pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

December 2, 2022

VIA EMAIL AND CERTIFIED MAIL NO. 7017 2400 0000 0919 9292

Mr. LeRoy Brobst, Secretary
Northampton Borough
1401 Laubach Avenue
Northampton, PA 18067

VIA EMAIL AND CERTIFIED MAIL NO. 7017 2400 0000 0919 9308

Ms. Ilene Eckhart, Secretary
Allen Township
4714 Indian Trail Road
Northampton, PA 18067

Re: Approval Letter –Plan Update Revision
Act 537 Planning
Joint Act 537 Plan for Northampton Borough and Allen Township, Northampton County
APS ID # 1064356, AUTH ID # 1397963
Northampton Borough, Allen Township, Northampton County

Dear Mr. Brobst and Ms. Eckhart:

The Department of Environmental Protection (DEP) has reviewed the proposed Official Sewage Facilities Plan Update Revision (Plan) dated May 2022 (received by the Department on May 24, 2022) with additional information dated November 23, 2022 (received by the Department on November 26, 2022) as prepared by Gilmore & Associates, Inc and entitled Joint Act 537 Plan for Northampton Borough and Allen Township.

The proposal is located in Northampton Borough (Borough) and Allen Township (Township). The Plan consists of separate alternatives for the Borough and the Township. The Borough will renovate two pump stations, reduce inflow and infiltration throughout the existing sanitary sewer system, and renovate, upgrade and expand the existing wastewater treatment plant from 1.50 MGD to 2.00 MGD on an annual average flow basis. The Township will be allocated an additional 320 equivalent dwelling units (EDUs) of wastewater flow in the Borough's treatment plant to use for existing and future development in the Township. The Township will also implement an on-lot sewage management program. The Township will also negotiate with Catasauqua Borough to develop an intermunicipal agreement for the conveyance and treatment of wastewater flow from future developments. The current user rates are not expected to change as the projects in the Borough will be financed through a bond and the projects in the Township will be financed through the purchase of the EDU allocation by developers and remitted to the Borough.

The submission is consistent with the planning requirements in Chapter 71 of DEP's regulations. The plan provides for an upgrade and expansion of the Northampton Borough Wastewater Treatment Plant sewage treatment facility.

The plan revision is approved with the following comments.

PROJECT SPECIFIC COMMENTS

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1. The approved project will require an NPDES (Part I) permit for the proposed increase in the Borough's treated effluent discharge. The permit application must be submitted in the name of the municipality or authority, as appropriate.

2. The approved project will require a Water Quality Management (Part II) Permit for the construction and operation of the proposed sewage facilities. The permit application must be submitted in the name of the municipality or authority, as appropriate. Issuance of a Part II permit will be based upon a technical evaluation of the permit application and supporting documentation. Starting construction prior to obtaining a Part II permit is a violation of the Pennsylvania Clean Streams Law (CSL).

3. Following final municipal adoption, a copy of the onlot sewage management program, and any other ordinances associated with the implementation of the Joint Act 537 Plan for Northampton Borough and Allen Township must be submitted to this office and the Bethlehem District Office.

4. It is now Northampton Borough and Allen Towship's responsibility to implement the Plan in accordance with the schedules contained within the Plan.

5. In accordance with the provisions of the Pennsylvania Sewage Facilities Act and of Chapter 71 (Administration of Sewage Facilities Act) of Pennsylvania Code 25, we will hold Allen Township responsible for implementing the sewage management program as described in said plan.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at http://ehb.courtapps.com or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

If you have any questions or concerns, please contact Ms. Staci Shoemaker at 570.826.2333 and refer to Application No. 1064356 and Authorization No. 1397963.

Sincerely,

Amy Bellanca, P.E.
Acting Program Manager
Clean Water Program

cc: Mr. Thomas Duffy, P.E., Project Engineer/Gilmore & Associates, Inc.
Ms. Andrea Martin, Staff Professional/Barry Isett & Associates, Inc.
Mr. Kenneth Hall, Secretary/Northampton Borough Planning Commission
Mr. Gary Krill, Chairman/Allen Township Planning Commission
Ms. Becky Bradley, AICP, Executive Director/Lehigh Valley Planning Commission

ANTHONY PRISTASH
MAYOR

LEROY E. BROBST
MANAGER - SECRETARY

ANTHONY LOPSONZSKI, JR.
PRESIDENT OF COUNCIL

JULIA KUTZLER
VICE PRESIDENT OF COUNCIL

Borough of NORTHAMPTON Pennsylvania

1401 LAUBACH AVE., P.O. BOX 70 • NORTHAMPTON, PENNSYLVANIA 18067-0070 • TEL.: 610-262-2576 • FAX: 610-261-0505

April 1, 2022

The Home News
255E S. Best Avenue
Walnutport, PA 18088

Attention: Legal Ads

Dear Sir/Madam:

Please publish the attached PUBLIC NOTICE OF PROPOSAL TO ADOPT A JOINT OFFICIAL SEWAGE FACILITIES PLAN (ACT 537 PLAN) BETWEEN NORTHAMPTON BOROUGH AND ALLEN TOWNSHIP, NORTHAMPTON COUNTY one time only on Thursday, April 7, 2022.

Please send us proof of publication.

Sincerely,

LeRoy E. Brobst
Borough Manager

LEB:bam
Enclosure

PUBLIC NOTICE OF PROPOSAL TO ADOPT A JOINT OFFICIAL SEWAGE FACILITIES PLAN (ACT 537 PLAN) BETWEEN NORTHAMPTON BOROUGH AND ALLEN TOWNSHIP, NORTHAMPTON COUNTY

PUBLIC NOTICE is hereby given that Northampton Borough and Allen Township, Northampton County, are proposing to adopt a Joint Official Sewage Facilities Plan (Act 537 Plan) for the purpose of comprehensive sewage disposal planning within both municipalities.

The Plan was prepared to address the sewage collection, treatment, and disposal needs of both municipalities. Topics included within the Plan consist of previous wastewater planning, system description, mapping of existing infrastructure (in relation to municipal boundaries and physical characteristics), future growth and expansion, evaluation of alternatives, and institutional evaluation. The Plan also includes a description of the legal and administrative activities necessary to implement the Plan.

As a result of the Plan, the Borough will renovate two of their pump stations, reduce Inflow and Infiltration throughout the sewer system, and renovate and upgrade their wastewater treatment plant. The Township is allocated a minimum of 320 EDUs from the Borough of which 251 will be available in the first 5 years for the High Meadows, North Hills, Quarry Hill Estates and a portion of Stone Ridge developments, implement an on-lot sewage management program, and negotiate with Catasauqua Borough to develop an intermunicipal agreement for the conveyance and treatment of future developments tributary to Catasauqua Borough.

The EDU allocation for the Township is purchased at the time of the tapping fee payment by developers and remitted to the Borough. The current user rate of 115% of the water bill per quarter is not projected to change as a result of the implementation of the plan. The average Township residential customer bill is $98.14 per quarter.

The direct cost to the Borough will be financed by issuing a bond. The bond will be serviced using the Borough's existing capital reserve fund, cash flow from user rates at the existing level, and anticipated tapping fees. The Borough's current customer user rate of 95% of the water bill per quarter is not projected to change as a result of the implementation of the plan. The average Borough residential customer bill is $74.54 per quarter.

Upon publication of this notice, a 30-day public review and comment period is in effect. A draft version of the Joint Act 537 Plan is available for public review at either of the below listed Municipal Buildings during normal business hours. A draft version of the plan is also available online at either www.allentownship.org or www.northamptonboro.com. Interested parties can submit written comments to your respective municipalities as follows:

Allen Township
4714 Indian Trail Road
Northampton, PA 18067
Attn: Ilene Eckhart, Township Manager

Northampton Borough
1401 Laubach Avenue
Northampton, PA 18067
Attn: LeRoy Brobst, Borough Manager

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Allen Township
4714 Indian Trail Road
Northampton, PA 18067
Attn: Ilene Eckhart, Township Manager

Northampton Borough
1401 Laubach Avenue
Northampton, PA 18067
Attn: LeRoy Brobst, Borough Manager

(4/7)

beginning on May 4. Food truck Wednesdays will be from 4 to 8 p.m. Switching to a more somber topic for a moment, our hearts go out to the family who recently lost two daughters to a fire in Hellertown, the fire claimed the lives of two young girls, a 10-year-

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

March 3, 2022
File No. 2001026A5

Allen Township Planning Commission
4714 Indian Trail Road
Northampton, PA 18067

Reference: Northampton Borough and Allen Township Joint Act 537 Plan Update

Dear Sir or Ma'am:

On behalf of Northampton Borough and Allen Township, enclosed for your consideration is a draft copy of their Joint Act 537 Plan Update. Please review the enclosed plan and return any comments you may have to my attention within sixty (60) days. All comments received will be carefully considered and included in our final submission to Pennsylvania Department of Environmental Protection.

Should you have any questions, you can contact me at 610-366-8064 or via email at tduffy@gilmore-assoc.com. If you have questions pertaining to the Allen Township component, please contact Andrea Martin at 484-833-4833 or via email at amartin@barryisett.com.

Sincerely,

Thomas J. Duffy, P.E.
Project Manager

Enclosures: 1. Draft Act 537 Plan Update

JOINT ACT 537 PLAN

DRAFT

FOR

NORTHAMPTON BOROUGH AND ALLEN TOWNSHIP

NORTHAMPTON COUNTY, PENNSYLVANIA

March 2022

Prepared by:

GILMORE & ASSOCIATES, INC.
Engineers ♦ Land Surveyors
Planners ♦ GIS Consultants
5100 Tilghman Street, Suite 150
Allentown, PA 18104
610-366-8064
www.gilmore-assoc.com

BARRY ISETT & associates INC
MULTI-DISCIPLINE ENGINEERS AND CONSULTANTS
85 South Route 100
Allentown, PA 18106
610-398-0904
www.barryisett-assoc.com

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<u>GENERAL PLAN</u>

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LIST OF FIGURES

(Note: figures are located in Appendix C)

APPENDICES

ABBREVIATIONS / ACRONYMS

BFP – Belt Filter Press

BMP – Best Management Practices

BOD-5 – Biological Oxygen Demand, 5-day test

Borough – Northampton Borough

CAP – Corrective Action Plan

CBOD-5 – Carbonaceous Biological Oxygen Demand, 5-day test

cy – cubic yard

DCNR – Department of Conservation and Natural Resources

DRBC – Delaware River Basin Commission

EDU – Equivalent Dwelling Unit

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map(s)

FIS – Flood Insurance Study

ft – feet

gpcd – gallons per capita per day

gpd – gallons per day

gpm – gallons per minute

I&I – Inflow and Infiltration

IAW – In Accordance With

ICEAS – Intermittent Cycle Extended Aeration System

IRSIS – Individual Residential Spray Irrigation System

lb – Pound(s)

lbs/day – Pound(s) per day

LVPC – Lehigh Valley Planning Commission

MGD – Million Gallons per Day

mg/L – milligrams per liter

NBMA – Northampton Borough Municipal Authority

NPDES – Non-Point Discharge Elimination System

NRCS – National Resources Conservation Service

NWI – National Wetlands Inventory

OLDS – On-Lot Disposal System(s)

PA – Pennsylvania

PAC – Powdered Activated Carbon

PA DEP – Pennsylvania Department of Environmental Protection (formerly PA DER)

PA DER – Pennsylvania Department of Environmental Resources (currently PA DEP)

PA MPC – Pennsylvania Municipalities Planning Code

PENNVEST – Pennsylvania Infrastructure and Investment Authority

Plan – Pennsylvania Act 537 Sewage Facilities Plan

PNDI – Pennsylvania Natural Diversity Inventory

PPC – Preparedness, Prevention, and Contingency

SEO – Sewage Enforcement Officer

SMP – Sewage Management Program

SS – Suspended Solids

SSO – Sanitary Sewer Overflow(s)

Township – Allen Township

TSS – Total Suspended Solids

USACE – United States Army Corps of Engineers

USGS – United States Geological Survey

UV – Ultraviolet

WAS – Waste Activated Sludge

WTP – Water Treatment Plant

WQM – Water Quality Management

WWTP – Wastewater Treatment Plant

0 – Plan Summary

The Pennsylvania Sewage Facilities Act (Act 537) requires all municipalities to plan for and regulate all sewage systems situated within their jurisdiction. Previous wastewater planning, demographics of the municipality, physical constraints, conveyance capacity, and treatment facilities are all evaluated in the "Plan" to establish a basis for the needs of the municipality. With the addition of future growth and possible development, municipalities are required to anticipate the extent of facility modifications necessary to satisfy their current and future needs.

As per DEP's Order, dated July 9, 2021, this 537 Plan Update has been prepared jointly between Northampton Borough (herein known as "Borough") and Allen Township (herein known as the "Township") to evaluate the needs of their two municipalities. This Joint Plan will evaluate the demand for public sewage from both municipalities. With this information, specific upgrade to the WWTP can be recommended to implement the plan. The combined planning area for these municipalities is depicted in Figure 1.75.

0.A – Service Area and Major Problems

Borough

The Borough of Northampton owns and operates a Public Sewer System consisting of 40 miles of gravity lines, 8 pump stations, and 1 Wastewater Treatment Plant (WWTP). A majority of the system was built between 1920 and 1960 and is still in use.

In 1985 the WWTP was approaching capacity. To address this issue, the Borough prepared a 201 Facilities Plan. The 201 Facilities Plan analyzed and projected needs of Borough residents through the year 2005. The Service Area created by the 201 Plan included the entire Borough plus one development within Allen Township (Northampton Heights). Over the years, the service area has been expanded through individual planning modules to include many more developments within Allen Township.

The 201 Plan was implemented in 1990 by upgrading the WWTP through Water Quality Management Part II Permit 4887414 (monthly average flow of 1.50 MGD and monthly average organic loading of 2,190 lbs/day). Since 1990, organic loading into the WWTP has continually increased and eventually surpassed the limit of the plant.

In 2014, a “paper re-rate” was prepared to keep the plant in compliance (Part II permit 4813404 for 1.65 MGD and 2,409 lbs/day). The intent of this re-rate was to provide the additional time necessary to thoroughly evaluate the service area and plan for a substantial upgrade to the plant.

The other major customer of the Borough is the NBMA Water Treatment Plant (WTP). The WWTP receives all of the waste generated by the WTP, which is estimated to generate almost as much solids as the entire Borough (see **Appendix B** - 1985 Basis of Design for the WWTP). The actual quantity of solids produced by the WTP is unknown since it is not sampled or monitored. It is suspected that the waste from the WTP is causing operational issues at the WWTP. This Act 537 Plan Update will evaluate these factors and recommend safeguards to mitigate potential impacts.

Regarding private sewer, there are only a handful of properties within the Borough still utilizing On-Lot Disposal Systems (OLDS). This Act 537 Plan Update will identify those properties and assess their needs. See Table 1 below for a list of OLDS properties’ areas and associated properties in the Borough, and **Appendix L** for mapping of the properties.

Table 1: OLDS Areas and Associated Properties in Northampton Borough

OLDS Area	Property Number and Street
1	323 W 27th St
	308 W 27th St
	303 W 27th St
	239 W 27th St
	237 W 27th St
	4 W 27th St
	2608 Main St
	2614 Main St
2	452 E. 10th St
3	646 Sipos Dr
	642 Sipos Dr
	550 Howertown Rd
	555 Howertown Rd
4	550 Lincoln Ave
5	10 W 1st St
	22 Newport Ave
	23 Newport Ave
	111 Newport Ave

Township

The purpose of the Plan Update is to provide the Township and the region with a comprehensive document that provides for a well-defined public sewer service area, update the number and location of existing public sewer service customers, review the existing flows from the Township with respect to Inflow and Infiltration (I&I), and evaluate the future public sewer needs of the Township. The Lehigh Valley Planning Commission (LVPC) and the Township have been working on preparing comprehensive plans, ordinances, and resolutions to address the ever-changing landscape of development in the region. Sanitary sewer infrastructure planning is a critical piece to the overall land use plan for the future of the Township.

Both on-lot and public sewer areas in the Township have been evaluated with differing levels and areas of focus over the time. In the 1970s, the Township designated very broad, largely undefined areas to consider for public sewer service areas. Most of the older (40+ year) homes in these areas were constructed with OLDS. These planning efforts are discussed in detail in **Section I.A.1 – Previous Planning Efforts** and mapping of the OLDS areas is provided in Figure 15.25.

In the 1990s, developers began to request public sewer service to serve their proposed developments, primarily near the Borough boundary. The Township had reached an agreement with the Borough to serve a portion of the Township. This area was adjacent to the Borough where minor public sewer extensions to serve existing homes were highly feasible. With the increase in development interest at that time, the Township evaluated other potential development areas, both existing and proposed for public sewer service.

Throughout the plan preparation, it became apparent that the full scale of the public sewer service area needed to be defined, but generally, not extended beyond the current limits of the service area. The major concern for sewer planning in the Township revolves around capacity allocation and service fees with the Borough and providing for long term capacity for the properties within the public sewer service area.

The southern area of the Township has also seen an increase in development interest, primarily for commercial development, but there is residential development potential as well. This area of the Township was not included in previous sanitary sewer planning and the Township will be addressing that through this plan.

Therefore, the intent of this plan update is to have all Township sewer planning information located in a single document for reference and guidance as the Township moves forward into the future. This concise sewer planning document will also allow for the Borough to properly prepare for and allocate capacity for the sewage from the Township at the Borough Wastewater Treatment Plant (WWTP). In the event that a new service agreement with the Borough cannot be reached, the Township is evaluating other available treatment options, which includes an agreement of service with Catasauqua Borough or constructing a separate Allen Township owned WWTP.

0.B – Alternatives Chosen to Implement

Based on the findings of this study, and subsequent discussions between the two municipalities, it was agreed to continue their intermunicipal relationship. The Borough will continue to provide sewage treatment for all existing customers, as well as future customers, as identified in this plan.

To meet the existing operating needs of the facility and accommodate the future growth, a plant rating of 2.0 million Gallons per Day (MGD) will be required. In addition, the Borough has decided to repair two of their pump stations and re-affirm their commitment to reducing I&I within the Borough. Therefore, the selected alternatives are:

- Investigate and Reduce I&I within the Sewer System
- Renovate the 21st Street and Stewart Street Pump Stations
- Renovate and Upgrade and WWTP to 2.0 MGD
- Expanded Capacity at the Borough of Northampton Borough WWTP and Developer negotiated capacity at Catasauqua Borough WWTP for the respective service areas

0.C – Estimated Cost and Funding

Borough

The total estimated cost to implement the selected alternatives is $7.9 Million. The Borough will bear this cost with no financial commitment from private developers or the Township. The Borough does not have this amount in capital reserves and intends on issuing a bond to finance the work.

At this time, the Borough does not anticipate the need to increase user rates. The Borough will utilize their capital reserve fund, cash flow from user rates at the existing level, and anticipated tapping fees to service the bond. For additional information, refer to **Section VI.E – Funding Methods**.

Township

The proposed alternative for the Township is to continue conveying sewage to the respective boroughs, as identified in the plan. The implementation costs rely solely on the negotiated intermunicipal agreements, which address both the capacity reservations as well as the user rates for each service area.

The Township will be responsible for sewer access payments in accordance with the intermunicipal agreement, as developers and property owners pay their tapping fees to the Township. The sewer access fee payable from the Township to the Borough is equal to the Borough tapping fee in effect at the time the capacity request is made for connection to the system. The Township charges a $500 tapping fee (in addition to the Borough fee) to be retained by the Township. User fee payments to Northampton will be made in accordance with any agreements that are in place at that time.

The developer-driven need for public sewer service in the Catasauqua Borough Service Area will be reviewed for any sewer collection system or WWTP upgrades needed to accommodate the increased flow and fees to be negotiated between the parties in an agreement. At this time, there is no need for public sewer in the Catasauqua Sewer Service Area to extend beyond the Fuller Trust Property, known as Willowbrook Farms. Capacity for this development would be secured through an intermunicipal agreement and paid for by the developer. User rates for the development would be set in that agreement. The connection for this development is planned to flow into the Catasauqua Borough collection system for direct conveyance to the WWTP and does not need to pass through Hanover Township (Lehigh County). Therefore, Hanover Township would not be an interested party to that agreement. The existing properties that discharge to the Catasauqua Borough WWTP are connected to the Hanover Township (Lehigh County) interceptor, and an intermunicipal agreement is in place for the operation and maintenance of that line apportioned based on percentage of reserve capacity.

0.D – Municipal Commitments

Both Allen Township and Northampton Borough were directed by the PA DEP to prepare this joint Act 537 Plan. Each municipality, therefore, is responsible for adopting the plan. The implementation of the plan is solidified with the execution of the intermunicipal agreement. Sanitary sewer service provided by Catasauqua Borough for the Township will be established through a separate intermunicipal agreement.

Over the past two years, each municipality has spent a significant amount of time and resources evaluating the needs of their municipality and investigating possible alternatives. The development of the Joint Plan has been discussed at various public meetings and the final document has been adopted by each municipality by Resolution.

Implementation of alternatives discussed herein will be provided through the existing administrative structure, with contracted services including specialized contractors and professional engineers. Both municipalities have the necessary staff and administrative resources required to implement the plan. No new departments or Authorities will be required.

Administrative management of the sewer system will be provided by each municipality and the maintenance of sewer lines provided by their respective Public Works Departments. The operation of the WWTP and all pump stations will be provided by the Borough Sewer Department.

For areas of the Township tributary to Catasauqua Borough, sewer service will be accomplished with individual developer agreements.

0.E - Schedule of Implementation

Borough

The following schedule begins when the PA Department of Environmental Protection (DEP) approves the Joint Act 537 Plan.

Year 1

- Meet with equipment manufacturers to select equipment for plant upgrade.
- Perform pilot testing for treatment plant equipment.
- Complete existing conditions survey of treatment plant property.
- Meet with the Delaware River Basin Commission (DRBC) to determine effluent limitations.
- Begin design of 21st Street and Stewart Street Pump Station Renovation Projects.

Year 2

- Complete design of 21st Street and Stewart Street Pump Station Renovation Projects.
- Publicly bid the 21st Street and Stewart Street Pump Station Renovation Projects.
- Begin technical design of plant upgrade.

Year 3

- Complete construction for the 21st Street and Stewart Street Pump Station Renovation Projects.
- Finalize design of plant upgrade.

- Apply for permits to upgrade plant.

Year 4

- Receive all permit approvals.
- Procure financing for plant upgrade.
- Publicly bid and award contract for plant upgrade.

Year 5

- Substantially complete construction for plant upgrade project.

Township

The intermunicipal agreement is the only item needed to be in place in order for the Township to allow for additional connections to the sewer system for conveyance and treatment at the Borough WWTP for that service area. The Township understands that the Borough cannot accept the full amount of projected additional wastewater until certain WWTP upgrades are complete and will follow the schedule established by the Borough for the necessary WWTP upgrades and improvements. The Borough is solely responsible for the timeline of future connections in the Township as there are no improvement needs identified within the Township sanitary sewer collection system to serve any additional customers in the Township. Any extensions to the collection system will be constructed by the developer(s).

Sanitary sewer system extensions in the Catasauqua Borough Service Area will be based on the proposed schedule of the developer and their desire to move forward with the proposed project. Prior to construction, the necessary service agreements will be negotiated and executed.

I – Previous Wastewater Planning

I.A.1 – Previous Planning Efforts

Borough

The Borough WWTP was originally constructed in 1928 and upgraded in the 1950s. During the 1970s, the PA Department of Environmental Resources (PA DER, now known as the PA Department of Environmental Protection) established treatment requirements for wastewater point sources based on Chapter 93 of the PA Code (27). On November 10, 1972, the DER ordered the Borough to meet new effluent requirements for the continued discharge of wastewater to the Lehigh River. At that time, additional studies were conducted by the PA DER to re-evaluate effluent limitations for discharge to the Lehigh River. As a result of these evaluations, the final effluent limitations were revised in 1983 by PA DER (20).

In the early 1980s, the flows into the plant were approaching capacity and more stringent effluent requirements were being implemented. To address capacity and effluent issues, a 201 Facilities Plan was prepared and approved in 1985. A major planning document, the 201 Facilities Plan evaluated the needs of the Borough with population growth and development projected through the year 2005. The 201 Facilities Plan also provided for potential service to the Northampton Heights Area of Allen Township. The need for evaluation of the Township was originally noted in the Comprehensive Feasibility Study for Sanitary Sewage System, completed in 1973. The 1973 study determined the feasibility of providing public sewer throughout the entire Township (20).

To implement the adopted 201 Facilities Plan, the Borough WWTP was upgraded in 1990 through Water Quality Management (WQM) Part II Permit 4887414 to provide for the reduction of Biological Oxygen Demand, 5-day test (BOD-5), Carbonaceous Biological Oxygen Demand, 5-day test (CBOD-5), suspended solids (SS), and ammonia-nitrogen. The Borough WWTP design limits were established based on a monthly average flow of 1.50 MGD and an average organic loading of 2,190 lbs/day.

Soon after the completion of the 1990 project, representatives of the Borough and the Township began discussion for service to the Cherryville Road area in the southern section of the Township. At this time, the area included a sanitary sewer system and a failing WWTP. In 1993, the Borough and the Township entered into an Agreement which provided for service to this area of the

Township. The Township WWTP was decommissioned, and its sanitary sewer system connected to the Borough system for conveyance of wastewater to the Borough WWTP.

Following this successful and cooperative effort, the two municipalities began discussions regarding possible areas of the Township that could be served by the Borough. Preliminary field investigations and planning indicated that an interceptor could be built in anticipation of future development within the Township. The area identified followed an existing but abandoned railroad bed. This area was chosen for construction of a new interceptor pipeline, and planning for the Railroad Interceptor was completed in 1998.

In 2000, the Township studied Northampton Heights, Drexel Heights, Atlas Heights, and a handful of other parcels. These areas had failed OLDS and were utilizing holding tanks. The study was adopted by the Township, but immediately supplemented by “Addendum C” which expanded the scope of the study to include 17 proposed developments. The conclusion of the updated study was that all of these areas would be conveyed to the Borough. The new connections were proposed to go through the Railroad Interceptor or the Dry Run Interceptor and treated at the Borough WWTP. Formal agreements were executed to implement the recommendations of planning.

Table 2 summarizes all prior planning studies for the Borough.

Table 2: Northampton Borough
List of Previous Planning Studies

No.	Title	Date	Prepared by
1	Detailed Study of Sewerage System for Borough of Northampton	March 8, 1963	Roy F. Weston, Inc.
2	Borough of Northampton Wastewater Management Facilities Plan	February 1975	Betz Environmental Engineers, Inc.
3	Borough of Northampton 201 Facilities Plan	October 10, 1985	Gannett Fleming, Inc.
4	537 Plan Update (Railroad Interceptor)	March 1998	Gannett Fleming, Inc.
5	Borough of Northampton Comprehensive Plan 2005 – 2030	September 15, 2005	Borough of Northampton
6	Borough of Northampton Washington Avenue Pumping Station Special Study	March 7, 2006	Gannett Fleming, Inc.
7	537 Plan Revision (Replacement of Main Pump Station)	October 29, 2019	Gilmore & Associates, Inc.

Township

Sanitary sewer planning in the Township has been occurring since the 1970's. In the 1999 Act 537 plan, the previous planning was summarized as follows:

<u>1973: Comprehensive Feasibility Study for Sanitary Sewage System</u>
By: Richard S. Cowan and Associates

- Studied the entire Township for feasibility of sanitary sewer service.
- Separated the Township into four major drainage basins: Lehigh River (1), Hokendauqua Creek (2), Dry Run Creek (3), and Catasauqua Creek (4).
- Noted that most of the Township drains toward the Borough, and a smaller portion drains toward Catasauqua Borough.
- Identified and studied five concentrated population centers of the Township: Northampton Heights, Kreidersville, Howertown, Weaversville, and Seemsville (in the year 2000).
- At the time of this study, the Borough WWTP was overloaded. The cost figures in this study included an estimate for renovating the Borough plant.
- Federal grants were also in existence at the time, which accounted as a 75% savings to

this plant upgrade and for interceptor construction.

The following conclusions were drawn from this study:

- Northampton Heights was feasible for sanitary sewer service to the Borough. Northampton Heights was built with central sewer collection lines, with the intent of connection to the Borough collection system but due to plant overloads, this connection never took place and the developer connected the development sewers to holding tanks.
- Kreidersville was feasible for sanitary sewer service to the Borough or with an interim wastewater treatment plant if Area 1 and Area 2 were developed (see map attached with this 1973 study).
- Howertown and Weaversville were found to be infeasible for service. If Kreidersville, Howertown, Weaversville, Area 1 and Area 2 were all studied together, they were considered highly feasible.
- Seemsville was not studied in detail due to the small number of dwellings at that time.

In preparation of the 1999 Act 537 Plan, it was determined that due to the nature of development around the area of Kreidersville, Howertown and Weaversville, public sewers would not be economically feasible in these areas.

The Northampton Heights area of the Township was connected to the Borough through the extensions of multiple gravity lines within the development. Metering of the existing flow was difficult due to these multiple connections. A number of assumptions were made from the limited flow metering in this area for the purposes of this plan. These assumptions are used to evaluate the presence or lack of I&I in the system and remaining capacity in this area of the system.

<u>1988: Comprehensive Feasibility Study for Sanitary Sewage System</u>

By: Richard S. Cowan and Associates

- Eliminated public sewerage systems planned throughout the Township as a whole.
- Concentrated study focused on the more densely populated areas of Cherryville (Northampton) Heights, Weaversville, Kreidersville, Howertown, and Seemsville.
- Attempted to better plan for sewer extensions based on the Township Comprehensive Plan and Zoning ordinance.

The following conclusions were drawn from this study:

- Negotiations with the Borough for the connection of Cherryville Heights were to begin (the Borough WWTP was still in an overload condition.) Provisions were made for a small WWTP for the area if the Borough connection did not occur.
- The Howertown and Weaversville area were to be served with public sewer and the construction of a new WWTP along the Dry Run Creek. These areas were found to be highly feasible. The Weaversville area was planned to be served by a low-pressure force main.
- Kreidersville and Seemsville were to remain with OLDS since public sewers were not feasible for these areas. A Management Agency was to be created to oversee an OLDS Management Plan in this area. The Township Authority was to be this Management Agency. Its duties were to be:

    - Collect and dispense information to homeowners on proper operation and maintenance of individual OLDS,
    - Allow the Management Agency to enter into contracts with adjacent municipalities for disposal of septage/sewage hauled to their sewerage system from individual treatment systems or holding tanks, and
    - Conduct other Management Agency functions as outlined under the Wastewater Facilities Program.

Based upon this study, the following events resulted:

- The connection of Cherryville Heights to the Borough system occurred in 1994 (see Intermunicipal Sewage Treatment Service Agreement, dated 12-16-93).
- The sewer system and WWTP were never constructed due a change in development plans.
- Providing public sewer to the Seemsville and Kreidersville Areas was not deemed feasible or necessary.

<u>1989: Addendum #1 to the Comprehensive Wastewater Plan</u>

By: Cowan Associates, Inc.

- With the submission of a 950-lot residential subdivision on the Willowbrook Farms property, it was decided to group the existing Equivalent Dwelling Units (EDUs) with these (and other) new EDUs into one point of treatment along the Catasauqua Creek. This required the construction of a pump station at Savage Road and Willowbrook Road.

- The construction of a small WWTP for Cherryville Heights was further studied in the event that negotiations for connections with the Borough failed (the WWTP was not needed once the Willowbrook farms development was built.)

<u>1992: Addendum #2 to the Comprehensive Wastewater Plan</u>

By: Cowan Associates, Inc.

- This addendum was prepared to address interim measures for sewage disposal until public sewer is available.
- Provided for the following:
    - Community OLDS - in areas with moderate and severe limitations to OLDS, Community OLDS were encouraged instead of individual OLDS.
    - Small Flow Treatment Facilities - for use in areas unsuitable for subsurface disposal.
    - Holding Tanks - used for repair only.

As a result of this addendum, Ordinance 92-3 was passed, governing the above items and incorporating standard maintenance agreements. In 1995, the Ordinance was amended to allow holding tanks for new development if it met a set of strict, well-defined standards (Ordinance 95-2).

<u>1999: Allen Township Official Act 537 Plan – Adopted 2001</u>

By: Hanover Engineering

- First official Act 537 Plan adopted by the Township.
- This plan identified Drexel Heights and Atlas Heights as areas of need for public sewer service within the Township. The areas of Cherryville Heights and Northampton Heights, including the North Hills development, had already been connected through previous service agreements. The flow from these developments was not accounted for in this plan.
- The Borough and the Township could not come to an agreement to service the Drexel Heights and Atlas Heights area. In response, the Township which had formed an Authority, entered into an Agreement with the Borough of North Catasauqua for the treatment and disposal of an initial allocation of 100,000 gallons per day (gpd).

- The existing Borough Service Area of Northampton Heights and North Hills was not discussed in this plan.

2001 Act 537 Plan Addendum C

By: Hanover Engineering

- While the plan prepared in 1999 was officially adopted, prior to the implementation of the plan, the Township and the Borough came to an agreement to provide for sanitary sewer service to the Drexel Heights and Atlas Heights areas of the Township. This service was provided through the construction of the Dry Run Interceptor and the Railroad Interceptor. This opened up the option for public sewers for several large development projects in the area.
- The Plan referenced an ultimate service area including the Dry Run watershed without definitively identifying the limits but did estimate the total future flow of 605,660 gpd from the entire service area. This estimate was also included in the Borough Act 537 Plan.
- The flow from the existing service areas were not addressed in this Addendum.
- There was no discussion on the Catasauqua Borough service area in this plan.

Previous wastewater planning in the Township (in conjunction with the Borough, primarily through intermunicipal agreements), utilized a variety of gpd/EDU flow estimates, with little to no justification provided for the difference from one planning document to the next.

For the purposes of this Act 537 Plan and all future sewer planning in the Township, a value of 225 gal/day/EDU shall be used. This closely represents the industry standard of 90 gallons per capita per day (gpcd) multiplied by the US census rate of 2.42 people per household in the Township. This also correlates to the same flow per EDU that the Borough has used in their sewer planning efforts.

Throughout the course of the sewer planning process, an agreement was ultimately reached with the Borough to provide connection points to their system for conveyance of sewage from the Township to the Borough WWTP for treatment and disposal. Following the adoption of the Township Act 537 Plan Amendment C in 2001, the Township and the Borough sewage conveyance and treatment arrangement were negotiated by agreement. The agreement was modified several times over the next 15 years.

Once the Township had purchased all available EDUs from the Borough, the municipalities attempted to negotiate additional capacity at the WWTP. This was done to serve the needs of the remaining developments and provide capacity for potential developments within the ultimate service area of the Township 2001 Act 537 Plan Amendment C. The understanding of the Township was that the Borough had planned for the ultimate capacity from the Township in their Act 537 plan, but a new service agreement allocating that capacity to the Township was not reached.

The latest agreement signed in 2011 allowed the Township to continue to discharge waste from the EDUs which were already connected as of the date of the agreement and purchase up 531 additional EDUs by the end of 2016. Since that time, the Township has also evaluated and revised both the Township Zoning Plan and Comprehensive Plan. Through the planning efforts since 2016, Township officials have determined that an updated Sewage Facilities Plan (Act 537) was needed to align all of the Township planning documents and resources.

I.A.2 – Work Not Performed from Previous Planning

Borough

Based upon historical documentation and currently in-place approved documents, the Borough has carried out planning with the adoption of pre-determined project work scopes, alternatives, and schedules. Therefore, all projects relating to the Borough WWTP and sanitary sewer system have been approved by the appropriate regulatory agencies and implemented according to the work scope of that particular project. Projects that were required by the PA DEP to bring the WWTP back into compliance with regulatory requirements have been implemented.

Township

The sanitary sewers identified in the 1999 and 2001 Addendum C plans were installed and there are no outstanding items from the implementation schedule in either of those plans.

Previous Township wastewater planning revolved around specific developments and strictly defined service areas within those developments. This was done with little regard to any existing structures or additional lots with development potential within or in close proximity to the service areas. Wastewater flow from these structures does not appear to have been included in future projections for service during the planning stages. The chosen alternative for this plan allows for minor sewer extensions or connection points for these lots within the public sewer service area, utilizing the existing collection system infrastructure. Any future agreement with either neighboring municipality for wastewater allocation, conveyance, and treatment will include the flow projections from the entire public sewer service area.

Wastewater planning for the Catasauqua Borough Service Area of the Township was not specifically addressed in the 1999 base plan, or 2001 Amendment C Act 537 Plans, which were approved by the Township. This area has seen significant development interest where commercial development has been built out, and future residential and commercial development has been proposed within their existing zoning districts. Public sewer service to these areas has been approved through the planning module process and arranged through developer agreements with the Township, Hanover Township (Lehigh County) and Catasauqua Borough. Full public sewer service to this area will be negotiated by the Township and Catasauqua Borough and involve Hanover Township (Lehigh County) and developers as necessary.

I.A.3 – Planning under a Corrective Action Plan

Borough

A Corrective Action Plan (CAP) was initiated in 2014. At that time, the WWTP had a small re-rate approved and the CAP was removed. However, the re-rate was considered a temporary solution until more substantial planning and a WWTP upgrade could be completed. The intent of this Act 537 Plan is to plan for the necessary upgrade.

Township

The Township does not anticipate any additional service areas or infrastructure needs beyond the identified public sewer service area. Any development within the proposed sewer service area would provide and construct their own collection systems and connect to the existing system at their own cost. The Township does not have a WWTP, and is not subject to a CAP.

I.A.4 – Planning Modules and Exemptions

Planning modules are the method of revising a municipalities Act 537 Sewage Facilities Plan. Small residential land development projects (less than 10 lots) require minimal planning, with approval required by the Borough and the PA DEP. Larger land development and non-residential projects can require significant sewage facilities planning and could require approval from LVPC and the municipal Sewage Enforcement Officer (SEO) (or another appropriate competent person), prior to being approved. These more-in-depth planning modules also need to be consistent with other municipal, County, or State planning documents as well as natural and cultural resource protection programs.

Borough

Planning exemptions can be approved for projects that meet the current Act 537 Plan of the Borough, such as public sewer connections in the identified public sewer service area. Since the Borough Service Area coincides with its municipal boundaries, this would apply to individual lot connections.

Over the past few decades, growth within the Borough has been minimal. The Borough has been built out for a long time. The potential for redevelopment exists, but due to the decline of manufacturing in the area, the Borough does not anticipate many planning modules or exemptions in the foreseeable future.

Township

The primary driver of future development within the Service Area is from the Township. To accommodate this future development, sewage generated in the Township will need to be conveyed through the Township collection system, into the Borough conveyance system, and treated at the Borough WWTP. The intent of this Act 537 plan is to determine whether the necessary capacity is available at these three stages to serve the anticipated development.

The wastewater planning in this document accounts for all proposed development which is known at the time of plan preparation. Previous wastewater planning identified tracts of land by owner/developer name or by subdivision name as it was known at that time. Flow estimates were provided based on the best information available at that time. This plan accounts for the calculated flow from those developments as they were constructed (which in some cases differed from what was planned for), based on the number of EDUs at a flow rate of 225 gallons/day/EDU. The calculations include updated flow estimates for any remaining tracts of land that have no current plans for development within the public sewer service area with an estimated number of EDUs available.

II – Physical and Demographic Analysis

The demographic (i.e., population growth and distribution) and physical (i.e., geology, soil types, water bodies, etc.) characteristics of each of these municipalities (the Borough and the Township) are important considerations in wastewater facilities planning. Physical features determine the suitability of areas for on-lot sewage disposal. Demographic characteristics, such as the location of older communities that utilize OLDS, and the rate and distribution of population growth (reflected by the location of proposed developments), provides insight into where dense population centers are likely to occur in the future. These growth areas present potential sewer service needs if the development occurs in geographic areas that are unsuitable for on-lot sewage disposal, or if the type of development is not conducive to OLDS.

Borough

The philosophy of the Borough is to encourage connection to the sanitary sewer system rather than the permitting of new OLDS.

Township

The philosophy of the Township is to maintain their current conveyance and collection systems and permit new OLDS if site conditions are found to be appropriate.

II.A – Planning Area

The Borough and the Township are located in the western central area of Northampton County, along the eastern border of Lehigh County. The Borough occupies 2.58 square miles and is located approximately 5 miles northwest of Allentown. The Township occupies 10.84 square miles and borders the northern and eastern side of the Borough. Towns around the Borough and the Township include Catasauqua, Coplay, Walnutport, and Bath. Major cities in the area include Allentown and Bethlehem, and farther east, Easton. Regionally, the planning area is located approximately 60 miles northwest of Philadelphia and approximately 90 miles southwest of New York City (20). The general areas of the Borough and the Township are illustrated in the Cementon and Catasauqua USGS Maps, shown in Figure 1 and Figure 1.5. The Planning Area Map for the Borough and the Township is shown in Figure 1.75.

Borough

The Borough is bordered by the Township to the east, the Lehigh River to the west, and North Catasauqua Borough to the south. Primary access to the Borough is provided from Route 22 by taking Route 145 North (MacArthur Road) and then turning east onto Route 329. Route 329 also provides access to the Township. Other significant roads in the area that connect to Route 329 are Route 873 around Schnecksville, and Route 512 and Route 987 around Bath. See Figure 1.80 for a development map of the Borough.

Township

The Township is bordered by The Lehigh River, North Catasauqua Borough, and the Borough to the west; Lehigh Township and Moore Township to the north and east; East Allen Township to the east; and Catasauqua Borough and Hanover Township (Lehigh County) to the south.

There are two separate public sewer service areas in the Township: the Borough Service Area and the Catasauqua Borough Service Area. The Borough Service Area is divided into five subdrainage basins for current EDU and flow analysis as well as future connections and flow estimates:

- Northampton Heights Area (9 interconnections),
- Horwith/Hokendauqua Area (2 interconnections, 1 pump station),
- Railroad Interceptor (3 interconnections, 1 interceptor),
- Dry Run Interceptor (3 interconnections, 1 interceptor), and
- Willow Green (1 interconnection, 1 pump station).

See Figures 1.85 and 1.95 for a summary of developments and drainage basins in the Township.

The Catasauqua Borough Service Area is the entire southern portion of the Township along the municipal boundary with the Borough to West Bullshead Road, along Willowbrook Road to the southern boundary of the County Park land to the municipal boundary with East Allen Township. There are alternative discussions in this plan that would potentially remove public service areas from the Borough to Catasauqua Borough, but the overall extent of the public sewer service area boundary limit does not change.

II.B – Physical Characteristics (Hydrology)

The Borough and the Township are part of the Lehigh River drainage basin and are bounded on the west by the Lehigh River. The Borough and the Township are located within the Lehigh River, Hokendauqua Creek, and Catasauqua Creek watersheds. Drainage from the Lehigh River is provided by these watershed areas. Approximately half the area of the Borough is located in the Lehigh River watershed, with the remaining amount split between the Hokendauqua Creek and Dry Run watersheds. Approximately half the area of the Township is located within the Hokendauqua Creek watershed, with the remaining area split between Dry Run, Catasauqua Creek, and Lehigh River watersheds (20). Refer to Figure 2 for a hydrology map of the Borough, and Figure 2.5 for a hydrology map of the Township.

II.B.1 – Summary of Creek Watershed Areas, Surface Water Areas, and Impoundments

A summary of creek watershed areas, surface water areas, and impoundments is listed below. Table 2.40 summarizes Chapter 93 stream designations and impairments for the Borough and the Township.

- The Hokendauqua Creek is a 17-mile tributary of the Lehigh River, branching off from the Lehigh River around Canal St/ West 10th Street. It flows from its source at the foot of the Blue Mountains above Emanuelsville through the towns and villages of Petersville and Kreidersville. Along the way, Bertsch Creek, Indian Creek, and a number of springs contribute to the Hokendauqua Creek (1).
- Dry Run is a 2.6-mile tributary of the Lehigh River, branching off from the Lehigh River around East 4th Street in Northampton. It is often dry, hence its name (2).
- Catasauqua Creek is a 6.6-mile tributary of the Lehigh River, branching off from the Lehigh River around the Race Street Bridge in Catasauqua. It originates from springs of the Blue Mountain barrier ridge, several miles below the Lehigh Gap (3).
- Indian Creek is a tributary of the Hokendauqua Creek, branching off from the Hokendauqua around Millrace Road and Indian Trail Road near the village of Kreidersville (4).

Table 2.40: Chapter 93 Stream Designations and Impairments (36,37)

Waterway	Ch.93 Designation	Municipality	Impaired?	Nature of Impairment
Catasauqua Creek	CWF, MF	Allen Township	No (Potential)	Miller Slate Pond
Dry Run	CWF, MF	Both	Yes	Runs dry in certain sections
Hokendauqua Creek	CWF, MF	Both	Yes	Supply Dam off of Smith Lane, Lappawinzo Dam off of Lappawinzo Road
Indian Creek	CWF, MF	Allen Township	No	
Lehigh River	TSF, MF	Both	Yes	Siltation due to Urban Runoff / Storm Sewers, acid mine drainage

Key for Ch. 93 Designations:

CWF – Cold Water Fish

MF – Migratory Fish

- A number of manmade ponds exist within the Township, north and east of the Borough. These are considered to be part of the Northampton Quarry complex. Other small ponds are also present through the Township. Two lakes, known as the Twin Lakes, exist in the northwest corner of the Township.

- The main impoundment of consideration in the area is Spring Mill Reservoir, located around the intersection of Route 145 (MacArthur Road) and Roosevelt Street in Lehigh County, across the Lehigh River from the Borough and the Township. The reservoir serves as a source of supply for fresh water and is approximately 1000 feet (ft) south of the NBMA WTP. Refer to **Section II.F – Potable Water Supplies** for more detailed information about public water supplies in the Borough.

- The Lehigh Canal, built in 1818 and completed in a period of 20 years, historically served as a means to transport materials, including anthracite coal and pig iron, to different towns on the Lehigh River. At the height of its use, the canal was 72 miles long (5). The Lehigh Canal is still used today to control water levels for recreation and adds sediment to the NBMA WTP that eventually goes to the WWTP.

- Other impoundments in the area include: the Lappawinzo Dam, the Northampton Dam, the Whitehall Dam, the Old Laury Dam, and the Supply Dam (6).

Two different impoundments are known to have releases throughout the year that can affect the NBMA WTP. These are the Francis Walter Dam (located in White Haven) and the Beltzville Dam (located in Lehighton). Both of these dams are operated by the United States Army Corps of Engineers (USACE), and are utilized for flood control. In the summertime, Francis Walter Dam will hold back or release water based upon the activities around that time. Generally during the weekends, water is released to allow for fish spawning activities. These releases are held back seasonally for the purpose of maintaining the river level for rafting and other recreational activities. In a conversation with WTP personnel on June 4th, 2021, it was noted that the dam releases can have an impact upon certain water quality parameters at the WTP. In general, the basic trend is seen as elevated turbidity in the raw water intake, and the greater effects are seen as a decrease in raw water pH. The change in these parameters, however, is not always consistent with, or indicative of, dam releases.

II.B.2 – Flooding, High Flow Events, and Past History

Borough

The majority of the Borough WWTP is situated within the flood zone of the Hokendauqua Creek. All of the tanks and other structures within the plant were constructed with this in mind and the top of concrete elevations were set at or above the 100-year flood elevation. For a delineation of flood zone areas, The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for the Borough (including the Borough OLDS properties) are shown in Figures L-1 through L-7 in **Appendix L** (32).

Flooding of the Lehigh River or Hokendauqua Creek has not caused any significant damage since the plant was upgraded in 1990. Between 2000 and 2009, 2 separate 100-year storms caused flooding from the Hokendauqua Creek. This flooding overflowed onto plant grounds but did not cause a disruption in operations (17).

2011 was the wettest year on record for the Lehigh Valley with 72-inches of precipitation. January and February had lots of snow, springtime was very wet, and a period between August 13th and

October 31st saw multiple inclement events occur in the area. The average daily flow at the WWTP was 1.229 MGD with a maximum 3 monthly average of 1.529 MGD. There were 3 SSOs for that year.

WWTP flows between March and October of 2017 were considered significant by the plant superintendent and it was noted in the annual report of that year that the plant was in "storm mode" for most of that time. Due to significant flows during these months, the superintendent noted that the air flow in the WWTP had to be adjusted frequently. However, nothing is noted in the 2017 annual report about flooding.

Although heavy flows have required the treatment process to operate in storm mode, the Borough has not experienced many Sanitary Sewer Overflows (SSOs) in recent years. Between 2016 and 2020, there have been 5 observed SSOs with the majority occurring within the Headworks Building. Refer to Table 3.50 for a list of Borough permit violations.

During 2020, one of the most significant storm events to occur historically. The storm was Hurricane Isaias which dropped an estimated 5" of rainfall over an 8-hour period. According to the National Oceanic and Atmospheric Administration Precipitation Frequency Data Server for Northampton, PA (31), Hurricane Isaias was considered a 100-year storm in terms of probability of occurrence. A summary of the impacts of Hurricane Isaias at the WWTP as told by the Borough WWTP superintendent on August 4th, 2020 is included as **Appendix H**.

II.C – Soils

Soil surveys classify the soil and the material in which it formed and are helpful tools for identifying suitability features of various types of soil.

Borough

The information presented for the Borough is taken from the Web Soil Survey, operated by the United States Department of Agriculture Natural Resources Conservation Service (NRCS) (23). This is an online tool that generates soil reports based upon various selected soil properties from previously compiled data.

Figure 3 shows the soil map of the Borough, and Figure 4.25 shows soil properties of soils in the Borough.

Township

The information regarding soils and soil characteristics was taken from the Soil Survey of Northampton County, PA (41). The following soils have been identified in the Township service area according to this survey:

- Clarksburg (ClB)
- Duffield (DuB)
- Middlebury (Mb)
- Ryder (RyC)
- Urban Land (UrA), (UrC)

Clarksburg, Middlebury, Ryder, and Urban Land (U) are all soil types that are classified as having severe limitations to installation of septic tank absorption fields. Urban Land (U) is classified as having variable limitations to adequately handle septic tank absorption fields and moderately slow permeability is listed as another characteristic. Therefore, it is considered for this study that Urban Land (U) has severe limitations in respect to utilizing septic tanks. Figure 3.5 shows the soil map of the Township, and Figure 4.50 shows soil properties of soils in the Township.

II.C.1 – Soils and Determination of OLDS Installation

One method for determining the feasibility on-lot systems is by evaluating the soil groups according to drainage classes. These soil drainage classes can be divided into four groups: well-drained, moderately well-drained, somewhat poorly drained, and poorly drained. In-ground systems are generally installed in well-drained soils and sand mound systems in moderately well-drained soils. Individual Residential Spray Irrigation Systems (IRSIS) can be installed in moderately poorly drained soils. In general, poorly drained soils are considered to be unsuitable for any of these sanitary systems.

Another important category for feasibility is the depth to bedrock. If the bedrock is considered too shallow, this may prevent installation of wastewater systems in general, due to additional costs of excavation and site preparation. Shallow depth to bedrock may also prevent treated effluent from percolating into the surrounding soil. Due to the increased potential of the presence of limestone, especially in the Jacksonburg Formation, a determination of bedrock depth should be considered before any installation. Thus, developing OLDS within areas known for karst topography is discouraged, even in well-drained soils, due to the structural aspects of subsurface dissolution and effect of carbonate chemistry and hardness upon installed systems and piping. Site specific testing is needed to verify existing conditions when determining the feasibility of OLDS.

Borough

The On-Lot Septic Suitability Map Drainage Class Map for the Borough is shown in Figure 5.

Township

Overall, 22.8% of the Township is labeled as very limited for on-lot suitability where 28% is considered moderately limited and 35.6% is slightly limited. The Urban Land (U) soil areas were not rated. The On-Lot Septic Suitability Drainage Class Map for the Township is shown in Figure 5.50.

II.C.2 – Explanation of System Feasibility

The NRCS has developed a methodology to determine (within a certain set of assumptions) the soil characteristics that can limit the installation of various wastewater systems. Each of these categories of importance is given a score, and then the overall score is tabulated. Determination of the feasibility of a certain system in a certain soil type is then made, and an assignment of suitability based upon these determinant categories is the result. The lower the score, the more likely that the soil is suitable for the proposed system. Instead of showing this developed system in table form with associated calculated numerical scores, maps are used to display the relevant information for the Service Area.

Borough

The soil properties for the Borough are shown in Figure 4. Refer to Figures L-8 through L-26 in **Appendix L** for the location of OLDS in the Borough.

Township

Refer to Figure 15.25 for the location of OLDS areas in the Township.

II.C.3 – Prime Farmland

Refer to **Section VI.A – Consistency – 7. Pennsylvania Prime Agricultural Land Policy** for an additional discussion of Prime Agricultural Land. Refer to **Section II.C – Soils** and **Section II.G – Wetlands** for a more detailed description of the soils in the Borough and the Township.

Borough

Much of the soil in the Borough is designated Urban Land (U) and is not considered to be Prime Farmland. A soil map of areas in the Borough considered as Prime Farmland is shown in Figure 6.

Township

A majority of the soil in the Township is considered to be of good quality, and falls under the classification of Prime Farmland. The Township has a long history of supporting agricultural activities, and this land use is still highly regarded by the Township residents and landowners. Agricultural land use is scattered through the Township and a number of different farms are present such as crop production, livestock, pastures, and tree farms. Overall, there are over 3,200 acres of agricultural or undeveloped land utilized in the Township. A significant portion of the Township is listed as Prime Farmland or Farmland of Statewide Importance and is located throughout the Township. Agricultural land conservation is promoted throughout Northampton County through Agricultural Conservation Easements implemented by the Northampton County Farmland Preservation Office. There are six farms in the Township which have preserved approximately 790 acres (a little over 10% of the Township.) A soil map of areas in the Township considered to be Prime Farmland is shown in Figure 6.5.

II.D – Geologic Features

Most of the Borough and the Township are underlain by sedimentary rocks from the Middle and

Upper Ordovician period. Five major bedrock formations are found in the planning area. The Allentown formation, which is part of the Conococheague Group, Cambrian Age, is found along the southern edge of the Township. The Ordovician Age formations include: Martinsburg, Jacksonburg, Ontelaunee, and Epler (20).

Borough

The Jacksonburg Formation underlays approximately 90% of the Borough. This formation consists of dark-gray shaly limestone (cement rock) with slaty cleavage, with basal medium- to thick-bedded limestone (cement limestone) increasing in thickness going eastward (10). The Jacksonburg Formation is only preserved in two small fault blocks in Saucon Valley. There is thus scanty evidence of its nature and of its former relations to overlying and underlying formations in this region (9).

The Martinsburg Formation, which underlays approximately 10% of the Borough, is grouped into three categories: the Pen Argyl member (an upper thick-bedded claystone slate), the Ramseyburg member (a middle unit of interbedded graywacke and slate), and the Bushkill member (a lower thin-bedded claystone slate)(8,11). See Figure 7 for the geologic features map of the Borough.

Township

The geologic composition of the Township can generally be described as well bedded, moderately weathered with good surface and subsurface drainage with medium to high groundwater yield. The northern half of the Township is mostly underlain with the Martinsburg Formation, which consists of shale, sandstone, and limestone masses. The southern half of the Township is underlain by geologic features from the Ontelaunee, Epler and Allentown Formations. The type of rock normally found in these formations is finely crystalline dolomite, finely crystalline limestone, and thick dolomite. Throughout the southern portion of the Township, closed depressions and sinkholes are evident in cultivated fields. The Jacksonburg formation underlays the central portion of the township and is described as dark-gray shaley limestone. The geologic features map for the Township is shown in Figure 7.5.

II.D.1 – Potential for Nitrate-Nitrogen Pollution

The area is known for carbonate-bearing formations, and the presence of sinkholes and surficial depressions has been well documented (12). Carbonate (CO_3) in limestone formations is generally found in association with calcium and magnesium, and it is not considered to be a source of nitrate-nitrogen pollution. The map showing karst topography of the Borough is shown in Figure 8, and the map showing karst topography of the Township is shown in Figure 7.5 (as part of the Geologic Features Map of Allen Township.)

Borough

The Borough is heavily developed and has minimal lawn areas and farmland. These would be potential source areas if a concern for nitrate-nitrogen pollution was present. However, due to the general lack of lawn areas and farmland, and the Urban Land (U) designation given most soil in the Borough, the concern for nitrate-nitrogen pollution in excess of 5 milligrams per Liter (mg/L) is negligible.

The effect of the 18 OLDS in the Borough on the NBMA WTP is also considered to be negligible. The NBMA WTP is situated on the western side of the Lehigh River in Lehigh County. It is not possible for wastewater from a failing OLDS in the Borough to have travel pathways or quantity to contaminate the Lehigh River or Spring Mill Reservoir sufficiently to affect source water quality.

Township

The Township, in contrast, contains substantial areas of farmland. As a common farming practice, nitrogen-based fertilizers are often used to increase crop yield in agricultural areas. Agricultural land can produce run-off, typically from rainstorms and snow melt, which can transport soil into nearby waterways. This nitrogen-enriched run-off can be an existing contributor to nitrate-nitrogen pollution, potentially affecting surface water and groundwater sources in the long run. The factors of dilution, degradation, and dispersion over time, however, lessen the potentially detrimental effect of nitrate-nitrogen on surface and groundwater systems.

II.E – Topography

The Borough and the Township are located in the Great Valley section of the Ridge Valley Physiographic Province. The southern part of the Great Valley section consists of the Allentown

Valley, which is underlain by a fairly broad belt of Cambrian and Ordovician limestone. The floor of this valley is generally nearly level to undulating, though in a few areas there are broad low stream divides containing small streams with gently sloping sides. Slopes in the planning area range from 0 to greater than 25 percent. Naturally occurring slopes in excess of 50 percent exist in the northwestern areas have been artificially created by mining activities at the numerous quarries found in the area. Elevations in the planning area range from 730 ft above mean sea level in the northwestern corner of Allen Township to 280 ft along the Lehigh River at the southwestern edge of the Borough (20). Higher elevations generally slope down to low-lying areas around the footprint of the Hokendauqua Creek and to the west along the Lehigh River (13). The topography of the Borough and the Township are shown in the Cementon and Catasauqua USGS Maps in Figure 1 and Figure 1.5, respectively.

Borough

Based upon the United States Geological Survey (USGS) website “Quaternary Faults and Folds, Earthquake Hazards,” there are no known fault lines to exist within the Borough (28,29). Maps showing on-lot septic suitability based upon slopes for the Borough are shown in Figure 10.

Township

The topography of the Township is generally driven by the drainage basins of the 4 main creeks. Steep slopes are primarily found near perennial streams within the northern portion of the Township, in the areas underlain by shale and slate. The southern portion of the Township is generally a rolling to flat terrain underlain by limestone and dolomite. Across the Township there is nearly a 450 ft elevation difference.

