitigation Strategy

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### HHPD Goals

HHPD Goal 1 - Participate in FEMA’s High-Hazard Potential Dam Program (HHPD).

- Educate New Castle County municipalities, property owners, and businesses about FEMA’s HHPD program.
- Reduce long-term vulnerability from eligible high-hazard potential dams that pose an unacceptable risk to the public.
- Identify, by area, locations in New Castle County that could potentially be impacted by FEMA’s HHPD program.
- Develop floodplain management strategies to reduce HHPD risk.

<sup>41</sup> FEMA, Rehabilitation of High Hazard Potential Dams, [https://www.fema.gov/sites/default/files/2020-08/fema\\_hhpd\\_grant\\_guidance.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_hhpd_grant_guidance.pdf).

<sup>42</sup> FEMA, Rehabilitation of High Hazard Potential Dams, [https://www.fema.gov/sites/default/files/2020-08/fema\\_hhpd\\_grant\\_guidance.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_hhpd_grant_guidance.pdf).

<sup>43</sup> FEMA, Rehabilitation of High Hazard Potential Dams, [https://www.fema.gov/sites/default/files/2020-08/fema\\_hhpd\\_grant\\_guidance.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_hhpd_grant_guidance.pdf).

<sup>44</sup> Washington Department of Ecology, Rehabilitation of High Hazard Potential Dams Grant Program Fiscal Year 2021, <https://apps.ecology.wa.gov/publications/documents/2111021.pdf>.

<sup>45</sup> Ibid.

## HHPD Mitigation Actions

The following mitigation actions have been developed specifically for the breach of a High high-hazard dams and to reduce the vulnerabilities associated with HHPDs in New Castle County. All HHPD-related actions have been evaluated and prioritized through a process based on cost-effectiveness, impacts to the environment, and technical feasibility. Like the mitigation strategy for all other hazards, the same prioritization criteria were applied for the HHPD, as provided in Table 6.1. The three criteria (economic, administrative, and social considerations) were used to determine the level (high, medium, and low) for the social, administrative, and economic considerations for each action.

**Appendix A Table 1 HHPD Mitigation Actions**

Action #	Hazard	Action	Lead Agency	Prioritization Total	Timeline	Cost	Funding	Action Category
HHPD 1	Dam Failure	Distribute educational pamphlets about the HHPD program to municipalities and county residents.	County EMA and County Planning	10	1-2 years	<\$25,000	FEMA HHPD Grant Program	Outreach and Education
HHPD 2	Dam Failure	Provide education on local mitigation policies and programs that address high-hazard potential dams to county residents and municipalities.	County EMA and County Planning	10	1-2 years	<\$25,000	FEMA HHPD Grant Program	Outreach and Education
HHPD 3	Dam Failure	Maintain digitized dam inundation GIS polygons to determine at risk populations for dams designated High-Hazard Potential Dams.	County EMA and County Planning	12	1-2 years	<\$25,000	FEMA HHPD Grant Program	Structure and Infrastructure Projects
HHPD 4	Dam Failure	Explore the rehabilitation of high hazard potential dams within the County as the need arises by.	County EMA and Dam Owners	9	1-2 years	>\$100,000	FEMA HHPD Grant Program	Structure and Infrastructure Projects
HHPD 5	Dam Failure	Enforce land use and subdivision ordinances within identified dam breach flood zones.	County Planning	10	Continuous	<\$25,000	FEMA HHPD Grant Program	Local Plans and Ordinances
HHPD 6	Dam Failure	Explore the acquiring and/or elevating structures, and/or acquiring easements within identified high hazard dam inundation/flood zones.	County EMA and County Planning	12	1-2 years	<\$25,000	FEMA HHPD Grant Program	Structure and Infrastructure Projects
HHPD 7	Dam Failure	Implement flood protection measures such as berms, floodwalls or floodproofing within identified high hazard dam inundation/flood zones.	County EMA and County Planning	16	1-2 years	>\$100,000	FEMA HHPD Grant Program	Structure and Infrastructure Projects