II.F – Potable Water Supplies

A majority of the Borough and the Township are served by the NBMA WTP. Maps for the water service area of the Borough are shown in Figure 12, 12.25, 12.50, and 12.75. The Township is additionally served by the City of Bethlehem public water system. The Township service areas for the NBMA WTP and the City of Bethlehem public water system are shown in Figure 12.85.

The NBMA WTP utilizes water from the Lehigh River mixed with the Spring Mill Reservoir for distribution to the Borough and the Township. The Lehigh River is the main water source and supplies approximately 3 MGD to the NBMA distribution system consisting of about 50,000 customers. The Spring Mill Reservoir supplies approximately 300,000 gpd and is located directly south of the WTP (14). The water taken from the Lehigh River and treated in the NBMA WTP has a lower pH, in addition to inherent taste and odor issues. Historically, this lower pH is from increased acidity from the effect of anthracite coal fields and degradation through acid mine drainage in the Lehigh River. The NBMA WTP, therefore, utilizes a raw water blending of the Lehigh River with Spring Mill Reservoir to mitigate additional chemical usage and process modification. To ensure safe drinking water for all customers, the NBMA WTP performs laboratory tests on finished water quality to verify the sufficient removal of major pathogens before being sent into the distribution system.

These surface water supplies (the Lehigh River and Spring Mill Reservoir) have a safe yield of 145.1 MGD and a storage capacity of 5.2 million gallons (20). From a recent discussion with NBMA WTP personnel on June 4th, 2021, it was noted that the maximum rated treatment capacity is 8 MGD, and the plant averages 4 MGD of final treated water. The reserve capacity, therefore, is calculated to be 4 MGD, or 50% of plant treatment capability, taken as the difference of the maximum capacity and average treatment flow. A process flow diagram of the NBMA WTP is shown in Figure 13.

II.F.1 – Description of Groundwater Quality

Two different types of aquifers underlay the Borough and the Township. One type is a sandstone and shale aquifer, with fractured sandstone and shale as the main components. Water chemistry shows that sandstone layers have soft water with less than 200 mg/L dissolved solids, while shale layers have hard water and 200 to 250 mg/L dissolved solids. The depth ranges from 80 to 200 ft, and the general range of yield is between 100 to 1000 gallons per minute (gpm).

The second type of aquifer is a crystalline rock aquifer, with fractured schist and gneiss as the main components. Water chemistry shows that the soft water contains less than 200 mg/L dissolved solids, while some moderately hard water can contain high iron concentrations. The depth ranges from 75 to 150 ft, and the general range of yield is between 5 to 25 gpm (15).

Groundwater can be extracted from all the formations in the planning area, although the water yield and quality from each formation is variable. The median well yields in the geologic units are:

- Martinsburg formation – 36 gpm,
- Jacksonburg formation – 20 gpm,
- Ontelaunee formation – 200 to 500 gpm,
- Epler formation – 15 gpm, and
- Allentown formation – 60 to 210 gpm.

Water quality in the Martinsburg formation is adequate for most uses, but may have a high iron and/or hydrogen sulfide content. Water quality in the remainder of the geologic units is similar due to their lithologic composition. This groundwater is high in dissolved solids and hardness and problems with excessive iron, turbidity, and coliforms were also noted (20).

In the limestone and dolomite formations, underground solution channels are commonly present and these have a great effect on groundwater movement and on the quantity of water that is available for well extraction. Solution channels are commonly larger and occur more frequently in the valleys than on the hillsides and hilltops. Therefore, wells drilled in the valley will have a greater probability of being successful in the carbonate regions (20).

II.G – Wetlands

The existence of wetlands is commonly determined by criteria established in the 1987 USACE Wetlands Delineation Manual (16). Of one primary criteria is the existence of hydric soils. Over 50% of the soil within the Borough is mapped as Urban Land (U) or has a major component of the soil being Urban Land (U) (23). The “Urban” mapping unit is described as:

> *Land that occurs in industrial and residential areas where the activities of man have completely destroyed the original soil profile, but in some scattered areas the soils remain intact*.

According to the NRCS definition, hydric soil is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. This classification, along with the presence of hydrophytic vegetation and wetland hydrology, are 3 parameters utilized in determination of a jurisdictional wetland (16),(24). Based upon these parameters, the extent of wetlands within the planning area is minimal. Further support for this conclusion is shown on National Wetlands Inventory (NWI) mapping. As per the NWI mapping, wetlands are only depicted in isolated pockets and none are depicted within any of the proposed alternative project areas.

A map with wetland areas in the Township and the Borough is shown in Figure 14.5. For additional information on soils in the Borough and the Township and their respective properties, refer to **Section II.C – Soils**.

Borough

Based on the prevalence of Urban land (U), the existence of wetlands in the Borough is limited.
A map showing the hydric soils in the Borough is shown in Figure 14.

Township

The Township, however, has much less Urban Land (U) area. There are no anticipated wetland impacts as a result of the sewer planning effort in the Township. In the soil survey for the Township from Northampton County, a majority of the soil is not listed as being hydric.

III – Existing Sewage Facilities

III.A – Summary of Public Facilities

Borough

The Borough owns and operates a public sewer system consisting of 40 miles of sewer lines, 8 pump stations, and the WWTP. The Borough also operates 2 pump stations for the Township which are tributary to the Borough.

All major wastewater equipment and operations at the plant and pump stations are checked daily and are on a regular maintenance schedule, set forth by the plant superintendent. The WWTP buildings and grounds are maintained by plant personnel, which includes sweeping floors, trash removal, lawn maintenance, snow plowing/shoveling/snow blowing, ice removal, painting, and general housekeeping (17).

The wastewater generated by the Borough is generally domestic and commercial in nature. The one exception is the NBMA WTP which is a “Significant Industrial User”. The NBMA WTP discharges clarifier sludge and filter backwash which primarily consists of SS, aluminum sulfate, and powdered activated carbon (PAC).

Township

There is no WWTP in the Township, other than a privately owned WWTP in the Whispering Hollow manufactured home park in the northeast area. The plant is a 0.02 MGD activated sludge plant with chlorine disinfection. The effluent discharges to an unnamed tributary of the Hokendauqua Creek. The WWTP operates under the PA DEP Non-Point Discharge Elimination System (NPDES) Permit No. 0033740 (effective until Dec 31, 2023) and WQM Permit No. 4817402, which was issued on July 10, 2018. The WQM permit provided for modifications to the treatment process, including a 15,000 gpd flow equalization tank and a new aerobic sludge digestion tank. The DRBC Docket D-2018-002-1 was issued to address these modifications as well as require the installation of a standby generator and remote monitoring system.

III.A.1 – Main Sewer Lines and Pump Stations

<u>Collection System</u>

Borough

The majority of the Borough sanitary sewer system was constructed around 1930, with the remainder built in the 1950s. The sanitary sewer system pipes range in size from 8-inches to 24-inches in diameter. These are constructed of vitrified clay, reinforced concrete, and asbestos cement. A small amount of PVC pipe is present from more recent extensions and replacement. In addition, there are approximately 550 manholes of either brick, precast, or poured concrete construction, as well as 29 lampholes in the sewer system. Because of the age, the Borough sanitary sewer system is subject to occasional pipe collapse and periodic I&I problems (20). Figure 15 shows an overall plan of the sanitary sewer system for the Borough.

Township

The Township owns and operates the sewage collection and conveyance system within their municipal boundaries. The majority of the Township system was built in recent years and is constructed primarily of PVC pipe. Wastewater generated in the Township is both domestic and commercial in nature. No business within the Township falls under the "Significant Industrial User" category. Figure 15.25 shows the main interceptors and trunk lines in the sanitary sewer system for the Township.

The Borough Service area is quite complicated due to the number of interconnections within the service area, largely due to the multiple developments which straddle the municipal boundary line and the topography between the municipalities. The 5 separate service areas that discharge to the Borough are shown on Figure 1.75 and highlighted in **Section II.A – Planning Area – Township.**

There are two separate interceptors in the service area, and both were implemented because of the 2001 Act 537 Plan Addendum C evaluation. A description of these interceptor and service areas is as follows:

The Railroad Interceptor, a 15-inch PVC main, was installed primarily to provide sewer service to the Atlas Heights and Drexel Heights area of the Township, which were identified in the adopted 1999 Act 537 Plan as areas of public sewer needs. The interceptor is 15-inch PVC pipe, primarily sized for some projected future development in the ultimate service area including a property in East Allen Township owned by the Northampton Area School District. Within the delineated service area, no individual interconnections have been identified. However, due to the configuration of the last Township-owned manhole, a flow meter could not be installed. Two upstream meters have been installed that monitor approximately 95% of the flow from this drainage basin.

The Dry Run Interceptor was installed to service proposed residential developments in that area of the Township. The interceptor is an 8-inch PVC pipe installed along the western side of the Dry Run Creek, with one creek crossing serving nearly half of the drainage basin, including the Catasauqua High School. Due to the topography, and that some developments straddle the municipal line with the Borough, there are three minor interconnections that are not metered.

The Willow Green development, in the southeastern portion of the service area, has one interconnection point to the Borough sanitary sewer system. This connection has a flow meter that monitors flow from this development. There is one vacant property in close proximity that could potentially connect to this discharge location, depending on the proposed layout of the future development.

The Horwith/Hokendauqua service area has two separate discharge points to the Borough system. The Horwith Lane area is isolated due to topography, the quarry across Route 329, and proximity of other nearby service areas. This area is zoned Industrial/Commercial and limited development opportunity exists for connections to this service area. The Horwith Pump Station service area is also isolated, due to the boundary with the Borough, proximity to the Horwith Lane service area, and the quarry across Route 329, restricting potential future connections to this pump station.

The Northampton Heights Service Area now refers to all of the interconnections to the Borough sanitary sewer system in the area of Towpath Estates, Northampton Heights, Cherryville Heights, North Hills, and Boro Vu. This includes all existing and vacant lots in the Township along Jeffery Lane, Frank Drive, Center Road, Eisenhower Road, Kennedy Drive, Oakland Drive, 31st St, and Tepes Drive. Due to the topography, the existing development comprises of extensions of developments and streets within the Borough without a clear dividing line. This was due to these multiple interconnections between municipal systems being the most economical and realistic approach to providing public sewer service to this area. Flow metering, therefore, has been difficult. However, the Township did install two meters in the older areas with the greatest number of connections to monitor flows. The Township will be conducting manhole investigations in this area to assess the condition of the sewer system in the future.

The public sewers in the Catasauqua Borough service area are currently limited to the sewer main along Willowbrook Road to the boundary with Hanover Township (Lehigh County.) The sewer service to this area of the Township was provided by the developers of the FedEx property and provided a service connection to other industrial properties in the area. The sanitary sewers within each industrial development are private, but the installation of the mains and manholes were observed by Township representatives. There is a private pump station in the system that discharges into the municipally owned trunk line along Willowbrook Road. The Township has an intermunicipal agreement with both Hanover Township (Lehigh County) and the Borough of Catasauqua for the conveyance and treatment of the sewage discharged from the warehouses along Willowbrook Road. Flow from these developments is metered at the interconnection point with the Hanover Township (Lehigh County) and meter readings are reported quarterly to Hanover Township (Lehigh County) and Catasauqua Borough. The municipally owned sewer mains in the Borough and Catasauqua Borough public service areas are shown in Figure 15.25.

Pump Stations

Borough

Refer to Table 4.25 for a summary of pump stations in the Borough.

Township

The Township conveyance system contains two pump stations that are operated by Borough personnel, including the Willow Green Pump Station and the Horwith Pump Station. A summary of these pump stations is given below:

The Willow Green Pump Station was installed in the 2000s by a contractor for a private developer. A few years later, the Township was forced to take ownership. Little information exists regarding the installation of the system and pump station. However, the Township has been working towards upgrading and maintaining the system and pump station, particularly in recent years. A wet well level monitor was installed, with the intention that is will ultimately replace the float system as an alarm indicator and pump operational control. A wireless alarm system and pump station monitor has also been installed, which allows for the ability to monitor pump cycles and operations, wet well conditions, generator run times, and loss of power. The pumps appear to be operating roughly at 100 gpm and a 4-inch force main discharges to a gravity manhole within the development. From there, the effluent continues through the gravity collection system from the rest of the development for ultimate discharge into the Borough collection system. There are no proposed or anticipated future connections to this pump station due to topographic and municipal boundary limitations.

The Horwith Pump Station serves a small area of Industrial/Commercial properties along Route 329 to the east of the Hokendauqua Creek. Current uses in this area consist of a gas station with food service, a few low-use offices, and a trucking depot. The pump station discharges through a 4-inch force main, across the Hokendauqua Creek to a gravity manhole in the Borough. The Township installed a flow meter at the pump station in 2018 as well as a wireless alarm system which monitors pump cycles and operations, wet well conditions, generator run times, and loss of power. The influent flow pattern into this pump station is very consistent, with most of the flow occurring during the weekdays and very little flow over the weekends. The pumps operate at 40 gpm and the only issue with the pump station is that a float fails occasionally. Through the online monitoring system, this issue is usually noticed and rectified quickly.

III.A.2 – Wastewater Treatment Plant

The Borough WWTP is located at 2 Lerchenmiller Drive, Northampton, PA 18067. The plant was originally constructed in 1928 as a primary treatment plant. In 1956, the plant was upgraded to include secondary treatment with the addition of a rock media trickling filter. In 1959, an anaerobic digester and vacuum filter were added.

To meet new effluent limitations, the plant was upgraded again in 1990. This upgrade replaced aging equipment and converted the plant process from fixed film system to activated sludge. The activated sludge process utilized is ICEAS (Intermittent Cycle Extended Aeration System). This process is used for suspended solids (SS), organic removal, and nitrification.

Three ICEAS basins are currently present, with provisions and some equipment/piping for a future fourth basin. Digested solids generated within the ICEAS basins are stored within the two sludge holding tanks before being dewatered on a belt filter press (BFP) prior to disposal. During this upgrade, the liquid chlorine system was changed to ultraviolet (UV) light disinfection (17). The process train can be summarized as follows:

Table 2.50: Treatment and Sludge Process Diagram

Treatment Process:

Flow Metering → Screening → Grit Removal → Pre-Aeration Basin → Pumping →

ICEAS Tanks → Effluent Equalization Tank → Disinfection → Hokendauqua Creek

Sludge Process:

ICEAS Tanks → Sludge Holding Tanks (aerobic) → Belt Filter Press → Landfill

The only chemical used in sufficient quantity on a regular basis at the WWTP is polymer for the BFP. This polymer is stored in leak-proof containers in a spill control area inside the dewatering building. Small quantities of dry chlorine are used to clean the UV channel once a week. Any other chemicals used are stored in small quantities and used intermittently (17).

Discharge Parameters

The NPDES permit for the Borough WWTP is PA0031127 and the WQM Part II Permit is 4887414. The design of the plant is based on an average monthly flow of 1.50 MGD, organic loading of 2,190 lbs/day, and a Peak Wet Weather flow rate of 4.42 MGD. In 2014, the plant was re-rated to a maximum monthly design flow of 1.65 MGD and a maximum monthly organic load of 2,409 lbs/day. This plant re-rate was done under WQM Permit 4813404. The current NPDES Permit is set to expire on August 31st, 2022.

The WWTP outfall is located within the Hokendauqua Creek, which is tributary to the Lehigh River. The effluent limitations based on the NDPES permit for the Borough WWTP are shown in the Table 3.

Table 3: NPDES Permit Effluent Limitation Parameters

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lb/day)(1)		Concentrations (mg/L)				Minimum Measurement Frequency (2)	Required Sample Type
	Average Monthly	Weekly Average	Min.	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.17	See Permit*	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	312	500	XXX	25.0	40.0	50.0	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) - Intake	XXX	XXX	XXX	Report	Report	XXX	2/week	24-Hr Composite
Total Suspended Solids	375	563	XXX	30.0	45.0	60.0	2/week	24-Hr Composite
Total Suspended Solids - Intake	XXX	XXX	XXX	Report	Report	XXX	2/week	24-Hr Composite
Fecal Coliform (CFU/100 mL) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
Fecal Coliform (CFU/100 mL) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	182	XXX	XXX	14.5	XXX	29.0	2/week	24-Hr Composite
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1,000	XXX	XXX	1/month	24-Hr Composite
Copper, Total (µg/L)	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite

Notes:

(1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.

(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.

III.A.3 – Problems with Existing Facilities

Borough

In 2012, the Municipal Wasteload Management Report (i.e. Chapter 94 Report) projected an organic overload at the WWTP and a CAP was enacted. Upon further review, the Borough Engineer realized that the Basis of Design and subsequent WQM Part II Permit for the WWTP were based on average monthly ratings and did not consider maximum monthly ratings. In 2014, a WQM Part 2 Permit (4813404) was completed to document the maximum monthly flow (1.65 MGD) and maximum monthly organic loading (2,409 lbs/day). This was done for the purpose of Chapter 94 reporting and to bring the WWTP back into compliance until more substantial improvements could be planned for.

Table 3.50 and Table 3.75 summarize all permit violations for the Borough WWTP in recent years. Most of the violations occurred between July 1st and September 30th, 2018, and again in June and August of 2020. **Section II.B.1 – Summary of Creek Watershed Areas, Surface Water Areas, and Impoundments** highlights the intensive precipitation that fell during those time ranges.

Most permit violations at the WWTP occurred during high flows caused by frequent, prolonged, and heavy precipitation events. This is particularly true for fecal coliform violations, which could be avoided in the future with improvements to the WWTP. Only a small fraction of these violations were due to operator error.

A review of the current Municipal Wasteload Management Report (Ch. 94 Report) indicated that the Borough WWTP is near capacity (a copy of this report is presented in **Appendix G**.) The WWTP operating near capacity was anticipated even with the 2014 rerate, and addressing this issue is one of the primary objectives of consideration of this Act 537 Plan Update.

Table 3.50: Northampton Borough Wastewater Treatment Plant Permit Violations				
Date(s)	**Parameter**	**Permit Limit**	**Result/ Exceedance**	**Nature of Violation**
Week of February 24, 2016	Overflow	None specified	60,000 gal	Overflow of headworks of plant
November 15, 2017	Ammonia-Nitrogen	None specified		Effluent 24-hr Ammonia-Nitrogen composite sample not taken
February 13, 2018	Overflow	None specified	5000 gal	Sanitary Sewer Overflow
April 6, 2018	Overflow	None specified	10,000-20,000 gal	Sanitary Sewer Overflow
June 24, 2018	D.O.	5.0 mg/L	39 mg/L	Not meeting Dissolved Oxygen permit limit
Week of July 12, 2018	CBOD	500 mg/L	685 mg/L	Exceedance of CBOD permit limit due to high flows
July 24, 2018	Fecal Coliform	1000 CFU/100 mL (I.M.)	1089 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
July 26, 2018	Fecal Coliform	1000 CFU/100 mL (I.M.)	1393 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
July 30, 2018	Fecal Coliform	200 CFU/100 mL (G.M.)	239 CFU/100 mL	Exceedance of Fecal Coliform counts in Effluent sample
July 30, 2018	Fecal Coliform	1000 CFU/100 mL (I.M.)	4440 CFU/100 mL	Exceedance of Fecal Coliform counts in Effluent sample
August 4, 2018	Overflow	None specified	319,000 gallons/ 8.5 hours	Overflow of headworks of plant
August 14, 2018	Fecal Coliform	1000 CFU/100 mL (I.M.)	2000 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
August 23, 2018	Fecal Coliform	1000 CFU/100 mL (I.M.)	1323 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
September 1, 2018	Ammonia-Nitrogen	182 lb/day	186 lb/day	Exceedance of Ammonia-Nitrogen permit limit
September 1, 2018	Ammonia-Nitrogen	14.5 mg/L	16.48 mg/L	Exceedance of Ammonia-Nitrogen permit limit
September 1, 2018	Fecal Coliform	1000 CFU/100 mL (I.M.)	100000 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
November 22, 2018	CBOD	312 lb/day	388 (338?) lb/day	Exceedance of CBOD permit limit due to high flows
December 1, 2018	CBOD Concentration	25 mg/L	25.37 mg/L	Exceedance of CBOD average concentration permit limit due to high flows
January 1, 2019	CBOD	500 lb/day	529 lb/day (W.A.)	Exceedance of CBOD weekly average permit limit
January 1, 2019	CBOD	25 lb/day	25.05 lb/day (M.A.)	Exceedance of CBOD average monthly permit limit
May 1, 2019	% CBOD Removal	85%	84%	% Removal of CBOD lower than permit limit
May 29, 2019	Fecal Coliform	1000 CFU/100 mL (I.M.)	2457 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
December 18, 2019	Overflow	None specified	200,000 gal	Equalization basin pumped down and control was IN HAND
April 22, 2020	Fecal Coliform	10,000 CFU/100 mL (I.M.)	11,000 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
June 24, 2020	Fecal Coliform	1000 CFU/100 mL (I.M.)	11,700 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample (Basin Offline)
June 25, 2020	Fecal Coliform	1000 CFU/100 mL (I.M.)	1155 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample (Basin Offline)
August 4, 2020	Fecal Coliform	1000 CFU/100 mL (I.M.)	3100 CFU/100 mL (I.M.)	Exceedance of Fecal Coliform counts in Effluent sample
August 4, 2020	Overflow	None specified	500,000 gal	Overflow of headworks of plant and Sanitary Sewer Overflow
December 1, 2020	Influent composite	None specified		Influent 24-hr composite sample not taken

Table 3.75: EPA 3-Year Enforcement and Compliance History of Northampton WWTP

Statute	Program/Pollutant/Violation Type				QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12
	CWA (Source ID: PA0031127)				04/01-06/30/18	07/01-09/30/18	10/01-12/31/18	01/01-03/31/19	04/01-06/30/19	07/01-09/30/19	10/01-12/31/19	01/01-03/31/20	04/01-06/30/20	07/01-09/30/20	10/01-12/31/20	01/01-03/31/21
	Facility-Level Status				No Violation Identified	Violation Identified	Violation Identified	Violation Identified	Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	Violation Identified	Violation Identified	No Violation Identified	No Violation Identified
	Quarterly Non-compliance Report History					Other Violation	Other Violation	Other Violation	Other Violation				Other Violation	Other Violation		
	Pollutant	Disch. Point	Monitor. Location	Freq.												
CWA	BOD, carbon. [5 day,20°C]	001 - A	Effluent Gross	Mthly			Nov:24%	Jan:0%								
CWA	BOD, carbon. [5 day,20°C]	001 - A	Effluent Gross	NMth		Aug:37%		Jan:6%								
CWA	Coliform, fecal general	001 - A	Effluent Gross	NMth		Jul:344% Aug:100% Sep:900%			May: 147%				Apr:10% Jun:1070%	Aug: 210%		
CWA	Nitrogen, ammonia total [as N]	001 - A	Effluent Gross	Mthly		Sep:14%										
CWA	Oxygen, dissolved [DO]	001 - A	Effluent Gross	Neither	Jun:22%											

Township

There are no known existing problems in the Township collection and conveyance system. In the limited flow monitoring and metering that the Township has started, there has been no evidence of any significant surcharge conditions or indications of excessive I&I. The Township will continue to evaluate the system through the flow metering and manhole inspection programs. The Township is planning to acquire sewer cleaning and televising equipment to monitor the conditions of the existing infrastructure in case the need arises for any repair or rehabilitation efforts.

Treatment Plant Need (Hydraulic Capacity)

The primary rating of any WWTP is the Annual Average Flow. This flow is calculated by averaging the Average Monthly Flows during a calendar year. Many of the pollutant removal calculations are based on an assumed Annual Average or Maximum Monthly flow. Assurance that a plant continues to operate below these thresholds is essential when determining if a plant is operating within design parameters.

Monthly data summarizing the flow entering the WWTP between 2013 and 2020 is summarized in Table 4. Annual rainfall amounts and EDUs have been shown for comparison purposes.

Table 4: Northampton Borough Monthly Average Flows for the Past 8 Years (MGD)

	2013	2014	2015	2016	2017	2018	2019	2020
January	1.099	1.282	1.058	0.944	0.957	1.063	1.558	0.943
February	1.098	1.126	1.000	1.355	0.848	1.431	1.308	1.046
March	1.077	1.174	1.326	0.871	1.038	1.277	1.357	0.979
April	1.010	1.246	1.026	0.781	1.288	1.151	1.294	1.120
May	0.882	1.272	0.768	0.851	0.991	1.322	1.731	0.941
June	1.088	1.029	0.972	0.713	1.020	0.958	1.170	0.883
July	0.954	0.928	0.996	0.759	1.179	1.175	1.281	0.860
August	1.211	0.865	0.793	0.695	1.181	1.922	0.886	1.130
September	1.050	0.828	0.752	0.688	1.021	1.415	0.731	0.910
October	0.914	0.856	0.838	0.711	0.893	1.257	0.937	0.863
November	0.919	0.902	0.773	0.759	0.868	1.824	1.066	0.823
December	1.144	1.087	0.903	0.862	0.841	1.566	1.064	1.187
Annual Average	1.037	1.050	0.934	0.832	1.010	1.363	1.199	0.974
Max 3-Month Average	1.091	1.231	1.128	1.067	1.127	1.549	1.649	1.048
Total Annual Rainfall (In)	46	45	41	37	50	67	61	50
Total EDUs	5,534	5,556	5,597	5,637	5,647	5,691	5,723	5,799
Avg. Flow per EDU	187	189	167	148	179	240	210	168
Avg. Flow per Capita	75	76	67	59	72	96	84	67
Plant is Rated 1.65 MGD								

The plant approached the rated capacity in 2018 and 2019. A plant is considered to be at capacity when the flow exceeds the rated capacity for 3 consecutive months. Although it was close, an overload did not occur during those years.

It should be noted that 2018 and 2019 were particularly wet with 67-inches and 61-inches of precipitation, respectively. The average precipitation in the Borough is 47-inches. The increase of flow during 2018 and 2019 compared to other years highlights the need to implement some form of I&I reduction.

Treatment Plant Need (Wet Weather Capacity)

Monthly average flows into a treatment plant is not necessarily indicative of the peak instantaneous flows. Depending on the extent of I&I, the peak flow into a plant can vary significantly between municipalities. This is particularly true for systems with older infrastructure.

A review of the records for the plant confirms that the influent has exceeded the peak wet weather capacity (4.42 MGD) at an average of 5 times per year over the past 10 years. When wet weather events contribute flows that exceed the capacity of a facility, inadequate treatment, operational difficulties, and/or permit violations can result. The Borough has the need to increase the peak wet weather rating of the plant from 4.42 MGD to 6.0 MGD and implement I&I improvements to ensure that wet weather flows do not exceed 6.0 MGD. Wet weather issues with the collection system are discussed further in **Section III.A.3 – Collection and Conveyance Needs – Aged Infrastructure**.

Treatment Plant Need (Organic Capacity)

To assure adequate biological treatment, the sewage plant was rated in 1990 for a maximum monthly organic load of 2,190 pounds per day (lbs/day). In 2012, the plant reached this limit and a CAP was required to manage the organic overload. The plant was re-rated in 2014 to 2,409 lbs/day to bring it back into compliance. This was a “paper re-rate” and no physical improvements were made to the WWTP. The engineer who prepared the re-rate noted that “The 2014 re-rate should be considered a temporary measure until an Act 537 Plan is completed to allow for an upgrade of the WWTP.” The intent of this Act 537 Plan Update is to provide the necessary planning for that upgrade.

Since 2013, the organic loading has remained near the limit of the plant. Influent data between 2013 and 2020 is provided in Table 4.10 below.

Table 4.10: Northampton Borough Monthly Average Organic Load for the Past 8 Years (lb/day)

	2013	2014	2015	2016	2017	2018	2019	2020
January	1,836	2,034	1,588	1,886	1,957	1,812	2,221	2,023
February	1,577	2,243	1,787	2,072	1,737	1,829	1,967	1,955
March	1,576	1,583	1,615	1,627	1,956	1,771	1,921	2,122
April	1,768	2,232	1,648	1,630	1,975	1,995	1,930	2,381
May	2,169	1,938	1,690	1,774	1,898	1,810	1,830	2,309
June	1,708	1,552	2,001	1,827	1,613	1,485	1,683	2,214
July	1,376	1,488	1,585	1,397	1,703	1,910	1,208	2,089
August	1,851	1,787	1,441	1,586	2,077	1,890	1,570	1,756
September	1,727	1,729	1,641	1,449	2,078	2,401	1,296	2,005
October	1,661	1,753	1,693	1,692	2,008	1,804	1,653	1,807
November	1,852	1,940	1,693	1,947	2,018	1,927	1,625	1,779
December	2,225	1,906	1,891	1,877	2,045	2,051	1,914	1,955
Annual Avg.	1,777	1,849	1,689	1,730	1,922	1,890	1,735	2033
Max Month Avg.	2,225	2,243	2,001	2,072	2,078	2,401	2,221	2,381
Total EDUs	5,534	5,556	5,597	5,637	5,647	5,691	5,723	5,799
Plant is rated 2,409 lbs/day								

Organic treatment for this facility is provided by the three ICEAS basins operating in parallel. Each of the ICEAS basins provide flow equalization, biological oxidation, nitrification, sedimentation, and aerobic sludge digestion. The sizing of these tanks was based on a maximum monthly organic concentration of 175 mg/L. Prior to 1985, 175 mg/L was the typical organic concentration entering the plant. However, since the water conservation measures implemented in the 1990s, the organic concentration entering the plant has increased. Table 4.20 below shows that the trend of the organic concentration entering the plant has consistently been above the design value of the plant.

Table 4.20: Northampton Borough Monthly Average Organic Concentrations for the Past 8 Years (mg/L)

	2013	2014	2015	2016	2017	2018	2019	2020
January	200	190	180	240	245	204	171	269
February	172	239	214	183	246	153	180	234
March	175	162	146	224	226	166	170	272
April	210	215	193	250	184	208	179	268
May	295	183	264	250	230	164	127	310
June	188	181	247	307	190	186	172	302
July	173	192	191	221	173	195	113	315
August	183	248	218	274	211	118	212	219
September	197	250	262	253	244	203	213	242
October	218	246	242	285	270	172	212	270
November	242	258	263	308	279	127	183	264
December	233	210	251	261	292	157	216	226
Annual Avg.	207	214	222	255	232	171	179	266
Max Month Avg.	295	258	264	308	292	208	216	315
Plant was designed based on 175 mg/L								

The design of the aeration system, timing of stages, and sizing of the ICEAS basins were all based on a lower concentration than what is experienced today. As a result, the capacity for biological treatment for this facility will be limited by the organic loading rather than hydraulic loading.

Treatment Plant Need (Solids Management – including TSS)

Every day organic and inorganic solids enter the plant. To maintain mass balance, these solids are either digested by bacteria or hauled offsite. The operator manages the balance of solids by adjusting the wasting rate within the ICEAS basins. Once the solids leave the ICEAS basins, it is processed in four stages:

1. Sludge Holding
2. Sludge Thickening
3. Dewatering
4. Sludge Removal

This facility is experiencing issues with each of these stages that need to be addressed.

Stage 1 – Sludge Holding

Sludge wasted from the ICEAS Basins is conveyed to the either the Small Holding Tank (51,000 gallon) or the Large Holding Tank (205,000 gallon). The primary purpose of these holding tanks is to store the sludge until it could be dewatered and hauled offsite. Table 4.23 on the following page shows the amount of sludge produced in the past 8 years and the holding time as compared to the design of the plant.

The amount of liquid sludge wasted from the ICEAS tanks over the past 8 years has been 156% of the original design and the total pounds of sludge produced was 225%. As a result, the time available for the operators to dewater and remove sludge from the plant has decreased from an average of 16.4 days to 10.5 days. The inability to dewater and haul away solids within 10.5 days has backed up the operation of the ICEAS basins. This problem is projected to get worse over time. The 2014 rerate assumed the facility would be able to remove sludge within 6.6 days.

The two sludge holding tanks permitted to hold sludge have become undersized and do not meet the operational needs of the facility.

Table 4.23: Northampton Borough Wastewater Treatment Facility Sludge Production 2012 - 2020												
	Units	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**9-Yr Average**	**1990 Design**	**2014 Rerate**
Sludge Wasted	(gal/yr)	7,216,613	8,544,036	9,436,377	8,436,377	9,465,382	9,287,889	8,271,224	8,006,377	9,766,886	8,714,573	5,698,380	14,096,300
	(gal/d)	19,772	23,408	25,853	23,113	25,933	25,446	22,661	21,935	26,759	23,876	15,612	38,620
	(ton/yr)	507	569	545	574	561	572	480	484	494	532	238	411
	(lbs/d)	2,778	3,118	2,986	3,145	3,074	3,134	2,630	2,652	2,707	2,914	1,302	2,255
Solids Conc.	(%)	1.68	1.6	1.39	1.63	1.42	1.48	1.39	1.45	1.21	1.46	1.00	0.7
Sludge Holding Time*	(days)	12.9	10.9	9.9	11.1	9.9	10.1	11.3	11.7	9.6	10.7	16.4	6.6
*Note: based on capacity of small and large holding tanks													

Stage 2 - Sludge Thickening

Both the Small and Large Holding Tanks were originally intended to perform as aerobic digesters. The purpose of aerobic digesters is to reduce the amount of organic solids in the system that need to be stored, dewatered, and ultimately landfilled.

Typically, the volatile solids of the biomass within an aerobic digester can be reduced by 40% and the residual biomass can be concentrated between 2% and 4%. When solids are destroyed and the remaining solids concentrated, the need to store liquid sludge is reduced. For example, the total volume required to store 4% solids is half of the volume required to store 2% solids. For this reason, any progress towards solids concentration is beneficial.

At the Borough WWTP, the tanks do not store sludge long enough for digestion to occur. Based on operator reports, the volume of solids entering these two tanks are roughly equal to the volume solids leaving these tanks.

This facility has the need to increase the concentration of solids within the sludge holding tanks. This will provide additional storage time within the existing tanks and allow digestion and reduction of solids to occur.

Stage 3 – Dewatering

Dewatering at the Borough WWTP is provided by the BFP, which was installed during the 1990 upgrade. The BFP is housed within the Dewatering Building adjacent to the two Sludge Holding Tanks. According to recent operator reports, the press currently produces cake between 15% and 18% solids.

The BFP is operated an average of 40 hours per week. The 1990 design calculations estimated the press would only be operated 16 to 24 hours per week. The additional amount of operation is due to the increased amount of sludge being generated by the facility and the decreased concentration of solids within the sludge. The inability to dewater more sludge from the plant is backing up the Holding Tanks and the biological process within the ICEAS Basins.

Stage 4 – Sludge Removal

During the 1990 upgrade, it was anticipated that the plant would utilize land application for sludge disposal. However, due to increased restrictions, the Borough has transitioned away from land application. The 1990 design also anticipated the use of reed beds. These beds have been abandoned and are no longer active. Currently, the only method to remove dewatered sludge from the site is to haul it away and dispose at a landfill.

After sludge is dewatered, it is stored within a 10 cubic yard (cy) dumpster until it is hauled away. The dewatering operation cannot continue until another dumpster is delivered. A new dumpster is delivered the next day, with deliveries occurring 5 or 6 days a week. Due to logistics, only one dumpster is typically delivered each day.

The 1990 Basis of Design did not designate a particular size of dumpster for this facility. Due to the layout of equipment and the configuration of the site, only a 10-cy dumpster fits within the allocated space. A larger dumpster would require a modification of the existing building and equipment.

The limitation of a 10-cy dumpster is a bottleneck that backs up the entire operation of the plant. By hauling away more sludge, the operators would be able to press additional sludge on the BFP.

Treatment Plant Need (Solids from Water Treatment Plant)

The NBMA WTP provides water service for roughly 50,000 people residing in six different municipalities (Northampton Borough, North Catasauqua Borough, Coplay Borough, Allen Township, Whitehall Township, and North Whitehall Township). The primary water source for the WTP is the Lehigh River, while the secondary source is Spring Mill Reservoir. The treatment process for the NBMA WTP was previously described in **Section II.F – Potable Water Supplies**.

As a result of the water treatment process, the facility generates waste. One hundred percent of the process waste generated by the WTP is discharged into the Borough collection system at the Jeffrey Lane Pump Station and treated at the Borough WWTP. The WTP does not utilize any other method of removing process waste.

The waste is primarily Powered Activated Carbon (PAC), aluminum sulfate, and SS from the Lehigh River. The proportion of these three treatment chemicals depends on the Lehigh River flow and the season. During summer months, it is primarily PAC and during winter months, it is primarily SS, from the Lehigh River.

The Borough WWTP was last upgraded in 1990 with the intention of receiving waste from the NBMA WTP. The 1985 Basis of Design for the Borough WWTP anticipated a maximum of 1,000 lbs/day of inorganic solids and 8 lbs/day of organics from the WTP. The discharge from the WTP is not regularly sampled but the Borough believes that the solids have exceeded the current design values resulting in operational issues at the WWTP.

In 2007, the NBMA WTP was upgraded. The capacity of the WTP was increased from 6 MGD to 8 MGD, with provisions for 12 MGD. The anticipated waste from the upgraded facility was evaluated in the design memo titled “New 8 MGD Treatment Plant and Related Facilities – Design Memorandum – Append D – Residuals Waste Treatment”. This report will be referred to as “Residual Waste Study” and is provided in **Appendix K**.

As per the Residual Waste Study, the anticipated solids produced by the WTP varies significantly, depending on the quantity of water treated and the SS of the Lehigh River. Table 4.24, shown below, is from page 4 of the Residual Waste Study (40).

Table 4.24: Northampton Borough Municipal Authority Solids Production - Residual Waste Study

Treated Flow (mgd)		Solids Production (lbs/day)	
		Average Solids (21 mg/l)	Maximum Solids (308 mg/l)
Minimum	3.0	525	7,706
Average	5.3	928	13,614
Maximum	8.0	1,401	20,549
Ultimate	12.0	2,102	30,825

Currently, the WTP treats roughly 4.0 MGD of drinking water. Based on the above table, the solids loading from the WTP at 4.0 MGD is extrapolated to be 700 lbs/day (Average) and 10,275 lbs/day (Maximum). As previously discussed, the 1985 design for the WWTP was 1,000 lbs/day of solids from the WTP and 3,171 lbs/day from the entire Service Area. **The WTP alone could easily overload the WWTP.** Although the Borough does not believe it received any discharges as high as 10,275 lbs/day, there are no safeguards in place to prevent this from occurring.

As previously discussed, the Borough WWTP has an issue with excessive solids. The WTP could be responsible for the excess sludge at the WWTP, but that assertion has not been confirmed. The operation of the WTP does not require any monitoring of the solids in the discharged waste. The only parameter monitored is the volume of waste as measured by a flow meter. The Borough samples the combined influent for the plant and does not monitor any individual discharges. As a result, the actual quantity and variability of solids discharged from the WTP is unknown.

The Borough has the need to protect the WWTP by sampling the WTP discharge to assume the WTP is not inadvertently overloading the WWTP.

Treatment Plant Need (Headworks Building)

The Headworks Building was constructed during the 1990 upgrade. The building contains the influent channel, a bar screen, an aerated grit chamber, and accessory equipment. Each of these items has operational issues.

The screening system consists of a coarse screen that is cleaned by a mechanical rake arm that drops screenings onto a conveyor and then into a dumpster. All solids less than 1/2 inch in size pass through the bars and enter the WWTP. As a result, rags accumulate on all downstream equipment and clog pumps. This has become a serious maintenance issue for this facility.

The amount of grit removed by the aerated grit chamber is substantially less than expected. The system is ineffective, and the accumulation of grit has been observed in all downstream tanks. During wet weather, the chamber is surcharged, and flow is conveyed through the bypass channel around the grit removal system. This circumstance effectively bypasses the entire process.

The capacity for the influent channel inside the Headworks Building is limited. It has multiple bends and changes, reducing the hydraulic capacity of the channel as well as the effectiveness of the screening and grit removal equipment. The conveyor for the bar screen is an obstruction that cuts across the upper half of the channel. The opening in the channel for the conveyor also creates a low point where sewage has overflowed several times in recent years.

For the above reasons, the Borough has the need to replace their Headworks Building. It is noted that any capacity improvements to the Headworks Building would also require an improvement to the primary lift station. This lift station pumps transports all sewage from the Headworks Building to the ICEAS Basins.

Treatment Plant Need (UV Chamber)

The UV Chamber was built on the northwestern side of the effluent tank as part of the 1990 upgrade and provides disinfection of pathogenic microorganisms. There have been several violations in the amount of fecal coliform being discharged into the stream in recent years. The UV system has had issues with the electrical system as well. The UV conduits are packed full, and this has resulted in several fires. Any major upgrade to the plant should consider replacement of this system.

Collection and Conveyance Need (Aged Infrastructure)

The original construction of the Borough sanitary sewer system was around 1927. Another major portion of the system was built around 1954. As a result, 75% of the lines in the Borough are over 70 years old.

In 2020, the Borough relined 2 manholes. Considering 550 manholes currently exist within the system, this rate of 2 manholes relined a year would equate to 275 years. The rate of growth, especially within the Township, provides additional flow each year, increasingly reducing the available capacity within the existing lines of the Borough. To manage the wet weather flows and replace aged infrastructure, the Borough has the need to increase the annual maintenance of their system.

To facilitate an effective maintenance program, a comprehensive investigation of the system should be conducted. Gathering information by televising lines or I&I monitoring would provide the necessary information to make informed decisions regarding maintenance of the system.

Collection and Conveyance Need (Known Back-ups in Borough)

In a conversation with the Borough Manager on June 7th, 2021, it was noted that two areas of the Borough are known to have back-ups: West 27th Street and the 1800 – 1900 block of Washington Avenue. Based on the tributary area to the collection lines in these areas, the existing sewer mains are adequately sized. The back-ups are likely caused by excessive I&I. The I&I resulting in these back-ups needs to be addressed by the Borough.

Collection and Conveyance Need (21st Street Pump Station)

The 21st Street Pump Station has a known issue of recycled flow. When the downstream system is surcharged, sewage flows over a bypass within the discharge manhole and back towards the pump station. The intent of this configuration is to prevent flooding of residential basements. This cycle continues until downstream capacity becomes available. It is believed that recycled flow occurs only a couple of times a year during extreme wet weather events.

Separately, the pumps at 21st Street Pump Station experience re-occurring blockage issues. The Borough Manager and WWTP Superintendent expressed their concerns about two businesses in the area as potential contributors.

Sacred Heart Senior Living by the Creek, a senior assisted living residency, agreed to color-code their handcloths and towels to help resolve this issue. The contributor was identified but new rags still enter the system. Sacred Heart then switched over to disposable wipes, which were in use for a short while. Shortly after the switch, rags started to appear again blocking the pumps. Unfortunately, after years of trying to resolve this issue, the pump station still clogs with rags. This issue has been problematic for a prolonged period of time and a more sustainable solution is required.

Collection and Conveyance Need (Pump Station Condition/ Replacement)

Borough

Many of the Borough pump stations have been continuously operating with the original pumps and piping for more than 50 years. As a result, replacement parts are hard to find and there is an elevated risk that catastrophic failure could occur.

Two of the pump stations were originally built starting in 1927, making those pump stations around 100 years old. Though numerous upgrades have occurred through the years with these pump stations, an overall assessment of should be made of their long-term functionality. Refer to Table 4.25 for a summary of pump stations in the Borough.

Table 4.25: Northampton Borough Pump Station Summary

Pump Station	**Year of Construction (or Plan Date)**	**Year of Upgrade or Major Renovation**
Main Plant	1951	2021
21^{st} Street	September 1929	January 1959, April 1980
Generator	September 1995	
Jeffery Lane	July 1999	
King Street (Formerly Washington Ave)	September 1951	September 2008
Newport Avenue	2006	
Smith Lane	1985	2015
Stewart Street	January 1928	January 1959

Based on the above table, 21^{st} Street and Stewart Street have been operating for a significant amount of time since their last major renovation. The Borough has the need to evaluate these facilities in further detail and plan for their eventual replacement.

Township

The 2 pump stations within the Township are of newer construction and there is minimal concern for repairing these stations.

<u>Collection and Conveyance Need (I&I Reduction)</u>

Criteria for evaluating I&I of a collection and conveyance system is best described in the Environmental Protection Agency (EPA) Handbook “Sewer System Infrastructure Analysis and Rehabilitation” (38). Based on this manual, investigations have often shown that aged sewer systems require rehabilitation or replacement to remain serviceable and accommodate expanding service areas. Due to the high cost of increasing interceptor and collection system capacity, especially in fully developed areas, municipalities need to take steps to minimize I&I when practical.

Understanding to full extent of I&I within a sewer system is often difficult. In many cases, it is not possible to clearly distinguish inflow, groundwater infiltration, and Rain Induced Infiltration. The sum of these components, however, can be estimated by subtracting the baseline flow from the total flow. These numbers can be used and compared to the accepted rules of thumb of 120 gpcd of domestic plus non-excessive I&I flow. The total daily flow during a rainstorm is evaluated separately and should not exceed 275 gpcd (pg.7,38). A cost-effective analysis for I&I requires that these two components be separated.

The flow rate of 120 gpcd for infiltration analysis contains two flow components: 80 gpcd of domestic base flow and 40 gpcd of non-excessive infiltration. When infiltration significantly exceeds 120 gpcd, further evaluation of the sewer system must be performed to determine the possibility of excessive I&I through a cost effectiveness analysis.

Although the Borough does not have any permanent meters within their collection and conveyance system to evaluating I&I, they do monitor flows at the plant. Fluctuations of flow at a WWTP can be an indicator of systemic I&I issues.

The recorded flows into the WWTP over the past 8 years are presented in Table 4.30. Based on the Borough census of 2.5 capita per household, the EPA threshold of 120 gpcd is equal to 300 gpd and during storms, 275 gpcd is equal to 688 gpd.

Table 4.30: Summary of Flow and EDUs in Northampton Borough over Past 8 Years

	2013	2014	2015	2016	2017	2018	2019	2020
EDUs	5534	5556	5597	5637	5647	5691	5723	5799
Average Flow (MGD)	1.037	1.050	0.934	0.832	1.010	1.363	1.199	0.974
Max 3-month Flow (MGD)	1.091	1.231	1.128	1.057	1.127	1.549	1.649	1.048
Average Flow/ EDU	187	189	167	148	179	240	210	168
Max 3-month Flow/ EDU	197	222	202	188	200	272	288	181
Peaking Factor	1.05	1.17	1.21	1.27	1.12	1.14	1.38	1.08
Annual Rainfall (in)	46	45	41	37	50	67	61	50

Although the EDUs connected to the WWTP over the 8-year period is relatively stable (roughly 0.5% growth per year), the flows entering the plant fluctuate with the amount of rainfall. There is certainly opportunity for reduction but based on the table and EPA criteria, the I&I for the Borough does not appear to be excessive or systemic.

III.A.4 – Treatment Plant Discussion

<u>Completed Upgrades/ Expansion</u>

The only improvement to the WWTP in the past 5 years has been the upgrade of the “Main Pump Station”. This pump station is situated within the treatment plant property and conveys sewage entering the plant from the eastern half of the Borough to the Headworks Building. In December 2020 through May 2021, the main pump station in the plant was renovated and upgraded from a capacity of 1.08 MGD to 1.36 MGD. The two pumps that were present since 1956 were removed, and replaced with three pumps, allowing for additional pumping capacity. Along with new pumps, new piping and valves were installed, creating a much cleaner and drier area for the pumps than before, greatly reducing concerns for corrosion. A new forcemain was connected to the siphon chamber, and the old forcemain was abandoned in place. A new electrical ductbank was installed between the main operations building and main pump station, with new wiring run to the main pump station and spare conduits in anticipation of a future upgrade to the plant.

Reserve Capacity/ Allocation of Reserve Capacity

Conveyance capacity within the sewer lines and treatment capacity at the WWTP are sold through the purchase of EDUs.

Borough

The Borough sells capacity directly to Borough residents through their tapping fee.

Township

The Township has their own tapping fee that includes conveyance through their collection system and treatment at the Borough WWTP, and purchases capacity at the Borough WWTP through inter-municipal agreements. Each of the inter-municipal agreements serve a particular group of developments and have different legal requirements. The capacity of connections between the Borough and the Township are reviewed with each intermunicipal agreement.

Rate of Growth with Existing and Proposed Facilities

Due to a lack of undeveloped land and the general decline of industry in the area, the Borough does not anticipate any significant growth in the near future. The potential for growth within the service area will come from within the Township. In order to facilitate such growth, contractual obligations between the Township and the Borough need to be established to support current and future financing of the WWTP and sanitary sewer system.

In the past, the Borough and the Township have worked together in cooperation to facilitate combined growth (refer to Table 2 and Table 2.25 in **Section I.A.1 – Previous Planning Efforts** for a list of previous planning studies and cooperative efforts.) The Township has utilized all of their purchased capacity and has the desire to purchase more.

Based upon the 2021 Municipal Waste Load Report (Ch. 94 Report) (22), the Township requires 253 EDUs to satisfy the planned connections between 2021 and 2025. The Township does not currently own this capacity and has tried to purchase this capacity from the Borough.

To facilitate future growth, the two municipalities need to come to an agreement for the sale of capacity, and the Borough WWTP will need to upgrade their plant to acquire the necessary capacity. Without additional capacity, any remaining reserve capacity will be quickly used up, leaving no capacity left for either the Borough or the Township.

The Borough of Catasauqua has provided documentation to the Township that indicates they have significant capacity at their WWTP to accept flow from Allen Township. Catasauqua Borough has an on-going operation and maintenance plan to address planned capital improvement projects. At the present, there is no indication the Catasauqua Borough has any need for capital improvement projects resulting from the introduction of additional flow from Allen Township.

III.A.5 – Small Flow Treatment System O&M Requirements

There are no small flow treatment systems in the Borough or the Township.

III.A.6 – Disposal Areas

The main effluent outfall of the Borough WWTP discharges to the Hokendauqua Creek, and the only treatment facility in the Township discharges to a stream.

III.B.1 – Use of On-Lot Systems

The PA DEP has released a document called “Impact of the Use of Subsurface Disposal Systems on Groundwater Nitrate Nitrogen Levels” (25). This document discusses the advantages and disadvantages of OLDS based upon the potential impact of nitrate-nitrogen pollution on groundwater resources.

Borough

There are 18 OLDS present within the Borough. These systems were installed because public sewer was not adjacent to their property when their dwelling was constructed. Over the years, additional sewer lines were built and now many of them could be connected to public sewer with minimal effort.

For example, the Borough owns a public sewer main that runs along Main Street near 1st Street at the southern end of the Borough (See **Appendix L** Figures L-23 through L-26). The homes located on Grape Street and Newport Avenue are situated at a lower elevation than Main Street were not able to connect to the sewer main by gravity when they were built. In 2005, a developer built 8 townhomes on Newport Avenue and installed a pump station to convey sewage from the townhomes up to Main Street. At that time, the existing homes on Grape Street and Newport Avenue could have abandoned their OLDS and connected to the pump station but were not required.

According to a conversation with personnel from Lehigh Engineering on May 17th, 2021, there are no known malfunctioning OLDS within the Borough. Lehigh Engineering has been contracted for the Borough since January 11th, 2011, and this is considered to be support for the premise that these OLDS have not been malfunctioning within this time frame.

A door-to-door survey for each of the OLDS systems was completed. The results of these surveys will be included with the Final Act 537 Plan and will be shown in **Appendix O**.

Refer to **Section III.B.3 – On-Lot Disposal Needs** for more information about the limiting nature of the soils in the Borough.

Due to the preference from the Borough, as written within the Northampton Borough Code and the Comprehensive Plan 2005 – 2030, no new OLDS are allowed for new development. In the long term, it is expected that all 18 OLDS will eventually connect to public sewer.

Relevant sections of the Borough Code (19), as they relate to OLDS, public sewer, and connection or installation of systems, are listed below:

- Chapter 190 discusses the requirements of the Borough in order to connect a user to the sanitary sewer system. Relevant portions of this chapter are listed in **Appendix D**.

- Under subsection 215-24 of Article V – Design Standards "Subdivision and Land Development," the Borough lists preference in terms of installation of sanitary sewage disposal systems. Also included in this subsection is the consideration of the installation or use of OLDS. This subsection is shown in **Appendix D**.

Township

The majority of OLDS in the Township are traditional septic tanks and drain fields. Table 4.60 shows the types of OLDS present with the Township.

Table 4.60: Analysis of SEO Records and Door-to-Door Survey Results for Allen Township	
Sewage System Description*	Percentage of Homes Surveyed (%)
Septic tank	93
Cesspool	1
Holding Tank	1
Elevated Sand Mound	20
In-ground System	9
Alternate System	3
Privy	0
Unknown System	0

* Note: some systems were cross-listed

Representatives of the Township Engineer (Barry Isett and Associates) contacted Township residents in 2021 and conducted a survey of OLDS owners utilizing PA DEP methodology (See **Section III.B.2 – Sanitary Survey** for a summary of this methodology). Since the study area for this Plan is the entire township, with little to no indication of failures due to survey results and SEO records, the target response rate was 15% for the Township.

In total, combining the field verification surveys and the mail-in questionnaire responses, a approximately 100 properties were evaluated for the condition of the OLDS and categorized according to these classifications. Table 4.70 shown below gives a summary of the results of the sanitary survey for the Township.

Table 4.70: Summary of Allen Township OLDS Sanitary Survey Results

CLASSIFICATION (MALFUNCTION CATEGORY)	SURVEY RESULTS (%)
No Malfunction	73
Potential	27
Suspected	0
Confirmed	0
TOTAL	100

The survey was conducted throughout the Township, with the greatest response rate from the central area of the Township. SEO records indicate that there are no concentrated areas of OLDS concerns or complaints in the last 5 to 10 years. As shown on Table 4.70, nearly 75% of the respondents have a known, permitted system that is not exhibiting any signs of malfunction. System repairs were noted by 28 respondents and the reported instances were mostly baffle repairs or replacements in the septic tanks, pump replacements for elevated sound mounds, or drainpipe repairs. One new system was installed within the last 10 years to replace an old holding tank and cesspool. The majority of respondents (87% of total properties evaluated) reported having their systems pumped within the past 5 years and most noted that their tanks are inspected at that time.

The only reason any potential malfunctions were reported is primarily due to either unknown or undated/unpermitted systems. The uncertainty surrounding these systems indicates that they need to be classified as potential malfunctions, even though there were no other factors indicating any concern with system operation. It was noted that the majority of the properties in the Township have suitable land size for a replacement system, if necessary. Nearly half of survey respondents indicated they have had their well water tested within the last 5-10 years and no contamination reports were given when the survey was conducted. 2 property owners noted their drain field is in a low lying area but the only drainage issue noted was during periods of significant rainfall (the both noted recent hurricane remnants affecting their property in general). No instances of lush green grass or significant wet or spongy areas were noted during the survey.

Due to the results of the door-to-door survey and SEO records, plus the general knowledge of the Township representative, there was no reason to conduct any water or well testing within the service area. Several respondents to the survey indicate they have their well water tested with some degree of regularity, and there were no reports of any contamination in the survey.

III.B.2 – Sanitary Survey

In the document “Act 537 Sewage Disposal Needs Identification,” (26) a description of the expectations, methodology, data results, and appropriate actions of the Sewage Sanitary Survey are presented:

a. *Sewage Sanitary Survey: These randomly verified field surveys may be conducted in two “tiers” (or steps), depending upon the scope of the Act 537 Official Plan revision being prepared. For “municipality-wide” or large area plans, a general or “tier one” approach is appropriate, especially with a goal of identifying and prioritizing sub-areas for closer scrutiny or simply gathering generic information for a large area. The “tier two” survey provides a much closer scrutiny of a study area and is more appropriate for smaller scale (less than municipality-wide) plans, for accurately defining and documenting suspected problem areas, and for prioritizing the severity of problems found in several areas. The “tier two” survey might also be appropriate for municipal-wide planning where the municipality is uniformly developed throughout or where it is anticipated that the rate of sewage disposal problems will be similar in both densely and less densely developed portions of municipalities that have variable development patterns.*

   Most “tier one” surveys use a minimum sampling rate of 15 percent; while for the “tier two” survey, representative sampling rates vary with the size of the area. In both cases, obtaining this representative sampling is important, as well as random selection of sampling points and sampling in a pattern that provides accurate, complete coverage of the survey area. Please note that a generic “tier one” 15 percent sampling rate will not be sufficient to assign a PENNVEST project priority rating for any project smaller than 1,000 units.

   A door-to-door survey conducted by consultant or municipal personnel is the preferred method of conducting a sewage sanitary survey. While a “mail-in” questionnaire survey, with provisions for specific confirmation of reported malfunctions or even a combination *of methods that involve both detection and confirmation of sewage disposal problems, may provide helpful information to augment the data gathering process, they are generally considered less reliable and less accurate and may not be substituted for a "door-to-door" survey when determining the sewage disposal "needs" of a study area. "Mail-in" survey results may not be used to prepare PENNVEST project priority ratings. When conducting sewage sanitary surveys, the percent of OLDS or EDUs inventoried in a door-to-door survey, the return rate of mail-in questionnaires and the percentage rate of the questionnaires subjected to field verification must all be reported.*

It is also highly recommended that the local PA DEP regional office be contacted to discuss appropriate survey methodology for specific situations.

In the document "Act 537 Sewage Disposal Needs Identification," (26) the PA DEP addresses considerations of malfunctioning OLDS. Four categories are shown to highlight the differing levels of functionality or non-functionality of the OLDS. These categories are formed from public health needs, to address the prevention of health hazards and water pollution from untreated or inadequately treated sewage:

1. *Confirmed Malfunctions: Those malfunctions documented by dye testing, laboratory test results, observation by a certified SEO or a professional with experience in OLDS, "Best Technical Guidance" repair permits, and seasonally wet absorption areas. Also included are piped discharges from a single structure with direct evidence of sewage (i.e., direct observation of soap suds, food residue, solids, odors, etc.), reported system backups, malfunctions with photographic documentation or other similar evidence.*

2. *Suspected Malfunctions: Those systems exhibiting some malfunction characteristics such as abnormally green grass in the vicinity of an absorption area, piped discharges from one (or more than one) dwelling without direct evidence of sewage (i.e., no observation of soap suds, food residue, solids, odors, etc.), absorption areas located in known unsuitable soils (observed wetlands, rock outcropping, etc.), cesspools (in high density development) and pit (not vault) privies.*

3. *Potential Malfunctions: Those systems that appear to be operating satisfactorily but were constructed prior to system permitting requirements (i.e., pre-regulatory systems), systems located in areas extremely unlikely to receive permitting by current standards, systems constructed in areas having soils mapped as unsuitable or with severe*

limitations for OLDS and systems located on exceptionally steep slopes greater than 25 percent. For the purpose of needs identification, OLDS permitting under Act 537 became effective on May 15,1972. Included as potential malfunctions are permits issues for OLDS repairs that meet Chapter 73 standards. While this needs category does not represent "stand alone" existing needs, the information may be utilized in a needs analysis to locate areas affected by poorly defined adverse circumstances. For example, clusters of legitimate repairs will often indicate areas requiring closer scrutiny.