Action #	Hazard	Action	Lead Agency	Prioritization Total	Timeline	Cost	Funding	Action Category
HHPD 8	Dam Failure	Identify HHPDs with deficiencies and work with the owners to perform an analysis to understand and address different deficiencies	County EMA and County Planning	12	1-2 years	>\$100,000	FEMA HHPD Grant Program	Structure and Infrastructure Projects
HHPD 9	Dam Failure	Pursue additional data and perform an in-depth analysis to understand the population at risk, including any vulnerable populations, for all HHPDs.	County EMA and County Planning and Dam Owners	12	1-2 years	<\$25,000	FEMA HHPD Grant Program	Structure and Infrastructure Projects

Each of the HHPD-related mitigation actions align with HHPD Goal #1. Appendix A Table 22 shows which actions align with the HMP's goals.

**Appendix A Table 2 Alignment of HHPD Goals and Actions**

HHPD Goal	Action Aligning with HHPD Goals
HHPD Goal #1: Participate in FEMA's High-Hazard Potential Dam Program (HHPD).	HHPD Actions 1 – 9
Goal 1: New Castle County and its municipalities will continue to maximize the use of technology (GIS, remote sensing, etc.) to develop sound mitigation policies and projects based upon risk and an enhanced risk assessment.	HHPD Actions 3, 9
Goal 2: New Castle County and its municipalities will continue to emphasize the use of sound planning practices to reduce the impacts of natural, technological, and human-caused hazards.	HHPD Actions 1 – 9
Goal 3: New Castle County and its municipalities will continue to acquire or upgrade existing equipment to improve disaster readiness and implement hazard mitigation measures.	HHPD 7,8
Goal 4: New Castle County and its municipalities will continue to improve communication and warning systems to better protect lives and property from the potential impacts of all hazards.	HHPD 4
Goal 5: New Castle County and its municipalities will continue to enhance and implement local codes and ordinances at higher standards to reduce the impacts of all hazards while considering a holistic approach at the project level.	HHPD 5
Goal 6: New Castle County and its municipalities, and the State (DELDOT) will continue to enhance measures to improve evacuation flow and operations, sheltering and security concerns.	N/A

Goal 7: New Castle County and its municipalities will continue to enhance education and outreach strategies to improve the dissemination of information to the public regarding hazards, including the steps that can be taken to reduce hazard impacts.	HHPD 1, 2
Goal 8: New Castle County and its municipalities will continue to adopt mitigation measures that better protect critical facilities and technology infrastructure from the impacts of all hazards.	HHPD 4, 6, 7
Goal 9: New Castle County and its municipalities will continue to identify and implement sound hazard mitigation projects.	HHPD 4, 6, 7
Goal 10: New Castle County and its municipalities will ensure that sound stormwater and drainage management principles are implemented throughout the County.	HHPD 5
Goal 11: New Castle County and its municipalities will continue to identify potential funding sources and partnerships for projects.	N/A

## HHPD Funding Sources

A potential current funding source to help implement mitigation actions and activities for HHPDs is the FEMA Rehabilitation of High Hazard Dam Grant Program, which is a component of the National Dam Safety Program. The Rehabilitation of High Hazard Potential Dams Grant Program provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high-hazard potential dams. A state or territory with an enacted dam safety program, the State Administrative Agency (SAA), or an equivalent state agency, is eligible for the grant. Eligible subrecipients under the HHPD grant program include non-federal governmental organizations (other than the designated applicant) and nonprofit organizations.

## Local Mitigation Policies, Programs, and Capabilities for HHPDs

For each High Hazard Potential Dam, it is required for an Emergency Action Plan (EAP) is required to be developed, and these Plans are an effective resource that lays out policies, programs, and capabilities associated with HHPDs in New Castle County. The EAP provides policies, programs, capabilities, and procedures related to the concept of operations, responsibilities and duties, administration and logistics, and exercise and training. Additionally, the EAP includes location and inundation maps, lists of traffic control points and the responsible entity for maintaining traffic control points, important contact lists, and pre-developed media announcements for early warning, warning, and evacuation, and incident resolved messages should a failure occur at an HHPD. The EAP identifies who and which entities will be involved in the Emergency Response to a dam failure.