4. *No Malfunction: Those systems that appear to be operating satisfactorily, were constructed since the implementation of system permitting requirements, and appear to have been constructed in accordance with the permitting requirements in effect at the time of construction. For the purpose of needs identification, OLDS permitting under Act 537 became effective on May 15, 1972.*

III.B.3 – On-Lot Disposal Needs

Borough

Most areas within the Borough are generally limited by space and previous development. These limitations would prevent a number of different types of OLDS from being installed. Systems that can be excluded because of these limitations are elevated sand mound, IRSIS, and drip-field irrigation, due to the area required for surface flow and percolation, constructed features, and the lack of soil permeability. In general, a majority of the soils within the Borough have the Urban Land (U) designation, and the minor soils present do not have substantial impact upon this designation. The Urban Land (U) soil classification within the Borough area is restrictive to installation of OLDS. Refer to **Section II.C – Soils** for a discussion of the soil types present within the area, and their suitability for various types of wastewater treatment systems.

Township

The soil, geology, and topology (i.e. very steep slopes) would all be considered limiting factors in the undeveloped portions of the Township. It should be noted, however, that the area outside of the public sewer service area delineation is not zoned for, and is not planned for, any sort of dense development that would require public sewer service. Conventional OLDS would be the logical choice for these undeveloped areas, if supported by soil survey analysis during the planning process.

III.B.4 – Individual Water Supply Survey

Borough

For more information about the NBMA WTP, refer to **Section II.F – Potable Water Supplies**.

Township

A significant number of sanitary survey respondents indicated that they have their well water tested with some degree of regularity and no contamination was ever reported. The only issue noted was that the Township has very hard water, leading most residents with wells to install a water softener and/or filter for taste and efficiency purposes.

III.C – Sludge and Septage Generation

III.C.1 – Location of Sludge/ Septage

Borough

The locations of the 18 OLDS are shown in Figures L-8 through L-26 in **Appendix L**. Sewage generated everywhere else in the Borough is conveyed to the Borough WWTP. Sludge generation is accounted for at the WWTP, and by the Borough Ch. 94 Report. The WWTP does not import or export any liquid sludge.

Township

The Township has approximately 700 OLDS in the municipality.

The OLDS within the Township are primarily septic tanks with in-ground drain fields. Professional haulers are typically hired to pump out the septic tanks and dispose of the septage on an as-needed basis, as coordinated by the property owners. The majority of the respondents to the survey indicated they have their systems pumped routinely, on average every 3 to 5 years. The sludge produced by the Whispering Hollow WWTP is also hauled away and disposed of by independent sludge haulers outside of the Township.

For a location of these OLDS, refer to Figure 15.25 for a map of OLDS areas in the Township. A copy the OLDS sanitary surveys for the Township are presented in **Appendix P**.

III.C.2 – Quantity of Sludge/ Septage

Borough

Refer to **Section III.A.1 – Existing Sewage Facilities** for a description of the nature of the wastewater in the Borough. Refer to Table 4.23 for a summary of sludge generation for the Borough WWTP, and refer to **Section III.A.3 – Treatment Plant Needs – Organic Capacity** for additional background about sludge generation at the WWTP. Septage generation within the Borough is estimated at 1,800 gallons annually. This is based on 18 OLDS generating an average of 300 gallons every 3 years.

Township

Professional septage haulers are licensed by the Commonwealth and dispose of septage at various WWTPs throughout the region. Haulers are only required to report to the municipality if there is a local ordinance or a reporting requirement in their permit.

Septage generation within the Township is estimated at 70,000 gallons annually. This is based on approximately 700 OLDS generating an average of 300 gallons every 3 years.

III.C.3 – Disposal Methods

Borough

Septage sludge is disposed by private haulers, utilizing tank trucks specifically designed for hauling liquid sludge. The septage is transported and disposed at various facilities outside of the Borough. The Borough does not require residents to provide hauling receipts on a regular basis, as expressed by the Borough Manager on November 9^{th}, 2021. Dewatered sludge generated at the WWTP is trucked to the Grand Central Sanitary Landfill, Inc. in Pen Argyl, PA (DEP Permit No. 100265). For a detailed description of the WWTP processes that divides types of flow and generates sludge, refer to **Section 10** of **"Borough of Northampton Wastewater Treatment Plant Evaluation"** in **Appendix F** (7). Storing and removing sludge from the WWTP has been difficult for the Borough for some time and is the driving force behind this study. Refer to **Section III.A.3 – Treatment Plant Needs – Organic Capacity** for additional background about sludge generation at the WWTP.

Township

Quantities of septage generated from individual homeowners is expected to be close to state averages. The US Census Bureau reports there 2.42 people per household in the Township. Assuming 90 gpcd, the average volume per house per day would be 218 gpd. In an effort to maintain consistency with the Borough and conservatively estimate flows, the EDU value of 225 gpd will be used in this plan. The volume of septage generated from the businesses will depend on the size and nature of the businesses. There are limited non-residential uses outside of the typical small office or in-home business types within the Township OLDS areas. These uses are primarily warehouse developments, and a small commercial and industrial area in the Horwith/ Hokendauqua service area, with limited available land for expansion or redevelopment.

IV – Future Growth and Development

IV.A.1 – Planning Documents

Borough

The Borough does not have any significant land available for development. The few remaining areas that have a possibility of being developed are discussed in **Section IV.B.3 – Future Growth – Borough**. The other possible source of growth would be redevelopment, but the Borough does not anticipate much redevelopment in the foreseeable future.

When development does occur, the Borough utilizes their Planning Commission and the LVPC to review the project. The Planning Commission utilizes the Borough Code and their Comprehensive Plan for guidance. The Borough Code does not have any sections that specifically encourage the redevelopment of properties. Additionally, the Borough is generally not in support of any changes to zoning districts within the Borough Code.

In 2005, the Borough approved The Northampton Borough Comprehensive Plan 2005-2030 (34). The Comprehensive Plan outlined the vision the Borough regarding zoning, land use, future development, and the growth of the community in general. Some of the goals listed within this plan are:

- *To extend public water and sewer lines to areas of new development as soon as economically feasible. Require all developments to connect to these public utilities.*

- *To improve and replace existing deteriorating public sewer lines in a systematic manner…*

- *To include Northampton Municipal Authority as the reliable supply of water for all properties in the Borough of Northampton.*

The Comprehensive Plan also provided the following recommendation:

- *Upgrade the sewage treatment plant capacity, efficiency, and degree of treatment during the next 30-year period.*

Township

The Township last updated their Comprehensive Plan in August 2017. The plan represents the goals, objectives, and policies of all aspects of life in the Township, and reflects the vision of the municipal officials, residents, landowners, and businesses. The significant growth the Township has experienced over the past few decades has drastically altered the landscape of the area and that is projected to continue. Prior to the 2017 Update, the Township has conducted and participated in multiple municipal, county, and regional planning efforts to adjust and accommodate the changing makeup of the area.

The Township Comprehensive Plan explicitly recommended that the Township update the 1999 Act 537 Plan to plan for future developments. Along with this, recommendations also included estimates of additional wastewater capacity that would be needed, and an assessment of growth areas for public sewer service. Recommendations also included highlighting conservation areas where future growth is less desirable. Relating to the goals of the Township, the plan identifies that development should be directed to areas that have existing or planned infrastructure, including public sanitary sewer, and establish boundaries for the public sanitary sewer service area. This includes both residential and commercial land use. The plan also encourages coordination efforts with the neighboring municipalities to accommodate the wastewater collected from within the Township.

The LVPC has recently updated the regional Comprehensive Planning document in 2019, known as the FutureLV Regional Plan. This document studies the entire Lehigh and Northampton County Area and addresses future planning needs for all land use planning, development, and infrastructure across the Lehigh Valley. Specific to the Township, the LVPC identified a number of general land uses including but not limited to: Natural Resource Areas, Farmland Preservation and Open Space, and Parks and Recreational Areas. Refer to Figure 17 in **Appendix C** for the LVPC FutureLV Regional Plan: General Land Use Plan.

IV.A.2 – Zoning Regulations and Lot Size

Borough

According to Borough Code as it relates to zoning, the Borough is divided into 9 zoning districts, with each district having its own building requirements for new or existing properties. The Borough Code Section 250, “Zoning,” lists the requirements with respect to lot sizes, building coverage, impervious cover, setbacks, and building heights. Refer to Figure 16.50 for “Schedule II” of the Northampton Borough zoning code for a summary table of lot requirements for each of the 9 districts. Refer to **Section IV.B.2 – Land Use Designations** for more involved discussion of zoning and planning.

Due to the limited number of OLDS present within the Borough and their unique locations, the Borough zoning ordinance is generally silent on them. The only requirement is that “all on-lot sewage disposal installation shall conform with the PA DEP Regulations”. The Borough does not have any specific lot requirements for their use. Furthermore, the Borough does not have an On-Lot Sewage Management Ordinance or any other specific ordinance that manages the installation and operation of these systems.

As stated in the Northampton Borough Comprehensive Plan 2005 – 2030 (34) under “Community Facilities Goals and Objectives,” the Borough expresses preference for public water supply and sanitary sewer system connections for new developments:

> *“To extend public water and sewer lines to areas of new development as soon as economically feasible. Require all developments to connect to these public utilities. Encourage compact development instead of leap-frog and sprawl development.”*

Township

The Township Zoning Map, last updated in 2018, is included as Figure 16.25. The map identifies all 10 zoning districts within the Township. In general, it can be stated that all the public sewer service areas proposed in this plan are located in the R-2, R-3, I/C, and H/C areas, and one portion of an NC area. Public sewers are not intended to be needed in any Agricultural, Rural or R-1 areas of the Township. The area designated as mobile home park is currently served by their own privately owned and operated WWTP, which will continue.

Refer to Figure 16.75 for the Township Zoning Ordinance Lot Size Information Chart.

IV.A.3 – Floodplain, Storm Water Management, and Related Plans

The LVPC, one of main agencies in Lehigh and Northampton Counties concerned with aspects of development, released the "Lehigh Valley Hazard Mitigation Plan," on October 10th, 2018 (35). This is a comprehensive document, outlining the Lehigh Valley community, employment, population, land use, and development. A major portion of the document outlines risk assessment, from inclement weather to natural disasters, and other types of hazards. Section 4.3.4 "Flood, Flash Flood, Ice Jam," deals with observed historical flooding trends of the area, in addition to efforts of mitigation.

As this plan notes (35), "flooding is the most significant natural hazard in the Lehigh Valley. Riverine, flash, stormwater, and ice jam floods occur around rivers, streams, and creeks found throughout the Lehigh Valley. Stormwater/urban flooding occurs in areas of ditches, storm sewers, retention ponds, and other facilities constructed to store run-off. The State has designated 16 watersheds in Lehigh and Northampton Counties for the purposes of stormwater management. The Lehigh Valley has ordinances in place for all 16 watersheds."

Borough

Due to the lower elevations in the Borough, a substantial portion of the municipality is prone to flooding. To minimize the damage from flooding and protect the environment, the Borough enacted the following floodplain regulations (relevant sections are included in **Appendix D**). Any capital improvements related to this Act 537 Plan Update must comply with these limitations.

- Chapter 125 of the Borough Code, "Flood Damage Prevention," (19) contains regulations for the classification and use of floodplain areas.

- Chapter 203 of the Borough Code, "Stormwater Management," (19) outlines the general guidance of the Borough in relation to storm water management. Any capital improvement project would have to meet the requirements of this chapter.

Based on flood mapping in **Section II.B.2 – Flooding, High Flow Events, and Past History**, the work area within the WWTP is situated within or adjacent to a floodplain.

To protect the WWTP, the Borough created the Preparedness, Prevention, and Contingency (PPC) Plan in June 2009, which outlines prevention and mitigation of emergency situations. Section 6.0 of the PPC Plan, "Storm Water Management Practices," highlights the efforts by plant personnel to mitigate storm water pollution (17). However, the PPC Plan does not adequately outline flood mitigation efforts in the event of significant rainfall or flooding from the creek, based upon review (7).

Township

There are 4 creeks which traverse through the Township, along with a portion of the western boundary bordering the Lehigh River. Any proposed future development will be evaluated as to the impact on any of these waterways and/or their floodplains in accordance with all Local, State, and Federal regulations.

IV.B.1 – EDU Summary

Borough

The Borough is aware of seven future developments. The locations of these development are depicted in Figure 1.80 and associated sewage flow for the 5-year, 10-year, and ultimate condition are tabulated below.

Table 5: Future EDU Summary for Northampton Borough

		Current Reserved		Remaining to be connected		5 Year			10 Year			Ultimate/future		
Development/Service Area	**Planned EDUs**	**2021 EDUs**	**2021 Flows**	**EDUs**	**Flow**	**Additional EDUs**	**Additional Flow**	**Cumulative Flow**	**Additional EDUs**	**Additional Flow**	**Cumulative Flow**	**Additional EDUs**	**Additional Flow**	**Cumulative Flow**
Willow Brook Phase II	50	0	0	50	11,250	50	11,250	11,250	0	0	11,250	50	11,250	11,250
Northampton Towns	40	0	0	40	9,000	40	9,000	9,000	0	0	9,000	40	9,000	9,000
Lehigh Valley Builders	26	4	900	22	4,950	0	0	0	22	4,950	4,950	22	4,950	4,950
Hampton Village (Castle)	23	21	4,725	2	450	0	0	0	2	450	450	2	450	450
Deichmeister (Tranquility Meadows)	100	0	0	100	22,500	0	0	0	100	22,500	22,500	100	22,500	22,500
Horwith Industrial/ Commercial	200	0	0	200	45,000	0	0	0	0	0	0	200	45,000	45,000
Sipos Development	29	0	0	29	6,525	0	0	0	29	6,525	6,525	29	6,525	6,525
Miscellaneous Development	49	0	0	49	11,025	10	2,250	2,250	30	6,750	9,000	49	11,025	11,025

		Current Reserved		Remaining to be connected		5 Year			10 Year			Ultimate/future		
	Planned EDUs	**EDUs**	**Flow**	**EDUs**	**Flow**	**Additional EDUs**	**Additional Flow**	**Cumulative Flow**	**Additional EDUs**	**Additional Flow**	**Cumulative Flow**	**Additional EDUs**	**Additional Flow**	**Cumulative Flow**
TOTALS	517	25	5,625	492	110,700	100	22,500	22,500	183	41,175	63,675	492	110,700	110,700

Township

The existing and proposed subdivision map is included as Figure 1.95. Table 5.10 lists the flow previously anticipated from past sewer planning efforts for the major developments listed in the 2001 Act 537 Plan Addendum C with both the 5-year and 10-year projections. These developments are primarily located in the Borough Service Area. At the time of the previous wastewater planning document preparation, there were no known developments in the Catasauqua Borough Service Area. The Willowbrook Farms development noted below became the development known as Willow Green.

Table 5.10: Township Developments Planned for in 2001 Plan Addendum C

Dry Run Service Area ***Includes Willow Green**	@ 260 gpd/EDU			
	5 year projection		10 year projection	
	5yr edus	5 yr flows	10 yr edus	10 yr flows
Wynne Field Estates	50	13,000	107	27,820
Sunny Slope Farms	70	18,200	142	36,920
Other Janidl	30	7,800	230	59,800
Catty HS	16	4,056	16	4,056
Deichmeister	-	-	40	10,400
Willowbrook Farms	-	-	125	32,500
Foulk	-	-	10	2,600
Total	**166**	**43,056**	**670**	**174,096**

Railroad Interceptor	@ 260 gpd/EDU			
	5 year projection		10 year projection	
	EDUs	Flow	EDUs	Flow
Atlas Heights	29	7,540	32	8,320
County Prop			25	6,500
Krapf			210	54,600
Horwith I/C - Stone Ridge			96	24,960
Rec Building	1	260	1	260
Horwith - Century Commerce			162	42,120
Kopper Penny/Ace Hardware	5	1,300	5	1,300
Drexel Heights	126	32,760	126	32,760
Northampton SD	69	17,940	69	17,940
Weaversville			103	26,780
Total	**230**	**59,800**	**829**	**215,540**

Horwith/Hokendauqua Area	@ 260 gpd/EDU			
	5 year projection		10 year projection	
	EDUs*	Flow	EDUs*	Flow
Wolfers	*2*	315	*2*	315
Horwith (1449 Nor-Bath Blvd)	*1*	118	*1*	118
Horwith (1330 Nor-Bath Blvd)	*7*	1785	*7*	1785
Horwith (1440 Nor-Bath Blvd)	*1*	238	*1*	238
Bank	*1*	120	1	120
Restaurant	*10*	2550	10	2550
strip mall	*13*	3200	13	3200
Total	**11**	**8,326**	**35**	**8,326**

*EDUs calculated by: flow estimate/260 GPD/EDU and rounded up

Many of the developments that were planned for during the 2001 Act 537 Plan had requested a specific capacity amount, and an unspecified number of EDUs at that time. During the subsequent years, as these developments were finalized, the actual approved and constructed number of EDUs and associated capacity had changed. Table 5.20 lists the actual developments as they were constructed and includes all other sewer connections that occurred in the service area outside of the of the previously identified developments and service areas. Flows are calculated based on 225 gpd/EDU and are calculated for 5-year, 10-year, and ultimate connection projections within each subdrainage basin, which would be anticipated in the next 20 years.

Table 5.20: Overall Future EDUs for Allen Township

Development/Service Area — Northampton Heights: includes EDUs already connected in 2001 plan	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected: 2021 EDUs	Current Connected: 2021 Flows	EDUs remaining to be purchased	Remaining to be connected	5 Year: Additional EDUs	5 Year: Additional Flow	10 Year: Additional EDUs	10 Year: Additional Flow	ultimate/future: Cumulative EDUs[2]	ultimate/future: Cumulative Flow
Cherryville Heights	R	50	50	11,250	-	0					50	11,250
North Hills	R	186	115	25,875	71	71	25	5,625	35	7,875	186	41,850
Center St Sewer ext	R	4	4	900	-	0		-		-	4	900
Boro View	R	32	32	7,200	-	0		-		-	32	7,200
Hampton Ridge	R	52	47	10,575	5	5	3	675	2	450	52	11,700
Towpath Estates	R	93	41	9,225	-	52	50	11,250	2	450	93	20,925
High Meadows	R	135	0	-	135	135	30	6,750	50	11,250	135	30,375
Total		**552**	**289**	**65,025**	**211**	**263**	**108**	**24,300**	**89**	**20,025**	**552**	**124,200**

@ 225 gpd/EDU

Development/Service Area — Dry Run Service Area *Includes Willow Green*	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected: 2021 EDUs	Current Connected: 2021 Flows	EDUs remaining to be purchased	Remaining to be connected	5 Year: Additional EDUs	5 Year: Additional Flow	10 Year: Additional EDUs	10 Year: Additional Flow	ultimate/future: Cumulative EDUs[2]	ultimate/future: Cumulative Flow
Wynnefield	R	107	97	21,825	10	10	-		-		107	24,075
Penns Chase/Sunny Slopes	R	142	142	31,950		0		-		-	142	31,950
Summer Glen & Willow Ridge	R	395	395	88,875		0		-		-	395	88,875
Catty HS	NR	16	11	2,475	5	5	2	450	3	675	16	3,600
Quarry Hill Estates	R	41	14	3,150	27	27	15	3,375	12	2,700	41	9,225
Willow Green	R	164	173	38,925		0		-		-	173	38,925
												-
Total		**865**	**832**	**187,200**	**42**	**42**	**17**	**3,825**	**15**	**3,375**	**874**	**196,650**

@ 225 gpd/EDU

Development/Service Area — Railroad Interceptor	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected: 2021 EDUs	Current Connected: 2021 Flows	EDUs remaining to be purchased	Remaining to be connected	5 Year: Additional EDUs	5 Year: Additional Flow	10 Year: Additional EDUs	10 Year: Additional Flow	ultimate/future: Cumulative EDUs[2]	ultimate/future: Cumulative Flow
Atlas Heights	R	39	34	7,650	5	5	2	450	3	675	39	8,775
Krapf	R	55	0	-	-	*32*	17	3,825	15	3,375	32	7,200
(mixed use Sketch Plan in 2021)	NR		3	675	-	*20*	3	675	17	3,825	23	5,175
Stone Ridge	R	116	98	22,050	18	18	10	2,250	8	1,800	116	26,100
Rec Building	NR	XXX	1	225	-	-		-		-	1	225
Century Commerce Center	NR	109	3	675	-	106	75	16,875	25	5,625	109	24,525
Kopper Penny	NR	5	3	675	2	2		-		-	5	1,125
Drexel Heights	R	126	102	22,950	-	--------		-		-	102	22,950
Abbey Rd Vet	NR		1	225	-	-		-		-	1	225
Northampton School District (no reservation)	NR	XXX	0	-	-	40		-	40	9,000	40	9,000
Atlas Estates I & II	R	57	57	12,825		-		-		-	57	12,825
Atlas Twins 1 &2	R	54	54	12,150		-		-		-	54	12,150
Jaindl/Watson	NR	142	0	-		142	25	5,625	100	22,500	142	31,950
Savage Road	R	XXX	8	1,800		-		-		-	8	1,800
Sycamore Drive	R	XXX	4	900		-		-		-	4	900
Atlas Circle	R	XXX	2	450		-		-		-	2	450
Total		**703**	**370**	**83,250**	**25**	**365**	**132**	**29,700**	**208**	**46,800**	**735**	**165,375**

@ 225 gpd/EDU

Development/Service Area — Horwith/Hokendauqua Area	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected: 2021 EDUs	Current Connected: 2021 Flows	EDUs remaining to be purchased	Remaining to be connected	5 Year: Additional EDUs	5 Year: Additional Flow	10 Year: Additional EDUs	10 Year: Additional Flow	ultimate/future: Cumulative EDUs[2]	ultimate/future: Cumulative Flow
Wolfers	NR	2	5	1,125							5	1,125
			1	225							1	225
Horwith Trucking	NR	8	1	225							1	225
			1	225							1	225
Palmerton Bank Subdivision:	NR	12	1	225							1	225
Commerce Drive Businesses			3	675	8	8	2	450	2	450	11	2,475
											0	
Horwith I/C Park: Brick Kiln Ct	NR	12	3	675	9	9	3	675	3	675	12	2,700
Total		**34**	**15**	**3,375**	**17**	**17**	**5**	**1,125**	**5**	**1,125**	**32**	**7,200**

@ 225 gpd/EDU

Development/Service Area — Future Connections in Any Drainage Basin	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected: 2021 EDUs	Current Connected: 2021 Flows	EDUs remaining to be purchased	Remaining to be connected	5 Year: Additional EDUs	5 Year: Additional Flow	10 Year: Additional EDUs	10 Year: Additional Flow	ultimate/future: Cumulative EDUs[2]	ultimate/future: Cumulative Flow
Multiple Unknown Connections	R	**XXX**	**0**	**0**	**25**	**25**	**10**	**2,250**	**20**	**4,500**	**25**	**5,625**

Allen Township Sanitary Sewer Planning Northampton Borough Service Area	Planned EDUs[1]	Current Connected: EDUs	Current Connected: Flow	EDUs remaining to be purchased	Remaining to be connected	5 Year: Additional EDUs	5 Year: Additional Flow	10 Year: Additional EDUs	10 Year: Additional Flow	ultimate/future: Cumulative EDUs[2]	ultimate/future: Cumulative Flow
Residential	1,847	1,468	330,524	296	380	162	36,450	146	33,075	1,849	416,025
Non-Residential	307	35	229,949	24	332	110	24,750	190	42,750	369	83,025
Total	**2,154**	**1,506**	**338,850**	**320**	**712**	**272**	**61,200**	**337**	**75,825**	**2,218**	**499,050**

[1] Planned EDUs are EDUs that were on plan submissions and planning modules and assumed to be connected to the Twp system eventually during any given project. Not all projects used all their EDUs

----> Note: "XXX" means there is no approved Planning Module and it was not existing during the previous ACT 537 Plan development

[2] Cumulative future EDUs are EDUs that were ACTUALLY connected in each development, plus any remaining EDUs they may have, plus EDUs that the Twp anticipates might still be developed and need capacity for

----> this includes warehouses that are only using a small about of capacity right now but have reserved a substantial amount of capacity for future use if needed. Cumulative Ultimate/Future EDUs includes all warehouses utilizing the full reserved amount of flow.

[3] The difference between Planned EDUs ([1]) and Cumulative EDUs ([2]) is that not all developments were built out exactly as planned (or include the exact number of EDUs that were accounted for on planning modules or in previous estimates (i.e. Drexel Heights)

The EDUs for non-residential customers were calculated by utilizing the water usage data and dividing by 225 gpd/EDU to determine the EDUs for each facility. At a minimum, each commercial establishment was assigned 1 EDU, regardless of water usage, and all EDUs are rounded up to the nearest whole number.

When evaluating the residential EDU list, a thorough evaluation of historical water use records from the City of Bethlehem service area and the NBMA Service Area indicates that the average residential house in the Township uses 130 gpd (data from the 3rd Quarter 2021 water meter readings). This is substantially less than the 225 gpd/EDU rate used for projected flow capacity needs for the existing users, as well as for future EDUs. Therefore, the actual flow from the Township to the Borough WWTP is considerably lower than the planned flow.

Each subdivision or service area in the Township is identified, mapped, and correlated with previous planning documents, including planned EDUs, actual EDUs connected, and remaining EDUs to be connected. In 2021, there were a total of 1,506 connected EDUs, with an additional 712 EDUs that could ultimately be connected (or equivalent flow contributed from the non-residential customers based on the reserve EDU capacity already purchased) within the Borough Service Area. At 225 gpd/EDU, that equates to a planned average daily flow from the connected EDUs of 338,850 gpd and an additional 160,200 gpd in future flow for a total of 499,050 gpd from a total of 2,218 EDUs. For the ultimate flow discussion in this ACT 537 Plan, the future flow will be 500,000 gpd. It should be noted that the "capacity equivalent" EDUs left to be purchased by the Township is 320 EDUs.

The future EDUs and future flow calculations include connections from all known subdivisions (whether approved or proposed), as well as 25 additional EDUs that may be developed within the Borough Service Area. These EDUs may be through minor subdivisions, or future rezoning/ change of use properties, or vacant lots within the service area that may be developed. The planned subdivision EDUs are anticipated from developments where construction has started and there are remaining lots to connect, as well as proposed developments that have submitted a plan to the Township for review and discussion. With the real estate market in constant flux, it is difficult to anticipate when these developments may seek approval and proceed to construction. The connection estimates are based on the best available data at this time.

In summary, the EDU and Flow charts contain:

- The current calculated reserved flow capacity at 225 gpd/EDU (not the actual flow based on water readings and/or sewer meter readings) from the connected EDUs.
- Total anticipated flow from the existing and proposed future development in the Borough service area for 5-year, 10-year, and ultimate connections.

Table 5.30 Current/Actual Subdivision & Development EDU and flow list including 5-year, 10-year and ultimate projections

Development/Service Area	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected		EDUs remaining to be purchased	Remaining to be connected	5 Year		10 Year		ultimate/future	
Northampton Heights: includes EDUs already connected in 2001 plan			2021 EDUs	2021 Flows			Additional EDUs	Additional Flow	Additional EDUs	Additional Flow	Cumulative EDUs[2]	Cumulative Flow
Total		**552**	**289**	**65,025**	**211**	**263**	**108**	**24,300**	**89**	**20,025**	**552**	**124,200**

Development/Service Area	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected		EDUs remaining to be purchased	Remaining to be connected	5 Year		10 Year		ultimate/future	
Dry Run Service Area ****Includes Willow Green***			2021 EDUs	2021 Flows			Additional EDUs	Additional Flow	Additional EDUs	Additional Flow	Cumulative EDUs[2]	Cumulative Flow
Total		**865**	**832**	**187,200**	**42**	**42**	**17**	**3,825**	**15**	**3,375**	**874**	**196,650**

Development/Service Area	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected		EDUs remaining to be purchased	Remaining to be connected	5 Year		10 Year		ultimate/future	
Railroad Interceptor			2021 EDUs	2021 Flows			Additional EDUs	Additional Flow	Additional EDUs	Additional Flow	Cumulative EDUs[2]	Cumulative Flow
Total		**703**	**370**	**83,250**	**25**	**365**	**132**	**29,700**	**208**	**46,800**	**735**	**165,375**

Development/Service Area	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected		EDUs remaining to be purchased	Remaining to be connected	5 Year		10 Year		ultimate/future	
Horwith/Hokendauqua Area			2021 EDUs	2021 Flows			Additional EDUs	Additional Flow	Additional EDUs	Additional Flow	Cumulative EDUs[2]	Cumulative Flow
Total		**34**	**15**	**3,375**	**17**	**17**	**5**	**1,125**	**5**	**1,125**	**32**	**7,200**

Development/Service Area	R = Residential NR = NonRes	Planned EDUs[1]	Current Connected		EDUs remaining to be purchased	Remaining to be connected	5 Year		10 Year		ultimate/future	
Future Connections in Any Drainage Basin			2021 EDUs	2021 Flows			Additional EDUs	Additional Flow	Additional EDUs	Additional Flow	Cumulative EDUs[2]	Cumulative Flow
Multiple Unknown Connections	R	**XXX**	**0**	**0**	**25**	**25**	**10**	**2,250**	**20**	**4,500**	**25**	**5,625**

Allen Township Sanitary Sewer Planning Northampton Borough Service Area	Planned EDUs[1]	Current Connected		EDUs remaining to be purchased	Remaining to be connected	5 Year		10 Year		ultimate/future	
		EDUs	Flow			Additional EDUs	Additional Flow	Additional EDUs	Additional Flow	Cumulative EDUs[2]	Cumulative Flow
Residential	1,847	1,468	330,524	296	380	162	36,450	146	33,075	1,849	416,025
Non-Residential	307	35	229,949	24	332	110	24,750	190	42,750	369	83,025
Total	**2,154**	**1,506**	**338,850**	**320**	**712**	**272**	**61,200**	**337**	**75,825**	**2,218**	**499,050**

[1] Planned EDUs are EDUs that were on plan submissions and planning modules and assumed to be connected to the Twp system eventually during any given project. Not all projects used all their EDUs

----> Note: "XXX" means there is no approved Planning Module and it was not existing during the previous ACT 537 Plan development

[2] Cumulative future EDUs are EDUs that were ACTUALLY connected in each development, plus any remaining EDUs they may have, plus EDUs that the Twp anticipates might still be developed and need capacity for

----> this includes warehouses that are only using a small about of capacity right now but have reserved a substantial amount of capacity for future use if needed. Cumulative Ultimate/Future EDUs includes all warehouses utilizing the full reserved amount of flow.

[3] The difference between Planned EDUs ([1]) and Cumulative EDUs ([2]) is that not all developments were built out exactly as planned (or include the exact number of EDUs that were accounted for on planning modules or in previous estimates (i.e. Drexel Heights)

In the Catasauqua Borough Service area, the Township has an agreement for service for the existing development along Willowbrook Road for 50,000 gpd for non-residential/ commercial warehouse use. The existing average daily flow from these developments is 11,000 gpd in 2021 until now. There is potential for future development in this service area. The Township has been approached by a developer for a portion of this service area for 700 residential EDUs and they have indicated a desire to include a few nonresidential uses, perhaps a restaurant, brew pub, day care, coffee shop, or other business. There are also approximately 12 existing structures on the property that would also need to be connected. Exact flow estimates are not available at this time so an estimate of 750 EDUs from this development is being used for the analysis. At 225 gpd/EDU, that would equate to 168,750 gpd. Catasauqua Borough has indicated that they are able to accept up to 800 EDUs worth of flow at this time to accommodate this development. Any negotiations with Catasauqua Borough would need to include both the developer and the Township to coordinate a new intermunicipal agreement. This agreement would secure the capacity needed to serve this development in their collection and conveyance system, as well as fund the WWTP. There is no other development opportunity beyond this property in the service area as it abuts the same development in the Borough, and then borders existing public sewer service areas and county park land on all other sides.

IV.B.2 – Land Use Designations

The PA Municipalities Planning Code (PA MPC), Act 247 of 1968, as amended, provides municipalities with the basic authority for the adoption and enforcement of local planning and development through the use of ordinances. The PA MPC gives the local governing body these abilities:

- The power to create and appoint a planning commission,
- Adopt a comprehensive plan,
- Prepare an official map to plan for acquisition of land for public purposes,
- Regulate subdivisions and land development,
- Adopt zoning ordinances to control the location, type, and density of land uses, and
- Allow for flexible residential development.

Borough

The Borough regulates land use under Chapter 250 of the Borough Code, “Zoning” (19). The different land uses are depicted in the zoning map in Figure 16. See below for the Borough Code as it relates to various zoning districts.

Based on the zoning map, the Borough is primarily residential, with this designation comprising over 60% of the land. The remaining areas of commercial, industrial, and conservation districts comprise 7%, 23%, and 8%, respectively.

In total, the Borough is divided into 9 districts. The following is a complete description of these districts:

Article III. Establishment and Designation of Districts

§ 250-8. Establishment of districts

A. The Borough of Northampton is divided into the following districts:

CO	*Conservancy District*
R-1	*Residential District*
R-2	*Residential District*
R-3	*Residential District*
R-4	*Residential District*
C-1	*Commercial Transition District*
C-2	*Commercial District*
I-1	*Industrial District*
I-2	*Industrial District*

B. In addition to the above nine zoning districts, there are floodplain overlay districts which shall also be applicable. The Borough has adopted a separate Floodplain Management Ordinance.[1] All specific floodplain management regulations are contained in that separate ordinance.

[1] Editor's Note: See now Ch. 125, Flood Damage Prevention.

§ 250-11. Intent and purpose of zoning districts

The general intent and purpose for each of the zoning districts established in § 250-3 above are as follows:

A. CO Conservancy District. To establish and preserve areas for watershed, flood control, forestry, cement quarry reclamation settlement and the general conservation of the land with its flora and fauna. Uses such as low-intensity outdoor recreation and other uses that do not significantly change the natural character of the land or do not attract large numbers of people would be compatible with this intent.

B. R-1 Residential District. To establish and preserve the lowest-density residential areas in the Borough for quiet single-family home neighborhoods free from incompatible activities which would generate distractive sights, sounds, traffic or which would in any way compromise the privacy and serenity of the living environment for the individual residential lots.

C. R-2 Residential District. To establish and preserve relatively low-density residential areas in the Borough for single-family, two-family and limited multifamily uses (three to eight units per structure) which are protected in the same manner as the R-1 District above.

D. R-3 Residential District. To establish and preserve medium-density residential areas where a variety of housing types, including single-, two-family and multifamily uses, are protected in the same manner as the R-1 District above.

E. R-4 Residential District. To establish and preserve a medium-density single-, two-family and townhouse residential area where mobile home parks could also be developed and which would be protected in the same manner as the R-1 District above.

F. C-1 Commercial Transition District. To establish and preserve areas in transition from residential to commercial so that the quality of the human living environment and the business environment may be jointly considered, respected and preserved to the greatest extent possible during the time of change in predominant land use for the area.

G. C-2 Commercial District. To establish and preserve compact business areas where a variety of retail, office and service businesses would receive priority consideration and protection. Residential uses already in existence or well-planned mixed uses would be permitted to coexist with the business uses. An attractive environment should be maintained within which to do business and/or to reside.

H. I-1 Industrial District. To establish and preserve areas of light, limited and/or low-intensity industrial land use activity. These types of areas may include older, already developed industrial buildings on sites where the scale of industrial and warehouse-type activity could be less intense than the I-2 District.

I. I-2 Industrial District. To establish and preserve areas for a variety of industrial uses, for certain commercial type uses and for farm and related uses. All uses would be required to comply with Borough performance standards. Permitted accessory and special uses would be given priority. Other uses would be considered to be incompatible and would not be permitted.

Township

As previously stated, the 2 major public sewer service areas both contain a variety of zoning districts. In both cases, however, the areas are primarily zoned for higher density residential areas, and industrial and commercial development. The majority of the Township that is to remain as OLDS is mainly lower density residential and agricultural land. Refer to Figure 16.25 for the Township Zoning Map.

IV.B.3 – Future Growth

In order to accurately identify the immediate sewerage needs of the Borough and the Township, the projected development over the next 20 years must be identified based on proposed plans and existing zoning. The total historical, current, and projected population of the Borough and the Township are shown in Table 5.50. Early population information is from the 201 Facilities Plan of 1985 (20). The 1990 population figures were provided by PA DEP on October 10, 1997. The 2000, 2010, and 2020 population figures were taken from the U.S. Census Bureau. The 2025 projected populations for the Borough and the Township were provided by the LVPC:

Table 5.50: Historical, Current, and Projected Population of
Northampton Borough and Allen Township

	DATA YEAR	BOROUGH OF NORTHAMPTON	ALLEN TOWNSHIP	TOTAL FOR SERVICE AREA
HISTORICAL	1940	9,622 (2)	1,082 (2)	10,704
	1950	9,322 (2)	1,095 (2)	10,417
	1960	8,866 (2)	1,183 (2)	10,049
	1970	8,389 (2)	1,856 (2)	10,245
	1980	8,240 (2)	2,465 (2)	10,705
	1990	8,717 (3)	2,672 (3)	11,389
	2000	9,159 (4)	3,072 (4)	12,231
	2010	9,926 (5)	4,269 (5)	14,195
CURRENT	2020	10,395 (6)	4,456 (6)	15,851
PROJECTED	2030	10,295 (6)	6,151 (6)	16,446
	2040	10,569 (6)	7,061 (6)	17,630
20-YR GROWTH		5.50%	48.00%	19.20%
PROJECTED POPULATION		10,569 (6)	7,061 (6)	17,630
CALCULATED EDUs (7)		4,228	2,824	7,052

Notes:

(1) Total population figures for Borough of Northampton and Allen Township.

(2) Data as shown in 201 Facilities Plan and as provided by the U.S. Census Data and the Joint Planning Commission Lehigh-Northampton Counties.

(3) As provided by PA DEP on October 10, 1997.

(4) Estimate provided by the LVPC on December 10, 1997.

(5) Information as supplied by the U.S. Census Bureau (30).

(6) Information as supplied by the LVPC.

(7) Based on 2.5 persons per household.

Borough

The projected growth of the Borough in the future will likely remain stable or decline slightly due to the long-term loss of manufacturing and industry in the area. This is based upon overall data trends. Only a few areas of land are available in the Borough that would have the potential for development. Based upon a simple aerial overview, the areas that could be developed (without investigating further planning requirements) include:

- Northeast of Slate Alley, northwest of E 23rd Street. This land is privately owned and may be sold at some point in the future for development. As of November 9, 2021, the Borough Manager reported that he does not believe the owner is not interested in selling this parcel.
- The corner of Sipos Drive and Howertown Road. Based upon information from the Northampton Borough Manager, planning commission is reviewing a proposed 29-unit development located northwest of Sipos Drive and northeast of Howertown Road. One unit will be built on 644 Sipos Drive, between 2 existing residences at 642 Sipos Drive and 646 Sipos Drive, respectively.

Zoning restrictions and costs associated with the extension of public water and sewer facilities are primary limitations on growth. Zoning designations are established by the Borough in order to direct growth and regulate land use patterns. In general, areas of the Borough that are zoned for commercial and industrial use are located in areas where public sewerage is available.

Since little land is available for new development, the possibility of redevelopment would be the only way that Borough could provide additional housing. In order for redevelopment to occur, modifications to the zoning map, in addition to designated land usage, would have to be approved by the Borough Council and incorporated into the Borough Code. At this time, the Borough is not interested in significantly revising their ordinances to allow for redevelopment.

Township

The Township has experienced significant growth in the last two decades. In 1990, the US census reported a population of 2,601, which rose slightly to 2,670 in 2000. In 2010, the population rose to 4,269. The most recent 2020 census reports the population as 4,456. This is nearly a 51% increase in two decades since the last sewer planning was completed for the Township.

The public sewer service area that would be served by the Borough is now largely built out or at least planned for through proposed development submissions.

The industrial properties in the Catasauqua Borough Service area are largely built out. However, there is a large tract of land known as the Fuller Trust Property, which is being evaluated for a large mixed-use development, Willowbrook Farms. While primarily residential, the Township is considering special zoning in this area to allow for cluster development with some mixed use to include retail and commercial space as well. The developer has not committed to a design layout plan, but at this time it is estimated that there could be a total of 750 EDUs which would be built in the Township and connected to the Catasauqua Borough sewage collection system.

IV.B.4 – Zoning and/or Subdivision Regulations (Comprehensive Plans)

One of the main agencies that considers aspects of development in the region is the LVPC. The LVPC addresses current and ongoing regional planning issues while fostering cooperation between governments, private sector and non-profit organizations, and the general public. As the bi-county planning agency for Lehigh and Northampton counties, the LVPC works closely with a variety of groups, including 62 municipal governments, PA DEP, PA Department of Conservation and Natural Resources (DCNR), environmental protection agencies, the federal government, regional transportation providers, municipal and non-profit housing agencies, county conservation districts, and other state, county, and federal agencies (21).

Borough

The Borough land use zoning regulations, Comprehensive Plan, and Subdivision and Land Development Ordinance regulations all protect land and water resources by regulating house density, percentage of impervious cover, water supplies, stormwater management, and erosion control. All developments must protect the streams, wetlands, and groundwater supplies through the implementation of Best Management Practices (BMPs). To ensure that water resources are properly protected, the Borough provides oversight through the following:

- Chapter 203 of the Borough Code “Stormwater Management.” (19)
- Chapter 215 of the Borough Code “Subdivision and Land Development.” (19)
- Chapter 240 of the Borough Code “Water.” (19)
- Chapter 250 of the Borough Code “Zoning.” (19)

- The Comprehensive Plan for 2005 – 2030 was adopted by the Borough Council on September 15, 2005. This is an essential land planning and development document that addresses the projected growth of the Borough (34).

Township

The Township Comprehensive Plan identifies use and protection of land and water resources as a key focus of Township planning. Development is encouraged in the public sewer service area (primarily the southern and western areas of the Township where significant infrastructure already exists.) The Township Zoning Ordinance was recently updated to reflect these recommendations for focused development, thereby protecting the more rural areas of the Township from development.

The FutureLV Regional Plan identified and recommended areas of the Township to be preserved and maintained for Farmland Preservation, Cultural Significance, Natural Resource Protection, Open Space, and Recreational Uses. These areas very closely align with the designated areas in the Township for OLDS. By limiting the availability of public sewers in these areas, the Township will be able to maintain and protect these areas from increased development.

Refer to Figure 18 in **Appendix C** for the FutureLV Regional Plan: Allen Township Open Space, Parks, and Recreational Areas map.

IV.B.5 – Sewage Planning – 5-year and 10-year Future Planning

Future Sewage Needs of the Service Area consist of residential and non-residential growth.

The residential growth can be evaluated by considering the supply and demand of residential units. The population of the Service Area is projected to increase from 15,851 in 2020 to 17,630 in 2040 (refer to Table 5.50). At 2.5 gpcd, the resulting sewage demand from new residential units will be 712 EDUs.

All of the known residential developments within the Borough (292 EDUs) and Township (425 EDUs), will provide a total supply of residential units of 717 EDUs. Based on the anticipated demand of 712 EDUs, the supply of new residential units (717 EDUs) is sufficient to meet the anticipated need of the Service Area.

With the addition of non-residential units, the Borough is projected to generate 492 EDUs and Township 725 EDUs over the next 20 years. The resulting need for the Service Area over the next 20 years will be 1,217 EDUs. Anticipated growth for 5-year, 10-year, and 20-year/Ultimate Buildout scenarios was detailed in the tables in **Section IV.B.1 – EDU Summary**.

As shown in Table 4.30, the maximum 3-month flow in recent years was 1.649 MGD (2019). Assuming all 1,217 connections will be tributary to the Borough WWTP, the flow into the plant will increase by 1,217 EDUs x 225 gpd/EDU = 273,825 gpd. Based on the 2019 maximum 3-months of flow, the minimum capacity necessary at the plant to accommodate the future development will be 1.649 MGD + 0.274 MGD = 1.923 MGD.

In regard to organic loading, based on Table 4.10, the largest monthly organic loading in recent years was 2,401 lbs/day (September 2018). Based on this loading, the minimum organic capacity necessary at the plant to accommodate the future development will be 2,401 lbs/day + 1,217 EDUs x 0.422 lbs/day = 2,915 lbs/day (note: 0.422 lbs/day is the maximum monthly loading in 2018 divided by the connected EDUs for that year).

Since the hydraulic capacity of the existing plant is 1.65 MGD and the organic capacity is 2,409 lbs/day, the existing facility does not have sufficient reserve capacity to meet the future need. Proposed alternatives for providing the necessary hydraulic and organic capacity are considered in **Section V.A.3 – Upgrading**.

Regarding conveyance capacity, the future scenario for each of the Borough's pump stations are evaluated in the following tables. It is noted that due to the relative minor difference between 5-year, 10-year, and Ultimate conditions, only the Ultimate Condition was considered.

Table 5.60: Future Developments and Downstream Borough Pump Stations

Municipality	**Development**	**Tributary to Pump Station(s)**	**Planned EDUs**	**Planned Flow (gpd)***
Northampton Borough	Willow Brook Phase II	King Street, Main	50	11,250
Northampton Borough	Lehigh Valley Builders	King Street, Main	22	4,950
Northampton Borough	Hampton Village (Castle)	King Street, Main	2	450
Northampton Borough	Deichmeister (Tranquility Meadows)	King Street, Main	100	22,500
Northampton Borough	Sipos Development	King Street, Main	29	6,525
Allen Township	Dry Run Interceptor	King Street, Main	61	13,725
Allen Township	Railroad Interceptor	Main	333	74,925
Allen Township	Miscellaneous Development	Main	25	5,625
Northampton Borough	Miscellaneous Development	Main	25	5,625
Northampton Borough	Horwith Industrial/ Commercial	Generator, Main	200	45,000
Allen Township	Horwith / Hokendauqua	21st Street	18	4,050
Allen Township	Towpath, Hampton Ridge	Jeffery Lane	57	12,825
Northampton Borough	Miscellaneous Development	None	24	5,400
Northampton Borough	Northampton Towns	None	40	9,000
Allen Township	Northampton Heights (excluding Towpath, Hampton Ridge)	None	206	46,350
Allen Township	Miscellaneous Development	None	25	5,625
TOTAL EDUs			1,217	273,825

*Based upon 225 gpd/EDU

Table 5.70: Ultimate Flows to Borough Pump Stations

Borough Pump Station	Capacity (MGD)	2020 Maximum Daily Flow (MGD)	Additional EDUs to be Connected	Projected Ultimate Daily Flow (MGD)*	Projected Overload of Pump Station?
Main Plant	1.360	1.116	847	1.688	Yes
Canal Street (a.k.a. Stewart St.)	0.612	0.490	0	0.490	No
21st Street	0.533	0.382	18	0.394	No
Smith Lane (a.k.a. Vo-Tech)	0.144	0.008	0	0.008	No
King Street (a.k.a. Washington Ave.)	0.920	0.484	264	0.662	No
Jeffrey Lane (a.k.a. Hampton Ridge)	0.360	0.230	57	0.268	No
Newport Avenue	0.058	0.013	0	0.013	No
Generator Pump Station	0.108	0.015	200	0.150	Yes

*Future Flows based on 225 gpd/EDU x 3.0 Peaking Factor = 675 gpd/EDU

The Main Pump Station and Generator Pump Station are identified as possibly being overloaded in the Ultimate Condition.

The Main Pump Station was recently upgraded. The installed pumps are physically capable of meeting the Ultimate Daily Flow Condition. The discharge of the installed pumps was intentionally limited due to the downstream capacity of the existing treatment plant. Once the capacity of the plant is improved, the capacity of the pump station could be re-rated to meet the Ultimate Need.

Regarding Generator Pump Station, the purpose of this pump station is to serve the industrial property. No formal plans have been submitted for the possible 200 future EDUs. If all of the EDUs are tributary to this pump station, the pump station will need to be upgraded. The necessary planning, permitting, and design to upgrade that pump station will be tied to the 200 EDU development.

Township

The planning projections for this plan considered development growth through 5-year, 10-year, and ultimate connection potential within the public sewer service area. The sanitary sewage collection system in the Township is appropriately sized for the projected growth in the service areas. The collection system network is entirely 8-inch PVC sewer mains and 4 ft diameter precast manholes. The Dry Run Interceptor is 8-inch PVC pipe. The Railroad Interceptor is 15-inch PVC pipe as that was determined to be the appropriate pipe size during the 2001 Addendum C Act 537 Plan Update. Willow Green and Horwith/Hokendauqua Pump Stations are not projected to see any substantial growth which would increase the flow at either pump station. The proposed High Meadow development off Cherryville Road is proposing a gravity collection system to a central pump station with a direct discharge to the Borough gravity collection and conveyance system.

V – Alternatives for Disposal Facilities

V.A – Conventional Alternatives

Borough

Based on the needs analysis and anticipated future development, the Borough has identified issues that will need to be addressed. The following sections of the Plan present alternatives for repairing and expanding public sewage facilities, as well as measures required to ensure that privately owned and operated on-lot systems are properly maintained.

Township

Based on the needs analysis and anticipated future development, the Township has identified issues that will need to be addressed. Various alternatives were considered for maintaining the public sewer service in the Township. Proposed alternatives for the Township are presented following the proposed alternatives for the Borough.

V.A.1 – Potential for Regional Wastewater Treatment

Borough

Sewage generated within the Township is conveyed and treated by the Borough. The arrangement of utilizing a neighboring municipality for treatment implements a "regional wastewater treatment" philosophy. This approach allows for more efficient management and monitoring of resources, while minimizing the number of discharges within a watershed.

Currently, the Township is the only municipality that is tributary to the Borough. To receive and treat sewage from other municipalities would require modifications to the collection system and upgrades to the plant. The Borough does not have the desire to install the infrastructure necessary to expand the service area to other municipalities at this time.

Township

The Township has existing connections to both nearby WWTPs in the Borough and Catasauqua Borough. The proposed service areas for both of these WWTPs is not anticipated to be expanded beyond the existing extent of the planned subdivisions, and all future connections are planned for within the service area boundaries. Therefore, the preferred alternative for the Township is to maintain the relationship with each municipality for the conveyance and treatment of the wastewater generated within the Township. The public sewer service areas consist primarily of gravity sewer collection mains and laterals and 2 relatively small and isolated pump stations.

V.A.2 – Potential of Extension of Existing Systems

Borough

As previously discussed, the Borough sewer system extends throughout the entire municipality. The only extension or modification to the system being considered is to serve the existing OLDS as discussed in **Section III.B.1 – Use of On-Lot Systems**.

<u>Alternative 1 – Connection of All OLDS to Borough Sanitary Collection System</u>

Currently, 18 residential properties are not connected to public sewer. These OLDS are believed to be functioning well and Borough has not required them connect.

The Borough Code requires any property to connect to public sewer within 90 days of receiving a notice. With the proper notice, the Borough could require all 18 properties to connect to public sewer.

The 18 OLDS present within the Borough are located within different areas of the Borough (refer to Figures L-8 through L-26 in **Appendix L**) A summary of the individual areas is shown in the list below. For a list of addresses as they relate to individual OLDS areas, refer to Table 1.

- Area 1 (northeast section of the Borough) – Includes 5 dwellings along West 27th Street, starting approximately from West 27th Street and Michael Ct, up to the intersection of West 27th Street and Main Street. 2 additional dwellings are located along Main Street, between West 26th Street and West 27th Street.
- Area 2 (central section of the Borough) – Includes a single property that is a rear-facing lot

located on East 10th Street (Northampton Avenue is the eastern boundary for this lot of houses).

- Area 3 (southeast section of the Borough) – Includes 4 dwellings along Sipos Drive and Howertown Road and their respective intersections.
- Area 4 (southwest section of the Borough) – Includes a single property that is centralized on the plot of land (6th Street is the northern boundary for this lot of houses).
- Area 5 (southern section of the Borough) – Includes 3 dwellings along Newport Avenue, and 1 dwelling on West 1st Street (Almond Alley is the southern boundary, and 2nd Street is the northern boundary).

Some of the subject properties already have an existing sewer main adjacent to their property that could be easily connect to. Other properties would require the extension of a nearby sewer main. **Appendix L** depicts these possible extensions for each of the OLDS to connect to public sewer.

Township

The Township has approximately 700 OLDS. Through the study of needs in the Township, there are no proposed service extensions due to malfunctioning systems. Any future sanitary sewer collection systems would be paid for and installed by developers. The existing collection system in the Township is in good condition and no new facilities are proposed to replace or rehabilitate any sections of the existing system.

A map of these OLDS areas are shown in Figure 15.25.

V.A.3 – Potential for Continued Use of Existing Systems

Borough

Roughly 50 miles of collection lines between the two municipalities drain to the existing WWTP. The expectation of continued development within the Township and the willingness of the Borough to provide treatment for both municipalities will require additional treatment capacity. There is limited space to provide new facilities. As a result, the existing facility must be utilized to the fullest extent practical. Modifications to the existing WWTP will be necessary to address existing needs while providing additional capacity for future customers.

Township

The intent of utilizing Alternative 7 (listed in the following pages) for continued public sanitary sewer service in the Township maximizes the use of existing facilities without the need for constructing a separate facility to treat the same ultimate amount of flow. It is the understanding of the Township that the Borough WWTP will require some upgrades in order to accommodate the existing and future flow projections from the Township. However, there is also an understanding that some of the proposed work would also be considered normal operation and maintenance requiring upgrades and replacement even under existing operating conditions.

V.A.3.a – Repair

<u>Alternative 2 – Investigate and Reduce I&I within the Sewer System</u>

The Borough owns televising equipment that is used on an as-needed basis. Televising sewer lines is a fundamental tool when identifying issues within the collection system. Over the past 10 years, the Borough has televised an average of 1,000 ft (0.2 miles) of sewer pipe each year.

Due to the size of the existing collection system, a more aggressive televising program is warranted. A more aggressive televising program would identify additional areas that need to be repaired, replaced, or further evaluated. It is recommended to increasing the amount of televising to 2 miles per year, which would allow fully investigate their sewer system with their existing staff in about fifteen years. Initially, the three areas with documented problems should be televised first (West 27th Street, the 1800 – 1900 block of Washington Avenue, and the discharge of the 21st Street Pump Station).

Based on direction from the Borough Manager, the areas to be televised should also include a targeted letter notifying residents of the Borough's commitment to reduce I&I. The letter would be followed up with a visit from the Code Enforcement Officer to verify that homes do not have a connected roof drain or sump pump.

In addition to televising, flow monitoring may need to be implemented throughout the system. Flow monitoring typically includes data collection of actual wet weather events. This data is used in hydraulic modeling/profiling of the existing lines to understand where I&I is entering the system.

Depending on the results of televising and the commitment of the Borough to implement this alternative, a flow monitoring study could be limited to a few areas of concern or expanded to include the entire Borough. It is recommended the Borough perform a comprehensive evaluation. This would identify areas in the Borough that may be overloaded and help to locate problem areas within the system.

Once the Borough has the necessary information from televising and flow monitoring, they will be in a position to make informed decisions to reduce the I&I of the system. Recommendation for scaling up their I&I program, as well as investigate sources of high BOD, are discussed further in **Section V.A.3 – Reduction of Loading to Existing Facilities**.

Alternative 3 – Renovate 21st Street and Stewart Street Pump Stations

The equipment within the Main Pump Station was installed in 1956. The original pumps operated for 64 years and were replaced in 2020. When the pumps and associated piping were removed, it was noted that they were heavily corroded and could have resulted in a risk of catastrophic failure.

Two of the pump stations owned by the Borough (21st Street and Stewart Street) are of a similar age and condition. To mitigate the risk of failure, the Borough could systematically replace the mechanical components within each of the aged pump stations rather than waiting for a significant issue to arise.

V.A.3.b – Upgrading

Alternative 4 – Renovate and Upgrade the WWTP to 2.0 MGD

The existing facility is operating at capacity and future growth of the Borough and Township will require additional that is not currently available. In addition, the existing facility has multiple issues that were discussed under various headings in **Section III.A.3 – Treatment Plant Needs**. To address all of these issues, the Borough should consider a major upgrade / renovation project.

Due to the complex inter-relationships between different tanks and treatment equipment, any change to one process could affect another. For this reason, it is recommended to design and construct the upgrade as a single project. A single project reduces the risk of compatibility issues from upgrading various tanks haphazardly. The components of this major upgrade are discussed in the following sections. It is noted that although the sections discuss each component individually, the intent is to implement all of the work as a single alternative. A sketch plan depicting the possible upgrade is shown in Figure 21.

Fourth ICEAS TANK

The existing facility utilizes three ICEAS tanks, each rated at 0.5 MGD, for a combined rating of 1.5 MGD. When the tanks were built, accommodations were provided for a possible fourth tank. A fourth tank would increase the rating of the plant to 2.0 MGD, meeting the projected future flow of 1.923 MGD and providing an additional 0.077 MGD of reserve capacity for unforeseen development.

The construction of a fourth ICEAS tank would also increase the organic capacity of the plant from 2,409 lbs/day to 3,169 lbs/day. This value is based on preliminary calculations by the manufacturer of the aeration equipment.

The fourth ICEAS tank would address the hydraulic and organic needs of the WWTP. This work could be completed while the existing tanks are online to provide continuous treatment for the community.

The decision to upgrade utilizing another process than ICEAS was also considered but rejected by the Borough. In the 201 Facilities Plan, the Borough performed a detail evaluation of seven different technologies for treatment. Based on that plan, the ICEAS process was selected due to its process stability, ease of operation, and life cycle costs. All of those reasons are still valid for utilizing the same technology today. Due to operator familiarity with the ICEAS process and the roughed-in provisions for a fourth tank, the Borough has elected to stay with this process.

New Sludge Holding Tank

Increasing the biological rating of the plant will generate additional sludge that needs to be removed. Currently, the three ICEAS basins generate roughly 25,000 gpd of sludge at 1.5% solids.

By upgrading the plant to 2.0 MGD, the basins are expected to generate 39,100 gpd at 1.0% solids (or 46,000 gpd at 0.85%).

The existing tanks have a combined capacity of 250,000 gallons. When wasting 25,000 gpd, the sludge holding time is 10 days. The minimum recommended solids retention time for stabilization of biological sludge is 15 days for Waste Activated Sludge (WAS) (Domestic Wastewater Facilities Manual Section 75.32). To meet the future demand of 39,100 gpd and hold sludge for 15 days, 586,500 gallons of storage is required. This will require a minimum of 336,500 gallons of additional storage to meet the anticipated needs.

A new tank could be built on the same concrete pad and with similar geometry as the fourth ICEAS Basin. A Sludge Tank built with these dimensions would have a storage capacity of 360,000 gallons. The equipment within the Sludge Holding Tank could also be built with the same equipment and piping as the ICEAS Basins for a minimal amount of cost. This would allow the operators the ability to operate any of the five basins as the sludge basin should the need arise.

<u>Improve Dewatering Process</u>

As discussed in the Needs Section (**Section III.A.3**), dewatering and removal of sludge has been a major bottleneck for this facility. The Borough dewaters six of the seven days and typically operates the dewatering equipment 31 hours per week. The need to reduce the operating time and increase the output of the equipment has been well documented in operator reports for years.

The rating of the existing sludge press is 588 dry lbs/hour. To accommodate future demand and reduce the operating time to 18 hours per week (3 days of operation), the dewatering equipment would need to be increased to 1,400 dry lbs/hour.

To achieve this higher rate, a larger BFP could be installed. However, a BFP is labor intensive and might not be the best alternative for this facility. A screw press, rotary press, or centrifuge are also commonly used to dewater sludge at this rate. The capital costs for each of these pieces of equipment are similar, and usually the life cycles costs are the most important factor for determining which technology to use. Differences between polymer usage and energy use could have magnified throughout the years. As a result, a pilot test is recommended before selecting a particular piece of dewatering equipment.

Depending on Borough preferences and the equipment selected, it is most likely the dewatering building will require additional space. It is believed that the new dewatering equipment would require a modest addition to the existing building.

Wet Weather Capacity

By upgrading the plant from 1.5 MGD to 2.0 MGD, the wet weather rating of the plant will also need to be increased. The existing facility is rated at 1.5 MGD average daily flow and 4.42 MGD peak wet weather, resulting in a design peaking factor just under 3.0. Using 3.0 as a peaking factor, the anticipated peak wet weather flow for the 2.0 MGD plant would be 6.0 MGD.

Due to excessive I&I, the facility has experienced 6.0 MGD in the past. This has resulted in overflows and treatment issues (refer to **Section III.A.3**). To accommodate a peak flow of 6.0 MGD, the Headworks, UV system, and Influent Pumps will need to be upgraded. Improvements to each of these components are discussed in subsequent sections of this study.

Replace Headworks Building

The existing Headworks Building does not meet the needs of the Borough. The hydraulic capacity of the influent channel is limited, the coarse bar screen allows a significant amount of rags to pass through to the plant, and the grit removal system is ineffective. All of these deficiencies justify a new building.

A new building could be built with larger influent channel, an automated fine screen, and a more effective grit removal system. A new Headworks Building would allow the Borough to upgrade all of these items to meet the peak wet weather flow and improve the efficiency of the existing system.

Due to the limited space within the treatment plant, there are not many locations where a new Headworks Building could be situated. It would need to be near the existing building and most likely built within the vacant field to the north of the plant (which is owned by the Borough). The Borough would utilize the old building for storage and to house new equipment.

Upgrade Primary Lift Station

The primary lift station is located on the eastern side of the Pre-Aeration Basin and consists of three centrifugal pumps. These pumps convey flow from the Pre-Aeration Basin to the ICEAS basins.

The combined capacity of the existing pumps is 4.4 MGD which is supplemented by the portable pump to convey 6.0 MGD. The fact that the operator needs to use a portable pump is evidence that the existing pumps do not meet the current wet weather needs of the plant.

A preliminary analysis of the existing system reveals that is possible to either add an additional pump or upgrade the existing pumps to meet the 6.0 MGD requirement. The Borough does not need to replace the existing forcemain between the Primary Lift Station and the ICEAS Basins to convey 6.0 MGD. At this time, it is believed that an additional pump would be added.

Replace UV System

The existing system was designed to operate at a peak flow of 4.4 MGD. It was not designed to operate at 6.0 MGD. As a result, there have been fecal coliform violations at high flows. Furthermore, the equipment is 30 years old and there has been documented operational issues.

The UV system has had issues with the electrical system; specifically burned wires. Rather than trying to repair the UV system, a replacement of the current system is warranted, given the operational issues and the age of the system.

A number of different UV technologies have been brought out over recent years that are effective in eliminating a greater degree of the disease vectors and pathogens present. This greater degree of removal/ inactivation would result in cleaner effluent that is more amenable for the receiving stream and more satisfactory to meet permit parameters. Based on preliminary analysis, a new UV System could be installed within the existing concrete channel.

Primary Treatment Process

The variability and significant amount of TSS from the WTP has caused operational issues at the plant (**Section III.A.3 – Treatment Plant Needs – Solids from Water Treatment Plant**). The existing facility does not have any Primary Clarifiers to manage these loads. A new process is recommended to manage this issue.

The primary treatment equipment currently considered is a disc filtration system. This process removes a significant amount of TSS while leaving the majority of BOD, which is necessary to support the downstream activated sludge process. The equipment could be installed inside either the new or existing Headworks Buildings. To determine the effectiveness of this equipment, a pilot study is recommended. Further investigation may also warrant the pilot testing of other forms of filtration equipment.

<u>Alternative 5 – Upgrade WWTP to 2.0 MGD (Alternative Process)</u>

To address the organic and hydraulic needs, the Borough does not need to build an ICEAS tank. The Borough could decide to build a separate process utilizing a different technology. The process would run in parallel to provide the additional capacity required.

In the 201 Facilities Plan, seven different technologies for the treatment plant were evaluated. Based on that plan, the ICEAS process was selected due to its process stability, ease of operation, and life cycle costs. All of those reasons are still valid for utilizing the same technology today. Furthermore, due to operator familiarity with the ICEAS process and the roughed-in provisions for a fourth tank, this alternative will not be pursued any further.

<u>Alternative 6 – Upgrade Wet Weather capacity of WWTP to 8.0 MGD</u>

The design wet weather peaking factor for the existing plant is 3.0. However, if no measures are implemented to reduce I&I, the actual peaking factor experienced by the plant could be closer to 4.0. In that case, the peak wet weather flow for the 2.0 MGD plant could be as high as 8.0 MGD.

Modify the plant's hydraulic capacity to convey a peak flow of 8.0 MGD could accomplished with relatively minor modifications to the Headworks Building, Primary Lift Station, Post-aeration Tank, and UV system. Assuming many of these facilities are already being replaced with the upgrade, it would not require significant expenditures to increase the peak conveyance capacity of the plant.

However, the facility is not intended to perform as a combined sewer system. As per the Borough's Comprehensive plant, it is goal of Borough to "*To improve and replace existing deteriorating public sewer lines in a systematic manner so that all old and deteriorating lines are replaced…*" The expense of continually processing excess stormwater is not an efficient use of resources. For these reasons, the Borough has decided to address I&I at the source, rather than dealing with capacity issues throughout the collection system or modifying process tanks at the plant. Therefore, this alternative will not be pursued any further.

V.A.3.c – Reduction of Loading to Existing Facilities

Most of the Borough collection system was constructed in the 1930s and 1950s. Many of these manholes were built with bricks and were situated within a floodplain. The result is a significant potential for I&I. To address this problem, the Borough has an annual program to selectively reline 5 manholes a year.

Due to the size of the Borough collection system, relining 5 manholes is fixing less than 1% of the manholes per year in the Borough. The effort to reline manholes has not kept up with the need to reduce I&I. This becomes obvious when comparing wet years versus dry years.

In 2016, a relatively dry year, the average daily flow into the plant was 0.832 MGD. In 2018, a very wet year, the average annual flow was 1.363 MGD. This is a 64% increase in flow over two years with no significant connections during that time.

A program to improve the existing collection system more aggressively would reduce the stress on all downstream facilities. Any improvement in I&I would also reduce the operating times of all equipment thereby reducing the O&M costs. It is recommended that the Borough utilize a more aggressive approach to managing the I&I within their collection and conveyance system.

Regarding organic loading, the typical BOD loading for municipal sewage is 0.17 lbs/day/cap (or 0.22 lbs/day/cap when garbage grinders are prevalent) as per Section 43.51 of the PA DEP Domestic Wastewater Facilities Manual. With 2.5 capita per household, the expected BOD loading for the Borough would be 0.425 lbs/day/EDU (or 0.55 lbs/day/EDU if garbage grinders are prevalent). The percent of garbage grinders in the community is unknown but believed to be similar to the national average of 50%.

As determined in **Section IV.B.5 – Sewage Planning – 5-year and 10-year Future Planning**, the highest monthly BOD loading in recent years was 0.422 lbs/day/EDU. Based on that value, the organic load per EDU is not particularly high. However, the fluctuations in BOD loading throughout the month have been substantial. At this time, the source of these fluctuations is unknown.

During a number of meetings with the Borough Manager and WWTP personnel, the possibility of "rogue" dumping of sewage (such as pump trucks opening a manhole in town and discharging directly into the collection system) or home breweries were discussed. It is the opinion of the Borough that neither of sources are believed to be the cause of the BOD fluctuations.

The potential that the high BOD is originating from the NBMA WTP was also considered. Based on the design of the WTP, previous reports and documents, as well as discussions with WTP personnel, it is believed that the WTP is not the source of the high BOD.

To identify the source of the fluctuations, the Borough has decided to institute a sampling program. Multiple samplers would be required to evaluate suspected areas. Within continued sampling and multiple iterations, the Borough should be able to isolate specific customers with excessive BOD.

<u>Alternative 7 – Expanded Capacity at the Borough of Northampton Borough WWTP and Developer negotiated capacity at Catasauqua Borough WWTP for the respective service areas</u>

Develop a new intermunicipal agreement with the Borough to expand the available capacity allocated to the Township at the Borough WWTP to meet ultimate future flow projections. Service to the future connections proposed in this service area will be funded and constructed by the developers. There is sufficient capacity in the existing Township collection system to accommodate the projected future flow from these developments.

Likewise, any new development in the Catasauqua Borough Service Area would require the developer to fund and construct the necessary infrastructure in the public sewer service area and secure the capacity in the Catasauqua Borough system and WWTP. Additionally, assist any developers of the unserved land in the Catasauqua Borough Service area with negotiations to connect to and transmit wastewater flow to Catasauqua Borough for treatment. A breakdown of EDUs for this alternative is provided in Table 5.80.

Table 5.80 Allen Township / Catasauqua Borough Service Area EDU/ Flow Analysis for Alternative 7

EDUs in Catasauqua Borough Service Area

Development/Service Area **Catasauqua Creek**	R = Residential NR = NonRes	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Fed Ex	NR				-		10	2,250	10	2,250		
Lot 5 Warehouse	NR	223	56	12,600	-	167	10	2,250	10	2,250	223	50,000
Lot 4 Warehouse	NR				-		10	2,250	10	2,250		
												-
(Prop) Willowbrook Farms	R				750	750	150	33,750	500	112,500	750	168,750
												-
Subtotal		**223**	**56**	**12,600**	**750**	**917**	**180**	**40,500**	**530**	**119,250**	**973**	**218,750**

Development/Service Area **Future Connections in Any Drainage Basin**	R = Residential NR = NonRes	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Multi Unknown Connections	R	**XXX**	**0**	**0**	**25**	**25**	**5**	**1,125**	**10**	**2,250**	**25**	**5,625**

Allen Township Sanitary Sewer Planning Catasauqua Borough Service Area	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Residential	-	-	-	775	775	155	34,875	510	114,750	775	174,375
Non-Residential	223	56	12,600	-	167	30	6,750	30	6,750	223	50,000
Subtotal	**223**	**56**	**12,600**	**775**	**942**	**185**	**41,625**	**540**	**121,500**	**998**	**224,375**

[1] Planned EDUs are EDUs that were on plan submissions and planning modules and assumed to be connected to the Twp system eventually during any given project. Not all projects used all their EDUs
----> Note: "XXX" means there is no approved Planning Module and it was not existing during previous sewer planning periods

[2] Cumulative future EDUs are EDUs that were ACTUALLY connected in each development, plus any remaining EDUs they may have, plus EDUs that the Twp anticipates might still be developed and need capacity for
----> this includes warehouses that are only using a small about of capacity right now but have reserved a substantial amount of capacity for future use if needed. Cumulative Ultimate/Future EDUs includes all warehouses utilizing the full reserved amount of flow.

[3] The difference between Planned EDUs ([1]) and Cumulative EDUs ([2]) is that not all developments were built out exactly as planned (or include the exact number of EDUs that were accounted for on planning modules or in previous estimates (i.e. Drexel Heights)

The primary impediment to Alternative 7, which is the preferred alternative, is pending litigation between the Borough of Northampton and Allen Township. Through the planning process and subsequent discussions between the two municipalities, this barrier has been removed. The **Appendix J** includes a copy of the intermunicipal agreement for the Borough to sell additional EDUs to the Township.

<u>Alternative 8 – Maintain the existing service at the Northampton Borough WWTP/ Negotiate for expanded capacity at Catasauqua Borough WWTP for existing Northampton Borough service area connections.</u>

The 2011 Intermunicipal Service Agreement with the Borough allowed for the existing customer list (1,349 EDUs plus an additional 531 EDUs), to be connected to and treated at the WWTP. The EDU allocation was based on 228 gpd/EDU, which allotted 120,000 gpd of discharge from the Township. To maintain that total number of 1,880 EDUs, the Township could remove some connections from the southern area of the Township on paper to allow for the connection of new development in the northern area of the service area, essentially freeing up EDU capacity in the Borough Service Area. Those connections removed from Northampton could be diverted to Catasauqua Borough, through construction of a pump station and relatively minor gravity sewers.

Two potential connection options were explored for the connection to Catasauqua Borough system. One option could provide for a connection through the proposed Willowbrook Farms development. The second option would be a force main routed along West Bullshead Road and Willowbrook Road to the existing Township connection into the Hanover Township (Lehigh County) sewer, which connects into the interceptor that goes to the Catasauqua Wastewater Treatment Plant. The Township would negotiate with Catasauqua Borough to develop an intermunicipal agreement for conveyance and treatment. The preferred connection would be through the Willowbrook farms development, but that route has not yet been defined by the developer or the Township, as the development is in the pre-planning stage at this point. Refer to Figure 22 for a map of Alternative 8 and Table 5.90 for the breakdown of EDUs under this alternative.

Table 5.90: Allen Township/ Catasauqua Borough Service Area for Alternative 8

EDUs in Catasauqua Borough Service Area

Development/Service Area **Catasauqua Creek**	R = Residential NR = NonRes	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Fed Ex	NR				-		10	2,250	10	2,250		
Lot 5 Warehouse	NR	223	56	12,600	-	167	10	2,250	10	2,250	223	50,000
Lot 4 Warehouse	NR				-		10	2,250	10	2,250		
												-
(Prop) Willowbrook Farms	R				750	750	150	33,750	500	112,500	750	168,750
												-
Subtotal		**223**	**56**	**12,600**	**750**	**917**	**180**	**40,500**	**530**	**119,250**	**973**	**218,750**

Development/Service Area **Future Connections in Any Drainage Basin**	R = Residential NR = NonRes	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Multi Unknown Connections	R	**XXX**	**0**	**0**	**25**	**25**	**5**	**1,125**	**10**	**2,250**	**25**	**5,625**

Allen Township Sanitary Sewer Planning Catasauqua Borough Service Area	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Residential	-	-	-	775	775	155	34,875	510	114,750	775	174,375
Non-Residential	223	56	12,600	-	167	30	6,750	30	6,750	223	50,000
Subtotal	**223**	**56**	**12,600**	**775**	**942**	**185**	**41,625**	**540**	**121,500**	**998**	**224,375**

EDUs that could be Removed from Northampton Borough Service Area and redirected to Catasauqua Boro

Development/Service Area **Dry Run Service Area** ***Includes Willow Green**	R = Residential NR = NonRes	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Wynnefield/Sunny Slopes	R	107	97	21,825	10	10					107	24,075
Penns Chase/Sunny Slopes	R	142	142	31,950		0		-		-	142	31,950
Summer Glen & Willow Ridge	R	395	395	88,875		0		-		-	395	88,875
Catty HS	NR	16	11	2,475	5	5	2	450	3	675	16	3,600
Willow Green	R	164	173	38,925		0		-		-	173	38,925
												-
Total		**824**	**818**	**184,050**	**15**	**15**	**2**	**450**	**3**	**675**	**833**	**187,425**

Development/Service Area **Railroad Interceptor**	R = Residential NR = NonRes	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Atlas Heights	R	39	34	7,650	5	5	2	450	3	675	39	8,775
Krapf	R	55	0	-		*32*	17	3,825	15	3,375	32	7,200
(mixed use Sketch Plan in '21)	NR		3	675	-	*20*	3	675	17	3,825	23	5,175
Stone Ridge	R	60	60	13,500	-	-		-		-	60	13,500
Rec Building	NR	XXX	1	225	-	-		-		-	1	225
Century Commerce Center	NR	109	3	675	-	106	75	16,875	25	5,625	109	24,525
Kopper Penny	NR	5	3	675	2	2		-		-	5	1,125
Drexel Heights	R	126	102	22,950	-	--------		-		-	102	22,950
Abbey Rd Vet	NR		1	225	-	-		-		-	1	225
Northampton School District	NR	XXX	0	-		40		-	40	9,000	40	9,000
Jaindl/Watson	NR	142	0	-	-	142	25	5,625	100	22,500	142	31,950
Savage Road	R	XXX	8	1,800	-	-		-		-	8	1,800
Sycamore Drive	R	XXX	4	900	-	-		-		-	4	900
Total		**536**	**219**	**49,275**	**7**	**347**	**122**	**27,450**	**200**	**45,000**	**566**	**127,350**

Sanitary Sewer Planning: EDUs/Flow from Nor. Boro Service area redirected to Cata. Boro	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Residential	1,088	1,015	228,375	15	47	19	4,275	18	4,050	1,062	238,950
Non-Residential	285	22	4,950	7	315	105	23,625	185	41,625	337	75,825
Total	**1,373**	**1,037**	**233,325**	**22**	**362**	**124**	**27,900**	**203**	**45,675**	**1,399**	**314,775**

Allen Township Sanitary Sewer Planning - Alt 2 Catasauqua Borough Service Area	Planned EDUs[1]	Exisiting 2021 EDUs	Exisiting 2021 Flows	EDUs remaining to be purchased	EDUs Remaining to be connected	5 Year Addtional EDUs	5 Year Additional Flow	10 Year Additional EDUs	10 Year Additional Flow	ultimate/future Cummulative EDUs[2]	ultimate/future Cummulative Flow
Residential	1,088	1,015	228,375	790	822	174	39,150	528	118,800	1,837	413,325
Non-Residential	495	78	17,550	7	482	135	30,375	215	48,375	560	125,825
Total	**1,583**	**1,093**	**245,925**	**797**	**1,304**	**309**	**69,525**	**743**	**167,175**	**2,397**	**539,150**

[1] Planned EDUs are EDUs that were on plan submissions and planning modules and assumed to be connected to the Twp system eventually during any given project. Not all projects used all their EDUs
----> Note: "XXX" means there is no approved Planning Module and it was not existing during previous sewer planning periods
[2] Cumulative future EDUs are EDUs that were ACTUALLY connected in each development, plus any remaining EDUs they may have, plus EDUs that the Twp anticipates might still be developed and need capacity for
----> this includes warehouses that are only using a small about of capacity right now but have reserved a substantial amount of capacity for future use if needed. Cumulative Ultimate/Future EDUs includes all warehouses utilizing the full reserved amount of flow.
[3] The difference between Planned EDUs ([1]) and Cumulative EDUs ([2]) is that not all developments were built out exactly as planned (or include the exact number of EDUs that were accounted for on planning modules or in previous estimates (i.e. Drexel Heights)

Alternative 9 – New Township owned WWTP to serve All Northampton Borough Service Area EDUs

Remove all connections from the Borough conveyance system and WWTP and construct a Township owned WWTP for all existing and proposed customers in the Borough Service Area.

Alternative 10 – New Township owned WWTP to serve EDUs over the Northampton Borough allocation

Remove equivalent number of customers from the Borough conveyance system and WWTP to leave just the 1,880 EDUs allocated through existing agreements and redirect excess equivalent flow, plus any additional future flow, to a new Township WWTP.

Note: Alternatives 9 and 10 are counterproductive to regional wastewater treatment due to the proposed construction of a completely new and separate WWTP. These alternatives are the least preferred methods to address public wastewater treatment in the Township, as they would be: more costly to the residents; the existing WWTPs are in very close proximity to the Township; the existing infrastructure is largely already in place or will be installed through areas of the Township which will be disturbed during construction anyway to stay connected to the Borough WWTPs; existing WWTP and other facility expansion would be less costly then design, permitting, construction, and operation of a separate WWTP for the Township; inefficient use of land, and potential environmental impacts from construction and operation.

Alternative 11 – Cancel Contract with NBMA WTP

The discharge from the WTP is believed to be causing operational issues at the WWTP. The entire solids waste stream from the WTP discharges to the WWTP and there is no mechanism in place to protect the WWTP from being overloaded. In addition, the biological process has been impaired by the need to continually waste solids. Given the potential for the WTP to overload the WWTP, the Borough could decide to no longer accept any solids from the WTP.

If the WTP was disconnected, the operating costs of the WWTP would be reduced by the reduction in solids. Furthermore, expense of the Primary Treatment Process considered under

Alternative 4 would be avoided. As a result, NBMA would need to provide an alternative means for managing the solids produced from their process. To accomplish this is a cost effective manner, the facility would probably need to add a dewatering process.

The Borough considered this alternative and decided they would like to maintain their relationship with NBMA. Based on preliminary discussions, NBMA has indicated that they are willing to contribute significant capital toward the Primary Treatment Process included under Alternative 4 and the Borough will continue to accept their sludge. As a result, this alternative will not be pursued any further.

V.A.3.d – Improved O&M

The increase in efficiency of the O&M program for the sanitary collection system and the WWTP would be enhanced by alternatives previously identified in this Act 537 Plan Update. These include the following alternatives:

- Alternative 2 – Investigate and Reduce I&I within the Sewer System
- Alternative 3 – Renovate the 21st Street and Stewart Street Pump Stations
- Alternative 4 – Renovate and Upgrade the WWTP to 2.0 MGD

V.A.3.e – Other Applicable Actions

<u>Alternative 12 – No More Capacity for Sale</u>

Based on the minimal growth projected within the Borough, they could meet their hydraulic capacity needs by ceasing to sell any capacity to the Township. Moreover, if the Township directed some of their existing flow to another municipality, it would further reduce the hydraulic load on the plant.

Based on discussions between the Borough and the Township, as well as the analysis provided within this 537 Study, this alternative will not be pursued. It is the desire of both of these parties to maintain their existing relationship and utilize the Borough WWTP for the treatment of future sewage from both municipalities.

V.A.4 – Repair or Replacement of Existing Collection and Conveyance Components

Borough

Some of the alternatives presented in this Act 537 Update will repair and replace existing components in the collection or conveyance system. Before work would proceed with fixing these components, a thorough evaluation of the system condition is necessary to identify the most critical areas to be repaired. The alternatives that have been proposed to evaluate the collection and conveyance systems would provide crucial information for further proposed repair and replacement work.

Township

There is no evidence of any need for repair, rehabilitation, or replacement of the existing collection system in the Township. Flow meters have been installed at 6 locations (including both interceptors), and the pump stations are being monitored for daily operation and flow pattern anomalies. There is little to no indication of I&I in the Township public sewer system.

V.A.5 – Construction of New Community Sewage Systems

Borough

The Borough already has the WWTP and collection system in place and is not interested in constructing any new community sewage systems, but rather, upgrade and maintain the infrastructure already present.

Township

The chosen alternative for providing sanitary sewer collections service in the Township is to continue to connect all users to either the Borough or Catasauqua Borough WWTPs for treatment. Sanitary sewer extensions needed to service new development would be installed at the cost of the developer. Any improvements to either the Borough or Catasauqua Borough conveyance systems and/or WWTP would also be paid for by the developers requiring that upgrade or through a new intermunicipal agreement with the Township.

In the event that a new service agreement cannot be reached which would allow for new connections from the Township, the Township would consider either removing EDUs or swapping out connections, sending the equivalent flow to the other municipality. If an agreement for service with either municipality cannot be reached, the Township would investigate the feasibility to construct, own, and maintain their own WWTP. As previously mentioned, this is the least economically feasible option and the least desirable option for the Township. Given that the majority of the collection system is in place, a new Township WWTP would require the installation of some conveyance infrastructure such as interceptor pipes and possibly a pump station. Regional treatment is supported by land use planning in the Township and neighboring municipalities.

V.B – Individual Disposal Systems

V.B.1 – Soil and Slope Suitability

Borough

The 18 OLDS in the Borough were determined to have the appropriate soil slopes and types at the time of installation. Based upon previous approvals, the 18 OLDS have suitable slopes and soil types for their continued use. No new OLDS systems are expected to be proposed for approval in the future for the Borough.

Township

Individual OLDS are effective and will continue to be the preferred method in the areas of the Township outside the public sewer service area. IRSIS are not currently in use in any areas of the Township nor are they anticipated in any future use areas.

Refer to **Section II.B – Soils** and the associated maps and figures for discussion of the suitability of soils (based upon slopes and soil types) within the Service Area for installed OLDS.

V.B.2 – Preliminary Hydrogeologic Evaluation

Hydrogeologic evaluation of the installation of OLDS is determined on a site-by-site basis. It is generally not recommended to install these systems in areas that have the potential to flood, or where there is a potential to impact to various surface water or groundwater sources. Refer to **Section II.B – Physical Characteristics (Hydrology)** and **Section II.D – Geology** for a discussion of background information as it pertains to installation of OLDS.

Borough

As shown in Figures L-2 through L-7 in **Appendix L**, none of the 18 OLDS are considered to be in a flood area. These OLDS are sufficiently distanced from surface water sources, and none are known to be malfunctioning.

V.B.3 – Sewage Management Programs

Borough

A Sewage Management Program (SMP) will not be created for the 18 OLDS present in the Borough through this Act 537 Update (Refer to **Section III.B.1 – Use of On-Lot Systems** for more information on these systems). Due to the limited quantity, their locations being outside of a flood plain, and the circumstances surrounding their installation, a SMP for these is unnecessary. No ordinance is currently written in the Borough Code for OLDS. If an individual OLDS is failing, the owner would be required to connect to public sewer, based on Borough Code.

V.B.4 – Repair and Replacement of Existing Malfunctioning Systems

V.B.4 – Existing Technology and Sizing Requirements

Refer to **Section III.B.1 – Use of On-Lot Systems** for the status of the OLDS within the Borough and the Township.

Borough

It is a requirement of the Borough to have a resident with a failing OLDS to connect to the sanitary collection system, based upon Borough Code. The Borough has no interest in fixing a failing

OLDS for an individual property.

V.B.4 – Expanded or Alternating Absorption Areas

Borough

The Borough has not approved and likely will not approve expanded or alternating absorption areas for any of these 18 OLDS. All these OLDS are considered to be fully functional, and the Borough requires residents with an OLDS to connect to public sewer if the system is malfunctioning or failing. Refer to **Section III.B.3 – On-Lot Disposal Needs** for discussion regarding the use of absorption areas.

V.B.4 – Use of Water Conservation Devices

Borough

The Borough is generally focused on repair, maintenance, and upgrade of the sanitary sewer system, pumping stations, and the WWTP. For the 18 OLDS that are present within the Borough, the main concern is that they are within established permit limits and not in violation by discharging to an inappropriate area. If an OLDS is failing, the concern of pollution to fresh water sources is crucial, and the property will be required to connect to public sewer by the Borough. Any water conservation measures that are applied to these systems will have minimal effect in the long term. Refer to **Section III.B.1 - Use of On-Lot Systems** for the status of the OLDS within the Borough.

V.C – Use of Small Flow Sewage Treatment Facilities

The PA DEP describes a small flow sewage treatment facility as a system that would treat domestic strength from single family residences, duplexes and commercial establishments that generate 2,000 gpd or less. The system consists of a treatment tank, filtration system, disinfection, and outfall sewer. The effluent from such a system would discharge to a stream or dry channel. The facilities would need to be approved for use in PA.

These systems cannot be located within 10 ft of a property line, occupied building, swimming pool, driveway, or a water supply line under pressure. It must be 50 ft away from an individual water supply or water supply system suction line and not within 25 ft of a stream, watercourse, lake, pond, or other surface water. The system cannot be located within a FEMA floodway or known wetlands.

These package plants are typically used to treat sewage in areas of poor soils, high water table, and limited open space where conventional septic tank/absorption fields are not feasible.

Township

Given the soils, topography, and geology of the Township, small flow treatment systems may need to be considered for some areas, which would be approved through the recommendation and guidance of an SEO.

V.C.1 – Treatment and Discharge Requirements

The small flow sewage treatment facility must be capable of continuously producing a suitable effluent of less than 10 mg/L BOD-5 and TSS without causing water pollution or public health hazards.

V.C.2 – Soil Suitability

A small flow treatment facility may only be used when soils are documented as not suitable for the installation of individual or community OLDS permitted by local agencies under the PA Sewage Facilities Act.

V.C.4 – Municipal, Local, Agency Controls over O&M Requirements

Borough

Township

An official SMP for OLDS is being developed by the Township.

V.E – Use of Retaining Tank Alternatives

A holding tank or retaining tank is not actually a treatment technology. A holding tank is defined by PA DEP regulations as a watertight receptacle which receives and retains sewage, and is designed and constructed to facilitate ultimate disposal of the sewage at another site. The PA DEP definition of a retaining tank includes the following: chemical toilets, privies, incinerating toilets, composting toilets, and recycling toilets.

Township

The Township adopted Ordinance 2007-4 which allows for the temporary use of holding tanks under very specific conditions. A copy of the ordinance is included in the **Appendix E**.

V.F – Sewage Management Programs and Future O&M Requirements

V.F.1 – Municipal Ownership

Borough

At this point, the Borough has no intention of taking over individual OLDS or other non-municipal treatment facilities. The focus of this Act 537 Plan Update is to provide a pathway for maintaining and upgrading the current WWTP and sanitary sewer system. Additionally, connection of the 18 remaining OLDS properties to the sanitary sewer system is a consideration for the Borough (Refer to <u>Alternative 1 – Connection of All OLDS to Borough Sanitary Collection System</u> under **Section V.A.2 – Potential of Extension of Existing Systems**). While no direct ownership will occur from connecting these OLDS, it will assist with the Borough philosophy of “regional treatment”, with all flows in the collection system ultimately going to the WWTP.

Township

A SMP provides a method of monitoring proper operation and maintenance of sewage facilities within a municipality. Currently, the Township does not have an official SMP. However, the regulations governing permitting and inspections has been established by the Township Code and other Ordinances. The Township is considering the adoption of an official SMP. At this point, the

Township has no intention of taking over individual OLDS or other non-municipal treatment facilities.

V.F.2 – Municipal Scheduled Inspections of Sewage Disposal Systems

Refer to **Section III.B.1 - Use of On-Lot Systems** for the status of the OLDS within the Borough and the Township.

Borough

Currently, no Borough regulations are in place for a regular schedule of inspections for OLDS, as only 18 systems are present with the Borough. Furthermore, no issues have been reported with any of these on-lot systems.

Township

The Township does not currently require scheduled inspections of existing OLDS. All proposed new and replacement OLDS are subject to Township permitting and inspections.

V.F.3 – Maintenance of Sewage Disposal Systems

There is no established schedule of maintenance for individual OLDS within the Borough or the Township**.**

V.F.4 – Repair, Replacement, or Upgrading of Malfunctioning Systems

Refer to **Section III.B.1 - Use of On-Lot Systems** for the status of the OLDS within the Borough and the Township.

V.F.4 – Enforcement of Ordinances

Borough

Since there are no OLDS that are known to be malfunctioning, aggressive enforcement is unnecessary. An establishment of protocol for malfunctioning OLDS is written in the Borough Code. However, the Borough does not have a separate OLDS ordinance.

Township

An official SMP can be established by an Ordinance which would allow the Township to enforce the rules and regulations of proper operation and maintenance of the existing systems, effectively reducing or eliminating the occurrence of malfunctioning systems.

V.F.4 – Public Education Programs

Borough

The limited number of OLDS within the Borough would not substantiate an effort for public education. However, public education would be helpful to reduce inappropriate items that are introduced into the sanitary sewer system and are transported to the WWTP.

Posting educational material to the Borough website (under the “more” tab, or on the summary page for the WWTP), would help to educate and inform citizens of materials that should not be discarded down the drain. These include wash cloths, plastic tampon applicators, and other debris that should be placed in refuse disposal. Ultimately, the prevention of these items entering the collection system will mitigate effects of pipe and pump blockage, and lead to less solid material that has to be removed at the headworks prior to sewage entering the main treatment processes of the WWTP.

Township

The SMP can be developed to include public outreach and education materials to inform residents of the proper operation and maintenance and repair of the existing OLDS on their property. The Township will continue a public information campaign to reinforce what is not acceptable to discharge into the public sewer systems, including but not limited to: fats, oils, grease, and storm water.

V.F.5 – Establishment of Joint Municipal Sewage Management Programs

A joint municipal SMP would be helpful to more clearly define the relationship between the Borough and the Township. However, discussion about formation of a joint municipal SMP has been considered for the Borough and the Township, and neither municipality is interested in the idea of an Authority.

Township

The Catasauqua Borough sewer service arrangement for treatment and disposal of waste generated from the industrial properties allots a percentage of the capacity to each of the contributing municipalities reserved through agreement. A similar arrangement will be made with Catasauqua Borough for the service provided to the Willowbrook Farms development.

The Township will continue to own, operate, and maintain their own infrastructure. All OLDS will be regulated and ordinances properly enforced within the Township. The Township will continue to remain as customers of the Borough WWTP.

V.F.6 – Requirements for Bonding, Escrow Accounts, and Management Agencies for Operations and Maintenance for Non-Municipal Facilities

At this time, the Borough and the Township do not intend to acquire any other additional non-municipal facilities for operation. Since no additional non-municipal facilities will be acquired by the Borough and the Township, accounts for bonding, escrow, and funds for O&M will not be needed.

V.G – Non-Structural Alternatives

Borough

Within the Borough, there is very little growth, and the primary need is to address their aged infrastructure. As a result, steering future growth through comprehensive planning will be ineffective to meet these needs.

Township

Land use designations and population density requirements are currently used to manage areas of growth within the Township. Growth within the Township is being encouraged in undeveloped areas that are in proximity to developed areas where public sewer and/or water are readily available.

V.G.1 – Modification of Existing Comprehensive Plans – Land Use Designations

The Borough is mature with very little growth. Land uses were established generations ago and have changed little over time. As a result, the Borough is not anticipating any significant changes to their comprehensive plans.

At this time, no change or revision of land use designations will be made within the existing Comprehensive Plan in either the Borough or the Township. Refer to Figure 16 for a zoning map of the Borough and refer to Figure 16.25 for a zoning map of the Township.

V.G.1 – Modification of Existing Comprehensive Plans – Densities

Borough

Based upon available data and LVPC projections, the expected population growth within the Borough will be 5.5% over the next 20 years (refer to **Section IV.B.3 – Future Growth**). With addition of a few new developments, residence density with the Borough is not expected to change significantly in the future.

Township

Based upon available data and LVPC projections, the expected population growth within the Township will be 48% over the next 20 years (refer to **Section IV.B.3 – Future Growth**). A number of industrial, commercial, and residential properties are in development in the Township. Residence density is expected to increase in the future due to this projected growth.

V.G.1 – Modification of Existing Comprehensive Plans – Municipal Ordinances and Regulations

The Borough and the Township are not considering any changes to their municipal ordinances as a result of this Act 537 Plan Update.

V.G.1 – Modification of Existing Comprehensive Plans – Improved Enforcement

Borough

Improved enforcement of regulations as they relate to OLDS is not feasible for the Borough, due to the small number of systems present, and the historical basis of properly functioning OLDS within the Borough.

Township

Enforcement is necessary to ensure that inadequate or failing OLDS are repaired or replaced.

V.G.1 – Modification of Existing Comprehensive Plans – Protection of Drinking Water Sources

Various environmental organizations are involved with ensuring the quality of the water in the Lehigh River. Non-structural alternatives are not necessary as the regulatory framework for the protection of surface and groundwater sources already exists. Refer to **Section II.F – Potable Water Supplies** for an explanation of the NBMA WTP and water sources. Refer to **Section III.B.4 – Individual Water Supply Survey** for discussion on the potential impact of OLDS on the Borough water supply.

V.G.2 – Consideration of Local Comprehensive Plan

Borough

The Borough and the Township already have a Comprehensive Plan in place.

V.G.3 – Alternatives to Creating or Changing Municipal Subdivision Regulations

The Borough and the Township have no intention of changing municipal subdivision regulations.

V.G.4 – Evaluation of Training Needs

Borough

The Borough WWTP hierarchy structure is sufficient for technical training purposes. The Borough has several certified operators who maintain their licenses through continuing education. These certified operators, in addition to the other wastewater personnel at the plant, attend various training events and seminars held through the year.

Regarding administrative training, any decision-making processes made by the administration of Northampton Borough will be considered by the Borough Council. This includes the discussion of a need for further training.

V.H – No-Action Alternative

As described previously, the WWTP is operating near capacity. For the Borough and the Township to continue providing public sewage for their residents, improvements to the WWTP must be made. These improvements will also need to provide additional capacity to facilitate even a modest amount of growth within these two municipalities over the next two decades. An effort will be made with this Act 537 Plan Update to form a reasonable agreement between the Borough and the Township. It is the opinion of the Borough that the No-Action Alternative would not address the above-referenced needs and would not ensure adequate wastewater disposal facilities to protect the public health and community service needs of the Borough and the Township.

Township

A no-action alternative for the Township would be unacceptable and leave the Township open for continued legal issues and unchecked development within the Township. The 2001 Act 537 plan is not consistent with the current Township zoning and comprehensive plans. If the Township were to take a no-action alternative approach to sewer planning, existing developments that are partially completed and lack comprehensive sewer planning would not have sewer service provided, since that service would be in conjunction with the Borough.

The following sections discuss the short-term and long-term implications of the no-action alternative.

V.H.1 – Water Quality/ Public Health

Water quality and public health will be adversely affected if a no-action alternative is chosen. Excess stress on the conveyance system, which is already in need of repair, will affect the ability of the Borough WWTP to properly treat sewage, causing greater potential for permit violations. These permit violations have the potential to impact public health through increased disease vectors in the effluent that are transported into the Hokendauqua Creek. Additionally, the Borough WWTP may not be able to handle larger high flow events, due to the restriction of flow by unit treatment processes. Increased flow will lead to consideration of bypassing treatment processes altogether to prevent flooding the WWTP. The sanitary sewer system, which is greatly affected by I&I, will continue to experience issues, likely further degrading and experiencing increased problems.

Township

There are no existing or projected issues with public health or water quality as the existing sanitary sewer system is in proper working condition and all connections within the public service area discharge to the collection system for conveyance and treatment.

V.H.2 – Growth Potential

Growth potential would be directly affected with a no-action alternative. The Borough WWTP is already experiencing treatment and capacity issues, and the conveyance system is in need of considerable repair. Further growth within the Borough, and more particularly within the Township, would only be facilitated by upgrade and repair of the sanitary sewer system and the Borough WWTP, in addition to written agreements between the Borough and the Township. Inaction in these efforts could result in a development moratorium, or a potential CAP that would need to be addressed before further considerations of development could be had.

Township

The rapid pace of development in the Township over the past two decades was not fully anticipated in previous wastewater planning efforts by the Township. The lack of an intermunicipal agreement with the Borough, which would allow for additional capacity at the WWTP, has stopped all potential for growth in the public sewer service area. The existing agreement agrees to collect, convey, and treat the waste from the existing customers and those that purchased capacity by the expiration of the offer period, but does not allow for any additional connections beyond that allotment.

The Township had granted capacity requests through planning module approvals when the development timetable of each property was unclear. This was done with the understanding that additional capacity would be available at the Borough WWTP. The capacity requests in the planning modules for these developments were approved by both the Township for collection and the Borough for conveyance and treatment without regard to the available capacity, which was based on a number of EDUs, in the Borough collection system and WWTP. In the absence of a new intermunicipal agreement which includes the allotment of additional capacity, the Township cannot authorize any additional connections within the Borough Service Area.

Alternative 8 discusses the option for the Township to swap EDUs, removing existing connections from the Northampton Borough system, and installing a new collection, conveyance, and treatment system to service these customers within the municipal boundary of the Township. New construction EDUs would be connected to replace them, which will effectively maintain the same number of EDUs being served by the Borough conveyance and treatment systems.

If an agreement with the Borough cannot be reached to provide this additional capacity as needed to service their public sewer service area, the Township will formally review the feasibility of a separate conveyance and treatment system to serve the properties in the Township that would be the most economical to connect to the new system. This could mean removing more connections from the existing Borough collection system then would be replaced by new construction.

V.H.3 – Community Economic Conditions

The economic condition of the community would suffer as a result of no-action. The upgrade and repair of the sanitary sewer system and the Borough WWTP would provide the opportunity potential for greater growth in an area affected by a historical loss of business and industry. More businesses could be encouraged to build in the Service Area if they are aware that they will have less restrictions in terms of connecting to the sanitary sewer system. Without any improvements to the WWTP, even the modest amount of growth would cease. No-action would result in the loss of these opportunities and would negatively impact the local community.

Township

The lack of growth potential in the public sewer service area directly impacts the economic conditions of this service area. A number of the reserved EDUs purchased at the end of the offer period of the last intermunicipal agreement were for large warehouse developments. There remain, however, a number of smaller commercial developments with potential and a substantial amount of residential development which would remain stagnant until the Township can design, permit, and construct their own public conveyance and treatment system to allow for new connections to be made to the Borough system, or discharge to the new Township facilities.

V.H.4 – Recreational Opportunities

Recreational opportunities would be impacted by a no-action alternative. Increased flows in the sanitary sewer system could cause overflows at sanitary manholes around the Borough. These overflows will directly affect whatever human activities are occurring near-by. Maintaining the Borough WWTP as it is without planning could result in a direct discharge to the Hokendauqua Creek, which is a stocked trout waterway. This would affect fishing activities in the creek, in addition to any other recreation that happens in that waterway. Any recreation that would require further development (i.e. baseball or soccer fields, playgrounds, etc.) would likely have flow restrictions placed upon it, or may not be able to be developed altogether.

Township

The proposed public sewer service area, whether it is served by the Borough, the Borough of Catasauqua, or the Township, would have little impact on recreational opportunities in the Township. County and local park land does exist within the service area which includes recreation opportunities, including trails, playgrounds, and ball fields. There are no proposed changes to the land use within these existing parks.

V.H.5 – Drinking Water Sources

Borough

The NBMA WTP is located across the Lehigh River, away from the footprint of the Borough itself. Deterioration of the sanitary sewer system could contribute wastewater to the Lehigh River, which is one of the main sources for the WTP, though the WTP intake is upstream from the Borough. Any water plant that is downstream from the Borough on the Lehigh River, however, could be impacted by unregulated wastewater flows.

Township

There are no drinking water sources within the Township.

V.H.6 – Other Environmental Concerns

Various environmental concerns have been taken into account in previous sections and have sufficiently detailed the impacts of the no-action alternative.

VI – Evaluation of Alternatives

For discussion of the Alternatives for the Borough and the Township presented in this Act 537 Update, refer to **Section V.A.2 – Potential of Extension of Existing Systems** through **Section V.A.3 – Other Applicable Actions**. These are listed in Table 6 below.

Table 6: Overall Alternative Summary

No.	Alternative	Primary Municipality
1	Connection of All OLDS to Borough Sanitary Collection System	Northampton Borough
2	Investigate and Reduce I&I within the Sewer System	Northampton Borough
3	Renovate the 21st Street and Stewart Street Pump Stations	Northampton Borough
4	Renovate and Upgrade the WWTP to 2.0 MGD	Northampton Borough
5	Upgrade WWTP to 2.0 MGD (Alternative Process)	Northampton Borough
6	Upgrade Wet Weather Capacity of the WWTP to 8.0 MGD	Northampton Borough
7	Expanded Capacity at the Borough of Northampton Borough WWTP and Developer negotiated capacity at Catasauqua Borough WWTP for the respective service areas	Allen Township
8	Maintain the existing service at the Northampton Borough WWTP/Negotiate for expanded capacity at Catasauqua Borough WWTP for existing Northampton Borough service area connections	Allen Township
9	New Township owned WWTP to serve All Northampton Borough Service Area EDUs	Allen Township
10	New Township owned WWTP to serve EDUs over the Northampton Borough allocation	Allen Township
11	Cancel Contract with NBMA WTP	Northampton Borough
12	No More Capacity for Sale	Northampton Borough

VI.A – Consistency

Title 25, Chapter 71.21(a)(5) of the PA Code requires that each alternative which is available to provide for new or improved sewage facilities for each area of need be evaluated for consistency with the objectives and policies of Comprehensive Plans, state water plans, plans developed under Chapter 94, plans developed under the Federal Water Quality Act, antidegradation requirements, PA Prime Agricultural Land Policy, plans adopted by the county and approved by PA DEP under the Storm Water Management Act, wetland protection, protection of rare, endangered or threatened plant and animal species as identified by the PA Natural Diversity Inventory (PNDI), and the PA Historical and Museum Commission. The alternatives identified to serve the sewage planning needs of the Borough and the Township involve expansion of the existing sewer service area to areas with existing needs and areas zoned for future development. These alternatives are similar in nature; therefore, an overall consistency determination was deemed satisfactory. The consistency determination is as follows:

1. Clean Streams Law

Borough

The conveyance and treatment of wastewater into the Borough WWTP and Borough sanitary sewer system is conducive with the Clean Streams Law, since the Borough treatment facilities are existing and permitted to provide treatment in compliance with the law. The provisions incorporated by the Borough and the Township to provide for long-term viability of OLDS is consistent due to the objectives of preventing inadequately treated discharges to the surface or groundwaters of the United States from such OLDS.

Township

The Clean Streams Law was developed to preserve and improve the purity of the waters of the Commonwealth. Article 4 is a prohibition against other pollution and Article 5 is protection of domestic water supply. Any wastewater discharge as part of this plan will be governed by a NPDES permit. This plan does not conflict with the Clean Streams Law.

The concern for controlling storm water discharges can be traced to the 1972 Clean Water Act Section 208 provisions for evaluating the impacts of and recommending controls for point and nonpoint source discharges in conjunction with the development of area-wide water quality management plans, known as 208 Plans. These plans were completed in the late 1970s/early 1980s and for the most part, identified the need to study further the specific impacts of urban runoff and alternative control measures to alleviate or prevent those impacts.

None of the alternatives reviewed for this Act 537 plan would be in conflict with other of these regulations.

2. Municipal Wasteload Management Plans

Borough

A review of Chapter 94 Reports submitted by the Borough and the Township did not indicate any apparent inconsistencies with projected hydraulic loadings or collection/conveyance system upgrades based on planned expansion at the Borough WWTP. Although the most current Chapter 94 Report (**Appendix G**) did not designate the plant as having a "projected overload," it is close enough to be generally described as operating at or near capacity. Furthermore, issues with surcharging and the recycled flow to the 21st Street Pump Station was noted in the report.

Township

The 2021 Annual Waste Load Management Report (Ch. 94 Report) information was prepared by the Township and provided to the Borough and Catasauqua Borough. This report does not indicate there are any existing or projected hydraulic or organic overload conditions within the Township sanitary collection system. The limiting factor to connecting additional EDUs to either the Borough or Catasauqua Borough conveyance system or WWTP is the lack of additional capacity allocated by agreement to the Township.

3. Federal Water Quality Act

Borough

The Federal Water Quality Act of 1987 established specific planning requirements for wastewater facilities planning. These requirements only apply to municipalities intending to apply for financial assistance from the Federal government for the construction of sewerage facilities. Consideration of applications for financial assistance from these municipalities depends on compliance with these planning requirements. Several of these planning requirements are beyond the scope of the plan content requirements for sewage facilities planning under Act 537.

A significant provision of the Federal Water Quality Act of 1987 provides for the capitalization of state revolving fund programs in the states. This fund is a separate component of the PENNVEST program in PA. Communities that propose to implement their official sewage plan updates with these funds must meet several specific planning requirements in order to be eligible to receive funding. While many of these requirements may be met through the normal plan content of the Act 537 planning process, several are outside the scope of Act 537. The most recent 201 Facilities Plan (1985) for the Borough was reviewed and the alternatives proposed are consistent with that plan.

Township

Titles II and VI of the Water Quality Act of 1987 addresses federal assistance for WWTP construction through grants and loans. The grants and loans are administered through PENNVEST in PA. This Township Act 537 Plan does not include or anticipate the use of PENNVEST funding for any sanitary sewer extensions of the collection system.

4. Comprehensive Planning

Borough

The Borough Comprehensive Plan was used to form a basis for the alternatives developed as part of this Act 537 Plan Update. The Comprehensive Plan designates areas for residential, commercial, and industrial development.

Township

Comprehensive planning in the Township designated certain areas for commercial, industrial, and higher density residential areas. These are primarily located in the public sewer service area. The areas of the Township designated for OLDS are primarily agricultural and low-density residential areas. Therefore, all of the alternatives discussed this plan for proposed public sewer service are in agreement with the most recent Comprehensive Plan of the Township.

5. Antidegradation Requirements Contained in Chapters 93, 95, and 102

Borough

Chapter 93, 95, and 102 regulate water quality standards, wastewater treatment requirements, and erosion and sediment pollution control, respectively. The Borough WWTP meets the NPDES permit effluent discharge limits and is therefore consistent with Chapters 93 and 95. Any construction associated with selected alternatives will include measures to control erosion and the resulting sedimentation pollution of surface waters of the Commonwealth consistent with Chapter 102.

Township

The protection of the surface waters of PA are regulated through the antidegradation requirements, as contained in PA Code Title 25, Chapters 93, 95, and 102. None of the alternatives of the Township discussed in this plan will impact the surface waters of the Commonwealth.

6. State Water Resource Planning

State water plans have been developed for use as a management tool to guide in the conservation, development, and administration of water and related land resources of the Commonwealth on a comprehensive and coordinated basis. Working under Act 220, the Office of Water Resources Planning last updated the State Water Plan in 2009.

The State Water Plan delineates the Commonwealth into six regional water resource planning areas. The Borough and Township are located within the Lehigh River planning area. The Lehigh River Basin is further delineated into sub-basins. The watersheds for the Dry Run and Hokendauqua Creek fall within the Sub-basin 02C. Refer to **Section II.B.1 – Summary of Creek**

Watershed Areas, Surface Water Areas, and Impoundments for more information about these watershed areas.

The primary goals of the Lehigh River Basin are the following:

- To coordinate land use decisions and water resource management in order to sustain and enhance the quality of life in the Lehigh River Basin.
- To improve management of water resources, including wastewater, stormwater, and waterway corridors to reduce damage from extreme conditions, such as floods and droughts.

The above goals can be achieved through the utilization of a variety of tools available at county and local levels, such as comprehensive planning. The county and local municipal planning agencies have reviewed the Plan and found it to be consistent with the State Water Plan.

7. Pennsylvania Prime Agricultural Land Policy

Borough

Most of the Borough falls under the classification of Urban Land (U) (Refer to **Section II.C – Soils** for a further discussion of this soil type). Due to this classification, the Borough is not believed to contain any delineated Prime Agricultural soils. Furthermore, the 537 Plan for the Borough does not plan to extend sewer service to any new area within the Borough.

Township

This land policy orders and directs the prevention of the irreversible conversation of prime agriculture land to uses that result in its loss as an environmental or essential food product resource. This policy also specifies the definition of prime agricultural land as “prime”, “unique”, or “of state or local importance”. A portion of the Prime Agricultural Area in the Township is currently developed. However, much Prime Agricultural Area remains, and a portion of this land is currently utilized as farmland.

Undeveloped areas of the Township seeking development will have to go through regulatory approval by such agencies as the Northampton County Conservation District, the LVPC, the DRBC, and others. Those areas not developed or planned for development are not included in the Sewer Growth Area. Therefore, the Selected Plan is consistent with PA Prime Agricultural Land Policy.

The alternatives presented in this plan consider the preservation of the prime agricultural land and rural nature of the Township, particularly the northern tier.

8. County Stormwater Management Plans

Borough

In 2006, LVPC adopted their Act 167 Plan. In 2007, the Borough adopted the Hokendauqua Creek and Lehigh River Sub-Basins Watershed Act 167 Stormwater Management Ordinance. The Borough stormwater ordinance supports the goals of the LVPC Plan and any development will need to be consistent with these two plans.

Township

The Township has significant stormwater regulations regarding water quality and establishing BMPs, including management techniques and design standards.

9. Wetland Protection Under Chapter 105

Borough

Wetlands present severe restrictions for future development. Therefore, wetland locations will be considered during the review of subdivision plans and possible sewer extension locations. No wetlands have been mapped on either the WWTP site or any of the OLDS properties.

Township

For the chosen alternative, there is no anticipated impact on wetlands in the public sewer service area of the Township. If any wetlands are impacted at all by future construction of collection, conveyance, or treatment systems proposed in the Township, these impacts will be minimized to the greatest extent possible, and all necessary permits and approvals will be obtained prior to construction.

10. Protection of Plant and Animal Species of Concern

Borough

As designated by PA DEP, the Bureau of Forestry, PA Game Commission, and PA Fish Commission, certain plant and animal species that are rare, threatened, or endangered must have a special survey conducted in order to ensure that the project does not encroach upon habitat for these species. This survey is known as a site-specific PNDI investigation.

The PNDI investigation provides the necessary accommodation to any affected species as part of the sewage planning process. Copies of the completed PNDI search results and any resulting mitigation efforts for the Borough are included in **Appendix M**. It is noted that all land associated with the alternatives being evaluated has been previously disturbed.

Township

It is not anticipated that the alternatives discussed in the plan would result in site disturbances that would involve a PNDI review. Any proposed development requiring sanitary sewer collection system construction would go through the PNDI review process as part of the planning process and would be required to resolve those issues prior to approval.

11. Pennsylvania Historical and Museum Commission Site Assessment

Borough

As part of sewage planning, a site-specific PA Historical and Museum Commission site assessment is conducted to provide the necessary accommodations when evaluating alternatives. The purpose of these searches is to identify, protect, and preserve the Commonwealth historic resources. Copies of the completed searches for the Borough are provided in **Appendix N**. It is noted that none of the alternatives being considered require the removal or alteration of a historic building.

Township

It is not anticipated that the alternatives discussed in the plan would result in impact to historic resources or review by the PHMC. Any proposed development would go through review by the PHMC as part of the planning process and would be required to resolve those issues prior to approval.

VI.B – Resolution of Inconsistencies

Borough

There are no inconsistencies with applicable planning requirements in the Borough or the Township.

VI.C – Water Quality Standards

Borough

The management of the existing OLDS will allow the Borough to protect water quality within the municipality. Furthermore, the discharge from the Borough WWTP is regularly sampled and subject to water quality requirements as listed in the facility’s NPDES Permit. Failure to improve or modify the plant will make it difficult to meet the effluent requirements in the future.

Township

Any OLDS improvements or repairs as a result of the continued use of OLDS and the implementation of an OLDS management program will be consistent with PA DEP water quality standards and permitting requirements for individual sewage systems.

VI.D – Cost Estimates

Borough

Alternative 1 – Connection of All OLDS to Borough Sanitary Collection System

Alternative 1 for connecting all 18 OLDS to public sewer. In that event, the cost to the Borough would be to install the sewer lines within the right-of-way. Fortunately, 9 of the OLDS have an existing sewer main nearby and only require the construction of a lateral to service that particular property. In that event, the property owner would be fully responsible to bear the expense of connecting their property.

Figures 19 and 20 show possible extensions and Table 6.5 below provides a budgetary cost for all of the OLDS areas to connect. It is noted that these are Borough costs only. There will be additional costs to the individual property owners to abandon their existing OLDS and install their lateral, as necessary to connect to the sewer main. In certain cases, the property own may want or need to install a grinder pump to serve all of the fixtures within their dwelling.

The combined budgetary cost to the Borough to connect all 18 OLDS to public sewer is $450,000 or $25,000 per lot.

Table 6.5

Alternative 1

Connecting Borough OLDS to Public Sewer

Budgetary Cost Estimate (Borough Costs Only)

			OLDS AREA 1		OLDS AREA 2		OLDS AREA 3		OLDS AREA 4		OLDS AREA 5	
Description	**Unit Price**	**Unit of Measure**	**Qty**	**Total Price**	**Qty**	**Total Price**	**Qty**	**Total Price**	**Qty**	**Total Price**	**Qty**	**Total Price**
Sawcut, remove, and replace asphalt pavement	$8	Square Feet	7,490	$59,920.00	0	$0.00	2,450	$19,600.00	0	$0.00	0	$0.00
Furnish and install new 8" SDR-35 PVC gravity sewer main including backfilling up to final subgrade	$150	Linear Feet	1,070	$160,500.00	0	$0.00	350	$52,500.00	0	$0.00	0	$0.00
Furnish and Install Sanitary Manhole	$6,000	Each	5	$30,000.00	0	$0.00	3	$18,000.00	0	$0.00	0	$0.00
Subtotal				**$250,420.00**		**$0.00**		**$90,100.00**		**$0.00**		**$0.00**
Contractor Mobilization, Bonds, Traffic Control, and General Conditions (10%)				$25,042.00		$0.00		$9,010.00		$0.00		$0.00
Engineering, Legal, and Inspection (20%)				$50,084.00		$0.00		$18,020.00		$0.00		$0.00
Total Project Costs for OLDS Area (rounded)				$330,000.00		$0.00		$120,000.00		$0.00		$0.00
GRAND TOTAL FOR ALL OLDS AREAS (ROUNDED)			**450,000.00**									

Notes:
Area 1 *includes approximately 500-lf of new sewer main from MH-5 on West 27th Street to a near manhole at Main Street and Kreidersville Rd as well as 570-lf from Michael Court, along West 27th Street to near existing MH-8.*
Area 2 *- There is an existing sewer main in front of the house on East 10th Street.*
Area 3 *includes approximately 350-lf of new sewer main from Sipos Drive, running eastward along Howertown Road*
Area 4 *- There is an existing sewer main on Lincoln Ave. that runs behind the house.*
Area 5 *- The newer townhomes along Newport Avenue installed a gravity sewer line in front of the homes and a small pump station that is currently operating at 20% capacity. The four OLD properties in this area can connect to the existing gravity line in front of the townhomes. The exception is 23 Newport Avenue which either run a lateral to the existing gravity line in front of the townships or install a grinder pump to pump up to Main Street.*

Alternative 2 – Investigate and Reduce I&I within the Sewer System

The borough is able to implement this alternative with existing personnel, equipment, and user rates.

Alternative 3 – Pump Station Repair

The budgetary cost to replace the pumps, piping, mechanical components, and electrical components within these pump stations is $200,000 per pump station. This cost is derived from the “Renovation of Main Pump Station Project”, which was completed in 2021.

Alternative 4 – Renovate and Upgrade the WWTP to 2.0 MGD

The most substantial alternative for the Borough to consider is to renovate and upgrade their WWTP. A sketch plan depicting a possible layout of the upgrade is provided in Figure 21 and the budgetary cost provided below. It is noted that all cost estimated include soft costs. Soft costs are estimated at 20% of hard costs and include survey, engineering, design, permits, funding, bidding expenses, construction inspection, and project management.