Operation and Maintenance Inspection Reports are also important resources that can help describe and analyze the effectiveness of local mitigation policies, programs, and capabilities that address HHPDs. The Operations and Maintenance Inspection Report typically describe the inspection findings and recommendations, project location maps, dam inspection photos, and a dam inspection

checklist. This resource provides in-depth analysis and information about specific dams, helping to provide effective county policies, programs, and capabilities to address HHPDs.

In the future, the County may consider additional ways to reduce risk related to high-hazard dams, for example, by developing tools or policies to regulate land use around dams.

## HHPD Funding Prioritization

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The National Dam Safety Review Board recommends a Project Prioritization Method for applicants to use to meet the priority system process required by the Water Infrastructure Improvements for the Nation Act. The Project Prioritization Method launched in tandem with the HHPD Notice of Funding Opportunity. Once the Notice of Funding Opportunity (NOFO) was announced, the HHPD application process established the funding states will receive by successfully making an application for that grant period. Grant recipients can prioritize and document how the funds will be allocated to eligible subrecipients.

For prioritizing funding for HHPDs, a benefit and cost prioritization will be performed by the County. All benefit and cost analyses should be completed, effectively providing a criterion for prioritizing funding for HHPDs. Limitations and future deficiencies associated with high-hazard dams are still under review and will be addressed as part of the next County HMP Update.

## APPENDIX B – BIBLIOGRAPHY

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# APPENDIX C – MEETING AND OTHER PARTICIPATION DOCUMENTATION

Meeting Summaries, Meeting Attendance Lists, and all information request worksheets returned from municipalities are included herein Appendix C. Appendix C includes:

- Meeting Agendas
- Meeting Attendance Sheets
- Local Hazard Area Responses
- Hazard Mitigation Action Responses

\*\*Capability Questionnaire Responses are included at the end of the PDF version of this Plan

Planning Process Timeline:

- Kickoff Meeting – 7/25/24
- Public Survey – 2/11/2025 – 4/1/2025 (13 total responses)
- Steering Committee Meeting 1 – 11/13/24
- Municipality Meeting 1 – 11/13/24
- Steering Committee Meeting 2 – 2/10/2025
- Municipality Meeting 2 – 2/10/2025
- Steering Committee Meeting 3 – 8/6/2025
- Public Meeting – 8/6/2025
- Public Draft Review Period – 10/23/2025-11/22/2025

Meeting Agendas and Attendance Sheets

**New Castle County 2025 Hazard Mitigation Plan Update**

**Steering Committee/Municipality Meeting #1**

**Meeting Agenda**

Date: November 13, 2024

Time: 2:00pm - 3:30pm/6:00pm-7:30

**Introductions**

- Welcome (NCC Emergency Management)
- Consultants Introduction (VPC)

**Project Overview Presentation**

- Background
- Progress to Date
- HIRA Overview and Preliminary Results
  - Review/Discuss Hazard Rankings

**Goals and Objectives Review**

- Review Past Hazard Mitigation Plan Goals
- Discuss Potential New Goals or Suggested Edits for 2025 Update

**Mitigation Actions Review**

- Review Past Countywide Hazard Mitigation Actions and determine the status of all past actions.
- Discuss Proposed New Actions or Suggested Edits for 2025 Update
- Discussion of Outreach Packets for Municipalities

**Open Discussion**

**Next Steps**

- Continue to update the Risk Assessment
- Receive Information packets back from municipalities
- Develop new actions based on HIRA and County feedback, and begin updating the Mitigation Strategy Chapter
- Update capability assessment based on feedback received from County and municipalities
- Begin Planning for and determine timeframe for the 2nd Steering Committee/Municipal Meeting
- Continue developing the HHPD Analysis
- Begin Developing Draft Plan

**Questions**

**Adjournment**