Table 6.75
Alternative 4
WWTP Upgrade and Renovation Project
Budgetary Cost Estimate

4th ICEAS Basin and Sludge Tank		
Item	**Description**	**Price**
1.1	Demolish abandoned Bio-reactor Tank	$50,000
1.2	Excavate area and prepare subgrade	$200,000
1.3	Install pre-cast concrete basins	$1,100,000
1.4	Furnish process equipment (blowers, decanters, diffusers, air piping, etc.)	$950,000
1.5	Install process equipment	$200,000
1.6	Site Piping	$100,000
1.7	Electrical Install	$50,000
	Subtotal	$2,600,000

Pre-treatment Equipment		
Item	**Description**	**Price**
2.1	Furnish Disc Filter	$210,000
2.2	Install Disc Filter	$30,000
2.3	Conveyor and Sludge Disposal	$100,000
2.4	Site Piping	$50,000
2.5	Electrical Install	$30,000
	Subtotal	$420,000

Upgrade Dewatering Process		
Item	**Description**	**Price**
3.1	Building Addition	$200,000
3.2	Remove Existing Press and demo existing equipment, conduits, and piping	$70,000
3.3	Furnish Dewatering Equipment	$500,000
3.4	Install Dewatering Equipment	$100,000
3.5	Funish and Install conveyor	$100,000
3.6	Modify Dumpster area	$50,000
3.7	Electrical Install	$100,000
	Subtotal	$1,120,000

Replace Headworks Building		
Item	**Description**	**Price**
4.1	Demolish existing Pavilion	$20,000
4.2	Demolish equipment within existing building	$30,000
4.3	Prepare site for new building	$50,000
4.4	New building (masonry block, slab on grade)	$600,000
4.5	Furnish fine screen	$150,000
4.6	Install fine screen	$15,000
4.7	Furnish grit removal equipment	$200,000
4.8	Install grit removal equipment	$20,000
4.9	New Pavement	$50,000
4.10	Site Piping	$70,000
4.11	Site Grading and site features	$20,000
4.12	Electrical Install	$100,000
	Subtotal	$1,325,000

Upgrade Primary Lift Station		
Item	**Description**	**Price**
5.1	Furnish and install 4th pump	$10,000
5.2	Modify Piping	$40,000
	Subtotal	$50,000

Replace UV System		
Item	**Description**	**Price**
6.1	Demolish existing equipment	$10,000
6.2	Furnish UV Equipment	$150,000
6.3	Install UV Equipment	$20,000
6.4	Funish additional electrical equipment	$50,000
6.5	Electrical Install	$30,000
	Subtotal	$260,000

Subtotal for all work	$5,775,000
Contractor Mobilization, Bonds, and General Conditions (10%)	$577,500
Engineering, Legal, and Inspection (20%)	$1,155,000
GRAND TOTAL (ROUNDED)	**$7,500,000**

Township

There are no construction costs or financing needs to implement the selected alternative in the Township. The costs for administration, operation, and maintenance of the collection system in the Township are included in the tapping fees and user fees, collected by the Township during the land development process, or after the request for the sanitary sewer connection permit. In the Borough service area, the tapping fee for the Township connections are set equal to the Borough rate plus $500 for the Township portion. The developer or Township property owner pays the entire tapping fee to the Township, and then the Township pays the Borough their portion of the Tapping fee.

The user fees for public sewer customers in the Township are set at 115% of the water bill, where 85% of the bill is payable to the Borough for the conveyance and treatment of the wastewater generated by Township customers. The precise terms of the agreement are under negotiation. However, the agreement will allow for the Township to purchase the additional required capacity at the WWTP on an as-needed basis. A copy of the agreement is included in **Appendix J.**

It is anticipated that any debt service relative to the capital improvement needs to provide additional capacity or to replace failing components in the Borough conveyance or treatment systems will be paid for through a rate evaluation of all customers in the Borough and the Borough service area in the Township.

VI.E – Funding Methods

Borough

This section of the plan addresses financing the alternatives. Commonly available funding methods for implementation of alternatives include the following sources:

1. Short-term Borrowing (loans)
2. Long-term Borrowing (bonds)
3. PennVEST Borrowing
4. USDA Borrowing
5. Special Assessment and/or tapping fees to property owners

6. Capital Reserves of the Municipality
7. Federal, State, or County Grants

The total cost to implement the preferred alternatives is estimated at $7.9 Million. The preferred alternatives are:

- Alternative 2 – Investigate and Reduce I&I within the Sewer System
- Alternative 3 – Pump Station Repair
- Alternative 4 – Renovate and Upgrade the WWTP to 2.0 MGD
- Alternative 7 – Expanded Capacity at the Borough of Northampton Borough WWTP and Developer negotiated capacity at Catasauqua Borough WWTP for the respective service areas

The Borough's Sewer Fund has roughly $3,600,000 available in capital reserves. Over the past four years, the balance of the Sewer Fund has increased an average of $128,000 per year. In addition, the Borough and Township have recently settled a dispute regarding user rates that will provide an additional $160,000 in sewer rates. As a result, the Borough is projected to generate $288,000 per year to finance capital improvements. The current fund balance and anticipated tapping fees can provide the capital necessary to implement the selected alternatives.

However, the Borough has decided to not require developers purchase reserve capacity at this time. Furthermore, the Borough will not require the Township to provide capital to finance the upgrade. As a result, the Borough will only have the following funds readily available to implement the alternatives.

- Borough Sewer Fund: The current balance is $3,600,000 (approximate)
- Outstanding usage payment from Township to Borough: $450,000 (approximate)
- Tapping Fee from Towpath Development: 50 EDUs x $5,070 = $253,500
- 4 years of sewer rates before the cost of upgrading the plant is incurred: 4 x $288,000 = $1,152,000
- Total funds available: $5,455,500
- Total funds required: $7,900,000
- **Additional funds needed: $2,444,500**

It is the Borough's preference to issue a bond to procure the addition funds. Assuming the Borough finances $3,000,000 to implement the Plan, the debt service payment for a 30-year term bond at 3.0% would be $160,000 per year.

The Borough's existing customer is roughly 5,900 EDUs. If the Borough increases rates to offset the new debt, the debt service cost would be $27 per year ($7 per quarter) per EDU.

The average sewer bill for existing residents is $298 per year ($75 per quarter). With the new debt payment, the new residential bill would be $325 per year ($82 per quarter).

Based on discussions with the Borough, it is their intent to absorb the new debt within their existing rate structure. This would reduce their annual cash flow from $288,000 to $128,000, still allowing the Borough to perform modest O&M projects until additional tapping fees are received.

Once the plant is upgraded, additional Tapping Fees will start to become available and pay back the debt in earnest. Based on the existing Tapping Fees of $5,070 (last updated in 2011), the anticipated fees are:

- Tapping Fees generated within the Borough: 492 EDUs x $5,070 = $2,494,440
- Tapping Fees generated within the Township: 320 EDUs x $5,070 = $1,622,400
- Total: $4,116,840

Township

It is not anticipated that the Township will seek funding from outside sources to implement the selected alternative.

The terms between the Borough and the Township to continue to provide public sewer service to the existing customers and provide adequate treatment capacity for future customers will be paid for through the existing tapping fee structure and user fees established by the agreement. The Borough is not expected to require any capital contributions for the proposed improvement projects (other than the agreed upon amount in the agreement) and will be payable from the Township sewer fund. No additional funding sources are expected.

Public sewer service in the Catasauqua Borough will be funded and constructed by private developers. The treatment and disposal of sanitary sewage at the Borough WWTP will be paid for through tapping fees and user fees established during the land development process. The Township will not be extending sewer service beyond the proposed development. Therefore, there is no need for public funding of sewers in this service area.

VI.F – Implementation of Alternatives

VI.F.1 – Activities to Abate Public Health Hazards

No additional activities are needed to abate public health hazards during the implementation of the chosen project alternatives. However, the timeframe in which these project alternatives can be enacted without greater impact continues to grow shorter. A proactive mindset in terms of upgrading facilities and the sanitary sewer system would prevent any future potential public health hazards from occurring.

VI.F.2 – Advantages of Construction Phasing

Borough

The Borough has a fund for capital improvement of the sanitary sewer system and/or WWTP. This fund will be used for the purchase of sewer line components. Manpower within the Borough will be utilized on a basis of availability to install new sewer line components. Otherwise, construction techniques beyond the ability of the Borough will be performed by contracted companies qualified for such activities.

For the alternatives considered to improve the sewage treatment plant, the Borough has a multitude of existing needs that have been documented within this study. The window for repairing the existing systems continues to narrow as replacement parts become less available each year. The work within the plant needs to be implemented in a timely manner.

Capital improvement projects within the plant could be done in either one large project or using a phased approach. Due to the complex interrelation between all of the processes within the plant, it is anticipated that the majority, if not all of the work within the plant will be implemented as a single project.

Since the plan work will be significant, it is anticipated the selected alternatives for projects outside will be implements parallel to any of the work considered within the plant.

Township

No phasing is necessary to implement the proposed alternatives identified in **Section V**.

VI.G – Legal Authority

The municipalities involved with the implementation of this plan have the legal authority to enter into agreements and collect the fees to provide public sanitary sewer collection, conveyance, treatment, and disposal of wastewater within their boundaries.

Borough

The Borough, as empowered by the Borough Code (Title 8, PA CSA)) has the administrative structure in place and the necessary legal authority to implement the Plan. These requirements can be enforced by the Borough Zoning Officer, the Borough SEO (or other appropriate competent person), and the Borough police department with guidance from the Borough Engineer.

Township

All OLDS will be subject to the SMP. It is anticipated that existing Township staff, in coordination with a qualified consultant, will be capable of program administration. Legal authority for the SMP is provided by Title 25, Chapter 71 of the PA Code.

VII – Institutional Evaluation

VII.A – Analysis of Institution

VII.A.1 – Financial Debt and Status

Borough

The Borough Sewer Fund does not have any outstanding debt associated with it. However, as a municipality, the Borough has obligations beyond sewer. To support the operations of the municipality, the Borough has two outstanding bonds. Both of these bonds are for the procurement of fire trucks.

1. Pierce Enforcer Pumper has an outstanding balance of $243,170.56 (mature date 2032)
2. Pierce Aerial Ladder Truck has an outstanding balance of $1,374,457.56 (mature date 2035)

Based on the 2020 census population of 10,395 the existing debt ratio for the Borough is $155.62 per resident. Due to the low level of existing debt, the Borough is in good financial condition and able to obtains loans or apply for grants utilizing typical alternatives available to municipalities.

Township

The sanitary sewer collection and conveyance system in the Township is owned and maintained by the Township. Through the implementation of this plan, the Township will continue to own and operate their collection system and has no outstanding debt including loans or bonds. The Township will continue to finance the operation, maintenance, upgrades, and purchase of additional sewage treatment and disposal capacity at the respective WWTPs through the sanitary sewer reserve fund and developer payments for new construction connections.

VII.A.2 – Available Staff and Administrative Resources

Borough

The Borough administers, operates, and maintains the sewer system and WWTP with full time employees. Any work that requires specialized knowledge or is beyond the capabilities of the staff is contracted out. Technical services including Engineering, SEO, and Legal Counsel, are provided by consultants.

Township

The Township has adequate staff to continue to adequately operate and maintain the sanitary collection system including the administrative responsibilities.

VII.A.3 – Existing Legal Authority

As legal municipalities in the Commonwealth of PA, the Borough and the Township have the right and ability to accomplish all of these items, as needed.

VII.B – Possible Institutional Alternatives

Consistent with the Borough and the Township and their responsibility to protect the health, safety, and welfare of its residents, the Borough and the Township have evaluated the options presented herein. The following discussion is a description of possible institutional alternatives.

VII.B.1 – Need for New Municipal Departments or Authorities

The Borough already includes a Public Works Department and a Sewer Department, and the Township has its own Public Works Department. At this time, it is not anticipated that any new municipal departments are required for the Borough or the Township to implement the various alternatives considered.

VII.B.2 – Function of Existing and Proposed Organizations

Borough

The Borough maintains all of their sewer lines, pump stations, the WWTP, and 2 pump stations situated within the Township.

Township

The Township maintains the sewer lines within their municipality, and supplies support, as necessary, to maintain the Township pump stations. The Township staff is capable of administering the operation and maintenance of the existing collection system, and any additional extensions to the system that may be constructed in the future.

VII.B.3 – Cost of Administration and Implementation

Borough

The Borough funds the administration, operation, and maintenance needs of the collection, conveyance, and sewage treatment plant. These operations are funded with a mixture of tapping fees, Borough customer user fees, Township customer user fees, and WTP user fees. The current fees from these revenue sources are:

- Tapping Fee = $5,070 per EDU
- Borough customer user fee = 95% of water bill
- Borough's portion of Township customer user fee = 85% of water bill
- WTP user fee = $5.01 per 1,000 gallons

Agreements are in place to revise rates from all four of these revenue sources, should the need arise.

Township

Administration and implementation costs of the selected alternative in the Township are included in the tapping fees and user fees collected by the Township during the land development process or at the time the sanitary sewer connection permit is requested. In the Borough service area, the tapping fee for Township connections are set equal to the Borough rate plus $500 for the Township portion. The developer or Township property owner pays the entire tapping fee to the Township and the Township pays the Borough their portion of the tapping fee.

The user fees for public sewer customers in Allen Township are set at 115% of the water bill, where 85% of the bill is payable to the Borough for the conveyance and treatment of the wastewater generated by Township customers. The precise terms of the agreement are under negotiation. However, the agreement will allow for the Township to purchase the additional required capacity at the WWTP on an as-needed basis.

It is anticipated that any debt service relative to the capital improvement needed to provide additional capacity or to replace failing components in the Borough's conveyance or treatment systems will be paid for through a rate evaluation of all customers in the Borough and the Borough service area in the Township.

Tapping fees and user fees in the Catasauqua Borough service area will likewise be negotiated during the land development process. Catasauqua has reviewed their existing infrastructure and indicated there is capacity in their portion of the collection system and at the WWTP to accommodate the additional flow from the Willowbrook Farms development.

VII.C – Administrative and Legal

VII.C.1 – Incorporation

Borough

At this time, the Borough does not intend to become incorporated to fulfill aspects of this Act 537 Plan Update, as incorporation of the Borough occurred in 1902.

Township

There will no new authorities or agencies formed as part of this Act 537 Plan. At this time, the Township does not intend to become incorporated to fulfill aspects of this Act 537 Plan Update. The Township was founded in 1752 and incorporated in 1845.

VII.C.2 – Development of Ordinances, Regulations, Standards, and Inter-Municipal Agreements

The Township and the Borough are currently negotiating an updated intermunicipal agreement for additional capacity for the Township at the respective WWTPs. The scope of the agreement included tapping fees, user rates, and sale of additional capacity.

Township

The Borough has indicated they will provide the additional future flow allocation required to serve the entire service area in the Township of 2,218 EDUs and 500,000 gpd. The sewer use fee calculation payable to the Borough will be set in the agreement. The Township will consider the annual operation and maintenance costs of the existing system and any extensions as they are constructed and continually evaluate the sewer use fee charged to the Township customers to make sure the expenses are adequately covered, and the reserve fund is sufficient for emergency responses.

The intermunicipal agreement with Catasauqua Borough will likewise establish the capacity allocated to Allen Township and the fees associated with securing that allotment.

The Township has already established sewer use rules and regulations which are reviewed and updated from time to time.

VII.C.3 – Rights-of-Way, Easements, and Land Transfers

Borough

For new installations and upgrades at the Borough WWTP, no easements or land transfers are anticipated, as the plant is fully on Borough property. However, due to lack of land for development within the 100-year FEMA floodplain, surrounding properties already owned by the Borough may end up being transferred to the control of the Borough WWTP for development.

In terms of OLDS, a site-by-site basis will be considered for any right-of-way or easements that need to occur to facilitate installation. In most cases, property owners or tenants are encouraged by the Borough to connect to the sanitary sewer system rather than build an individual OLDS or rehabilitate a failing OLDS.

Township

There is no need for any right of way, easement, or land acquisitions for the Township portion of the Act 537 Plan.

VII.C.4 – Adoption of Other Municipal Sewage Facilities Plans

At this point, the Borough does not intend to adopt a municipal sewage facility plan from another municipality. Rather, the intent is to more clearly define and codify their own municipal sewage facility plan by the inclusion of this Act 537 Plan Update. No municipal sewage facility plans will be adopted by the Township as part of this Act 537 Plan.

VII.C.5 – Other Legal Documents

Any legal document of concern has already been considered within the research and compilation of this Act 537 Plan Update. Any other legal documents that are discovered after this Act 537 Plan Update may be included for consideration in the future if necessary.

VII.C.6 – Dates or Times of Previously Listed Items in Section VII.C

None of the items listed previously are at a point of adoption. Therefore, nothing further will be noted on the project implementation schedule. Once this Act 537 Plan Update has been approved, work will be started for administrative or legal activities in regard to project schedules for chosen alternatives.

An Intermunicipal Agreement with the Borough and the Township is anticipated to be completed by March of 2022. Current negotiations will allocate a specific number of EDUs at the Borough WWTP.

Township

The timeframe for the implementation of Alternative 7 for public sewer service in the Township is strictly dependent on the execution of the intermunicipal agreement. For the Borough service area, there are a few EDUs ready to be purchased and connected immediately. It is anticipated that approximately 33% of the outstanding connections which have not yet secured their allocations will be purchased within the first 5 years. There is a significant number of EDUs that have been purchased but not yet contributing the equivalent flow, particularly from the warehouse developments. It is highly unlikely that the maximum reserved flow from these EDUs will ever be discharged.

For the Catasauqua Borough service area, the timeframe is strictly dependent on the development of Willowbrook Farms. The Township and the Borough will enter into the intermunicipal agreement for the conveyance and treatment of wastewater from this property once the developer is prepared to secure the capacity needed to move forward with the project. The design, permitting and construction timeline is also the responsibility of the developer.

VII.D – Institutional Alternative Selected

Borough

At this time, no institutional alternatives have been selected. In the future, a reassessment of institutional alternatives may be warranted to satisfy identified needs.

Township

The Township has adequate staff and resources on hand to continue to provide the administrative, operational, and maintenance services required to continue to own and operate their municipal wastewater collection and conveyance system. The Township retains the services of a municipal consulting engineering firm with sanitary sewer experience for advice and expertise beyond staff capabilities.

VIII – Implementation Schedule

VIII.A – Identified Alternative

Borough

A multitude of alternatives are proposed to address the long-standing issues present with the Borough sanitary sewer system and the WWTP. These alternatives have been chosen based on cost, ease of implementation, and with expectation to provide sufficient improvement of the process or effect on other processes.

As noted previously, some of the most major issues at the plant include sludge storage and wet weather hydraulic capacity. Short-circuiting of processes, excess wasting from the ICEAS basins, variable dissolved oxygen content, inconsistent variability in biological populations, and other effects are caused due to these factors.

VIII.A.1 – Existing Wastewater Disposal Needs

Borough

As noted previously in **Section VI.A – Consistency**, even though the most current Chapter 94 Report (**Appendix G**) did not designate the plant as having a "projected overload," it is close enough to be generally described as operating at or near capacity. This creates a multitude of issues for the personnel at the WWTP, and the ability to effectively operate the plant is greatly reduced. In addition, the Borough is on the borderline with regulatory limits and ability of the plant to handle flow and solids loading, with the potential to result in more violations, fines, or an initiated CAP.

Township

The regional approach to wastewater treatment in the Township is the most economical and environmentally conscious option available to meet public sewer needs. The existing needs of the Township are currently met through connections to the neighboring municipally owned WWTPs.

VIII.A.2 – Future Wastewater Disposal Needs

With the considerations of projected growth, particularly from the Township, greater involvement in the Operations and Maintenance (O&M) of the Borough sanitary sewer system and the WWTP would be advantageous for all parties concerned.

Township

Providing public sewer service to the designated future growth areas in the Township is solely dependent upon the execution of the intermunicipal agreement and the construction timeline set for by the Borough and the developer of the Willowbrook Farms property.

Introducing new infrastructure into the Township to redirect a portion of the flow from the Borough service area to the Catasauqua Borough service area would be costly to Township customers in both capacity reserve funds as well as construction costs. A new WWTP in the Township would be considerably more expensive and disruptive in terms of economic development delays. The process of design, permitting, and constructing the plant and other required infrastructure to convey the sewage to the plant would also incur significant costs.

VIII.A.3 – O & M Considerations

Borough

At this point, the WWTP is in need of major upgrades, to increase efficiency of operation, and prevent certain unit processes from breaking down. Proposed alternatives are meant to upgrade or replace aging systems, provide redundancy, and reduce operator involvement and time spent on particular processes. One of the most critical pieces of equipment in the WWTP, the BFP, has been in use for over 30 years. Multiple repairs to the BFP have created difficulties in dewatering sludge. The parts for the BFP are limited in quantity, based upon the age, and a lot of work that has to be done for this equipment is specialized and costly.

The Main Pump Station renovation project is a definitive case of increasing efficiency and reduction of maintenance through a necessary upgrade. The new pumps are able to handle rags and other larger solids, and do not need to be lubricated as often. separation of the two areas within the Main Pump Station help to further reduce operational difficulty and maintenance costs by isolating equipment away from the presence of hydrogen sulfide. This gas is often produced from the biological processes in wastewater, and has presence in wet wells, vaults, and other partially or full enclosed chambers present within a WWTP or other industrial facility.

Township

Through the implementation of Alternative 7, the Township will continue to own and maintain the public sanitary sewer collection system within the Township service areas.

VIII.A.4 – Cost Effectiveness

Typically, the initial expenditure on new systems, or the upgrade or repair of current systems, carries with it upfront costs. However, replacing systems results in lower costs in the long run, especially with O&M.

Township

The Township has paid for capacity in the Borough WWTP as connections have been made over time. The user fee system in place is administered by the NBMA for customers within their service area. The Township has established a billing system for sewer customers in the Bethlehem Water Service area. Capacity in the Catasauqua Borough Sewer service area has also been secured through intermunicipal agreement, and future allocation will be secured for the new development.

If the Township were to implement Alternative 8, the Township would essentially be purchasing capacity for customers a second time at a different treatment facility.

Alternatives 9 and 10 are the least cost-effective solutions for Township sewer customers, who would ultimately bear the full financial burden for the design, permitting, construction, and operation and maintenance of a new WWTP.

VIII.A.5 – Available Management and Administrative Systems

Borough

Alternatives that relate to upgrades at the WWTP would be managed by contractors under the oversight of the plant superintendent. Alternatives that relate to the sanitary collection system in the Borough would require involvement of the streets department. The management and administrative systems in place would be able to facilitate any of the chosen alternatives.

Township

The management and administrative systems for the Township public sanitary sewer system is established and functionally able to adapt to the expanded service area.

VIII.A.6 – Available Financing Methods

Financing available to implement the selected alternatives for the Borough and Township include the following sources:

- Capital Reserves
- Tapping Fees (Township)
- Tapping Fees (Borough)
- Special assessments
- Short-term or long-term borrowing
- Grants

VIII.A.7 – Environmental Soundness and Compliance

Borough

All selected alternatives presented generally help with prevention of greater environmental issues and would assist the Borough further in meeting parameters within the NPDES and WQM permits.

Township

Alternative 7 does not require any additional sewer system infrastructure outside of the proposed/ approved land development projects that have complied with all applicable Township rules, regulations, and ordinances in place.

VIII.B – Capital Financing Plan

The envisioned capital financing plan to implement the Selected Alternatives by the Borough issuing a bond. An attempt will also be made to secure grant funds from available sources.

VIII.C – Implementation Schedule

Borough

The following schedule begins when DEP approves the Joint Act 537 Plan.

Year 1

- Meet with equipment manufacturers to select equipment for plant upgrade.
- Perform pilot testing for treatment plant equipment.
- Complete existing conditions survey of treatment plant property.
- Meet with the Delaware River Basin Commission (DRBC) to determine effluent limitations.
- Begin design of 21st Street and Stewart Street Pump Station Renovation Projects.

Year 2

- Complete design of 21st Street and Stewart Street Pump Station Renovation Projects.
- Publicly bid the 21st Street and Stewart Street Pump Station Renovation Projects.
- Begin technical design of plant upgrade.

Year 3

- Complete construction for the 21st Street and Stewart Street Pump Station Renovation Projects.
- Finalize design of plant upgrade.
- Apply for permits to upgrade plant.

Year 4

- Receive all permit approvals.
- Procure financing for plant upgrade.
- Publicly bid and award contract for plant upgrade.

Year 5

- Substantially complete construction for plant upgrade project.

Township

An agreement between the Township and the Borough is expected by June 2022. The associated construction projects required to meet the needs of the Township will be set by the Borough.

The agreement between Catasauqua Borough and the Township will be dependent on the timeline of the developer for the Willowbrook Farms property. The Township will review the proposed SMP documents and be ready to implement the program by the end of 2022.

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APPENDIX A

ADMINISTRATIVE DOCUMENTATION

ACT 537 PLAN CHECKLIST

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name Northampton Borough and Allen Township Joint Act 537 Plan

2. Brief Project Description

Comprehensive evaluation of the sewer needs of Northampton Borough and Allen Township.

B. Client (Municipality) Information (Northampton Borough)

Municipality Name	County	City	Boro	Twp
Northampton	Northampton	☐	☒	☐

Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Brobst	LeRoy			Borough Manager

Additional Individual Last Name	First Name	MI	Suffix	Title

Municipality Mailing Address Line 1	Mailing Address Line 2
1401 Laubach Avenue	

Address Last Line -- City	State	ZIP+4
Northampton	PA	18067

Phone + Ext.	FAX (optional)	Email (optional)
610-262-2576	610-261-0505	LeRoyB@enter.net

C. Site Information (Northampton Borough)

Site (or Project) Name
Borough of Northampton (Municipal Name) Act 537 Plan

Site Location Line 1	Site Location Line 2

D. Project Consultant Information (Northampton Borough)

Last Name	First Name	MI	Suffix
Duffy	Thomas		

Title	Consulting Firm Name
Project Engineer	Gilmore & Associates, Inc.

Mailing Address Line 1	Mailing Address Line 2
5100 Tilghman St, Suite 150	

Address Last Line – City	State	ZIP+4	Country
Allentown	PA	18104	USA

Email	Phone + Ext.	FAX
tduffy@gilmore-assoc.com	610-366-8064	610-366-0433

3850-FM-BCW0003 6/2016
Checklist

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name: Northampton Borough and Allen Township Joint Act 537 Plan

2. Brief Project Description

Comprehensive evaluation of the sewer needs of Northampton Borough and Allen Township.

B. Client (Municipality) Information (Allen Township)

Municipality Name	County	City	Boro	Twp
Allen	Northampton	☐	☐	☒

Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Eckhart	Ilene			Manager

Additional Individual Last Name	First Name	MI	Suffix	Title

Municipality Mailing Address Line 1	Mailing Address Line 2
4714 Indian Trail Road	

Address Last Line -- City	State	ZIP+4
Northampton	PA	18067

Phone + Ext.	FAX (optional)	Email (optional)
610-262-7012	610-262-7364	manager@allentownship.org

C. Site Information (Allen Township)

Site (or Project) Name
Allen Township (Municipal Name) Act 537 Plan

Site Location Line 1	Site Location Line 2

D. Project Consultant Information (Allen Township)

Last Name	First Name	MI	Suffix
Martin	Andrea		

Title	Consulting Firm Name
Staff Professional	Barry Isett & Associates, Inc.

Mailing Address Line 1	Mailing Address Line 2
85 South Road 100	

Address Last Line – City	State	ZIP+4	Country
Allentown	PA	18106	USA

Email	Phone + Ext.	FAX
amartin@barryisett.com	610-398-0904	610-481-9098

note: "X" designates items included in Joint 537 Study

PART 2 ADMINISTRATIVE COMPLETENESS CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan	In addition to the main body of the plan, the plan must include items one through eight listed below to be accepted for formal review by DEP. Incomplete plans may be ***denied*** unless the municipality is clearly requesting an advisory review.
____	X	1. **Table of Contents**
		2. **Plan Summary**
____	X	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference - 25 *Pa. Code* §71.21(a)(7)(i)).
____	X	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference - 25 *Pa. Code* §71.21(a)(7)(ii)).
____	X	C. Present the estimated cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference - 25 *Pa. Code* §71.21(a)(7)(ii)).
____	X	D. Identify the municipal commitments necessary to implement the Plan. (Reference - 25 *Pa. Code* §71.21(a)(7)(iii)).
____	X	E. Provide a schedule of implementation for the project that identifies the ***major*** milestones with dates necessary to accomplish the project to the point of operational status. (Reference - 25 *Pa. Code* §71.21(a)(7)(iv)).
____	X	3. **Municipal Adoption:** ***Original***, signed and sealed Resolution of Adoption by the municipality which contains, at a minimum, alternatives chosen and a commitment to implement the Plan in accordance with the implementation schedule. (Reference - 25 *Pa. Code* §71.31(f)) Section V.F. of the Planning Guide.
____	X	4. **Planning Commission / County Health Department Comments**: Evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the municipality, planning agencies of the county, planning agencies with area wide jurisdiction (where applicable), and any existing county or joint county departments of health. (Reference - 25 *Pa. Code* §71.31(b)) Section V.E.1 of the Planning Guide.
____	X	5. **Publication:** Proof of Public Notice which documents the proposed plan adoption, plan summary, and the establishment and conduct of a 30-day comment period. (Reference - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
____	X	6. **Comments and Responses:** Copies of ***all*** written comments received and municipal response to ***each*** comment in relation to the proposed plan. (Reference - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
____	X	7. **Implementation Schedule:** A complete project implementation schedule with milestone dates specific for each existing and future area of need. Other activities in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference - 25 *Pa. Code* §71.31(d)) Section V.F. of the Planning Guide. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference - 25 *Pa. Code* §71.21(c)).
____	X	8. **Consistency Documentation:** Documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 25 *Pa. Code §*71.21.(a)(5)(i-iii). (Reference - 25 *Pa. Code* §71.31(e)). Appendix B of the Planning Guide.

PART 3 GENERAL PLAN CONTENT CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan		Item Required
_____	X	I.	**Previous Wastewater Planning**
			A. Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
_____	X		1. Previously undertaken under the Pennsylvania Sewage Facilities Act (Act). (Reference - Act 537, 35 P.S. §750.5(d)(1)).
_____	X		2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A-D)). Section V.F of the Planning Guide.
_____	X		3. Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A&B)). Section V.D. of the Planning Guide.
_____	X		4. Through planning modules for new land development, planning "exemptions" and addenda. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A)).
_____	X	II.	**Physical and Demographic Analysis utilizing written description and mapping** (All items listed below require maps, and all maps should show all current lots and structures and be of appropriate scale to clearly show significant information).
_____	X		A. Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference – 25 *Pa. Code* §71.21(a)(1)(i)).
_____	X		B. Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference - 25 *Pa. Code* §71.21(a)(1)(ii)).
_____	X		C. Soils - Analysis with description by soil type and soils mapping for areas not presently served by sanitary sewer service. Show areas suitable for in-ground onlot systems, elevated sand mounds, individual residential spray irrigation systems (IRSIS), and areas unsuitable for soil dependent systems. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)).
_____	X		D. Geologic Features - (1) Identification through analysis, (2) mapping and (3) their relation to existing or potential nitrate-nitrogen pollution and drinking water sources. Include areas where existing nitrate-nitrogen levels are in excess of 5 mg/L. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)).
_____	X		E. Topography - Depict areas with slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for onlot systems. (Reference - 25 *Pa. Code* §71.21(a)(1)(ii)).
_____	X		F. Potable Water Supplies - Identification through mapping, description and analysis. Include public water supply service areas and available public water supply capacity and aquifer yield for groundwater supplies. (Reference - 25 *Pa. Code* §71.21(a)(1)(vi)). Section V.C. of the Planning Guide.
_____	X		G. Wetlands-Identify wetlands as defined in 25 *Pa. Code* Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) mapped hydric soils. Proposed collection, conveyance and treatment facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference - 25 *Pa. Code* §71.21(a)(1)(v)). Appendix B, Section II.I of the Planning Guide.

_____	X_____	**III. Existing Sewage Facilities in the Planning Area - Identifying the Existing Needs**
		A. Identify, map and describe municipal and non-municipal, individual and community sewerage systems in the planning area including:
_____	X_____	1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(A)).
_____	X_____	2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's National Pollutant Discharge Elimination System (NPDES) permitted capacity, and the Clean Streams Law permit number. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(A)).
_____	X_____	3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under 25 *Pa. Code* Chapter 94 (relating to municipal wasteload management) or violations of the NPDES permit, Clean Streams Law permit, or other permit, rule or regulation of DEP. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(B)).
_____	X_____	4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Discuss any remaining reserve capacity and the policy concerning the allocation of reserve capacity. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(i & ii)).
_____	_____	~~5. A detailed description of the municipality's operation and maintenance (O & M) requirements for small flow treatment facility systems, including the status of past and present compliance with these requirements and any other requirements relating to sewage management programs (SMPs). (Reference – 25 *Pa. Code* §71.21(a)(2)(i)(C)).~~
_____	_____	~~6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference - 25 *Pa. Code* §71.21(a)(4)(i & ii)).~~
_____	X_____	B. Using DEP's publication titled *Act 537 Sewage Disposal Needs Identification* (3800-BK-DEP1949), identify, map and describe areas that utilize individual and community onlot sewage disposal and, unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) and retaining tank systems in the planning area including:
_____	X_____	1. The types of onlot systems in use. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(A)).
_____	X_____	2. A sanitary survey complete with description, map and tabulation of documented and potential public health, pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Act, the Clean Stream Law or regulations promulgated thereunder. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(B)).
_____	X_____	3. A comparison of the types of onlot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations sewage flows, and 25 *Pa. Code* Chapter 73 (relating to standards for sewage disposal facilities). (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).
_____	X_____	4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's *Act 537 Sewage Disposal Needs Identification* publication. (Reference – 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

_____	_____	5. ~~Detailed description of O & M requirements of the municipality for individual and small volume community onlot systems, including the status of past and present compliance with these requirements and any other requirements relating to SMPs. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(C)).~~
_____	X	C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:
_____	X	1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference – 25 *Pa. Code* §71.71).
_____	X	2. Quantities of the types of sludges or septage generated. (Reference - 25 *Pa. Code* §71.71).
_____	X	3. Present disposal methods, locations, capacities and transportation methods. (Reference - 25 *Pa. Code* §71.71).
_____	X	**IV. Future Growth and Land Development**
		A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:
_____	X	1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).
_____	X	2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – 25 *Pa. Code* §71.21(a)(3)(iv)).
_____	X	3. All limitations and plans related to floodplain and stormwater management and special protection (25 *Pa. Code* Chapter 93) areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)) Appendix B, Section II.F of the Planning Guide.
_____	X	B. Delineate and describe the following through map, text and analysis.
_____	X	1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of equivalent dwelling units (EDUs) in development, total number of EDUs currently developed and total number of EDUs remaining to be developed (include time schedule for EDUs remaining to be developed). (Reference - 25 *Pa. Code* §71.21(a)(3)(i)).
_____	X	2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(ii)). Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).
_____	X	3. Future growth areas with population and EDU projections for these areas using historical, current and future population figures and projections of the municipality. Discuss and evaluate discrepancies between local, county, state and federal projections as they relate to sewage facilities. (Reference - 25 *Pa. Code* §71.21(a)(1)(iv) and (a)(3)(iii)).
_____	X	4. Zoning, and/or subdivision regulations; local, county or regional comprehensive plans; and existing plans of any other agency relating to the development, use and protection of land and water resources with special attention to: (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)). --public ground/surface water supplies --recreational water use areas --groundwater recharge areas --industrial water use --wetlands

	X	5. Sewage planning necessary to provide adequate wastewater treatment for 5 and 10-year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(3)(v)).
	X	**V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities**
		A. Conventional collection, conveyance, treatment and discharge alternatives including:
	X	1. The potential for regional wastewater treatment. (Reference - 25 *Pa. Code* §71.21(a)(4)).
	X	2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(i)).
	X	3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)).
	X	a. Repair. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).
	X	b. Upgrading. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).
	X	c. Reduction of hydraulic or organic loading to existing facilities. (Reference - 25 *Pa. Code* §71.71).
	X	d. Improved O & M. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(C)).
	X	e. Other applicable actions that will resolve or abate the identified problems. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(D)).
	X	4. Repair or replacement of existing collection and conveyance system components. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).
		~~5. The need for construction of new community sewage systems including sewer systems and/or treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iii)).~~
		~~6. Use of innovative/alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).~~
	X	B. The use of individual sewage disposal systems including IRSIS systems based on:
	X	1. Soil and slope suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).
	X	2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).
	X	3. The establishment of a SMP. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)). See also Part "F" below.
	X	4. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for onlot disposal considering: (Reference - 25 *Pa. Code* §71.21(a)(4)).
	X	a. Existing technology and sizing requirements of 25 *Pa. Code* Chapter 73. (Reference - 25 *Pa. Code* §73.31-§73.72).
	X	b. Use of expanded absorption areas or alternating absorption areas. (Reference - 25 *Pa. Code* §73.16).
	X	c. Use of water conservation devices. (Reference - 25 *Pa. Code* §71.73(b)(2)(iii)).

_____	_____	C. The use of small flow sewage treatment facilities or package treatment facilities to serve individual homes or clusters of homes with consideration of: (Reference - 25 *Pa. Code* §71.64(d)).
_____	_____	1. Treatment and discharge requirements. (Reference - 25 *Pa. Code* §71.64(d)).
_____	_____	2. Soil suitability. (Reference - 25 *Pa. Code* §71.64(c)(1)).
_____	_____	3. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.64(c)(2)).
_____	_____	4. Municipal, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §71.64(d)). See Part "F" below.
_____	_____	D. The use of community land disposal alternatives including:
_____	_____	1. Soil and site suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).
_____	_____	2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).
_____	_____	3. Municipality, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)). See Part "F" below.
_____	_____	4. The rehabilitation or replacement of existing malfunctioning community land disposal systems. (See Part "V", B, 4, a, b, c above). See also Part "F" below.
_____	_____	E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference - 25 *Pa. Code* §71.21(a)(4)).
_____	_____	1. Commercial, residential and industrial use. (Reference - 25 *Pa. Code* §71.63(e)).
_____	_____	2 Designated conveyance facilities (pumper trucks). (Reference - 25 *Pa. Code* §71.63(b)(2)).
_____	_____	3. Designated treatment facilities or disposal site. (Reference - 25 *Pa. Code* §71.63(b)(2)).
_____	_____	4. Implementation of a retaining tank ordinance by the municipality. (Reference - 25 *Pa. Code* §71.63(c)(3)). See Part "F" below.
_____	_____	5. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference - 25 *Pa. Code* §71.63(c)(2)).
_____	X	F. SMPs to assure the future O & M of existing and proposed sewage facilities through:
_____	X	1. Municipal ownership or control over the O & M of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)).
_____	X	2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference - 25 *Pa. Code* §71.73(b)(1)).
_____	X	3. Required maintenance of sewage disposal systems including septic and aerobic treatment tanks and other system components on a schedule established by the municipality. (Reference - 25 *Pa. Code* §71.73(b)(2)).
_____	X	4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv) and §71.73(b)(5)) through:
_____	X	a. Aggressive pro-active enforcement of ordinances that require O & M and prohibit malfunctioning systems. (Reference - 25 *Pa. Code* §71.73(b)(5)).
_____	X	b. Public education programs to encourage proper O & M and repair of sewage disposal systems.
_____	X	5. Establishment of joint municipal SMPs. (Reference - 25 *Pa. Code*

§71.73(b)(8)).

_____ X___ 6. Requirements for bonding, escrow accounts, management agencies or associations to assure O & M for non-municipal facilities. (Reference - 25 *Pa. Code* §71.71).

_____ X___ G. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

1. Modification of existing comprehensive plans involving:

_____ X___ a. Land use designations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ b. Densities. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ c. Municipal ordinances and regulations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ d. Improved enforcement. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ e. Protection of drinking water sources. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 3. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal that consider lot sizes and protection of replacement areas. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 1. Water quality/public health. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 2. Growth potential (residential, commercial, industrial). (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 3. Community economic conditions. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 4. Recreational opportunities. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 5. Drinking water sources. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ 6. Other environmental concerns. (Reference - 25 *Pa. Code* §71.21(a)(4)).

_____ X___ **VI. Evaluation of Alternatives**

A. Technically feasible alternatives identified in Section V of this checklist must be evaluated for consistency with respect to the following: (Reference - 25 *Pa. Code* §71.21(a)(5)(i)).

_____ X___ 1. Applicable plans developed and approved under **Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act** (33 U.S.C.A. 1288). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A)). Appendix B, Section II.A of the Planning Guide.

_____ X___ 2. Municipal wasteload management **Corrective Action Plans or Annual Reports** developed under 25 *Pa. Code* Chapter 94. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(B)). The municipality's recent Wasteload Management (25 *Pa. Code* Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. Appendix B, Section II.B of the Planning Guide.

_____ X___ 3. Plans developed under **Title II of the Clean Water Act** (33 U.S.C.A.

1281-1299) or **Titles II and VI of the Water Quality Act of 1987** (33 U.S.C.A 1251-1376). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(C)). Appendix B, Section II.E of the Planning Guide.

_____ X___ 4. **Comprehensive plans** developed under the Pennsylvania Municipalities Planning Code. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(D)). The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section II.D of the Planning Guide.

_____ X___ 5. **Antidegradation requirements** as contained in 25 *Pa. Code* Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(E). Appendix B, Section II.F of the Planning Guide.

_____ X___ 6. **State Water Plans** developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(F)). Appendix B, Section II.C of the Planning Guide.

_____ X___ 7. **Pennsylvania Prime Agricultural Land Policy** contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide narrative on local municipal policy and an overlay map on prime agricultural soils. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(G)). Appendix B, Section II.G of the Planning Guide.

_____ X___ 8. **County Stormwater Management Plans** approved by DEP under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(H)). Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the county Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H of the Planning Guide.

_____ X___ 9. **Wetland Protection.** Using wetland mapping developed under Checklist Section II.G, identify and discuss mitigative measures including the need to obtain permits for any encroachments on wetlands from the construction or operation of any proposed wastewater facilities. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(I)) Appendix B, Section II.I of the Planning Guide.

_____ X___ 10. **Protection of rare, endangered or threatened plant and animal species** as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(J)). Provide DEP with a copy of the completed *PNDI Manual Project Submission Form*. Also provide a copy of the response letters from the 4 jurisdictional agencies regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.

_____ X___ 11. **Historical and archaeological resource protection** under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission (PHMC). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(K)). Provide DEP with a completed copy of a *Cultural Resource Notice* and a return receipt for its submission to PHMC. Provide a copy of the response letter or review stamp from the Bureau of Historic Preservation (BHP) indicating the project will have no effect on, or that there may be potential impacts on, known archaeological and historical sites and any avoidance and mitigation measures required. Appendix B, Section II.K of the Planning Guide.

_____ X_____ B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting a letter from the appropriate agency stating that the agency has received, reviewed and concurred with the resolution of identified inconsistencies. (Reference - 25 *Pa. Code* §71.21(a)(5)(ii)). Appendix B of the Planning Guide.

_____ X_____ C. Evaluate alternatives identified in Section V of this checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference - 25 *Pa. Code* §71.21(a)(5)(iii)).

_____ X_____ D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, O & M and user fees for alternatives identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(iv)).

_____ X_____ E. Provide an analysis of the funding methods available to finance the proposed alternatives evaluated in Section V of this checklist. Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost-effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within 5 years from the date of the plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(v)).

_____ X_____ F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)).

_____ X_____ 1. A description of any activities necessary to abate critical public health hazards pending completion of sewage facilities or implementation of SMPs. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(A)).

_____ X_____ 2. A description of the advantages, if any, in phasing construction of the facilities or implementation of a SMP justifying time schedules for each phase. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(B)).

_____ X_____ G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(D)).

_____ X_____ **VII. Institutional Evaluation**

A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:

_____ X_____ 1. Financial and debt status. (Reference - 25 *Pa. Code* §71.61(d)(2)).

_____ X_____ 2. Available staff and administrative resources. (Reference - 25 *Pa. Code* §71.61(d)(2))

_____ X_____ 3. Existing legal authority to:

_____ _____ a. Implement wastewater planning recommendations. (Reference - 25 *Pa. Code* §71.61(d)(2)).

_____ _____ b. Implement system-wide O & M activities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

_____ _____ c. Set user fees and take purchasing actions. (Reference - 25 *Pa. Code* §71.61(d)(2)).

_____ _____ d. Take enforcement actions against ordinance violators. (Reference - 25 *Pa. Code* §71.61(d)(2)).

_____ _____ e. Negotiate agreements with other parties. (Reference - 25 *Pa. Code* §71.61(d)(2)).

_____	X___	f. Raise capital for construction and O & M of facilities. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:
_____	X___	1. Need for new municipal departments or municipal authorities. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:
_____	X___	1. Incorporation of authorities or agencies. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	3. Description of activities to provide rights-of-way, easements and land transfers. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	4. Adoption of other municipal sewage facilities plans. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	5. Any other legal documents. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	6. Dates or timeframes for items 1-5 above on the project's implementation schedule.
_____	X___	D. Identify the proposed institutional alternative for implementing the chosen technical wastewater disposal alternative. Provide justification for choosing the specific institutional alternative considering administrative issues, organizational needs and enabling legal authority. (Reference - 25 *Pa. Code* §71.61(d)(2)).
_____	X___	**VIII. Implementation Schedule and Justification for Selected Technical & Institutional Alternatives**
		A. Identify the technical wastewater disposal alternative which best meets the wastewater treatment needs of each study area of the municipality. Justify the choice by providing documentation which shows that it is the best alternative based on:
_____	X___	1. Existing wastewater disposal needs. (Reference - 25 *Pa. Code* §71.21(a)(6)).
_____	X___	2. Future wastewater disposal needs. (5 and 10 year growth areas). (Reference - 25 *Pa. Code* §71.21(a)(6)).
_____	X___	3. O & M considerations. (Reference - 25 *Pa. Code* §71.21(a)(6)).
_____	X___	4. Cost-effectiveness. (Reference - 25 *Pa. Code* §71.21(a)(6)).
_____	X___	5. Available management and administrative systems. (Reference - 25 *Pa. Code* §71.21(a)(6)).
_____	X___	6. Available financing methods. (Reference - 25 *Pa. Code* §71.21(a)(6)).
_____	X___	7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference - 25 *Pa. Code* §71.21(a)(6)).

_____ X____ B. Designate and describe the capital financing plan chosen to implement the selected alternative(s). Designate and describe the chosen back-up financing plan. (Reference - 25 *Pa. Code* §71.21(a)(6))

_____ X____ C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a SMP. (Reference – 25 *Pa. Code* §71.31(d))

_____ _____ **IX. Environmental Report (ER) generated from the UER Process**

_____ _____ A. ~~Complete an ER as required by the UER process and as described in the DEP Technical Guidance (381-5511-111). Include this document as "Appendix A" to the Act 537 Plan Update Revision. ***Note: An ER is required only for Wastewater projects proposing funding through any of the funding sources identified in the UER.***~~

PENNVEST I.D. No. ___________________________

ADDITIONAL REQUIREMENTS FOR PENNVEST PROJECTS

Municipalities that propose to implement their official sewage facilities plan updates with PENNVEST funds must meet 6 additional requirements to be eligible for such funds. See *A Guide for Preparing Act 537 Update Revisions* (362-0300-003), Appendix N for greater detail or contact the DEP regional office serving your county listed in Appendix J of the same publication.

DEP Use Only	Indicate Page #(s) in Plan	Item Required
_____	_____	1. Environmental Impact Assessment. (Planning Phase) The UER replaces the Environmental Impact Assessment that was a previous requirement for PENNVEST projects.
_____	_____	2. Cost Effectiveness (Planning Phase) The cost-effectiveness analysis should be a present-worth (or equivalent uniform annual) cost evaluation of the principle alternatives using the interest rate that is published annually by the Water Resources Council. Normally, for PENNVEST projects the applicant should select the most cost-effective alternative based upon the above analysis. Once the alternative has been selected the user fee estimates should be developed based upon interest rates and loan terms of the selected funding method.
_____		3. Second Opinion Project Review. (Design Phase)
_____		4. Minority Business Enterprise/Women's Business Enterprise (Construction Phase)
_____		5. Civil Rights. (Construction Phase)
_____		6. Initiation of Operation/Performance Certification. (Post-construction Phase)

I/A TECHNOLOGIES

PARTIAL LISTING OF INNOVATIVE AND ALTERNATIVE TECHNOLOGIES

TREATMENT TECHNOLOGIES
Aquaculture
Aquifer Recharge
Biological Aerated Filters
Constructed Wetlands
Direct Reuse (NON-POTABLE)
Horticulture
Overland Flow
Rapid Infiltration
Silviculture
Microscreens
Controlled Release Lagoons
Swirl Concentrator

ENERGY RECOVERY TECHNOLOGIES
Anaerobic Digestion with more than 90 percent
Methane Recovery
Cogeneration of Electricity
Self-Sustaining Incineration

SLUDGE TREATMENT TECHNOLOGIES

Aerated Static Pile Composting
Enclosed Mechanical Composting (In vessel)
Revegetation of Disturbed Land
Aerated Windrow Composting

INDIVIDUAL & SYSTEM-WIDE COLLECTION TECHNOLOGIES
Cluster Systems
Septage Treatment
Small Diameter Gravity Sewers
Step Pressure Sewers
Vacuum Sewers
Variable Grade Sewers
Septic Tank Effluent Pump with Pressure Sewers

MUNICIPAL ADOPTION

PLANNING COMMISSION COMMENTS (MUNICIPAL AND COUNTY)

The Borough and the Township are taking the appropriate steps necessary to facilitate adoption of this Act 537 Plan Update through review by planning agencies of each municipality, as well as Catasauqua and LVPC. It is noted that Northampton County does not have a health department.

PUBLICATION

(PROOF OF PUBLIC NOTICE DOCUMENTING PLAN ADOPTION, SUMMARY, AND ESTABLISHMENT OF A 30-DAY COMMENT PERIOD).

PUBLIC COMMENTS

AND RESPONSES

IMPLEMENTATION SCHEDULE

For implementation schedule, see to Section 0.E of the narrative.

CONSISTENCY DOCUMENTATION

APPENDIX B

1985 BASIS OF DESIGN FOR NORTHAMPTON BOROUGH WASTEWATER TREATMENT PLANT

Basis of Design Summary Page for WWTP (1985)

APPENDIX 1 (Cont'd.)

DESIGN WASTEWATER FLOWS AND LOADINGS

Contributor	Avg. Daily, Q	Peak Daily, Q	Peak Wet Weather, Q
Boro Residential	759,000	1,518,000	2,277,000
Boro Commercial	100,000	200,000	300,000
Allen Twp.	61,000	122,000	183,000
NBMA	90,000	190,000	190,000
Boro Additional	490,000	980,000	1,470,000
	1,500,000	3,010,000	4,420,000

Contributor	BOD_5 (lbs/day)	SS (lbs/day)	NH_3-N lbs/day
Boro	1,251	1,251	125
Allen	102	102	10
NBMA	8	1,000	0
Boro Add'l (1)	818	818	103
Load's lbs/day	2,179	3,171	238
EQ Conc.	175	254	19

(1) Assumptions 200 mg/L BOD SS; mg/L NH_3-N

APPENDIX C

PLAN FIGURES

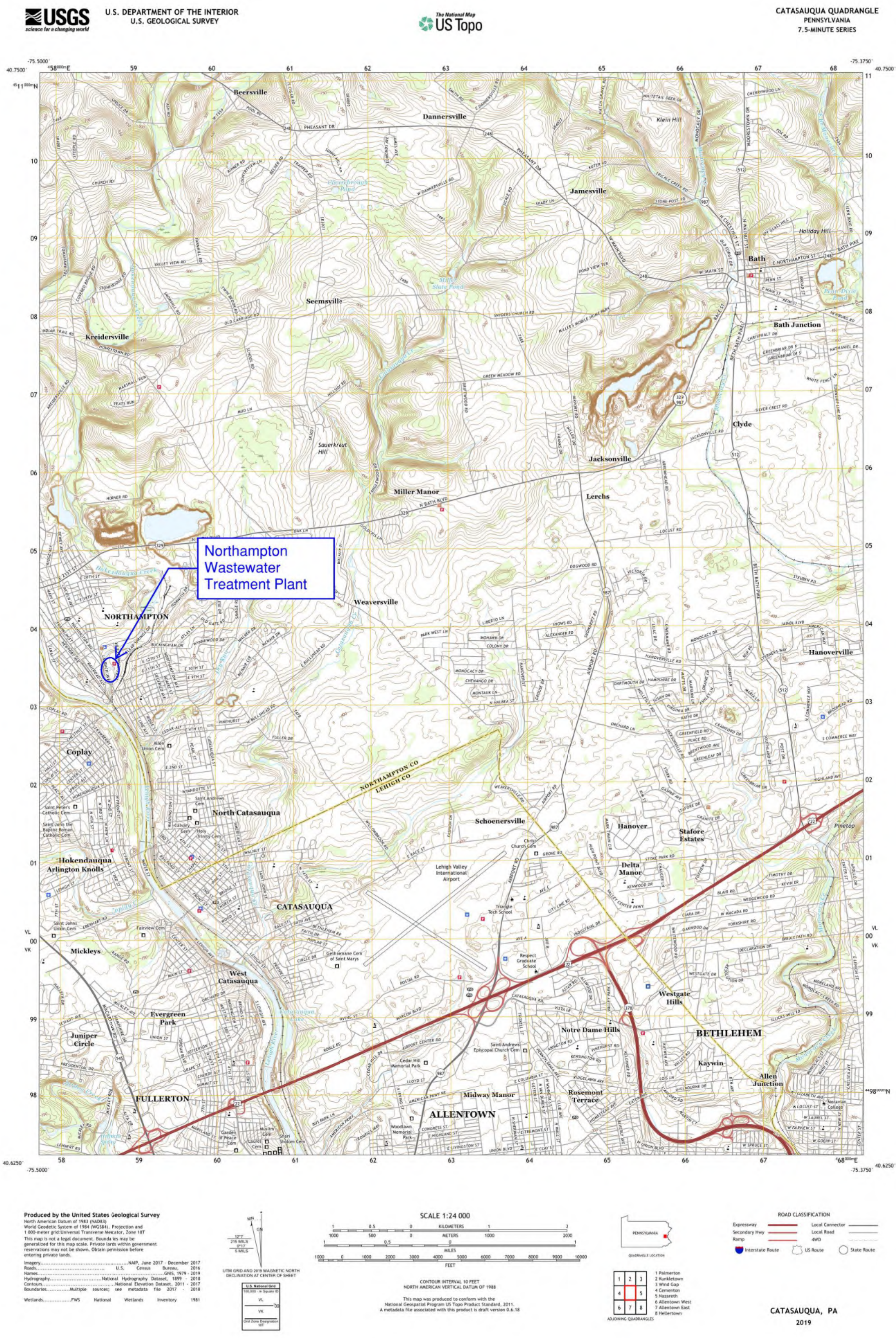
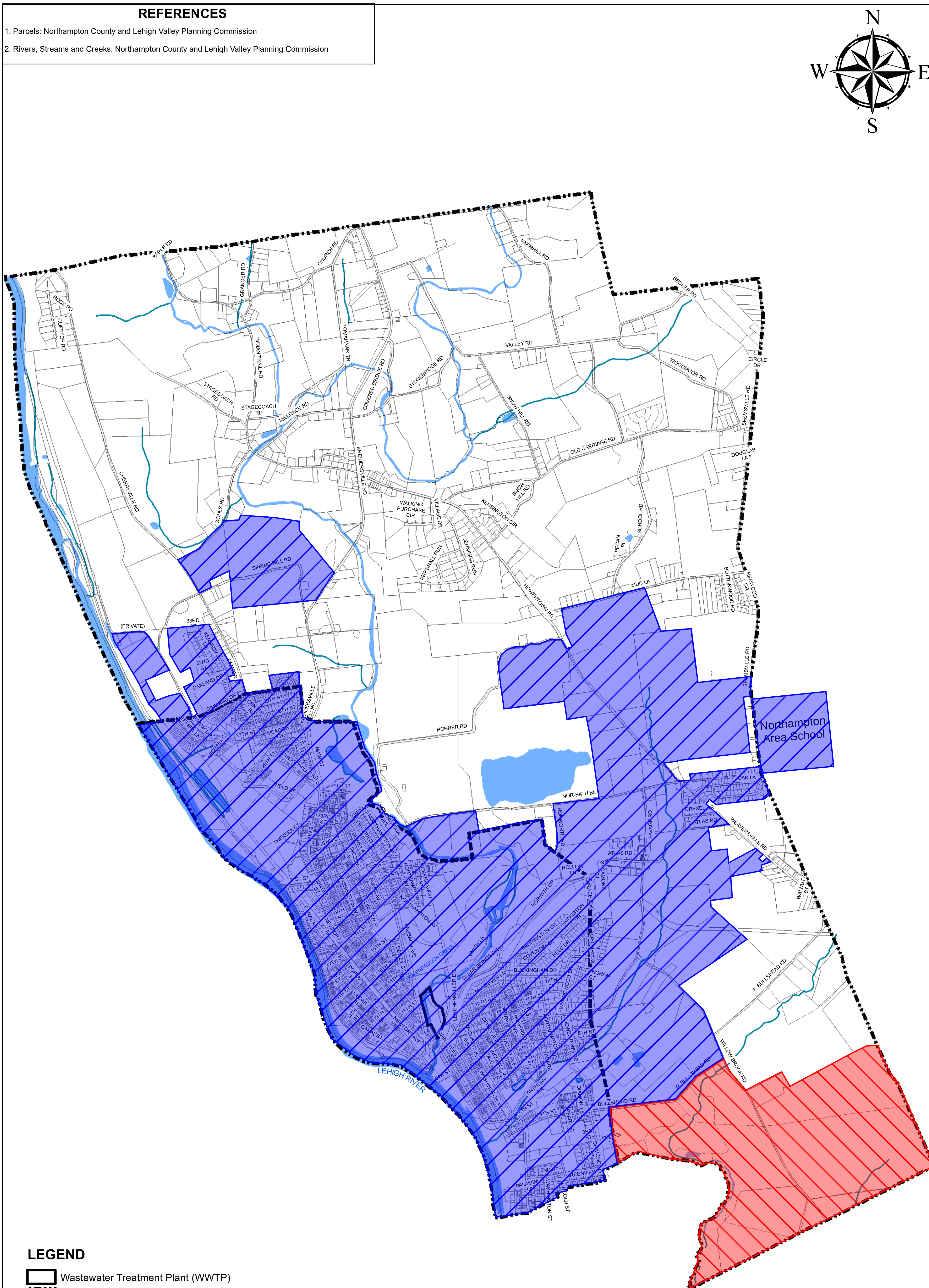


Figure 1.0: USGS 7.5-Minute Catasauqua Quadrangle Topographic Map

Figure 1.5: USGS 7.5-Minute Cementon Quadrangle Topographic Map

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission



LEGEND

- Wastewater Treatment Plant (WWTP)
- Municipal Boundary
- Hydrology
- Streams and Creeks
- Parcels
- Road Names
- Public Sewer Service Area to Catasauqua Borough
- Public Sewer Service Area to Northampton Borough Service Area

Figure 1.75
Planning Area Map of
Northampton Borough and Allen Township

NORTHAMPTON COUNTY, PENNSYLVANIA

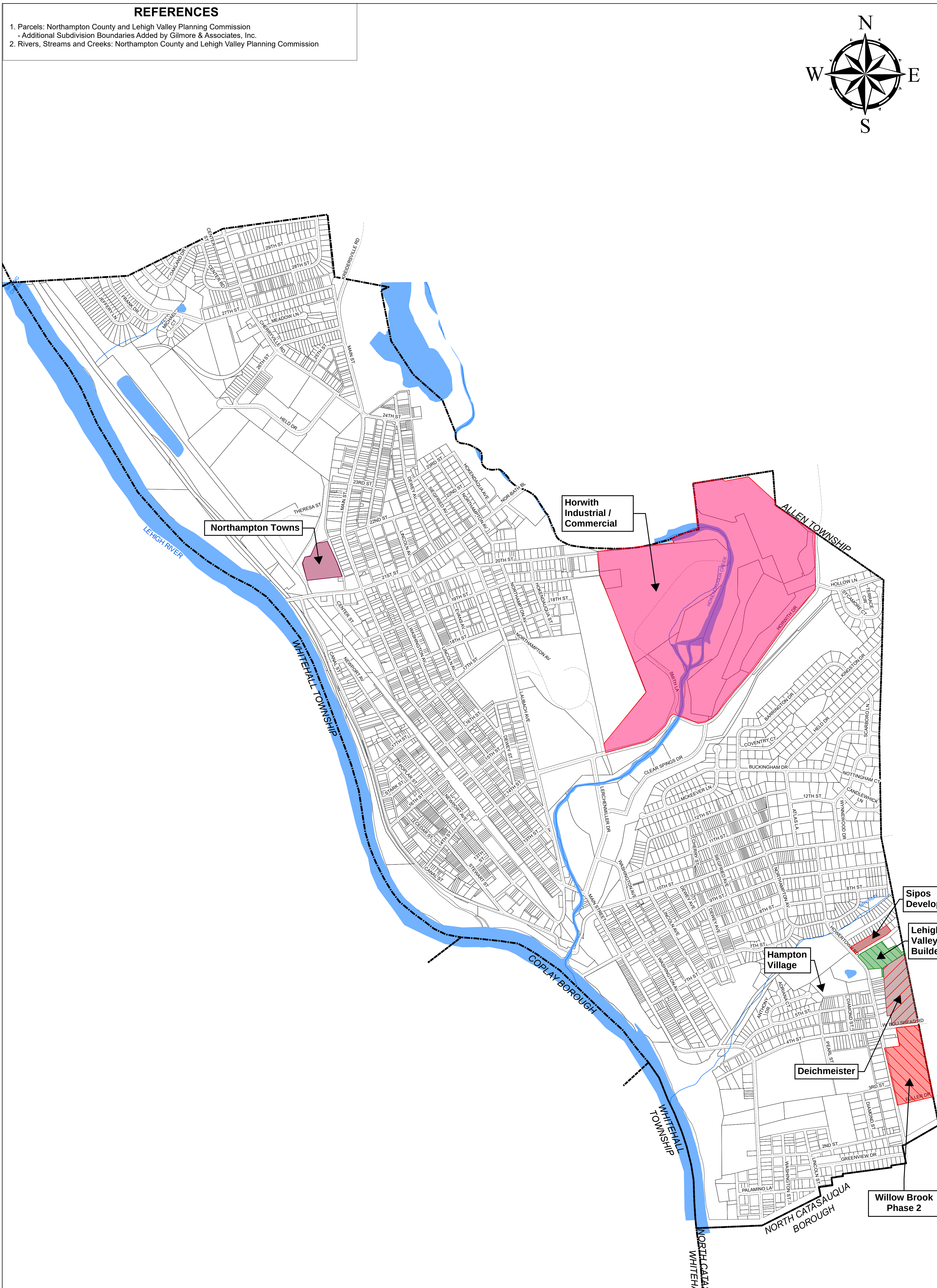
GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: DECEMBER 2021

0 500 1,000 2,000 3,000 4,000 Feet

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission



NORTHAMPTON BOROUGH

Figure 1.80 - Borough Development Map

FORKS TOWNSHIP, NORTHAMPTON COUNTY, PENNSYLVANIA

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
65 E. BUTLER AVE. SUITE 100, NEW BRITAIN, PA 18901-5106 - (215) 345-4330 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

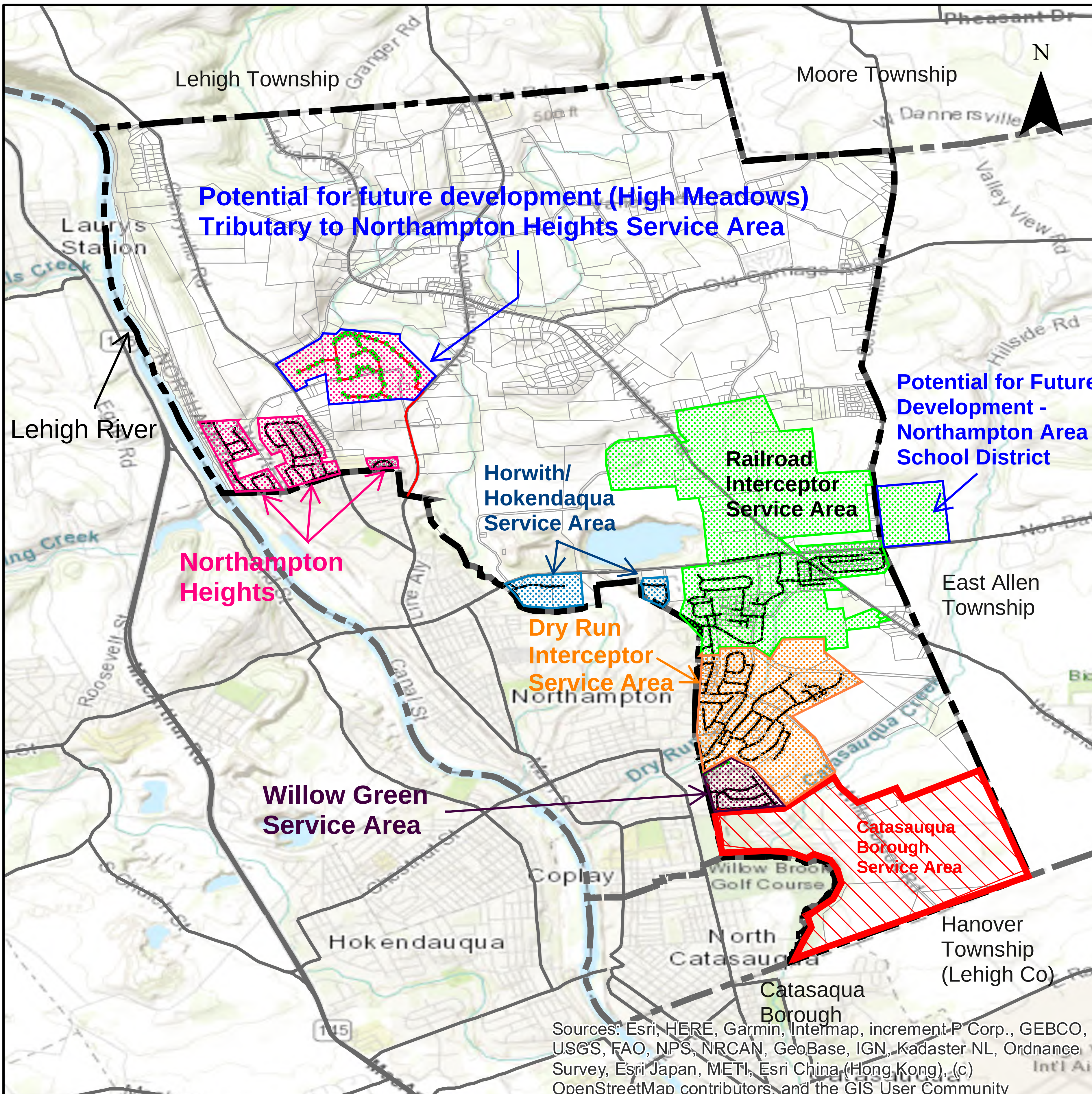


Figure 1.85 - Allen Township Service Area

1 inch = 5,000 feet

0 2,500 5,000 10,000 Feet

Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads

Note: Service areas with dotted hatching are in the Northampton Borough Service Area. The Catasauqua Borough Service area is noted with a slanted line hatching.

BARRY ISETT & associates INC

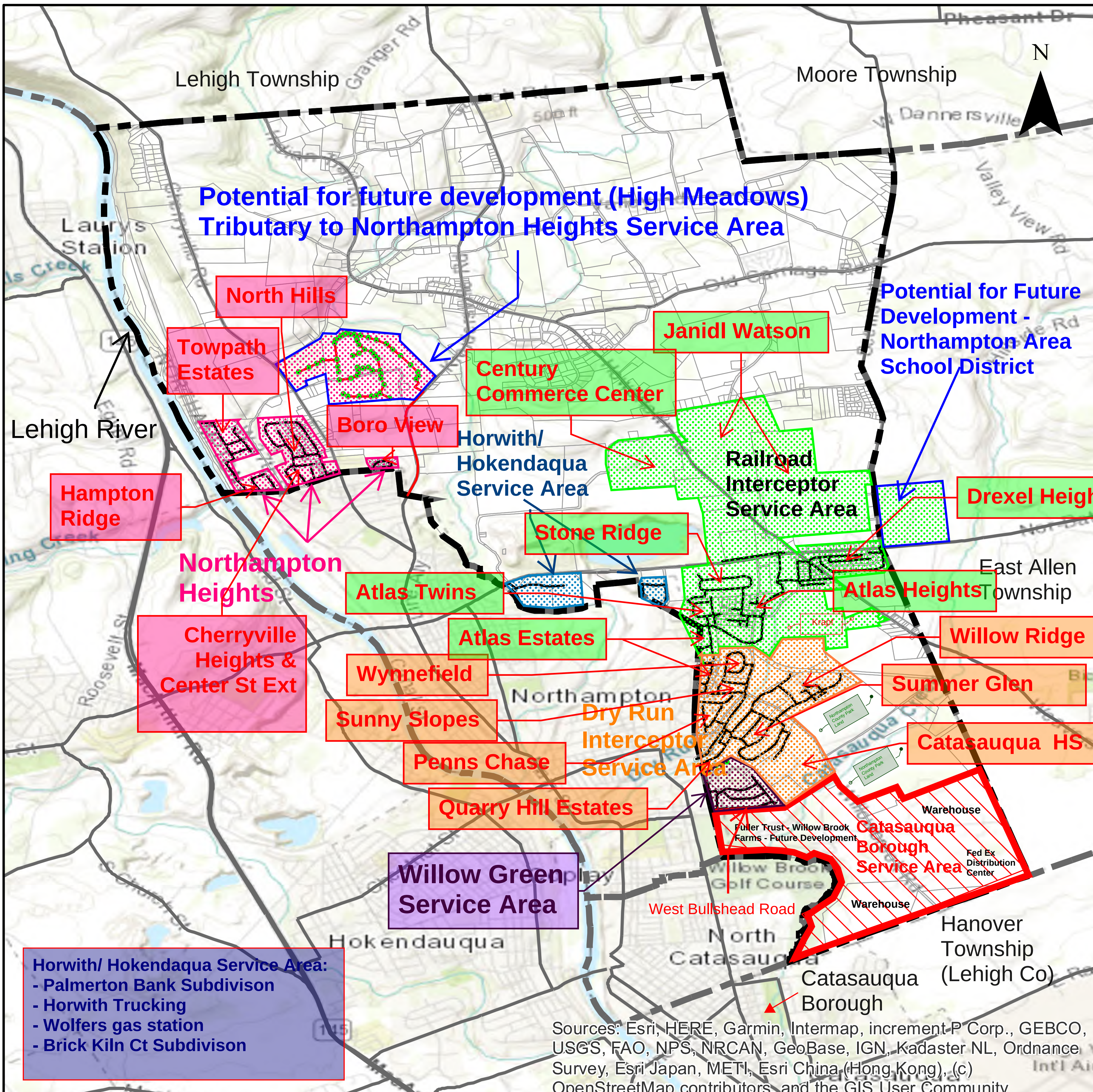


Figure 1.95 - Allen Township Subdivision and Drainage Basin Map

1 inch = 5,000 feet

0 2,500 5,000 10,000 Feet

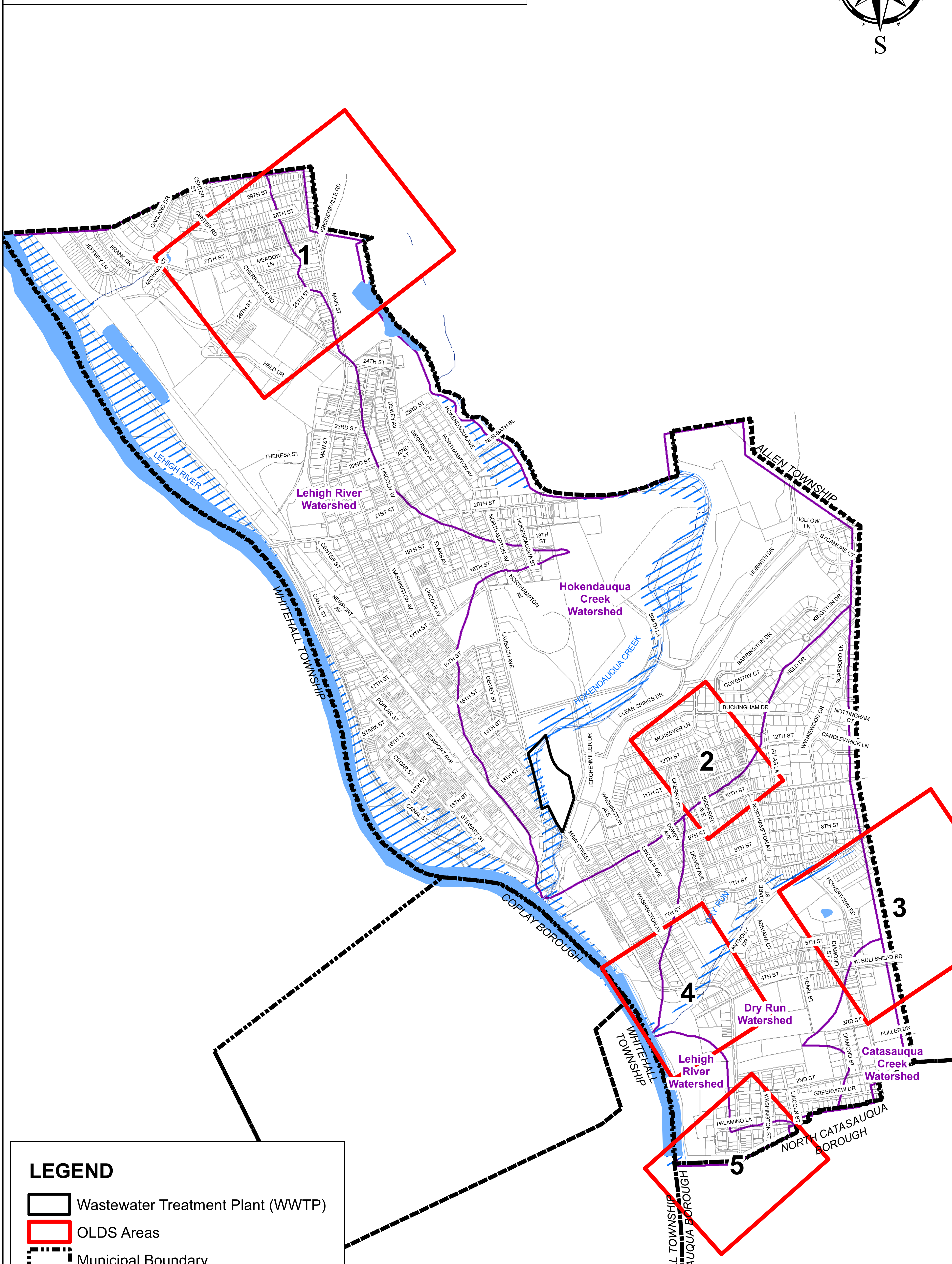
Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads

BARRY ISETT & associates INC

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Watershed Delineation: Pennsylvania Department of Environmental Protection



LEGEND

- Wastewater Treatment Plant (WWTP)
- OLDS Areas
- Municipal Boundary
- Hydrology
- Parcels
- Watershed
- 100yr Floodplains
- Streams and Creeks
- Road Names

NORTHAMPTON BOROUGH

Figure 2 Hydrology Map

NORTHMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

Figure 2.5 - Hydrology Map of Allen Township

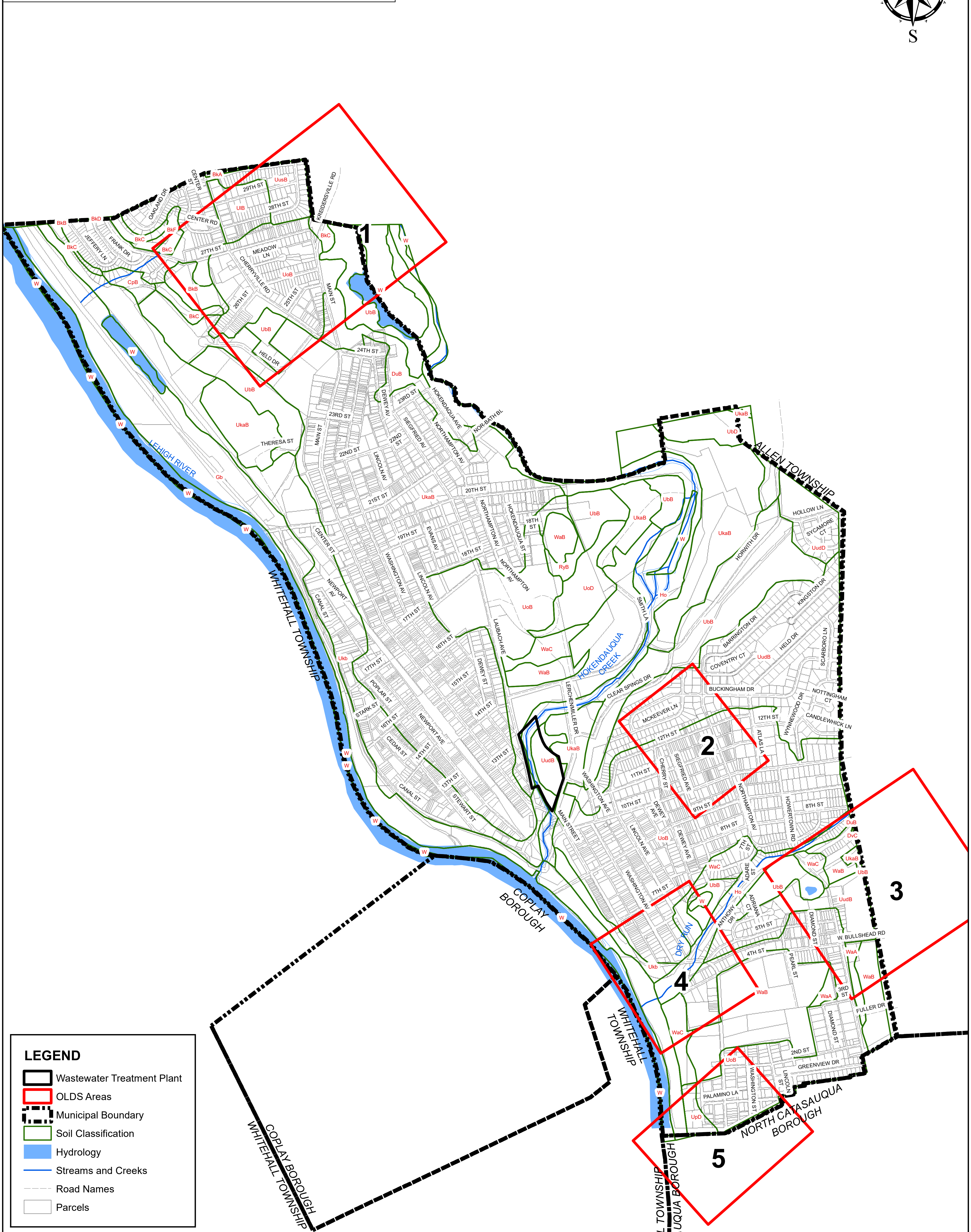
Legend

Proposed Sanitary Manholes
Sanitary Manholes
Proposed Sanitary Lines
Sanitary Lines
Proposed Pump Stations
Pump Stations
Allen Township Boundary
Municipal Boundaries
Parcels
Water Bodies
Streams
Watersheds
State Roads

BARRY ISETT & associates INC

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Soils Classification: USDA - NRCS Web Soil Survey



SOIL SYMBOL	SOIL MAP UNIT NAME
BkA, Bkb, BkC, BkD, BkF	Berks-Weikert complex
CpB	Comly silt loam
DvC	Duffield-Ryder silt loams
DuB	Duffield silt loam
Gb	Gibraltar silt loam
Ho	Holly silt loam
RyB	Ryder-Duffield silt loams
UbB, UpD	Udorthents, limestone
UkaB, Ukb	Urban land
UlB	Urban land-Berks complex
UoD	Urban land-Duffield complex
UpD	Urban land-Gladstone complex
UudB, UudD	Urban land-Udorthents, limestone complex
UusB	Urban land-Udorthents, shale and sandstone complex
WaA, WaB, WaC	Washington silt loam
W	Water

NORTHAMPTON BOROUGH
Figure 3 Soils Map

NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

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JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

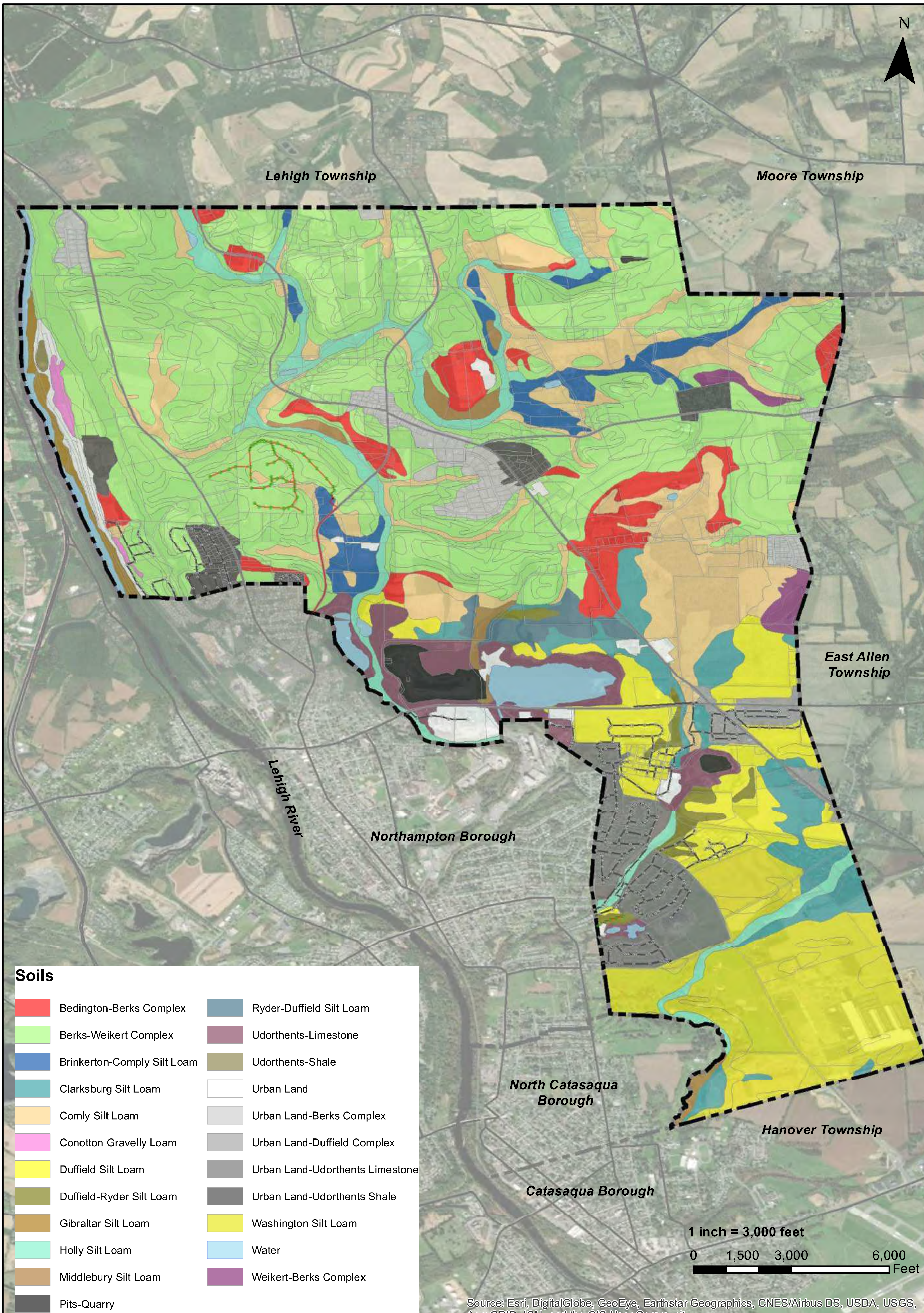


Figure 3.5 - Soils Map of Allen Township

Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads

BARRY ISETT & associates INC

Figure 4.25: Soil Properties of Northampton Borough

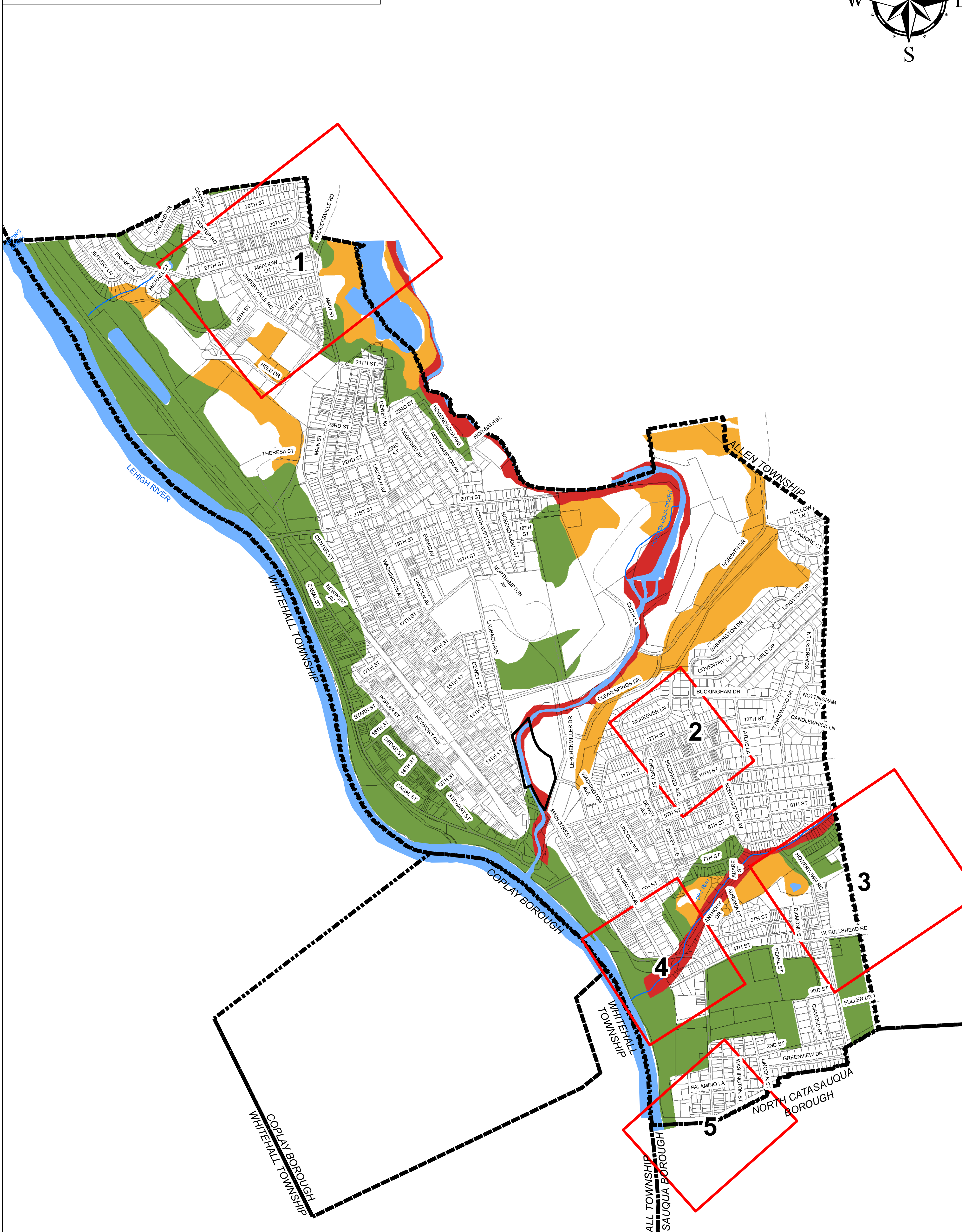
Abbreviation	Soil Class	Slope (%)	Depth to Rock (in)	Depth to Water Table (in)	Permeability	Drainage Class	Hydric Soil	Prime Farmland
BkA	Berks-Weimert Complex	0 to 3	20 to 40	>80	Moderately low to high	Well drained	No	Yes
BkB		3 to 8						Yes
BkC		8 to 15						Yes
BkF		25 to 60						No
CpB	Comly Silt Loam	3 to 8	60 to 96	12 to 36	Moderately low to moderately high	Moderately well drained	No	Yes
DuB	Duffield Silt Loam	3 to 8	48 to 120	>80	Moderately high to high	Well drained	No	Yes
DvC	Duffield-Ryder Silt Loam	8 to 15	48 to 120	>80	Moderately high to high	Well drained	No	Yes
Gb	Gibraltar Silt Loam		60 to 72	36 to 60	Moderately high to high	Well drained	No	Yes
Ho	Holly Silt Loam		>80	0 to 12	Moderately high to high	Poorly drained	Yes	Yes
RyB	Ryder-Duffield Silt Loam	3 to 8	24 to 40	>80	Moderately low to high	Well drained	No	Yes
UbB	Udorthents, limestone	0 to 8	40 to 99	60	Moderately low to moderately high	Well drained	No	No
UbD		8 to 25						
UkaB	Urban Land	0 to 8	No Data	No Data	No Data	No Data	No Data	No
Ukb	Urban Land, occasionally flooded		10 to 98	No Data	Very low	Excessively drained	No	No
UlB	Urban Land-Berks Complex	0 to 8	10 to 100	No Data	No Data	No Data	No	No
UoB	Urban Land-Duffield Complex	0 to 8	10 to 100	No Data	No Data	No Data	No	No
UoD		8 to 25						
UpD	Urban Land-Gladstone Complex	8 to 25	10 to 100	No Data	No Data	No Data	No	No
UudB	Urban Land-Udorthents, limestone Complex	0 to 8	10 to 99	No Data	No Data	No Data	No	No
UudD		8 to 25						
UusB	Urban Land-Udorthents, shale and sandstone Complex	0 to 8	10 to 99	No Data	No Data	No Data	No	No
WaA	Washington Silt Loam	0 to 3	60 to 99	>80	Moderately low to high	Well drained	No	Yes
WaB		3 to 8						
WaC		8 to 15						

Figure 4.50: Soil Properties of Allen Township

Abbreviation	Soil Class	Slope (%)	Depth to Rock (in)	Depth to Water Table (in)	Permeability	Drainage Class	Hydric Soil	Prime Farmland
BfA	Bedington-Berks Complex	0 to 3	60 to 99	>80	Moderately high to high	Well drained	No	Yes
BfB		3 to 8						
BkA	Berks-Weikert Complex	0 to 3	20 to 40	>80	Moderately low to high	Well drained	No	Yes
BkB		3 to 8						
BkC		8 to 15						
BkD	Berks-Weikert Complex	15 to 25	20 to 40	>80	Moderately high to high	Well drained	No	No
BkF	Berks-Weikert Complex	25 to 60	20 to 40	>80	Moderately high to high	Well drained	No	No
BtA	Brinkerton-Comly Silt Loam	0 to 3	60 to 99	0 to 6	Moderately low to moderately high	Poorly drained	Yes	No
BtB		3 to 8						
ClA	Clarksburg Silt Loam	0 to 3	60 to 99	18 to 36	Moderately low to moderately high	Moderately well drained	No	Yes
ClB		3 to 8						
CpA	Comly Silt Loam	0 to 3	60 to 96	12 to 36	Moderately low to moderately high	Moderately well drained	No	Yes
CpB		3 to 8						
CtB	Conotton Gravelly Loam	3 to 8	>80	>80	High	Well drained	No	Yes
DuA	Duffield Silt Loam	0 to 3	48 to 120	>80	Moderately high to high	Well drained	No	Yes
DuB		3 to 8						
DvC	Duffield-Ryder Silt Loam	8 to 15	48 to 120	>80	Moderately high to high	Well drained	No	Yes
Gb	Gibraltar Silt Loam		60 to 72	36 to 60	Moderately high to high	Well drained	No	Yes
Ho	Holly Silt Loam		>80	0 to 12	Moderately high to high	Poorly drained	Yes	Yes
Mb	Middlebury Silt Loam		60 to 99	6 to 24	Moderately high to high	Moderately well drained	No	Yes
PQ	Pits, quarry		No Data	No Data	No Data	No Data	No Data	No
RyB	Ryder-Duffield Silt Loam	3 to 8	24 to 40	>80	Moderately low to high	Well drained	No	Yes
UbB	Udorthents, limestone	0 to 8	40 to 99	60	Moderately low to moderately high	Well drained	No	No
UbD		8 to 25						
UhB	Udorthents, shale and sandstone	0 to 8	20 to 99	60	Moderately high to high	Well drained	No	No
UkaB	Urban Land	0 to 8	No Data	No Data	No Data	No Data	No	No
Ukb	Urban Land, occassionally flooded		10 to 98	No Data	No Data	Excessively drained	No	No
UlB	Urban Land-Berks Complex	0 to 8	10 to 100	No Data	No Data	No Data	No	No
UlD		8 to 25						
UoB	Urban Land-Duffield Complex	0 to 8	10 to 100	No Data	No Data	No Data	No	No
UudB	Urban Land-Udorthents, limestone Complex	0 to 8	10 to 99	No Data	No Data	No Data	No	No
UudD		8 to 25						
UusB	Urban Land-Udorthents, shale and	0 to 8	10 to 99	No Data	No Data	No Data	No	No
WaA	Washington Silt Loam	0 to 3	60 to 99	>80	Moderately high to high	Well drained	No	Yes
WaB		3 to 8						
WaC		8 to 15						
WkB	Weikert-Berks Complex	3 to 8	10 to 20	>80	Moderately high to very high	Well drained	No	Yes
WkC		8 to 15						Yes
WkD		15 to 25						Yes

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Soil Drainage Class: USDA - NRCS Web Soil Survey



LEGEND

- Wastewater Treatment Plant (WWTP)
- OLDS Areas
- Streams and Creeks
- Municipal Boundary
- Parcels
- Hydrology
- Road Names

Soils Drainage Class

- Somewhat Excessively Drained; Well-Drained
- Moderately Well-Drained
- Poorly-Drained
- Unclassified/Urban Land

NORTHAMPTON BOROUGH

Figure 5 On-Lot Septic Suitability Drainage Class Map

NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

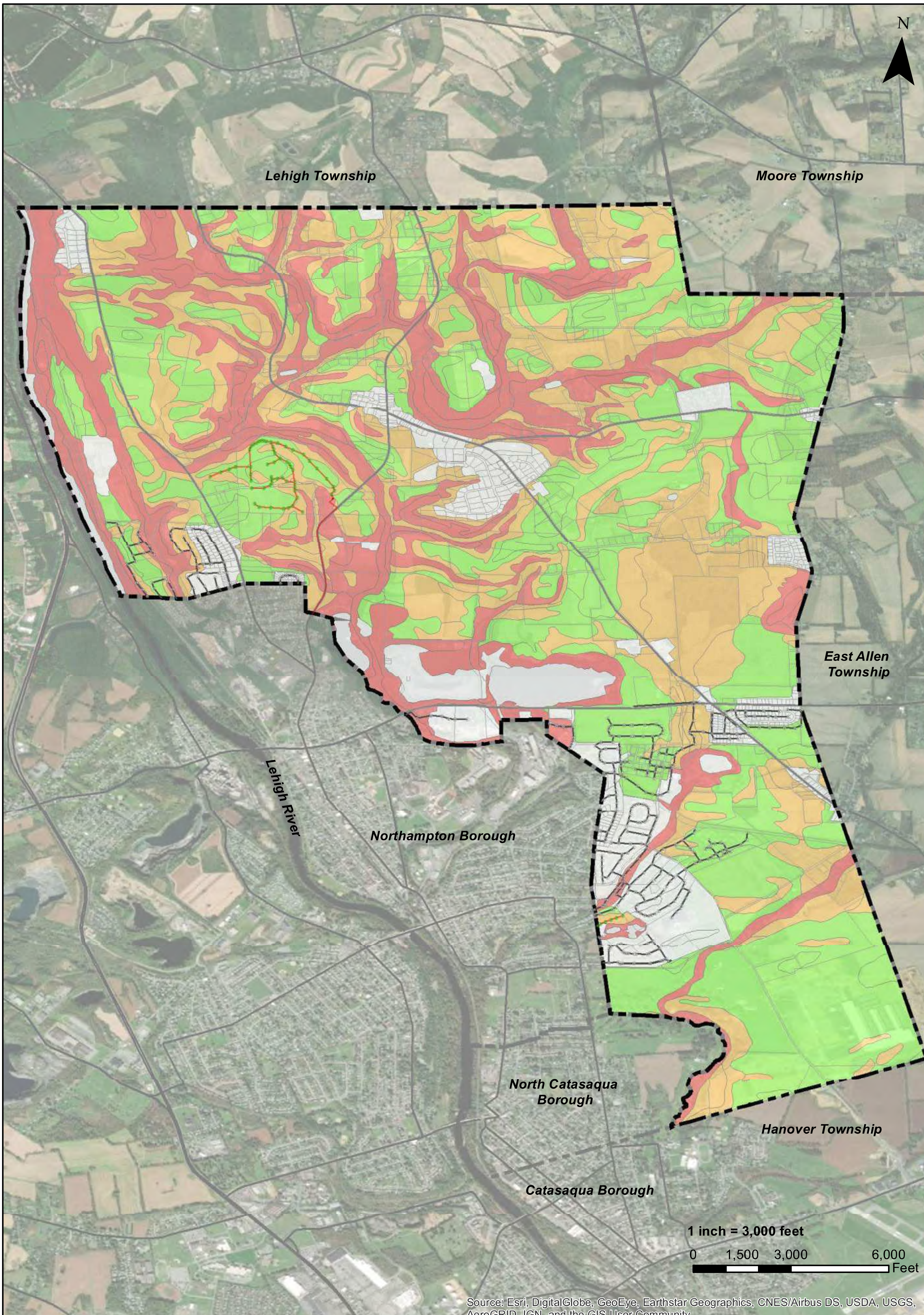


Figure 5.50 - On-Lot Septic Suitability Drainage Class Map of Allen Township

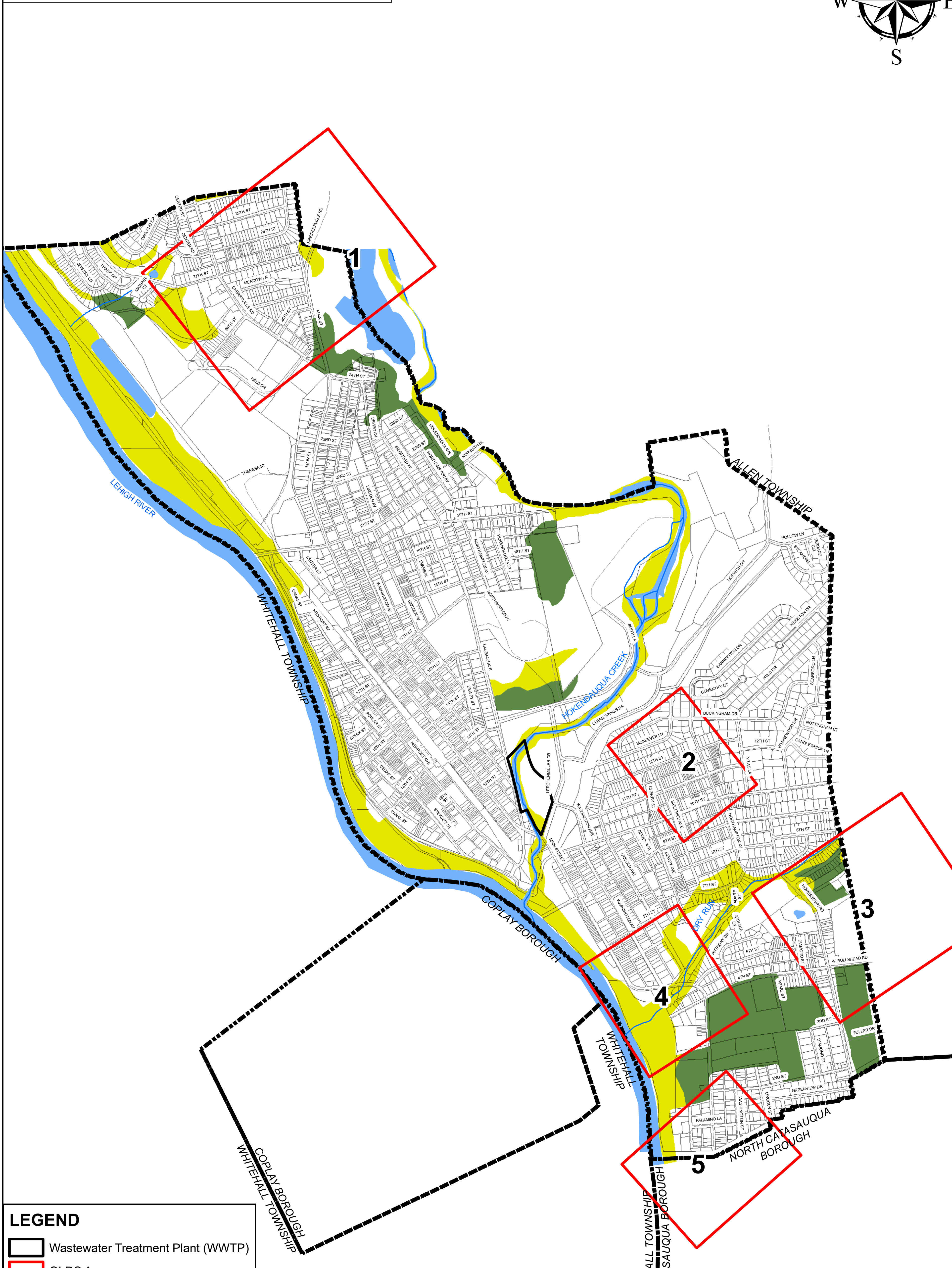
Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads
- Very Limited - 22.8%
- Moderately Limited - 28.8%
- Slightly Limited - 35.6%
- Not Rated - 12.8%

BARRY ISETT & associates INC

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Prime and Statewide Importance Farmlands: USDA - NRCS Web Soil Survey



LEGEND

- Wastewater Treatment Plant (WWTP)
- OLDS Areas
- Streams and Creeks
- Municipal Boundary
- Parcels
- Hydrology
- Road Names

NRCS Prime Farmland Classification

- Prime Farmland
- Farmland of Statewide Importance

NORTHAMPTON BOROUGH

Figure 6 Prime Farmland Soils Map

NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

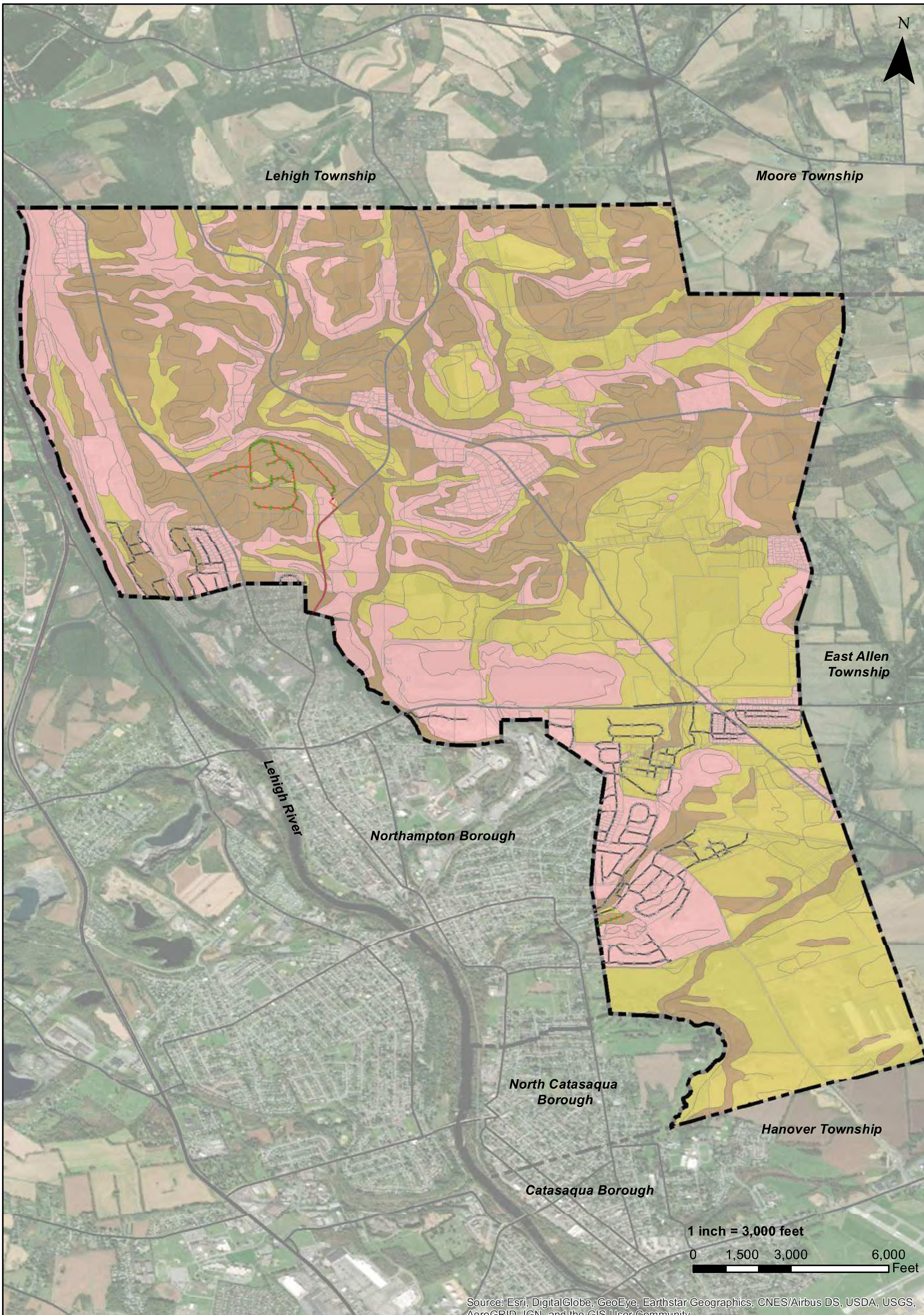


Figure 6.5 - Prime Farmland Soils Map of Allen Township

Legend

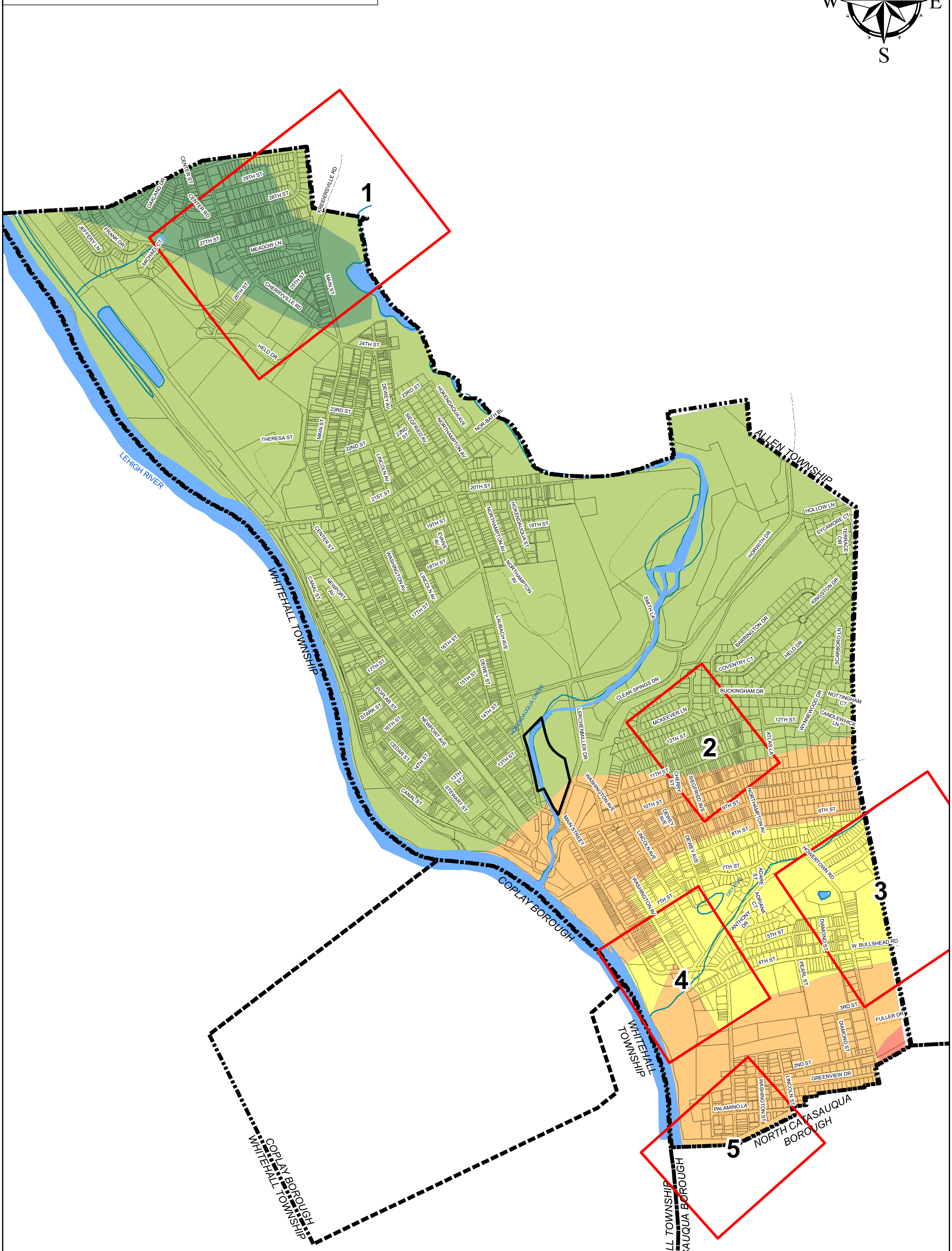
- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads
- Not Prime Farmland
- All Prime Farmland
- Farmland of Statewide Importance

Note:
Farmland soil classification sourced from USDA Web Soil Survey.

BARRY ISETT & associates INC

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Geology: PA Department of Conservation and Natural Resources (PASDA)



LEGEND

- OLDS Areas
- Municipal Boundary
- Wastewater Treatment Plant (WWTP)
- Streams and Creeks Northampton
- Hydrology Northampton
- Hydrology
- Parcels Northampton

Bedrock Geology

- Bushkill Member - Omb
- Jacksonburg Limestone - Oj
- Epler Formation of the Beekmantown Group - Oe
- Ontelaunee Formation of the Beekmantown Group - Oo
- Allentown Dolomite - OCa
- Road Names Northampton

NORTHAMPTON BOROUGH

Figure 7 - Geologic Features Map

NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

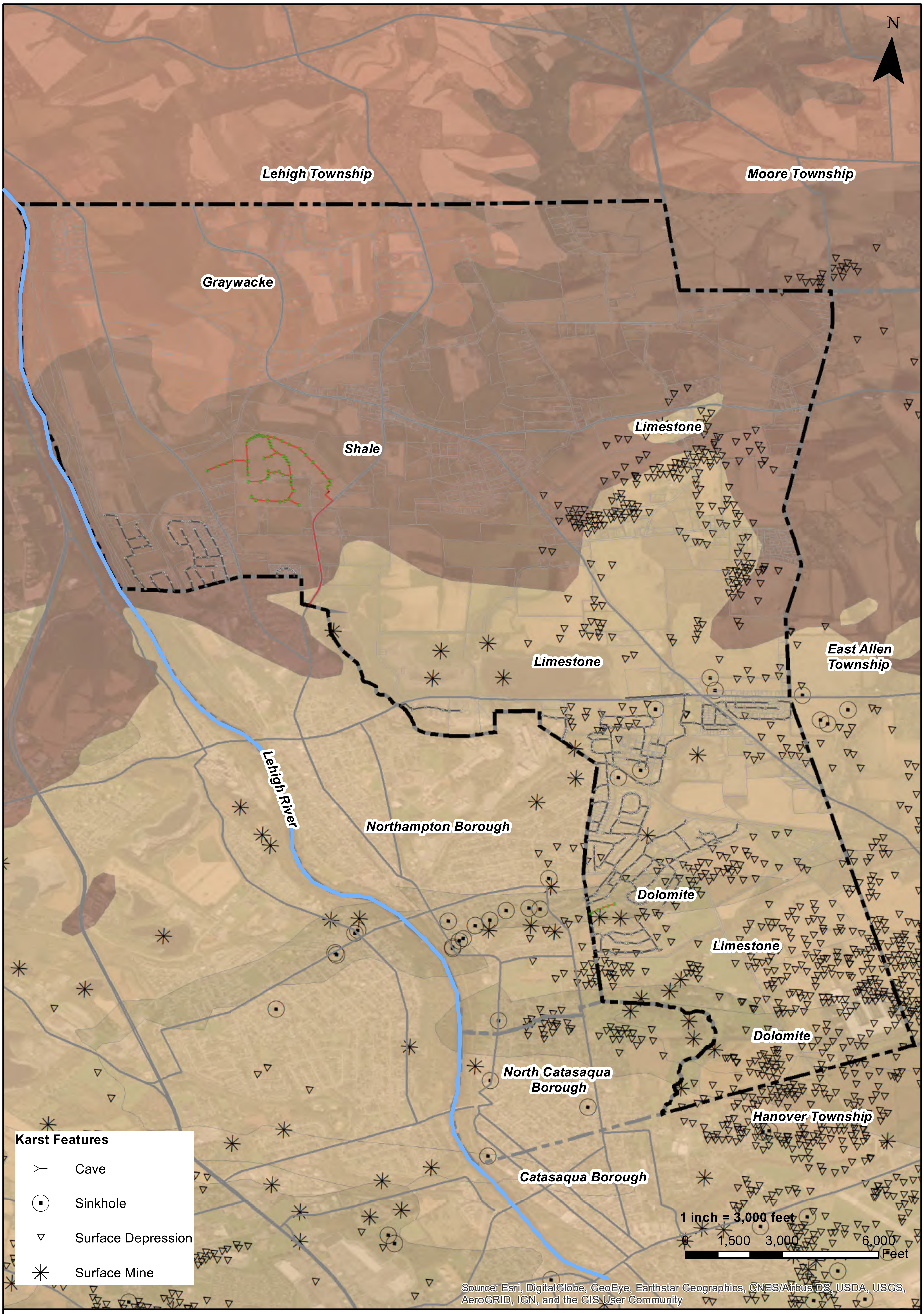


Figure 7.5 - Geologic Features Map of Allen Township

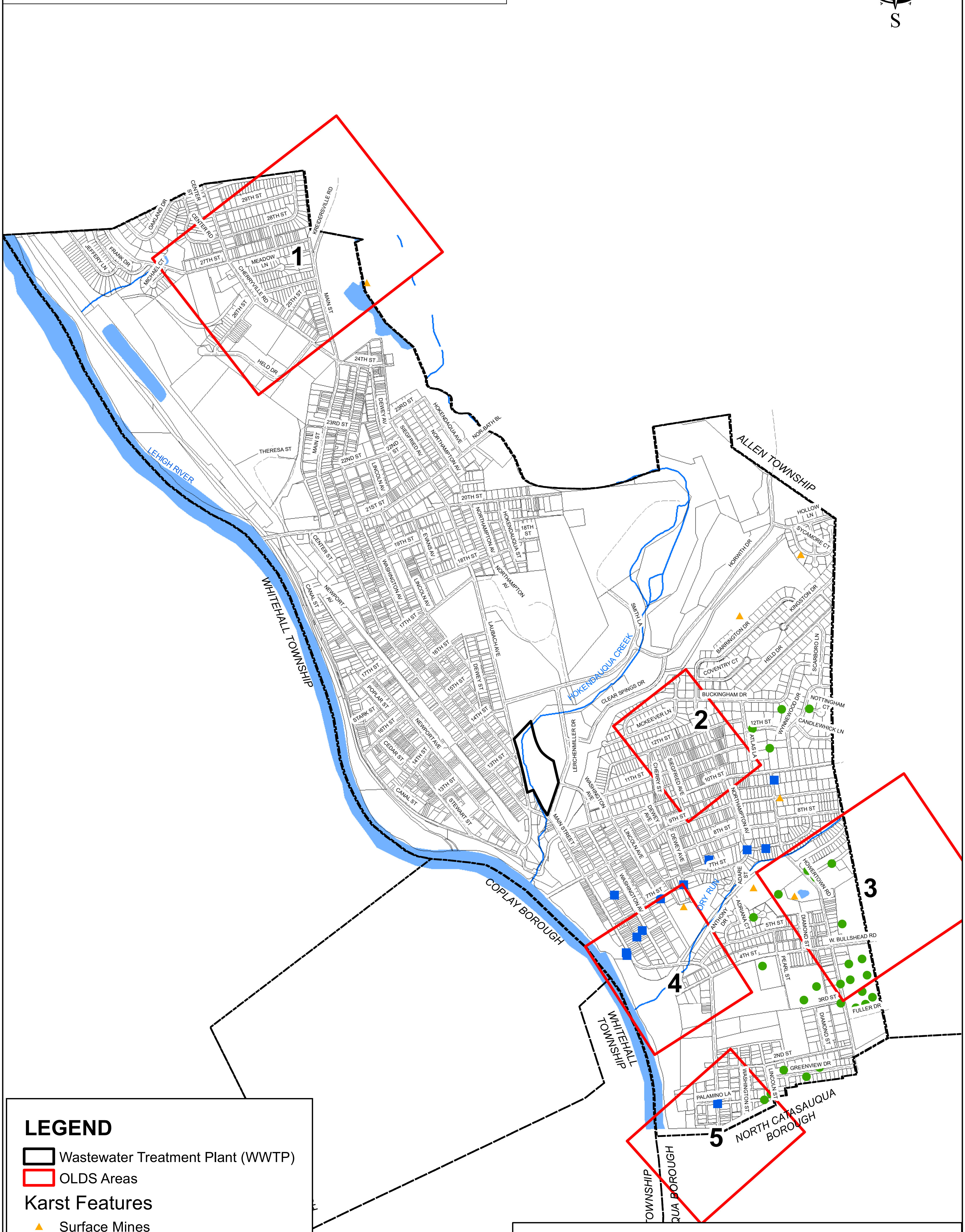
Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads

BARRY ISETT & associates INC

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Karst Features - PA Department of Conservation and Natural Resources (PASDA)



LEGEND

- Wastewater Treatment Plant (WWTP)
- OLDS Areas

Karst Features

- Surface Mines
- Sinkholes
- Surface Depressions
- Streams and Creeks
- Municipal Boundary
- Parcels
- Hydrology
- Road Names

NORTHAMPTON BOROUGH
Figure 8 Karst Features Map

NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

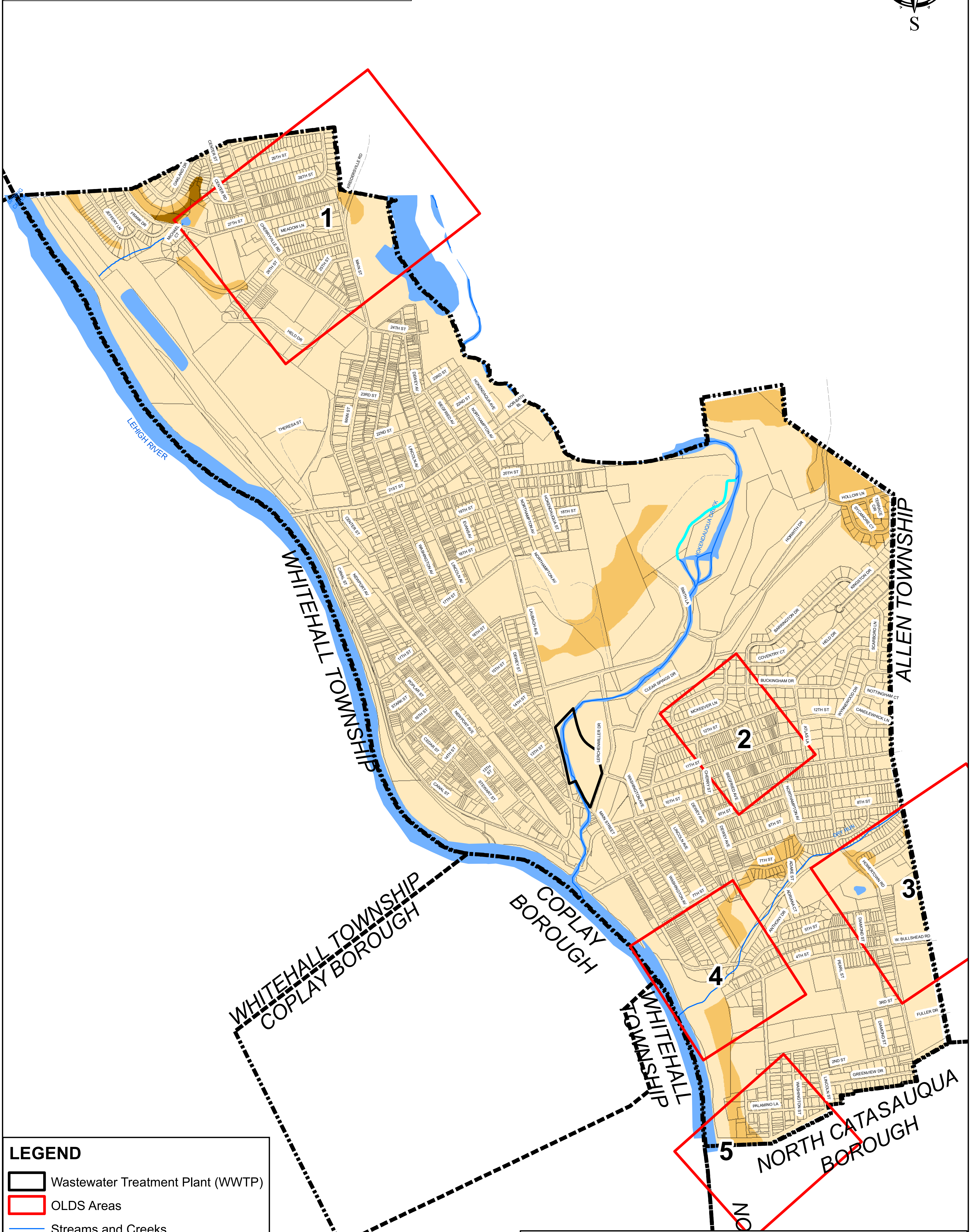
GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com

JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet

REFERENCES

1. Parcels: Northampton County and Lehigh Valley Planning Commission
   - Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. Slope Characterization: USDA - NRCS Web Soil Survey



LEGEND

- Wastewater Treatment Plant (WWTP)
- OLDS Areas
- Streams and Creeks
- Municipal Boundary
- Parcels
- Hydrology
- Road Names

SLOPE

- <12%
- 12% - 25%
- >25%

NORTHAMPTON BOROUGH

Figure 10 On-Lot Septic Suitability Slope Map

NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA

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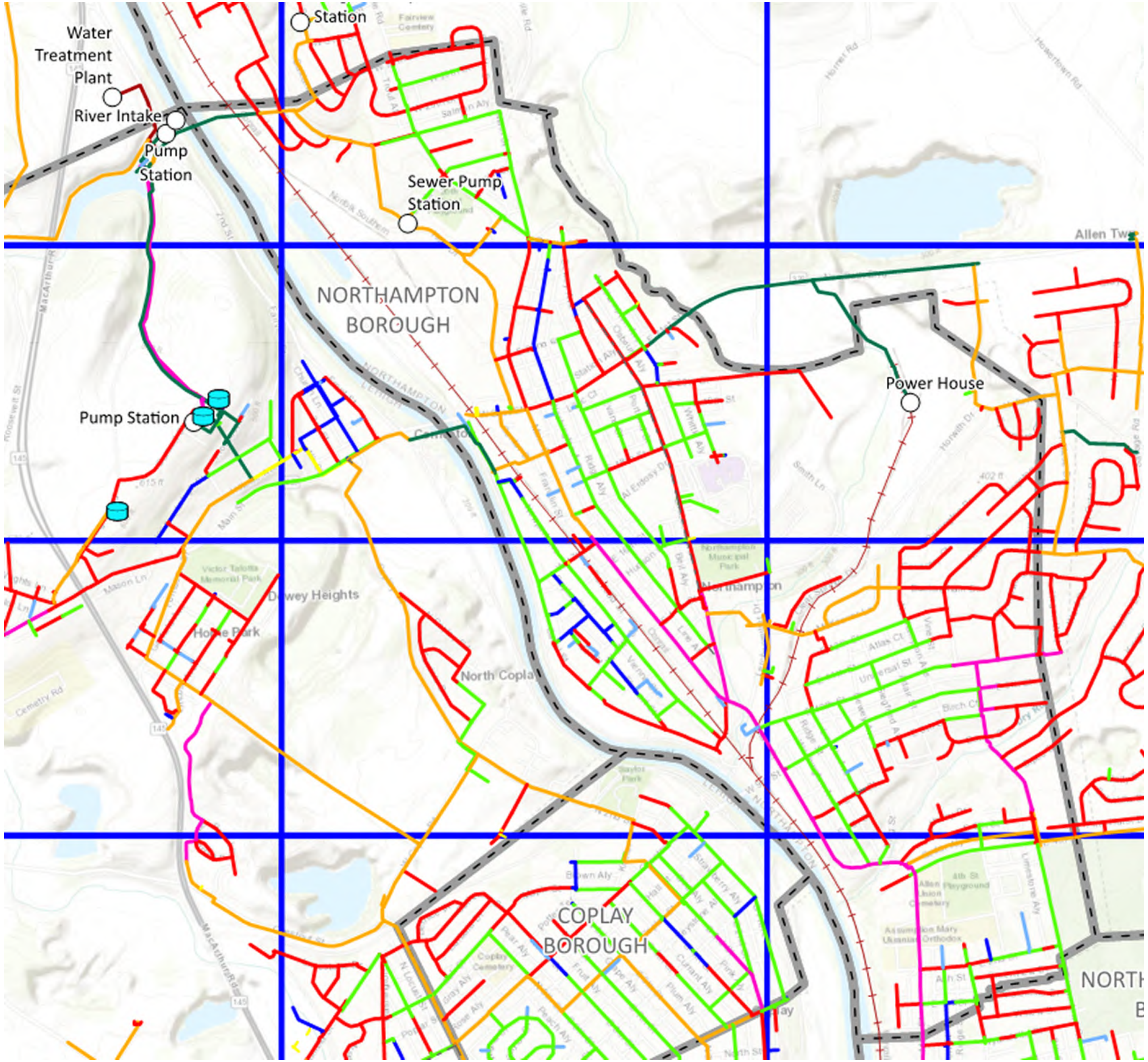
JOB NO: 20-01026A5 DATE: JULY 2021

0 250 500 1,000 1,500 2,000 Feet



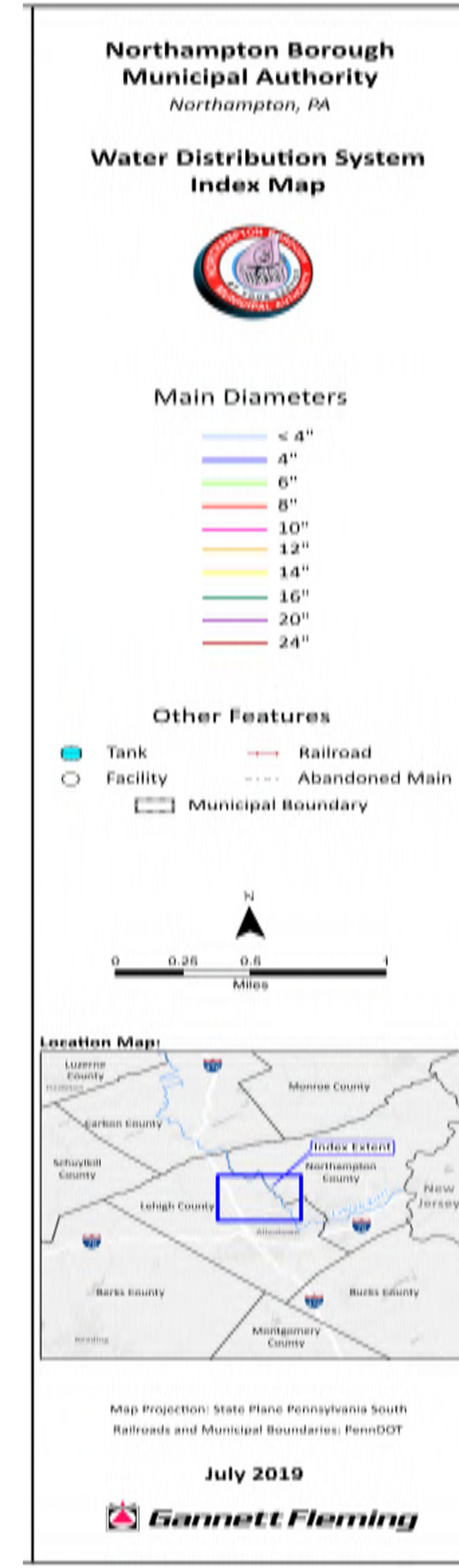
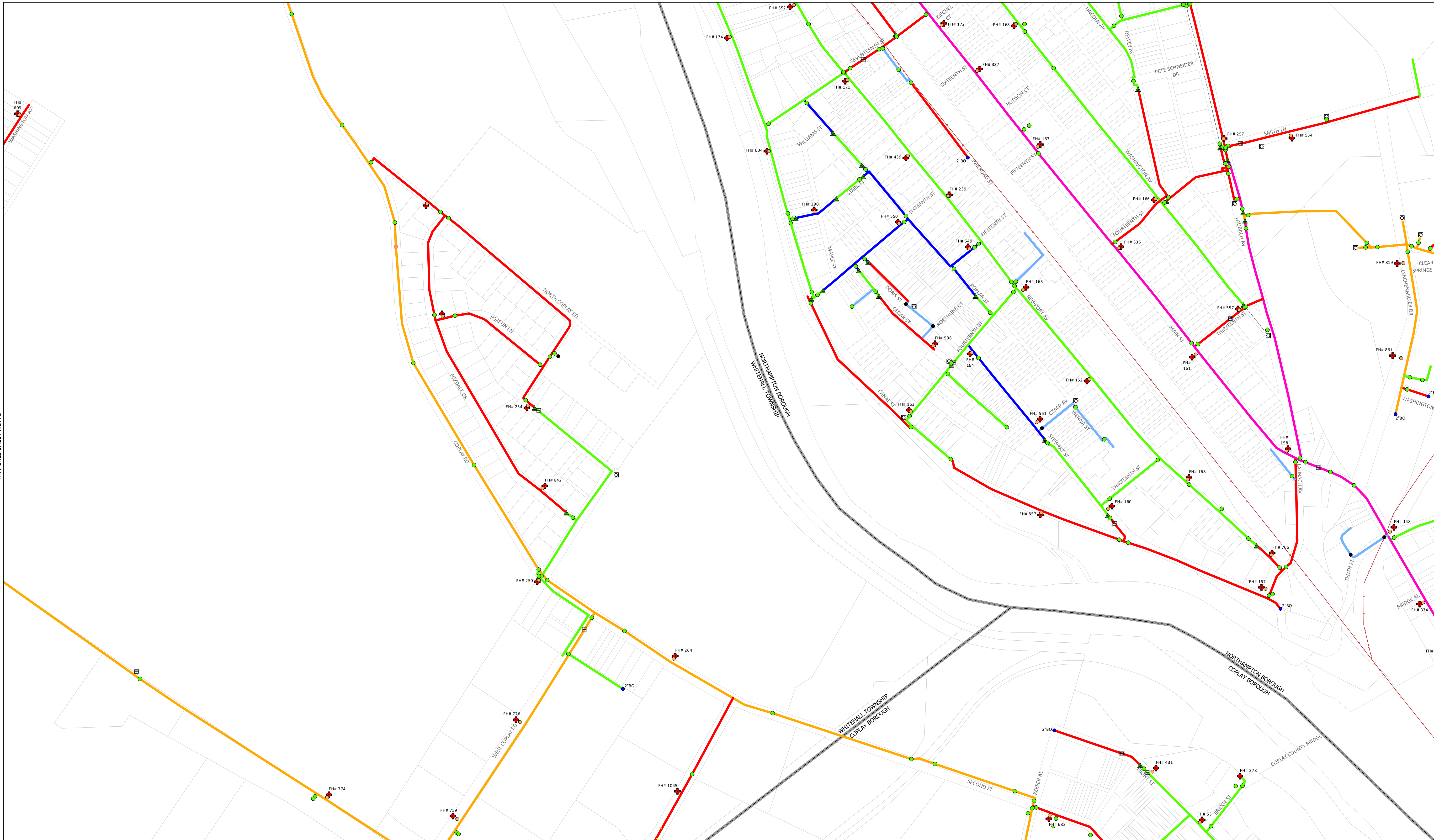


Figure 12: Overall Water Service Area Map (Northampton Borough)

MATCHES SHEET NO. G6



LEGEND

System Features

- Air Release
- Blowoff
- Cap
- Curb Stop
- Hydrant Valve
- Meter Pit
- Reducer
- Sleeve
- Stop
- Valve
- Hydrant

Main Diameters

- < 4"
- 4"
- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- 20"
- 24"

Other Features

- Tank
- Facility
- Service Lateral
- Abandoned Main
- Railroad
- Parcel
- Municipal Boundary

N

0 250 500 1,000
Feet

July 2019

Gannett Fleming

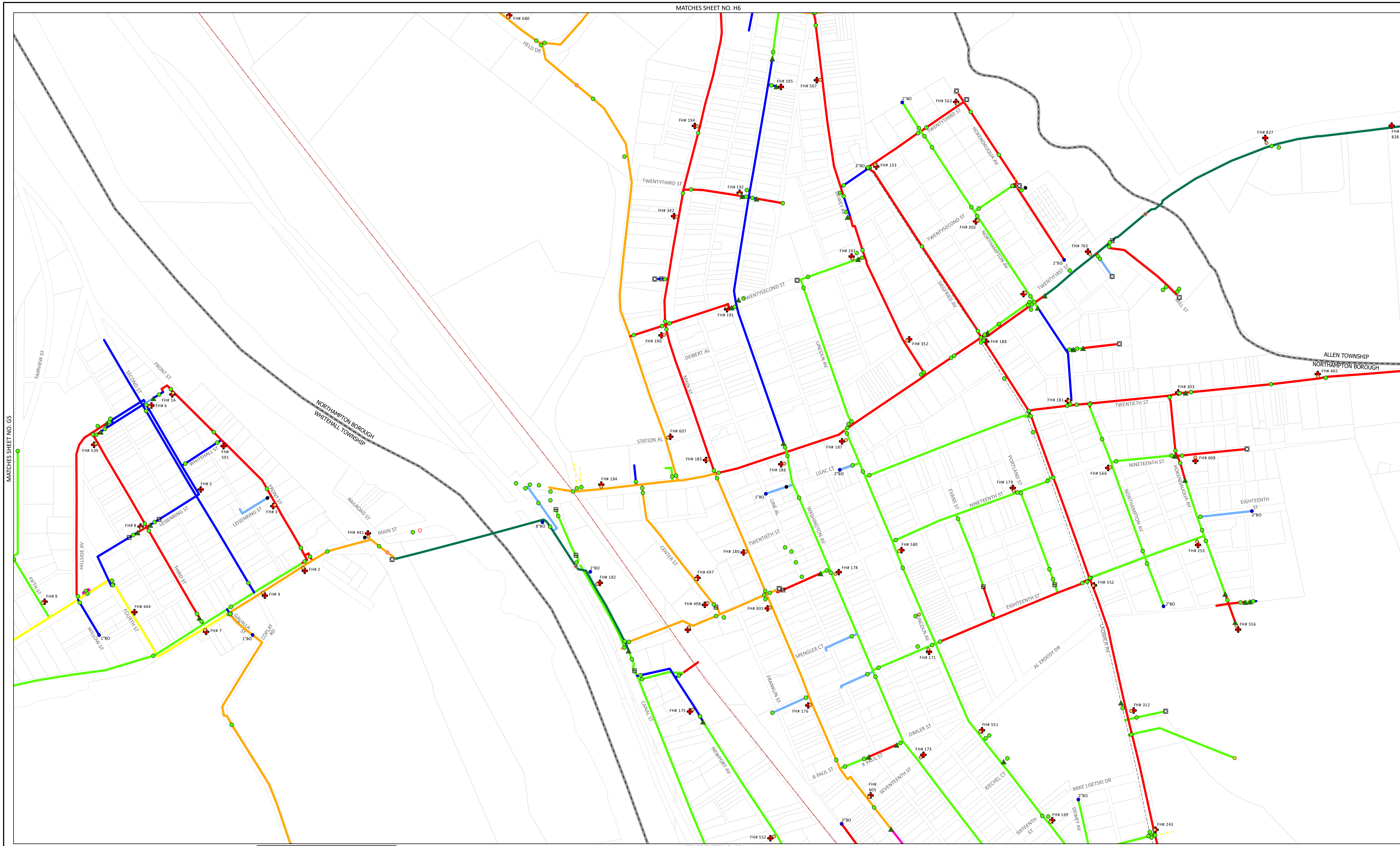
Map Projection: State Plane Pennsylvania South
Parcels: CoreLogic ParcelPoint
Road Names, Railroads and Municipal Boundaries: PennDOT

Northampton Borough Municipal Authority

Northampton, PA

Water Distribution System

Figure 12.25: Water Service Map Area 1



Northampton Borough Municipal Authority
Northampton, PA

Water Distribution System

LEGEND

System Features
- Air Release
- Blowoff
- Cap
- Curb Stop
- Hydrant Valve
- Meter Pit
- Reducer
- Sleeve
- Stop
- Valve
- Hydrant

Main Diameters
- < 4"
- 4"
- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- 20"
- 24"

Other Features
- Tank
- Facility
- Service Lateral
- Abandoned Main
- Railroad
- Parcel
- Municipal Boundary

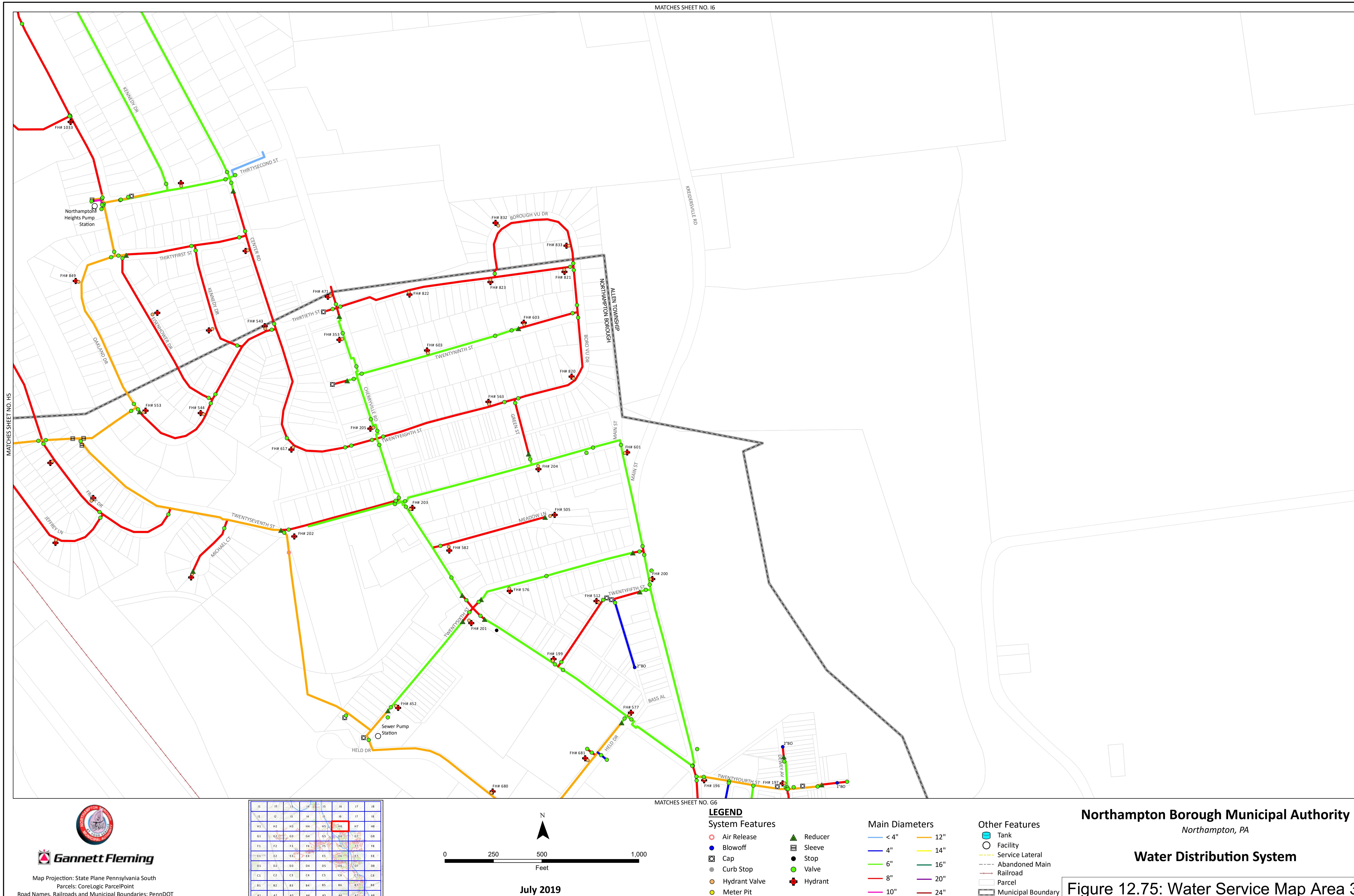
0 250 500 1,000
Feet

July 2019

Gannett Fleming

Map Projection: State Plane Pennsylvania South
Parcels: CoreLogic ParcelPoint
Road Names, Railroads and Municipal Boundaries: PennDOT

Figure 12.50: Water Service Map Area 2



Northampton Borough Municipal Authority

Northampton, PA

Water Distribution System

Figure 12.75: Water Service Map Area 3

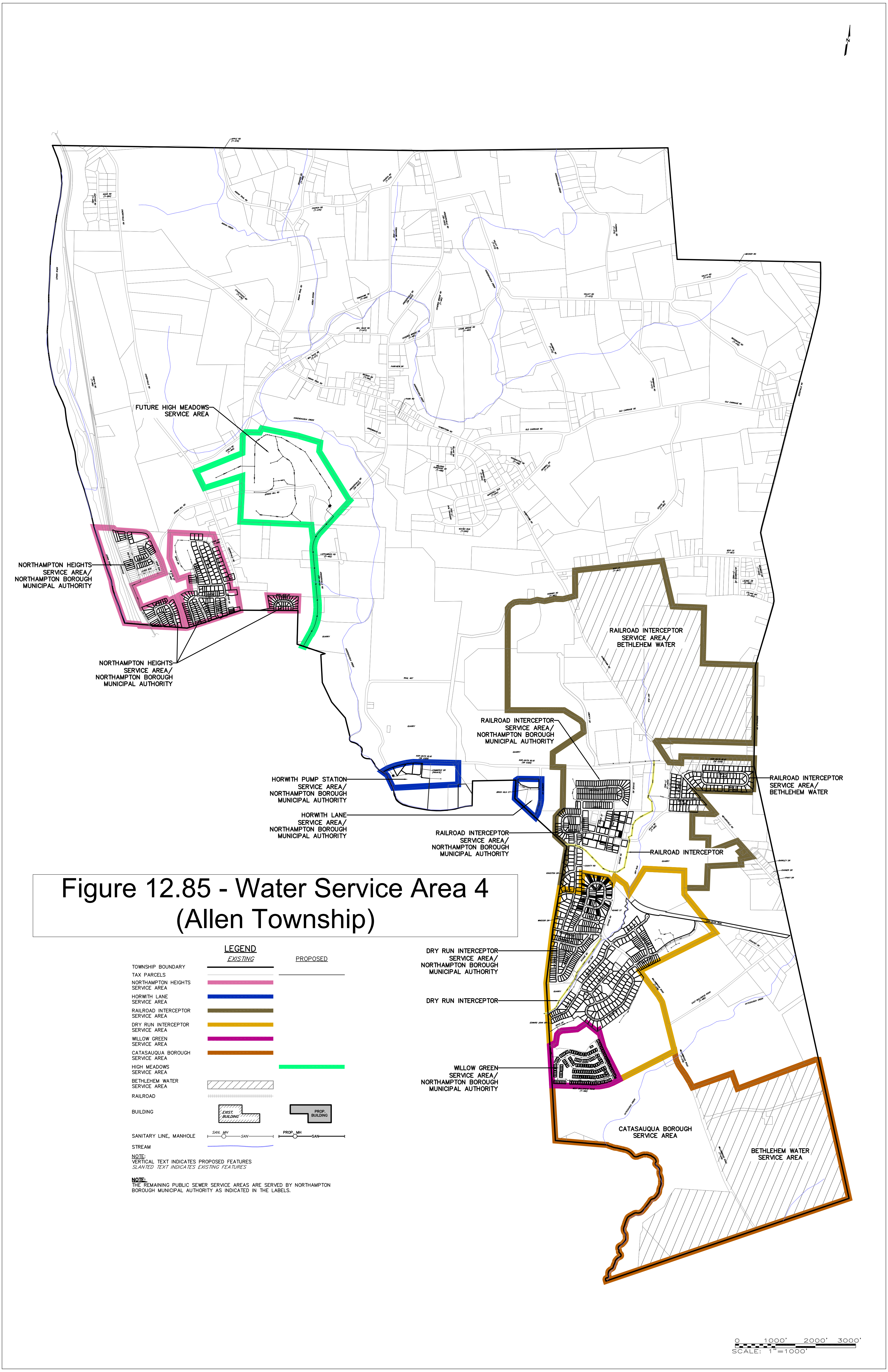
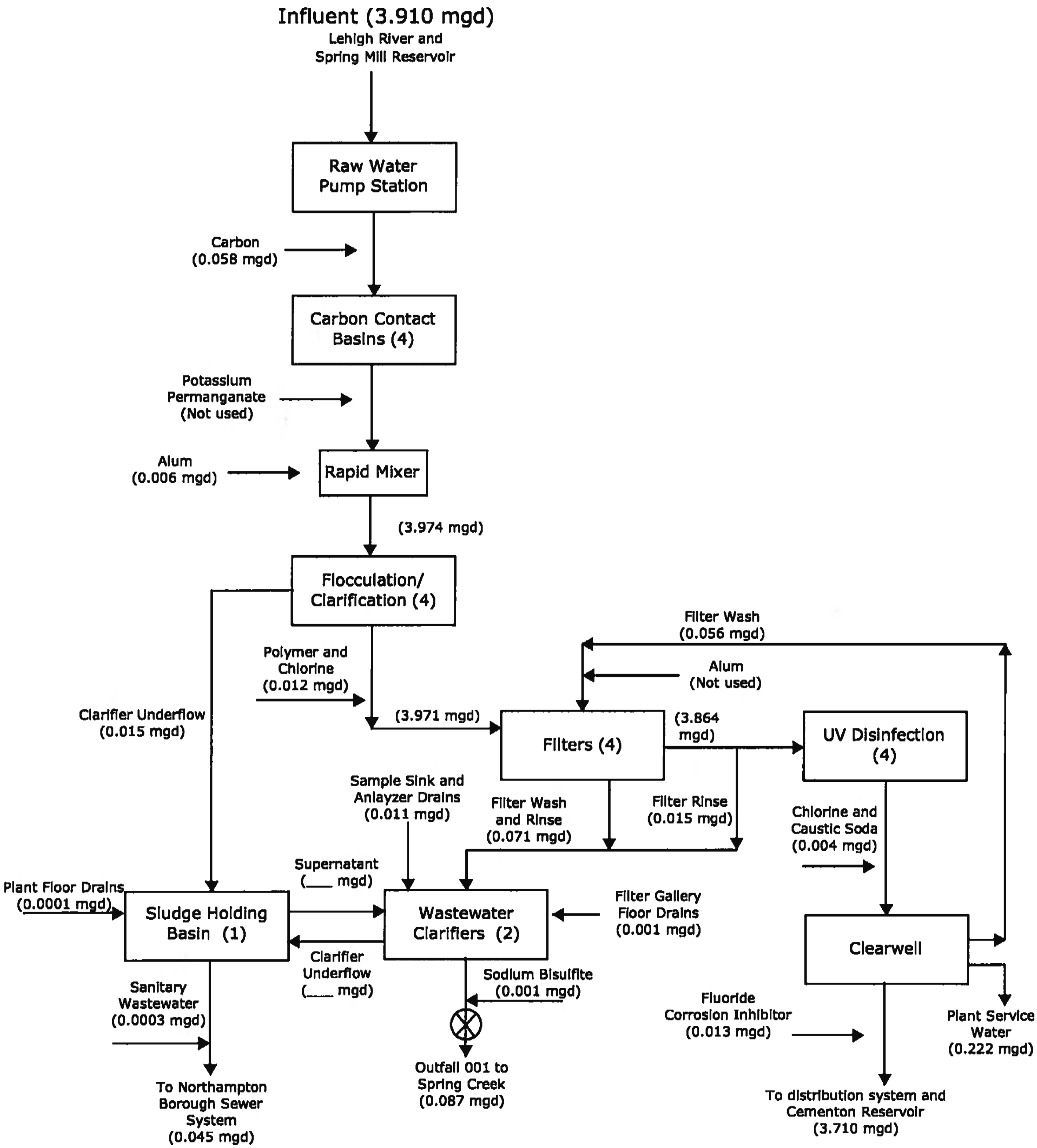


Figure 12.85 - Water Service Area 4 (Allen Township)



NPDES Sampling Point

Additional Sources of Wastewater

1) Flocculator/Clarifier drainage and cleaning; 109,000 gallons 1/year; wasted to Sludge Holding Basin. Will not affect Outfall 001

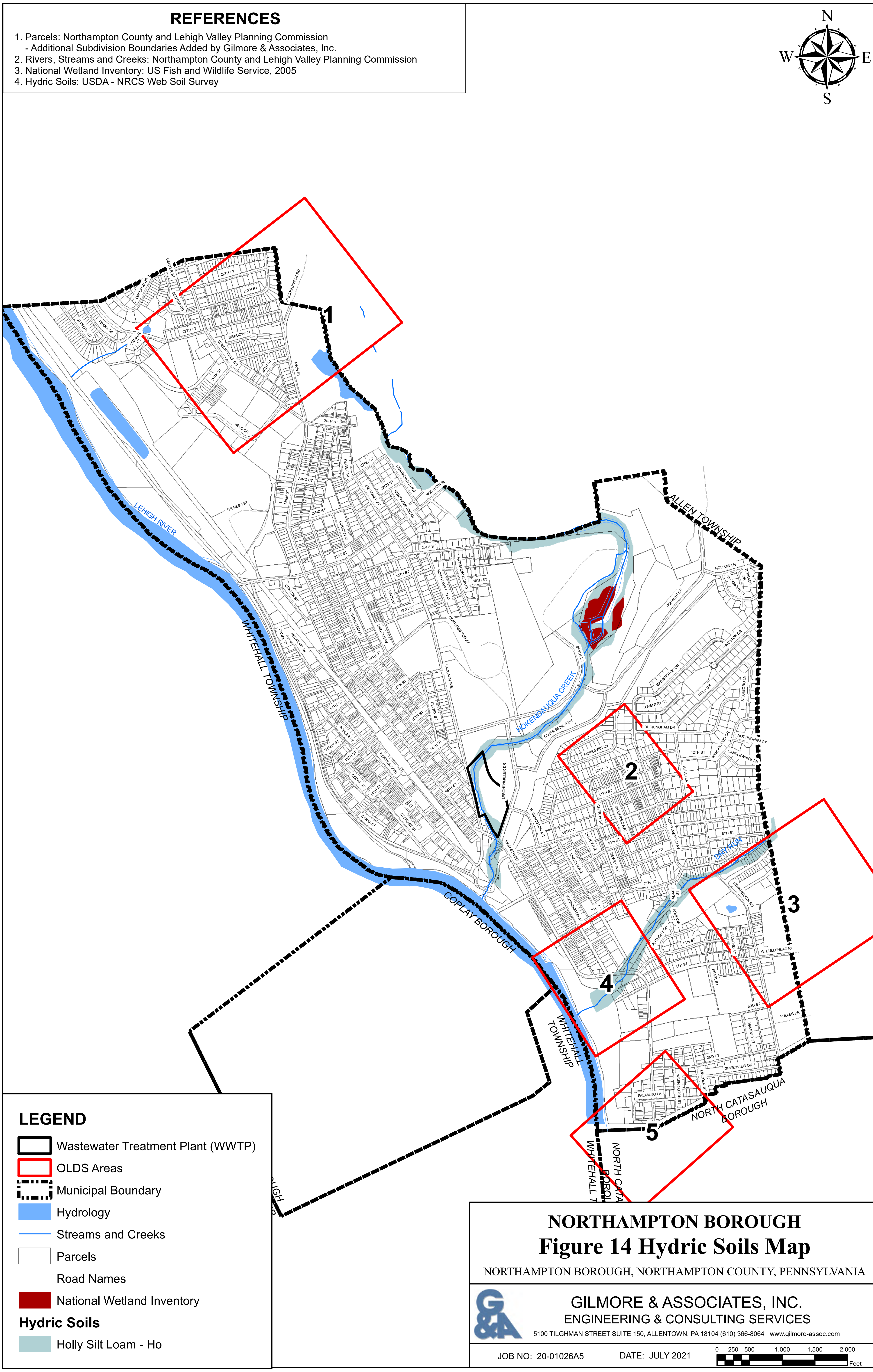
2) Clearwell overflow (dechlorinated); emergency use; 56,000 gallons at 8 mgd for 10 +/- min.; drained to Outfall 001

Northampton Borough Municipal Authority
Northampton, Pennsylvania

FLOW BALANCE DIAGRAM
(AVERAGE DAILY FLOW - JULY 2010)

GANNETT FLEMING, INC. February 2012

Figure 13 - WTP Process Diagram with Flow Balance (July 2012)


REFERENCES
1. Parcels: Northampton County and Lehigh Valley Planning Commission
- Additional Subdivision Boundaries Added by Gilmore & Associates, Inc.
2. Rivers, Streams and Creeks: Northampton County and Lehigh Valley Planning Commission
3. National Wetland Inventory: US Fish and Wildlife Service, 2005
4. Hydric Soils: USDA - NRCS Web Soil Survey
N
W
E
S
1
2
3
4
5
LEHIGH RIVER
WHITEHALL TOWNSHIP
HOKENDAUQUA CREEK
ALLEN TOWNSHIP
COPLAY BOROUGH
WHITEHALL TOWNSHIP
NORTH CATASAUQUA BOROUGH
DRY RUN
LEGEND
Wastewater Treatment Plant (WWTP)
OLDS Areas
Municipal Boundary
Hydrology
Streams and Creeks
Parcels
Road Names
National Wetland Inventory
Hydric Soils
Holly Silt Loam - Ho
NORTHAMPTON BOROUGH
Figure 14 Hydric Soils Map
NORTHAMPTON BOROUGH, NORTHAMPTON COUNTY, PENNSYLVANIA
GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES
5100 TILGHMAN STREET SUITE 150, ALLENTOWN, PA 18104 (610) 366-8064 www.gilmore-assoc.com
JOB NO: 20-01026A5
DATE: JULY 2021
0 250 500 1,000 1,500 2,000
Feet

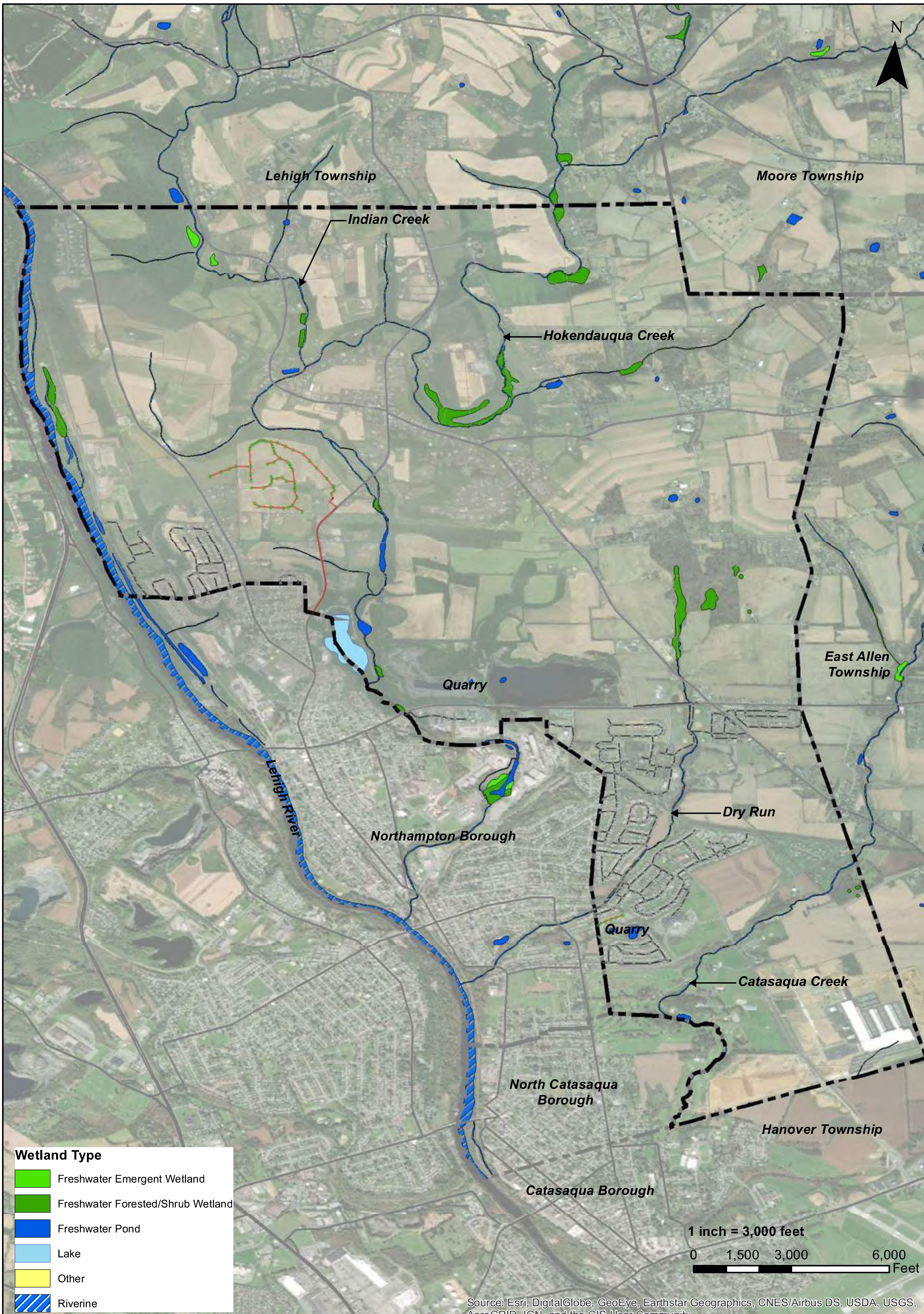
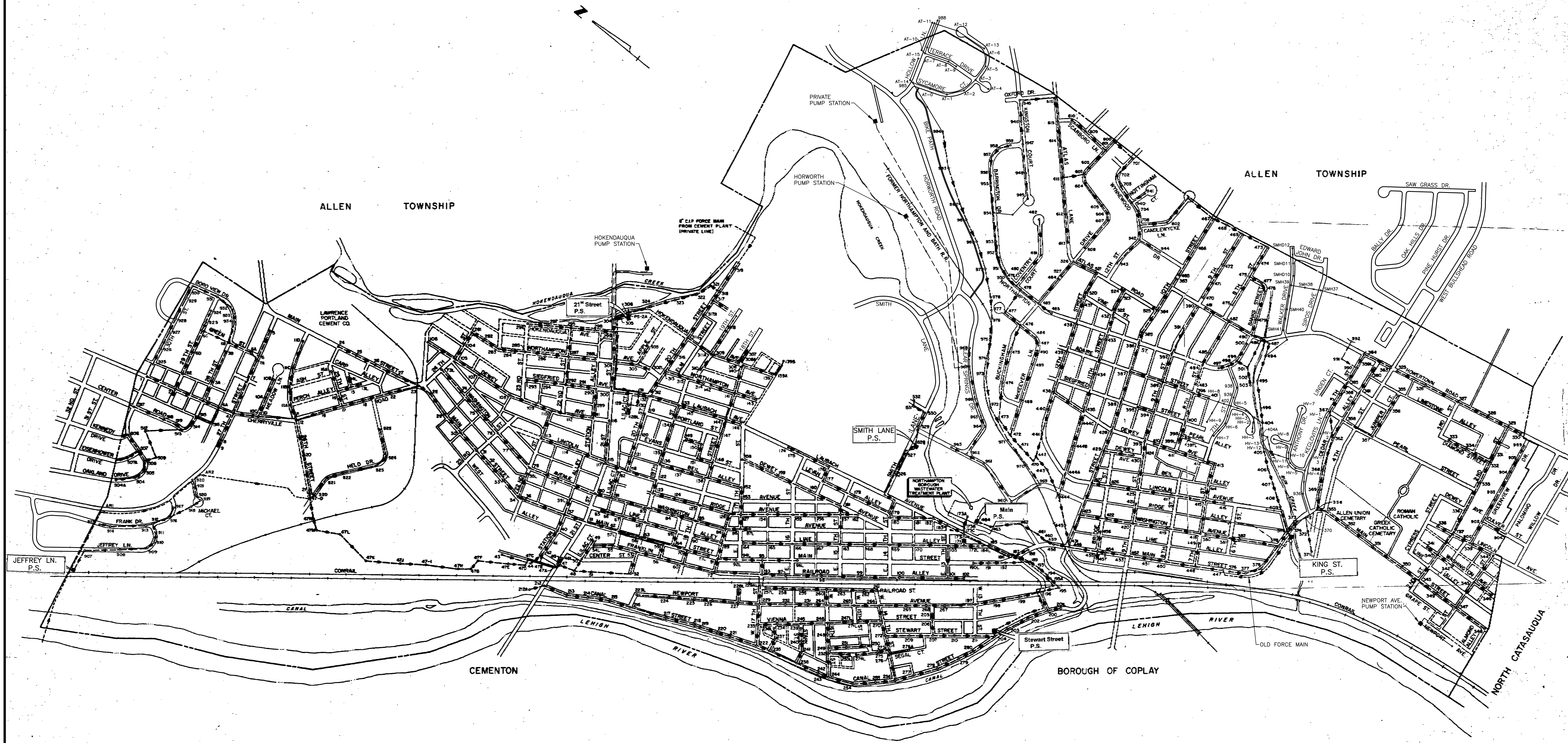


Figure 14.5 - Wetlands Area Map of Northampton Borough and Allen Township

Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads



SITE PLAN

SCALE: 1" = 500'

Figure 15 - Northampton Borough Sanitary Sewer System

SHEET LEGEND

- EXISTING INFORMATION
- REVISED INFORMATION
- FORCE MAIN
- SANITARY SEWER (8" PVC UNLESS OTHERWISE NOTED)

FILE: W:\W&WW ERD\50670 BOROUGH OF NORTHAMPTON\PROJECT DELIVERABLES\201007 - MISC ASSIST\SEWER INDEX MAP.DWG
DATE: 05/15/2012 TIME: 1:23:56 pm
NETWORK PATH W:\W&WW ERD\50670 Borough of Northampton\Project Deliverables\201007–Misc Assist

No.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
X.X.X.	D.R.F.	AS NOTED
CHECKED	APPROVED	APPROVED
X.X.X.	X.X.X.	X.X.X.

Gannett Fleming
HARRISBURG, PENNSYLVANIA

BOROUGH OF NORTHAMPTON
NORTHAMPTON COUNTY, PENNSYLVANIA

SEWER SYSTEM
INDEX MAP

JOB No. 50670
DATE MARCH 2011
SHEET No. 1

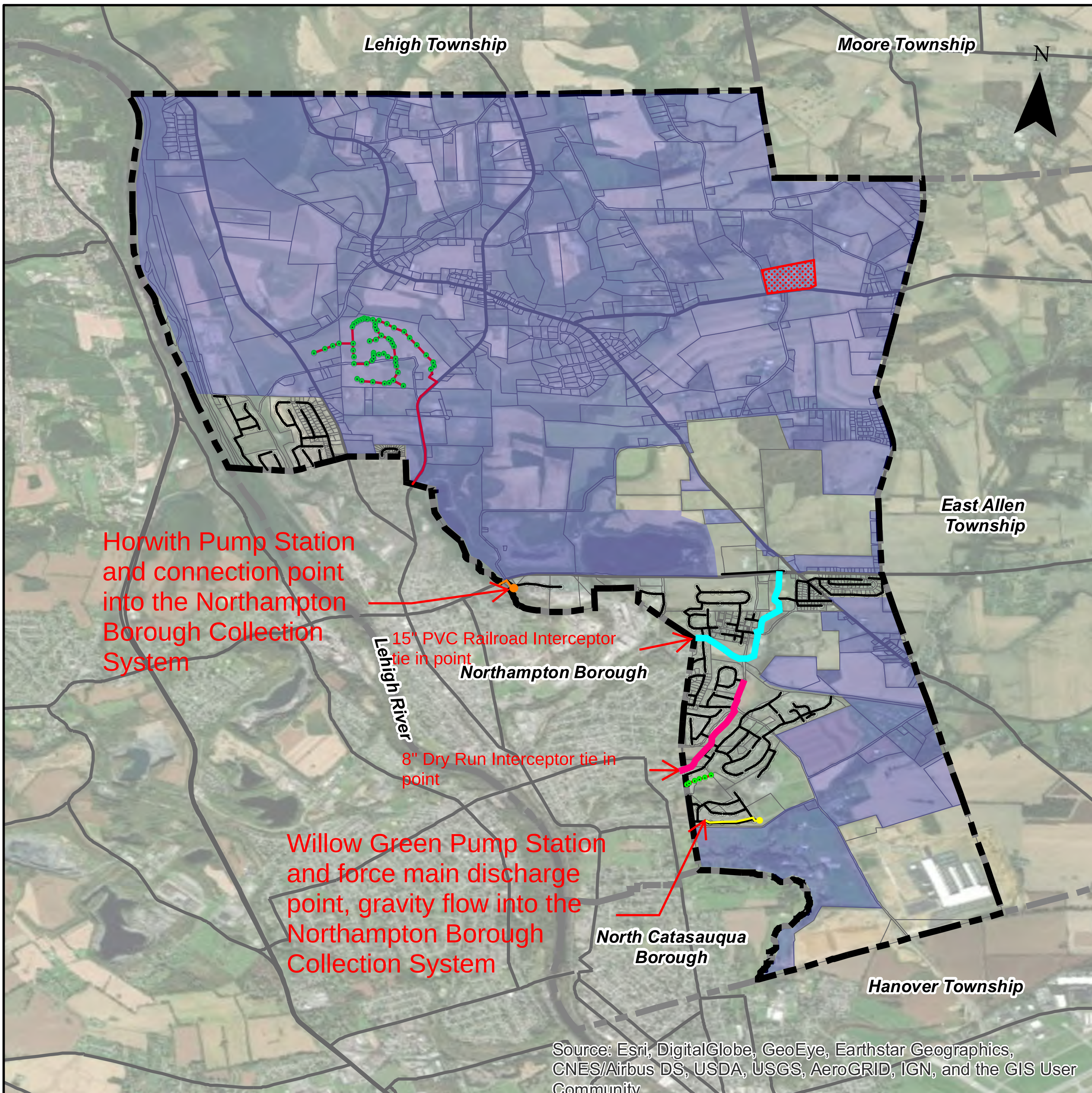


Figure 15.25 - Allen Township Sanitary Sewer System

1 inch = 5,000 feet

0 2,500 5,000 10,000 Feet

Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads
- Existing On-Lot Systems/Vacant Land
- Privately owned WWTP
- Railroad Interceptor
- Dry Run Interceptor
- Willow Green PS & FM
- Horwith PS & FM

BARRY ISETT & associates INC

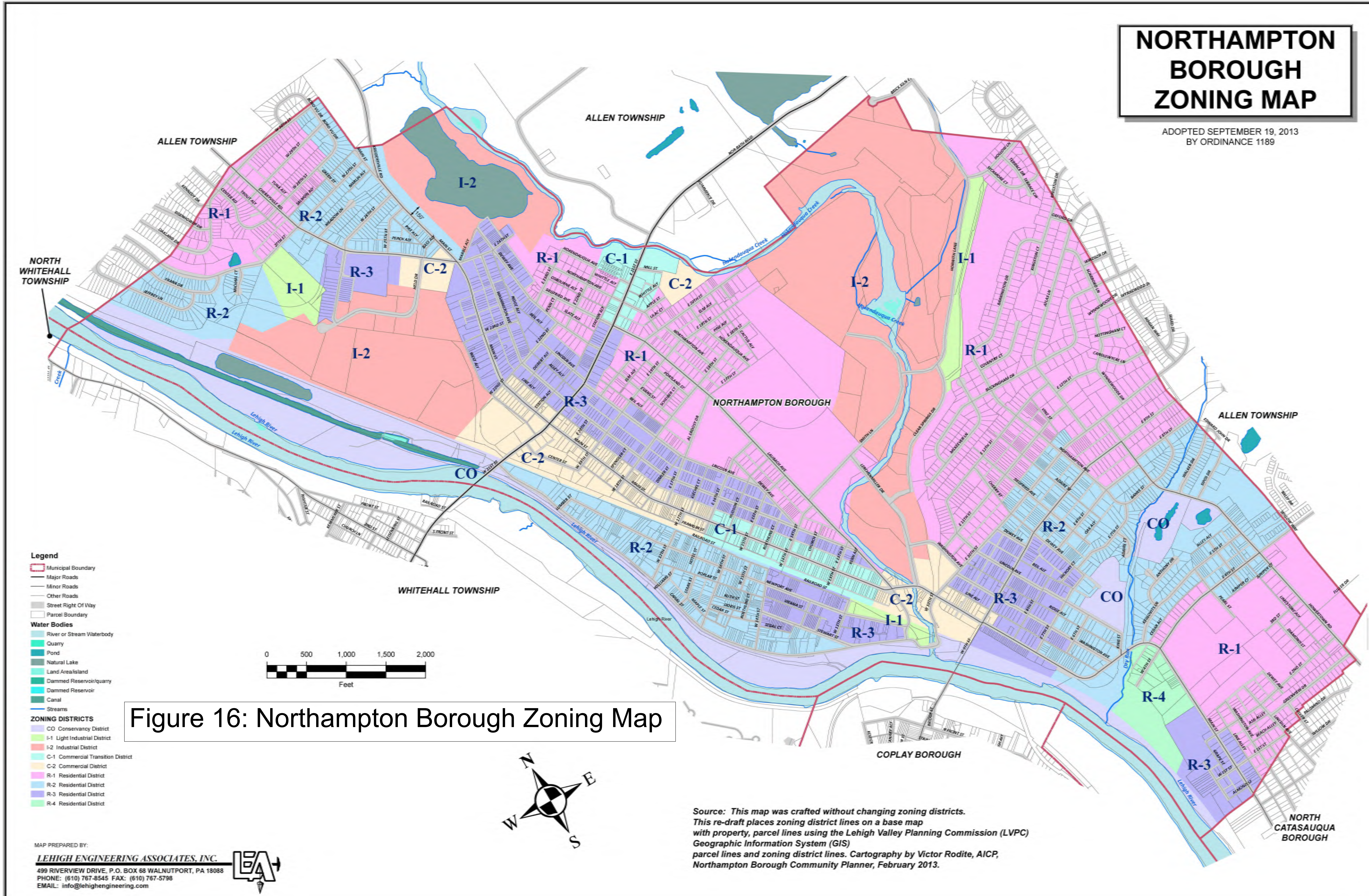


Figure 16: Northampton Borough Zoning Map

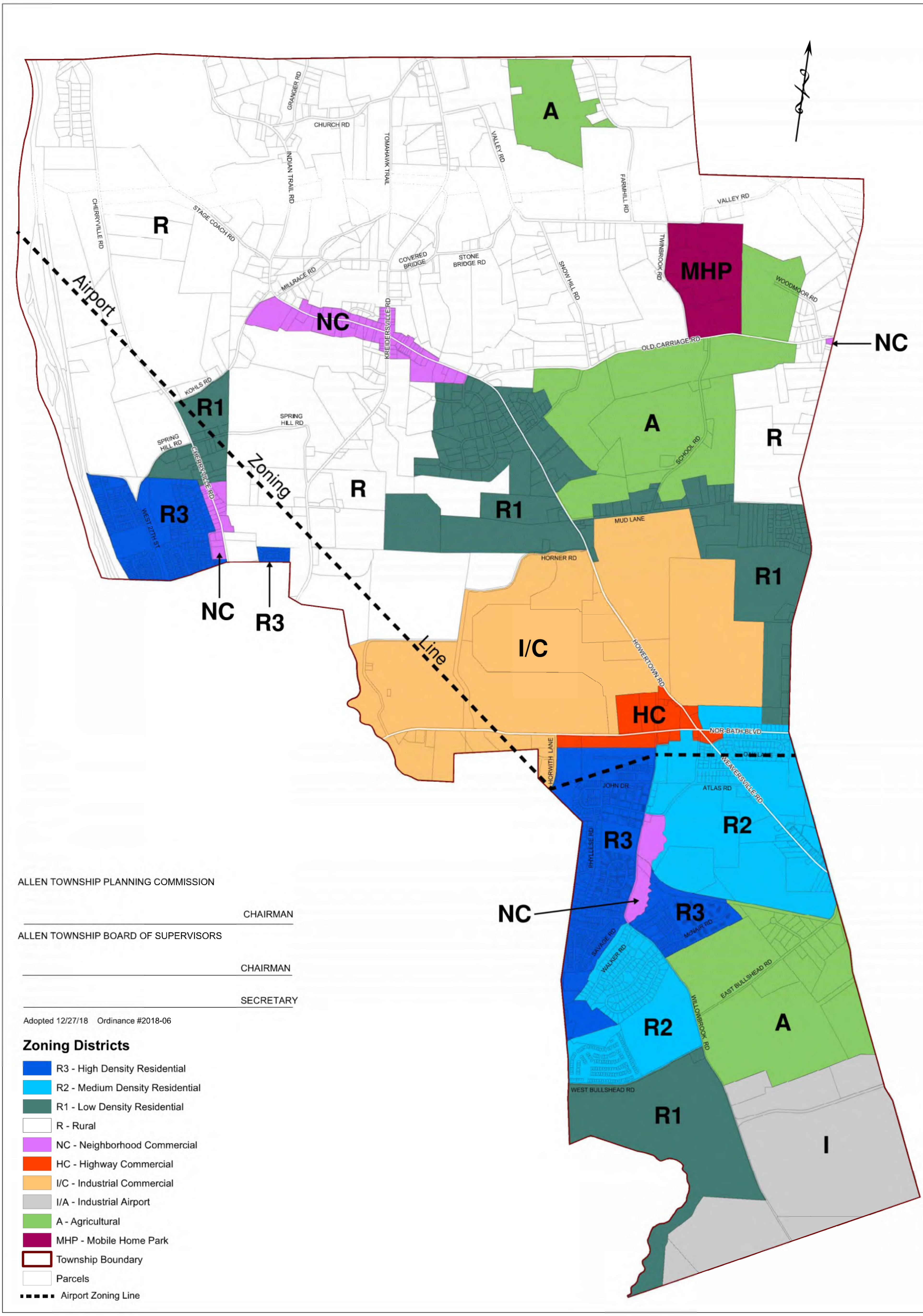


Figure 16.25 - Allen Township Zoning Map

BARRY ISETT & associates INC
MULTI-DISCIPLINE ENGINEERS AND CONSULTANTS

0 1,300 2,600 5,200 Feet

Borough of Northampton

Schedule II
Bulk and Coverage Controls
[Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I)]

District			Minimum Lot Dimensions			Minimum Yard Dimensions				
Map ID	**Name**	**Minimum Lot Area (square feet)**	**Minimum Lot Area Per Dwelling Unit (square feet)**	**Minimum Lot Width (feet)**	**Minimum Lot Depth (feet)**	**Minimum Front Yard (feet)**	**Minimum Side Yard* (feet)**	**Minimum Rear Yard (total feet)**	**Maximum Height of Building (feet/stories)**	**Maximum Lot Coverage**
CO	Conservancy	50,000	50,000	150	300	50	30/60	50	25/2	10%
R-1	Residential Single-Family	5,000	5,000	50	100	25	10/20	30	35/2.5	40%
R-2	Residential Single-Family	4,000	4,000	40	100	20	10/20	25	35/2.5	45%
	Two-Family	8,000	4,000	80	100	20	10/20	25	35/2.5	50%
	Multifamily	12,000	4,000	75	100	20	10/20	25	35/2.5	50%
	Townhouses (3-8 unit structures)	2,500	2,500	20	100	20	10/20	25	35/2.5	50%
R-3	Residential Single-Family	4,000	4,000	40	100	15	10/20	20	35/2.5	45%
	Two-Family	8,000	4,000	80	100	15	10/20	20	35/2.5	50%
	Multifamily (3-4 unit structures)	7,500	2,500	60	100	20	10/20	20	35/2.5	50%
	(5 to 8 units)	12,500	2,500	90	100	20	10/20	25	35/2.5	50%
	(9 or more units)	18,000	2,000	150	100	25	10/20	40	70/6	50%
	Townhouses	2,000	2,000	20	100	25	10/20	25	35/2.5	50%
R-4	Residential Single-Family	4,000	4,000	40	100	20	10/20	25	35/2.5	50%
	Two-Family	8,000	4,000	80	100	20	10/20	25	35/2.5	50%
	Townhouses	2,000	2,000	20	100	20	10/20	25	35/2.5	50%
C-1	Commercial	3,000	—	30	100	10	5.0**	25	35/2.5	50%
C-2	Commercial	3,000	—	30	100	10	5.0**	25	35/2.5	40%
I-1	Light Industrial	25,000	—	100	200	30	20/20	50	35/2.5	40%
I-2	Industrial	40,000	—	150	200	30	20/20	50	60/5	40%

NOTES:

* Where buildings are semiattached, then there shall be required only one minimum side yard of at least 10 feet; however, for access to a garage where the garage is not a part of the principal building, then a minimum side yard shall be 12 feet.

** Where buildings are attached, then the side yard shall be zero feet.

Figure 16.50 - Northampton Borough Zoning Code Schedule II - Bulk and Coverage Controls

	Without Public Sewer		With Public Sewer		With Public Water/Sewer		Duplex w/ Public Sewer	
	Lot Area	Lot coverage	Lot Area	Lot coverage	Lot Area	Lot coverage	Lot Area	Lot coverage
High Density Residential: This district is located adjacent to the neighboring Boroughs where public water and public sewer extensions are most feasible.								
Single Detatched Dwellings	1 acre	25%	25000 sq ft	30%	12000 sq ft	35%		
Duplexes					4500 sq ft	40%		
Town-homes					3000 sq ft	45%		
Multi-Family					2 acres	60%		
Medium Density: This district accommodates the suburban residential uses and coincides with expected sewer and water utility service areas within the near future.								
Single Family Detatched	1 acre	25%	25,000 sq ft	30%	12,000 sq ft	35%		
Low Density: Some areas of this district coincide with expected sewer and water utility service areas; however, the actual availability of these services is likely to occur at different times in different areas. As a result, permanent densities have been adjusted according to the availability of these public utilities. When no public sewers are provided, minimum lot area requirements have been sized to provide for an initial and an alternate on-site sewage disposal system.								
Single Family Detatched	1 acre	25%	25,000 sq ft	30%	20,000 sq ft	30%		
Other uses	2 acres	25%	2 acres	25%	2 acres	25%		
Rural : No public utilities are foreseeable within this district; therefore, larger lot sizes are used to provide sufficient space to install on-site sewer and water facilities.								
Single Family Detatched	2 acres	20%	2 acres	20%	2 acres	20%		
Farming/Animal Husbandry	10 acres	10%	10 acres	10%	10 acres	10%		
Kennel/Stable	6 acres	10%	6 acres	10%	6 acres	10%		
Other Uses	2 acres	20%	2 acres	20%	2 acres	20%		
Agricultural								
Single Family Detatched	1 dwelling	20%	1 dwelling per	20%	1 dwelling per	20%		
Farming/Animal Husbandry/Agri.	10 acres	10%	10 acres	10%	10 acres	10%		
Kennel/Stable	6 acres	10%	6 acres	10%	6 acres	10%		
Other Uses	1 acres	20%	1 acres	20%	1 acres	20%		
Neighborhood Commercial District								
	1 acre	70%	12,000 sq ft	70%			6,000 sq ft	35%

Figure 16.75 - Zoning Ordinance Lot Size Information Chart for Allen Township

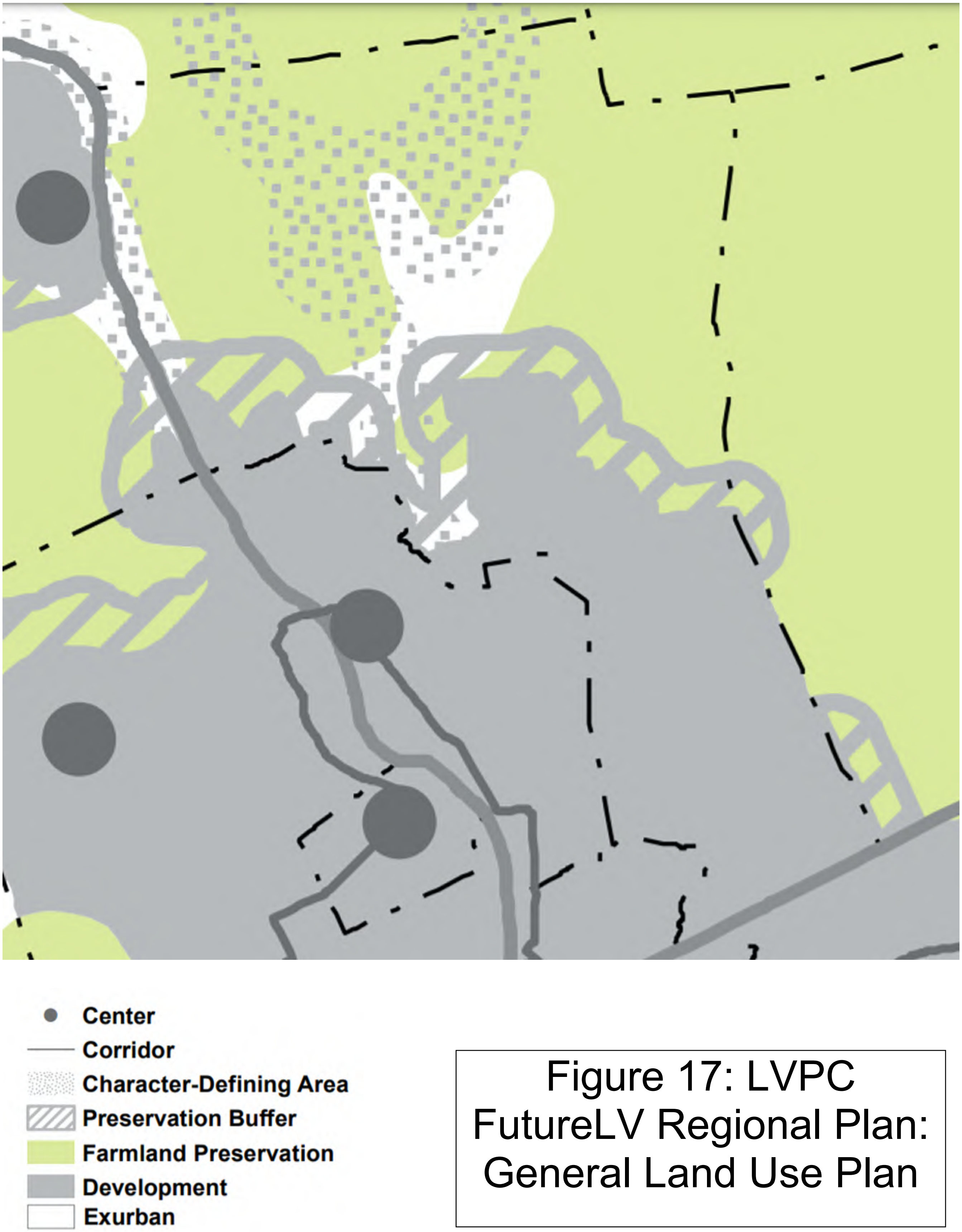


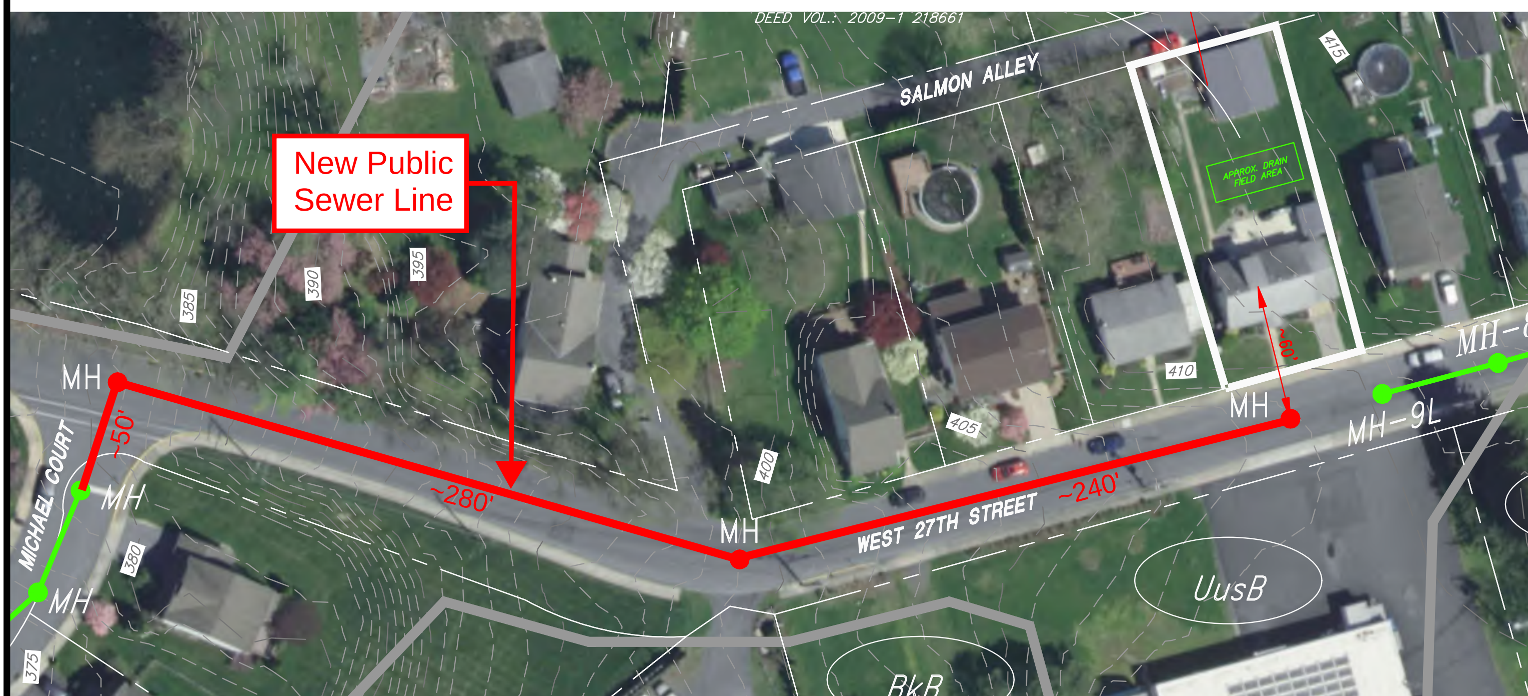
Figure 17: LVPC FutureLV Regional Plan: General Land Use Plan

PARKS, OUTDOOR RECREATION, OPEN SPACE AND SCENIC PLAN

This plan shows major existing and planned park, recreation, open space and scenic facilities and is used to guide efforts by private organizations and government agencies to expand, improve and connect regional assets. The plan combines natural resources and scenic assets to identify Character-Defining Areas. The LVPC uses this plan as an important component of proposal review and highly encourages projects that expand, improve or connect the network. Proposed improvements are compatible with any land use depicted on the General Land Use Plan.

Character-Defining Areas are identified on the General Land Use Plan.

Figure 18: LVPC FutureLV Regional Plan: Allen Township Open Space, Parks, and Recreational Areas

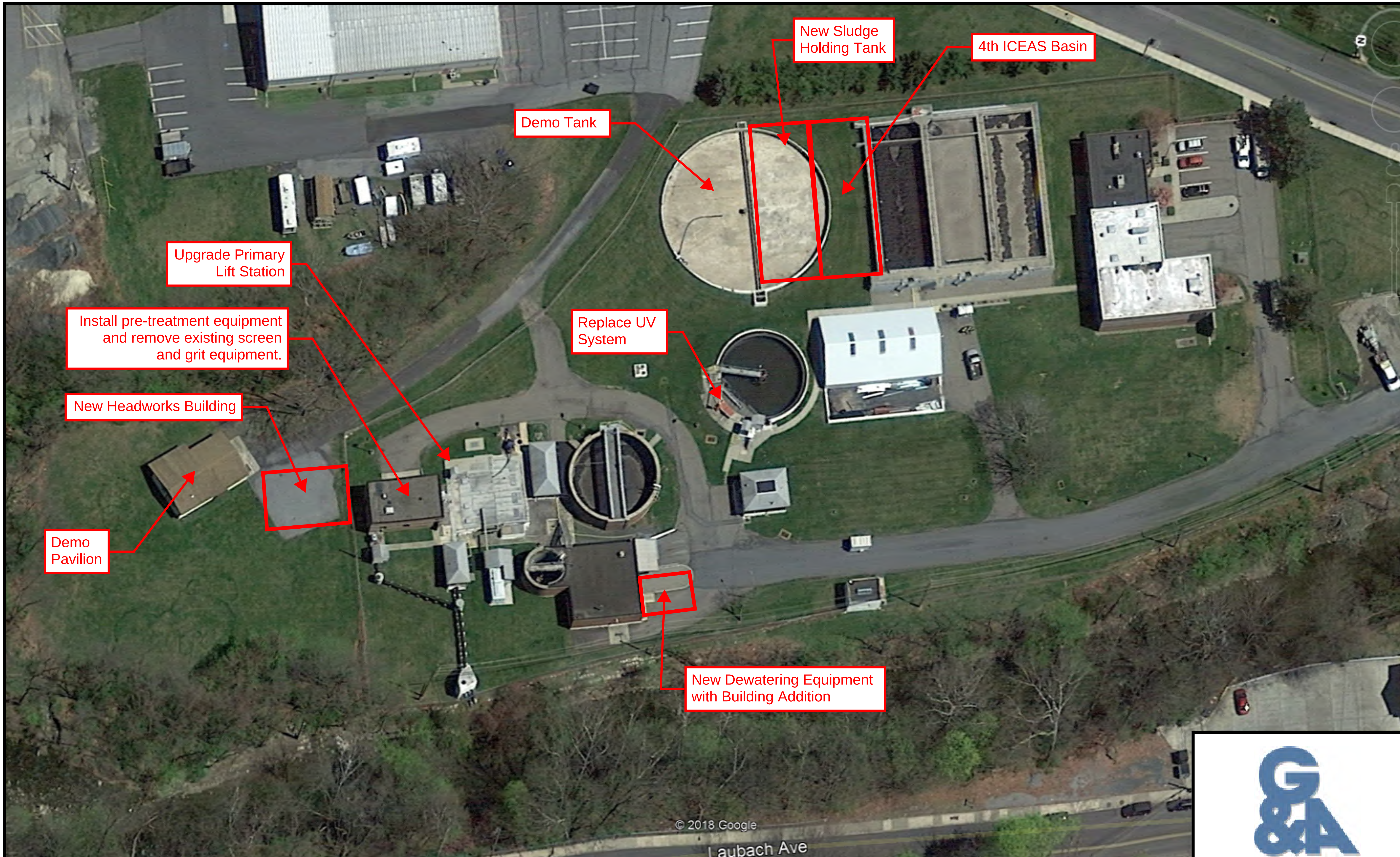


OLDS Area 1 - Public Improvements Map

Figure 19

OLDS Area 1 - Public Improvements Map

Figure 20



Plant Upgrade and Renovation Project - Preliminary Layout Plan

Figure 21

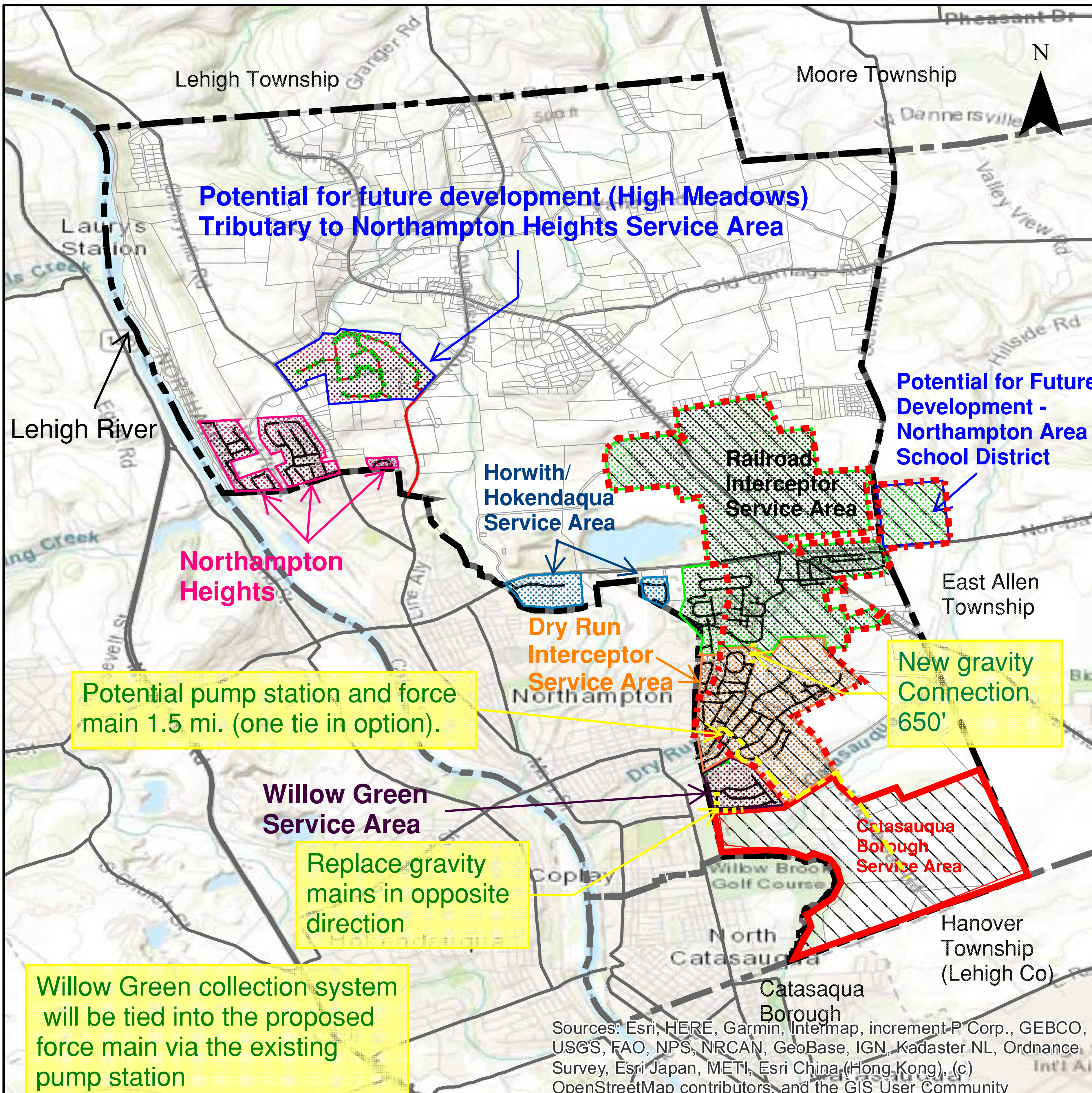


Figure 22 - Allen Township Alternative 8 Map

1 inch = 5,000 feet

0 2,500 5,000 10,000 Feet

Legend

- Proposed Sanitary Manholes
- Sanitary Manholes
- Proposed Sanitary Lines
- Sanitary Lines
- Proposed Pump Stations
- Pump Stations
- Allen Township Boundary
- Municipal Boundaries
- Parcels
- State Roads

Note: Service areas with dotted hatching are in the Northampton Borough Service Area. The Catasauqua Borough Service area is noted with a slanted line hatching.

APPENDIX D

SELECTED PORTIONS OF NORTHAMPTON BOROUGH CODE

§ 190-26 Connection to sewage collection system.

A. Connection to existing sewage collection system. All sewers of improved property in the Borough abutting on or adjoining any street, alley, lane or other public highway in which a sanitary sewer of the sewage collection system now owned by the Borough has been constructed shall be required to connect said improved property to the sewage collection system within 90 days of receiving written notice from the Borough to make such connection.

B. Connection to new or extension to sewage collection system. All owners of improved property in the Borough abutting on or adjoining any street, alley, lane or other public highway in which a new sanitary sewer and/or an extension to the sewage collection system is constructed shall be required to connect said improved property to the sewage collection system within 90 days of receiving written notice from the Borough to make such connection.

C. Failure of improved property to connect to sewage collection system. If, after the expiration of 90 days from the date of such written notice to connect, any owner of an improved property abutting on or adjoining any street, alley, lane or other public highway in which there is a sanitary sewer of the sewage collection system shall have failed to connect therewith as required by Subsection A or B above, the Borough may give such owner 45 days written notice to make such connection, from the date of receipt of such written notice, and upon failure of such owner to make such connection within said forty-five-day period, the Borough may make such connection and collect the cost thereof from such owner by a municipal claim or in action in assumpsit. The written notice shall be made by either personal service or by certified mail sent to the last known address of said owner.

D. Connection of a double dwelling unit. An improved property which is a double dwelling unit shall be connected to the sewage collection system as provided by this chapter.

E. Determining location of sewage collection system. The owner of an improved property to be connected and/or his contractor or plumber acting as his duly authorized agent is solely responsible for determining the precise depth of the sewage collection system prior to the construction of any improved property or building sewer in the case of *existing improved property. The Borough assumes no responsibility for any costs arising out of the failure of the owner or agent to determine, prior to the construction of any improved property or building sewer, the precise depth of the sewage collection system regardless of any information that may be made available by the Borough.*

F. Privatization of extraneous water. No person shall make connection of roof downspouts, exterior foundation drains, areaway drains or other sources of surface runoff or groundwater to the sewage collection system or to a building sewer which in turn is connected directly or indirectly to the sewage collection system.

G. Floor drains.

(1) Floor drains shall be permitted to be connected to the building sewer only where it can be shown to the satisfaction of the Borough Manager that their connection is absolutely necessary and imperative. Where such drains are permitted, arrangements shall be made to maintain a permanent water seal in the traps, and such drains shall be provided with check or backwater valves.

(2) Written permission shall be obtained from the Borough Manager before any basement floor drain may be attached to the building sewer; provided, however, that permission for a basement floor drain shall not be granted until the owner has executed and signed a written agreement in triplicate releasing the Borough from any damage that may result from the basement being flooded by the stoppage of the sewage collection system or the building sewer, which agreement shall be filed with the Borough and the owner shall at all times maintain one copy of same.

H. Testing of connection. The owner or his representative under § 190-29 shall notify the Manager at least 24 hours before actual connection and testing of a building sewer into the sewage collection system is to be accomplished. No such connection or testing shall be accomplished except in the presence of the Manager, and shall be accomplished in a manner satisfactory to said Manager. No portion of the building sewer shall be covered until it has been inspected, tested and approved in writing by the Manager. If any part of a building sewer is covered before being so inspected, tested and approved, it shall be uncovered for such inspection and testing at the cost *and expense of the owner.*

§ 190-27 Application for permit to connect to sewage collection system.

A. Application from improved property.

(1) All owners of improved property in the Borough who receive a written notice to connect to the sewage collection system under § 192-26A or B shall be required to make an application, on a form furnished by the Borough, for the construction of a building sewer to serve the improved property. Such application shall require, as a minimum, the owner of the improved property to indicate:

(a) Whether sanitary sewer and/or industrial waste will be discharged through the building sewer.

(b) That the owner agrees to pay all lawful charges for sewage and/or industrial waste discharged.

(c) That the owner will notify the Borough in writing upon change of owner.

(d) That the building sewer will be continuous use for at least one year.

(2) Owners of improved property who desire to discharge industrial waste through the building sewer into the sewage collection system may also be required to furnish additional information as required in § 190-30C.

(3) The application must also contain any other information as may be required by this chapter.

(4) The application must be signed by the owner of the improved property, his duly authorized representative and all other persons having interest of record in the improved property.

B. Issuance of permit. If the information contained on the application described in Subsection A above is complete and satisfactory to the Borough, and the appropriate fees as required by § 190-24 of this chapter have been paid, the Borough will issue a *permit for the connection of the improved property to the sewage collection system.*

C. Displaying permit. The permit required by this chapter shall be prominently displayed at the site of work, at all times, during construction of a building sewer and connection of a building sewer to the sewage collection system.

§ 190-28 Construction of building sewer to sewage collection system.

A. Construction requirements. All building sewers, which consists of a connection sewer and a customer sewer, shall be constructed in accordance with the requirements of this chapter, the Plumbing Code or any other applicable regulations of the Borough.

B. Connection sewer available. If the connection sewer is in place and available for use, the owner of the improved property shall construct or have constructed the customer sewer and connect it to the connection sewer. The Borough shall be notified prior to such connection to provide inspection of the customer sewer and the connection. All costs associated with the construction of the customer sewer and the connection are the responsibility of the owner of the improved property. Said owner is also responsible for all other fees of the Borough relative to this chapter.

C. Connection sewer not available. If the connection sewer is not in place, the Borough shall construct the connection sewer or have the owner of the improved property construct the connection sewer along with the customer sewer. If the Borough constructs the connection sewer, said owner will be responsible for all fees provided for said connection sewer in addition to all fees for said customer sewer as provided by this chapter. The provisions for notification and inspection and the payment of all costs and fees associated with the construction undertaken by said owner shall be as set forth in Subsection B above.

D. Prohibited connections.

(1) No privy, vault, cesspool, sinkhole, septic tank or similar receptacle shall be maintained at any time upon any improved property which had been connected to

the sewage collection system or which shall be required under § 190-26A or B to be connected to the sewage collection system.

(2) Upon connection to the sewage collection system, any existing privy, vault, cesspool, sinkhole, septic tank or similar receptacle in existence shall be abandoned and, at the discretion of this Borough, shall be cleansed and filled at the expense of the owner of such improved property and under the direction and supervision of this Borough; and any such privy, vault, cesspool, sinkhole, septic tank or similar receptacle not so abandoned and, if required by this Borough, cleansed and filled, shall constitute a nuisance and such nuisance may be abated as provided by law, at the expense of the owners of such improved property.

(3) No privy, vault, cesspool, sinkhole, septic tank or similar receptacle at any time shall be connected to the sewage collection system.

(4) In the event of the failure by any owner of an improved property to clean and fill any privy, vault, cesspool, sink hole, septic tank or similar receptacle, the Borough may perform such work and collect the costs thereof from such owner by a municipal claim, or in an action in assumpsit.

E. Unlawful connections. If any owner or tenant of an improved property should make any connection to the building sewer or the sewage collection system without a permit from the Borough, or allow any pollutant to be discharged into the building sewer or the sewage collection system except as provided by this chapter or violate any of the provisions with respect to this chapter, and shall after 10 days of receipt of written notice from the Borough fail or neglect to abate such condition, the Borough may, at its option, enter upon the improved property; or the Borough may by appropriate legal action proceed to compel said owner of said improved property to abate such condition. In addition to any other remedies available, the Borough, upon failure or neglect of said owner to comply with any provisions of this chapter, may enter the improved property and at the owner's cost, disconnect the said improved property from the sewage collection system and may require the payment of a fee for reconnection and all costs and expenses as a condition for reconnection. The Borough may file a municipal lien against the improved property for any and all costs incurred by the

Borough in abating such condition, together with such additional charges as may be permitted by applicable law.

F. Penalty for violation. Any person who shall violate any provision of this subpart shall, upon conviction thereof, be sentenced to pay a fine of not more than $1,000 plus costs and, in default of payment of said fine and costs, to a term of imprisonment not to exceed 30 days. Each day that a violation of this chapter continues shall constitute a separate offense.

§ 190-29 Requirements for construction of building sewer.

A. Registration required. It shall be unlawful for any person to engage in the business of constructing a building sewer, that is, shall or may be physically connected to the sewage collection system or to construct any other sewer plumbing within an improved property within the jurisdiction of the Borough without first being registered by the Borough to engage in said business.

B. Registration fee. The Borough reserves the right to establish and charge a registration fee for such person engaged in the business of constructing a building sewer or any other sewer plumbing within an improved property within the jurisdiction of the Borough.

C. Annual registration requirement. Any such registration validly obtained, and not otherwise revoked for cause as specified elsewhere in this chapter, shall expire at the end of one calendar year. Such registration may be renewed by the appropriate endorsement or reissued provided that the person holding a valid registration makes application or such renewal by not later than April 15, and provided further that the registration holder has demonstrated by past performance that he is qualified and capable of performing work covered in accordance with good plumbing practice and the provisions of this chapter, the Plumbing Code or any other applicable regulations of the Borough.

D. Revoking of registration. Any registration provided for in this chapter may at any time be revoked for incompetency, fraudulent use thereof, giving false witness or any *violation of this chapter, the Plumbing Code, or any other applicable regulations of the Borough relative to constructing a building sewer or sewer plumbing after a full and fair hearing by the Borough Manager. After revocation for cause, no registration shall be issued to such person until at least six months shall have elapsed.*

E. Nontransferability of registration. A registration issued under the provisions of this chapter shall not be transferable to any successor in business.

F. Bond/insurance requirement. No registration as described in this section shall be issued until the person applying therefor shall have given a bond in the sum of $1,000 and produced to the Borough Manager evidence that he is completely covered by insurance in connection with his construction work for property damage and public liability. The public liability coverage shall not be less than $10,000 for injury to any one person, and $20,000 total for any accident, and the coverage for property damage shall be not less than $5,000 to indemnify and save harmless the Borough of Northampton from any and all claims and suits for damages to persons or property arising from the negligence of any person, firm or corporation registered under the provisions of this section or by agents, employees or workmen of such registrations. Such registrations, with good and sufficient surety to the satisfaction of the Northampton Borough Council, will pay the full costs of restoration and repair for any and all damages which may happen or be caused to any tree, street, pavement, sidewalk or sewer belonging to said Borough, or to any telegraph, telephone or electric light pole or wire of any public service company, whether said damages or injury shall be inflicted by said registrant or by agents, employees or workmen of the registrant, and conditioned also that said party shall save and indemnify and keep harmless said Borough against all liability, judgment, damages, costs and expenses which may, in any case, secure against said Borough in consequences of the granting of such registrant, and will fully and completely restore to its original condition, to the satisfaction of the Borough Manager, and all streets, pavements and sanitary sewers which may be opened or disturbed by said party, and will in all things strictly comply with the conditions and provisions of this chapter and with the conditions of any permit issued pursuant thereto.

§ 215-24 Sanitary Sewage Disposal

A. The developer shall provide the most effective type of sanitary sewage disposal consistent with the natural features, location, and proposed development of the site. The following types of sanitary sewage disposal are listed in order of preference:

1. *Connection to a public sanitary sewage disposal and treatment system.*
2. *Provision by the developer of centralized sanitary sewage disposal and treatment system, to be IAW the requirements of the PA DEP.*
3. *Capped sewers with temporary, approved on-lot faculties.*
4. *On-lot sewage disposal systems consisting of septic tank with tile field.*

§ 215-24 Sanitary Sewage Disposal (cont.)

F. In subdivisions where neither connection to a public sewerage system nor a centralized sanitary sewer system is required, sewage disposal shall be provided on individual lots, consisting of septic tanks and tile absorption fields. The physical features of the tract on which on-lot disposal is provided shall meet the criteria established by the PA DEP for on-lot sewage disposal systems.

§ 125-18 Identification

A. The identified floodplain area shall be:

1. Any areas of the Borough, classified as special flood hazard areas (SFHAs) in the Flood Insurance Study (FIS) and the accompanying FIRMs dated July 16, 2014, and issued by the FEMA or the most recent revision thereof, including all digital data developed as part of the Flood Insurance Study; and

B. The above-referenced FIS and FIRMs, and any subsequent revisions and amendments are hereby adopted by the Borough and declared to be a part of this chapter.

§ 125-19 Description and special requirements of identified floodplain areas

The identified floodplain area shall consist of the following specific areas:

A. The Floodway Area shall be those areas identified in the FIS and the FIRM as floodway and which represent the channel of a watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without increasing the water surface elevation by more than one-foot at any point. This term shall also include floodway areas which have been identified in other available studies or sources of information for those special flood hazard areas where no floodway has been identified in the FIS and FIRM.

1. Within any floodway area, no encroachments, including fill, new construction, substantial improvements, or other development, shall be permitted unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

2. Within any floodway area, no new construction or development shall be allowed, unless the appropriate permit is obtained from the PA DEP Regional Office.

B. The AE Area/District shall be those areas identified as an AE Zone on the FIRM included in the FIS prepared by FEMA for which base flood elevations have been provided.

1. The AE Area adjacent to the floodway shall be those areas identified as an AE Zone *on the FIRM included in the FIS prepared by FEMA for which base flood elevations have been provided and a floodway has been delineated.*

C. *The A Area/District shall be those areas identified as an A Zone on the FIRM included in the FIS prepared by FEMA and for which no base flood elevations have been provided. For these areas, elevation and floodway information from other federal, state, or other acceptable sources shall be used when available. Where other acceptable information is not available, the base flood elevation shall be determined by using the elevation of a point on the boundary of the identified floodplain area which is nearest the construction site. In lieu of the above, the municipality may require the applicant to determine the elevation with hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough technical review by the municipality.*

§ 190-4 Discharge of stormwaters

No person shall discharge or cause or permit to be discharged any stormwater, surface water, groundwater, roof water, subsurface drainage or building foundation drainage into any sanitary sewer.

§ 190-5 Storm sewers

No person shall, at any time, discharge any wastewater, sanitary sewage or industrial waste into any storm sewer of the Borough, nor shall any person construct or utilize existing private storm sewers for such purposes.

Chapter 250 Zoning

[HISTORY: Adopted by the Borough Council of the Borough of Northampton 12-16-1999 by Ord. No. 1100 (Ch. 27 of the 1993 Code of Ordinances). Amendments noted where applicable.]

§ 250-3. Intent and purpose

The intent of this chapter is to establish comprehensive controls for the development of land in the Borough based on the Comprehensive Plan for the area and enacted in order to promote and protect health, safety, comfort, convenience and the general welfare of the people. The general purpose of this chapter is to seek the following general objectives.

§ 250-4. Objectives

Such regulations shall be made IAW the Comprehensive Plan and designed to lessen congestion in the streets, to secure safety from fires, flood, panic and other dangers; to promote the health and general welfare; to provide adequate light and air; to prevent overcrowding of land; to facilitate the provision of transportation, water, sewage, schools, parks and other public requirements. Such regulations shall be made with reasonable consideration, among other things, as to the characteristics of the district and its peculiarities for particular uses and with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout the Borough.

§ 250-5. Plan objectives

A. Land use goals and objectives

1. Residential

(a) To buffer residential areas from adjacent nonresidential incompatible land use activities.
(b) To allocate more acreage for medium-density land use than was proposed in the 1972 Borough General Plan. The preferred medium-density housing type is a two-family house.
(c) To permit some of the edges of the Uptown to be used for medium- and high-density residential land uses.

(d) To increase the off-street parking requirement for all residential land uses, except for senior citizen housing along bus routes.
(e) To expend the opportunities for home occupations in residential areas but clearly define the performance requirements for such uses so that they do not become a nuisance.
(f) To establish a policy regarding new land ownership patterns such as subdivision of an existing two or multifamily property and conversion of a multifamily property into a condominium or cooperative form of ownership.
(g) To provide technical advice to homeowners in regard to quality building maintenance, expansion, construction, energy conservation and environmental enhancement.

2. *Commercial*

(a) To consolidate and revitalize the Uptown as the Central Business District (CBD). At a minimum, the CBD should include Main Street from Nineteenth Street to Twenty-First Street, Twenty-First Street from Main Street to Center Street and Center Street.
(b) To encourage office and service commercial uses.
(c) To improve off-street parking opportunities in the Uptown CBD.
(d) To attract restaurants, offices, specialty, and convenience stores into the CBD.
(e) To facilitate reuse of vacant stores and buildings, particularly in the CBD.
(f) To explore the possibility of an Uptown Improvement District.
(g) To recognize that the midtown and downtown commercial areas deserve recognition and support. Their identity as business districts with special character should be preserved and enhanced. The downtown as a business area extends from Ninth Street to Thirteenth Street. The midtown business/residential area extends from Thirteenth Street to Eighteenth Street.

3. *Industrial*

(a) To attract technology-type businesses.
(b) To promote limited development of new factories.
(c) To encourage innovative reuse of existing industrial land.

4. Recreation and open space

(a) To preserve and enhance areas along streams and rivers for recreation and open space purposes.
(b) To preserve presently vacant high points with nice views for recreation purposes.

B. Community facilities goals and objectives

1. To preserve and enhance the Borough Municipal Building Complex.
2. To construct an indoor recreation center.

C. Transportation goals and objectives. To establish traffic, parking and pedestrian movement recommendations for the Northampton Business District Improvement Program.

1. To encourage orderly traffic flow through the Borough as a positive component for business opportunity in the Borough.
2. To establish and implement a plan for improving the efficiency and safety of traffic flow in the Borough.
3. To improve off-street parking resources within the Borough.
4. To further enhance pedestrian and bicycling movements within the Borough.
5. To encourage the development of mass transportation system service and to encourage intermodal terminals and/or stations to be located within the Borough.

Article III. Establishment and Designation of Districts

§ 250-8. Establishment of districts

A. The Borough of Northampton is divided into the following districts:

CO Conservancy District
R-1 Residential District
R-2 Residential District

R-3 Residential District

R-4 Residential District

C-1 Commercial Transition District

C-2 Commercial District

I-1 Industrial District

I-2 Industrial District

B. In addition to the above nine zoning districts, there are floodplain overlay districts which shall also be applicable. The Borough has adopted a separate Floodplain Management Ordinance.[1] All specific floodplain management regulations are contained in that separate ordinance.

[1] Editor's Note: See now Ch. 125, Flood Damage Prevention.

§ 250-11. Intent and purpose of zoning districts

The general intent and purpose for each of the zoning districts established in § 250-3 above are as follows:

A. CO Conservancy District. To establish and preserve areas for watershed, flood control, forestry, cement quarry reclamation settlement and the general conservation of the land with its flora and fauna. Uses such as low-intensity outdoor recreation and other uses that do not significantly change the natural character of the land or do not attract large numbers of people would be compatible with this intent.

B. R-1 Residential District. To establish and preserve the lowest-density residential areas in the Borough for quiet single-family home neighborhoods free from incompatible activities which would generate distractive sights, sounds, traffic or which would in any way compromise the privacy and serenity of the living environment for the individual residential lots.

C. R-2 Residential District. To establish and preserve relatively low-density residential areas in the Borough for single-family, two-family and limited multifamily uses (three to eight units per structure) which are protected in the same manner as the R-1 District above.

D. R-3 Residential District. To establish and preserve medium-density residential areas where a variety of housing types, including single-, two-family and multifamily uses, are protected in the *same manner as the R-1 District above.*

E. R-4 Residential District. To establish and preserve a medium-density single-, two-family and townhouse residential area where mobile home parks could also be developed and which would be protected in the same manner as the R-1 District above.

F. C-1 Commercial Transition District. To establish and preserve areas in transition from residential to commercial so that the quality of the human living environment and the business environment may be jointly considered, respected and preserved to the greatest extent possible during the time of change in predominant land use for the area.

G. C-2 Commercial District. To establish and preserve compact business areas where a variety of retail, office and service businesses would receive priority consideration and protection. Residential uses already in existence or well-planned mixed uses would be permitted to coexist with the business uses. An attractive environment should be maintained within which to do business and/or to reside.

H. I-1 Industrial District. To establish and preserve areas of light, limited and/or low-intensity industrial land use activity. These types of areas may include older, already developed industrial buildings on sites where the scale of industrial and warehouse-type activity could be less intense than the I-2 District.

I. I-2 Industrial District. To establish and preserve areas for a variety of industrial uses, for certain commercial type uses and for farm and related uses. All uses would be required to comply with Borough performance standards. Permitted accessory and special uses would be given priority. Other uses would be considered to be incompatible and would not be permitted.

APPENDIX E

SELECTED PORTIONS OF ALLEN TOWNSHIP CODE

Part 2
HOLDING TANKS AND SEWAGE MANAGEMENT

§ 18-201. Purpose. [Ord. 95-2A, 12/21/1995, § 1]

The purpose of this Part is to establish procedures for the use and maintenance of holding tanks designed to receive and retain sewage, whether from residential or commercial uses, and to establish regulations for community on-lot subsurface sewage and small-flow treatment systems; and it is hereby declared that the enactment of this Part is necessary for the protection, benefit, and preservation of the health, safety and welfare of the inhabitants of the Township.

§ 18-202. Definitions. [Ord. 95-2A, 12/21/1995, § 2]

Unless the context specifically and clearly indicates otherwise, the meanings of terms used in this Part shall be as follows:

BOARD OF SUPERVISORS — The Board of Supervisors of Allen Township of Northampton County, Pennsylvania.

COMMUNITY SEWAGE SYSTEMS — A sewage facility, whether publicly or privately owned, for the collection of sewage from two or more lots, or two or more equivalent dwelling units, and the treatment or disposal, or both, of the sewage on one or more of the lots or at another site.

A. COMMUNITY ON-LOT SEWAGE SYSTEM — A community sewage system which uses a system of piping, tanks or other facilities for collecting, treating, and disposing of sewage into a subsurface soil absorption area.

B. COMMUNITY SEWERAGE SYSTEM — A community sewage system which uses a method of sewage collection, conveyance, treatment, and disposal other than renovation in a subsurface absorption area, or retention in a retaining tank.

HOLDING TANK — A watertight receptacle, whether permanent or temporary, to which sewage is conveyed by a water-carrying system, which receives and retains sewage, and which is designed and constructed to facilitate the ultimate disposal of the sewage at another site.

IMPROVED PROPERTY — Any property within the Township upon which there is erected a structure intended for continuous or periodic habitation, occupancy or use by human beings or animals and from which structure sewage shall or may be discharged.

OWNER AND/OR PROPERTY OWNER — Any person vested with ownership, legal or equitable, sole or partial, of any property located in the Township.

PERSON — Any individual, partnership, company, association, corporation, or other group or entity.

SMALL-FLOW TREATMENT FACILITIES — An individual or community sewage system designed to adequately treat sewage flows not greater than 2,000 gallons per day for final disposal using a stream discharge or discharge to the surface of the ground.

TOWNSHIP — Allen Township of Northampton County, Pennsylvania.

USER(S) — Any individual or individuals engaged in utilizing a community sewage system or small-flow treatment system.

§ 18-203. Right and Privileges Granted. [Ord. 95-2A, 12/21/1995, § 3; as amended by Ord. 2007-04, 11/8/2007]

Holding tanks and community on-lot subsurface sewage and small-flow treatment systems shall, subject to the regulations of and approval of the Pennsylvania Department of Environmental Protection, be permitted in Allen Township only as provided and in accordance with the provisions of this Part.

§ 18-204. Use of Holding Tanks. [Ord. 95-2A, 12/21/1995, § 4; as amended by Ord. 2007-04, 11/8/2007]

1. Holding tanks may be permitted, based upon application to and a permit granted by the Allen Township Sewage Enforcement Officer, only for the purpose of repair, replacement, or upgrading of existing malfunctioning systems in poor or overused soils unsuitable for small-flow treatment facilities in accordance with the Official Allen Township Comprehensive Wastewater Plan, including all addenda, or in accordance with the provisions of Subsection 2 herein.

2. In no event shall holding tanks be permitted as a means of on-site sewage collection in the case of new residential subdivisions and/or commercial and industrial land development unless and until the Township determines that all of the following conditions and requirements have been met or satisfied:

   A. No community sewage system is available to service the property.

   B. The owner of the property has unsuccessfully applied to the Pennsylvania Department of Environmental Protection ("DEP") for a permit to allow for the construction of on-lot small-flow treatment facilities and has made good-faith, reasonable attempts to comply with all DEP requirements in order to obtain the same.

   C. The Township, in its sole opinion, has determined that a community sewage system will be available to service the subject property in the reasonably foreseeable future.

   D. The owner agrees to connect to the aforementioned community sewage system within six months of the same becoming available to service the subject property, or, in the event the same does not become available within five years, agreed to construct a sewage treatment system upon obtaining the recommendation and approval of the DEP and the Township, provided that the aforementioned five-year period may be extended, for good cause, in the sole discretion of the Board of Supervisors.

   E. The owner has fully complied with all of the remaining provisions of this Part, or agrees to do so within a reasonable time period to be established by the

Township.

F. The Township Board of Supervisors determines that the use of a holding tank in conjunction with the development of the subject property is in the best interests of the Township.

3. Holding tanks shall be permitted as a remedial measure or temporary measure in accordance with the following conditions:

A. Soil is unsuitable for subsurface and small-flow treatment facilities. (Reference Title 25, Subsections 71.62, 63 and 64.)

B. A specific replacement schedule is established to provide hook-up to a central sewage collection system, which has been proposed in the official plan. (Reference Title 25, Subsection 71.63.c.i.)

C. Designated conveyance and disposal facilities are identified. [Reference Title 25, Subsection 71.63.b(2).]

D. Provision of financial guarantees in form of escrow fund deposits have been established to cover inspections, malfunctions, cleanup, if required, and removal. (Reference Title 25, Subsection 71.73.b.vi.)

E. Tank is abandoned, emptied and removed (or filled with soil) within 90 days of when public sewerage facilities become available.

4. Nonresidential oil separation holding tanks shall be exempt from the requirements of this Part.

5. Chemical Toilets. Temporary use of portable chemical toilets at construction sites and at sites of public gathering and entertainment, where there is no water under pressure and no piped wastewater, shall be exempt from those requirements, except that a permit shall be obtained from the Township Secretary a minimum of seven days prior to installation or renewal. A permit fee shall be paid at the time of issuance and shall be valid for 180 days. The permit is renewable at the discretion of the Township.

§ 18-205. Use of Community On-Lot Subsurface Sewage and Small-Flow Treatment Systems. [Ord. 95-2A, 12/21/1995, § 5]

1. These systems shall be permitted in accordance with the Township Comprehensive Wastewater Plan:

A. In areas of marginal soils in new developments where public sewage is not available.

B. To allow individual small-flow treatment facilities for the purpose of remediation of malfunctioning systems.

2. Community on-lot subsurface disposal systems and small-flow treatment systems are permitted only in new developments.

§ 18-206. Rules and Regulations. [Ord. 95-2A, 12/21/1995, § 6]

The Township may enact such rules and regulations as it deems necessary to effect the purpose of this Part. All such rules and regulations adopted by the Township shall be in conformity with the provisions herein, all other ordinances of the Township, and all applicable laws, and applicable rules and regulations of administrative agencies of the Commonwealth of Pennsylvania.

§ 18-207. Inspections. [Ord. 95-2A, 12/21/1995, § 7; as amended by Ord. 2007-04, 11/8/2007]

1. Holding Tanks. The Township Sewage Enforcement Officer (SEO) shall have the right and power to establish the time and manner of inspections of the holding tanks. Each such tank shall be inspected and tested by the SEO or his designated agent at the expense of the applicant after installation and before use. At a minimum, the SEO or his designated agent shall annually inspect and provide a written report of said inspection to the Board of Supervisors. In the event of noncompliance with the terms of this Part, including, but not limited to, evidence of leakage, seepage, or escape of any materials from the holding tank or failure to provide the Township with full and complete evidence of, and/or regular pumping receipts for, the holding tank, said holding tank shall be subject to inspection by the Township SEO or his designated agent, at such time and for such period as the Township or SEO may determine necessary in the interest of the protection, benefit and preservation of health, safety and welfare of the inhabitants of the Township.

2. Community Subsurface and Small-Flow Systems.

   A. The system shall be approved by the Township and the Pennsylvania Department of Environmental Protection and subject to review and inspection by the Township Engineer or Township Sewage Enforcement Officer. The installation of the system and its start-up shall be under the supervision of the design engineer.

   B. The system shall be inspected by the Township's authorized agent quarterly during its first year of operation and, at a minimum, twice annually thereafter, which inspection shall include sampling and testing of effluent. The cost of inspections and testing shall be borne by the owner. The Township's agent shall prepare a report to rate performance of the system and outline any deficiencies requiring maintenance and/or repair.

§ 18-208. Rates and Charges. [Ord. 95-2A, 12/21/1995, § 8]

The Township shall have the right and power by resolution to fix, alter, charge and collect charges for permits to install holding tanks, community subsurface and small-flow systems and for the periodic inspection and/or testing of the same. Amounts for fees, permits, escrow accounts, and fines as established by this Part may be modified, from time to time, by resolution of the Board of Supervisors of Allen Township.

§ 18-209. Official Plan Approved Required for Community Subsurface and

Small-Flow Systems. [Ord. 95-2A, 12/21/1995, § 9; as amended by Ord. 2007-04, 11/8/2007]

1. The disposal of sewage by community on-lot and/or small-flow treatment facilities shall be in accordance with Addendum #2 to the Allen Township Comprehensive Wastewater Plan. The applicant is required to prepare land planning modules for an official plan revision and submit a comprehensive report as outlined in §§ II through VII of Plan Addendum #2.

2. An installation and/or operations application will not be accepted unless the Allen Township Comprehensive Wastewater Plan revision has been approved first by Allen Township and then by the Pennsylvania Department of Environmental Protection (PaDEP) as required by the ordinance and PaDEP Regulations embodied in Title 25, Chapter 71. For clarification of the permit processes, refer to the flow chart appended to this Part.[1]

§ 18-210. Application and Submission for Community Subsurface and Small-Flow Systems. [Ord. 95-2A, 12/21/1995, § 10; as amended by Ord. 2007-04, 11/8/2007]

No community on-lot sewage system or small-flow treatment system, as defined in the Allen Township Comprehensive Wastewater Plan, shall be permitted to be installed, constructed, or operated to service any structure or use as permitted by Allen Township Zoning Regulations [Chapter 27] until such facility has been permitted by the Township and PaDEP. Permit applications shall be on PaDEP forms and shall be accompanied by an administrative processing fee and posting of an escrow account to be established by resolution of the Board of Supervisors.

A. For Sewage Facility Plan Revision. Accompanying the form for plan revisions shall be the following:

   (1) Planning modules to revise the Township Act 537 Sewage Facilities Plan.

   (2) A site topographic plan drawn to a scale of 50 feet to the inch or larger and, if to a stream or ground surface, extending 400 feet beyond the owner's property line. The site topographic plan shall be prepared by a registered engineer and surveyor. The plan shall show existing and proposed contours at two-foot intervals, wooded areas, buildings, wells, wetlands, streams, on-lot sewage systems, plantings, grading, fences, and other pertinent topographical features.

   (3) Data as required per Title 25, Chapter 71, and the Township's Comprehensive Plan.

   (4) System design calculations and report.

   (5) If sludge or wastes are to be disposed of off site, a signed agreement with the facility accepting the waste.

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1. Editor's Note: The flow chart is on file and may be seen at the Township offices.

(6) Township application fee and escrow fee.

B. For Construction Plan Approval:

(1) Part I NPDES permit application.

(2) Part II DER construction permit application.

(3) Design report prepared by a Pennsylvania registered professional engineer.

(4) Plans and specifications prepared by a Pennsylvania registered professional engineer.

(5) Township application fee and escrow fee.

§ 18-211. Standards for Design, Construction and Operation for Community Subsurface and Small-Flow Systems. [Ord. 95-2A, 12/21/1995, § 11; as amended by Ord. 2007-04, 11/8/2007]

1. All wastewater systems constructed and installed in accordance with this Part and other applicable ordinances in the Township of Allen after the effective date of this Part shall be designed and installed in strict conformity to the requirements of the Pennsylvania Sewage Facilities Law (52 P.S. § 750.1 et seq.), the Pennsylvania Clean Streams Law (35 P.S. § 691.1 et seq.), the regulations of the Department of Environmental Protection applicable thereto, and the design standards set forth in this Part. All permits, licenses and approvals as may be required and necessary to be obtained at the applicant's sole cost and expense from any and all federal, state, and local agencies, departments or boards.

2. Applicants shall, prior to any installation, construction, or acquisition of materials, obtain and provide, at applicant's sole cost and expense, five copies or sets of design documents consisting of complete and detailed drawings and specifications of the collection, conveyance, or treatment facility and appurtenances prepared by a professional engineer registered in the State of Pennsylvania, copies of which design documents shall be submitted to the Township for review. The sole cost and expense shall be borne by applicants, which design documents shall be subject to the following conditions:

A. The design of community on-lot sewage systems and small-flow treatment systems shall be prepared in accordance and compliance with:

(1) PaDEP Title 25, Chapter 73, entitled "Standards for Sewage Disposal Facilities."

(2) PaDEP Domestic Wastewater Facilities Manual, Publication No. DEP 1397, latest edition.

(3) PaDEP Technical Supplement for Small STP's, A Supplemental Guide to the Sewerage Manual.

(4) PaDEP Operation and Maintenance Considerations in the Design of

Treatment Facilities, A Supplemental Guide to the Sewerage Manual.

(5) PaDEP "Design Guidelines" for Spray Irrigation.

(6) The latest edition of the Allen Township Authority's Construction Specifications for the Installation of Sanitary Sewers and Appurtenances.

(7) BOCA Plumbing Code.

B. A topographic plan shall be specifically prepared by field survey and/or photographmetic methods in accordance with national map accuracy standards attached hereto as Exhibit A and shall depict the site by specifically delegated boundaries, including any evidence or information regarding ownership, topography, vegetation cover, watercourses, and further identifying, if required by the Township, the proposed location for an all-weather access road to the treatment facility of a minimum width of 10 feet constructed from the nearest public roadway, a vehicle turnaround providing a minimum paved area of 200 square feet, a fence, a screen planting and lawn order to enhance the aesthetic quality of the site.

C. Such designs and standards as will achieve the Township's policy to maximize the efficiency and reliability of the facility while providing reliable and consistent access for service by operating personnel, minimizing maintenance and upkeep and avoiding such adverse impacts to the health, safety and welfare of the Township in the operation, use and maintenance of said system.

D. Any wastewater conveyance or treatment facility requiring a building to house equipment shall be constructed of concrete block or brick, designed and installed in such a manner to be compatible with the surrounding, neighboring, or adjacent structures with any and all controls and/or generators to be held within said superstructure, the same being in conformity with the then-applicable municipal building code to the extent such code establishes minimum standards and regulates health and firesafety issues, demands for integrity to withstand exterior weathering conditions and ingress and egress factors for individuals in the operation, and maintenance of the system and equipment installation or removal as may be determined necessary by the Township.

E. Complete installation drawings of all proposed equipment and materials for the collection, conveyance or treatment facility shall be submitted for review and written approval of the design engineer prior to acquisition, purchase, fabrication, delivery or installation of the same. A copy of the approved drawings shall be provided to the applicant and the Township. If the equipment/material to be installed differs from that approved at the time of design, it shall also be approved by the Township prior to acquisition and installation.

F. Operations and/or instruction manuals explaining how the system is to be operated and maintained, as well as manuals for any and all equipment, materials, or machinery installed in said system, shall be provided by the design engineer to the Township for review and approval prior to plant startup. Adequacy of the manual shall be approved by the Township. Upon approval by the Township, the manual shall be distributed by the design engineer to the Township (two copies), the owner of the system, and a copy kept at the facility.

G. Any and all equipment, material, and machinery to be incorporated or installed in any such facility shall be inspected by the applicant's (design) engineer prior to installation of the same to assure that it conforms to the approved design documentation and shop drawing, which compliance shall be certified in writing to the Township by the applicant's engineer prior to installation.

H. The applicant shall provide for initial testing and "start-up" of all such equipment, materials, and machinery by the manufacturer or fabricator's representative and shall secure from said representative, at the applicant's sole cost and expense, a written certification as to property installation of such equipment, materials or machinery providing copies of any operating materials, manuals or certifications and warranties prior to said installation and to provide for any and all necessary on-site training and demonstration of such equipment, materials and machinery for the operating personnel or licensed operator of such facility.

I. The applicant shall schedule tests as deemed appropriate by applicant's engineer and a final facilities inspection with the Township representative prior to any active operation of the facility and shall correct, at the applicant's expense, to the satisfaction of the Township, any defects or problems noted during such tests for final inspection or within the applicable maintenance period as hereinafter set forth, as part of which final inspection the applicant's engineer shall present a written certification that the facility and all appurtenances thereto have been installed and constructed in accordance with the approved design documents and shop drawings.

J. When determined appropriate by the Township Engineer, every such facility shall have installed on site an emergency generator.

K. Any and all excavation, grading, and/or earthmoving activities must be conducted in full and complete compliance with the rules, regulations, and requirements for soil and sedimentation control activities established by the Northampton County Soil Conservation District and the Pennsylvania Department of Environmental Protection and must be done subject to and in compliance with any and all appropriate permits as may be issued by the aforesaid agencies or other departments, bureaus, or agencies having appropriate authority to regulate the same.

§ 18-212. Duties of Property Owner. [Ord. 95-2A, 12/21/1995, § 12]

1. Holding Tanks. The owner of an improved property that utilizes a holding tank shall:

A. Maintain the holding tank in conformance with this Part or any ordinance of this Township, the provisions of any applicable law, and the rules and regulations of any federal governing body, the Township and/or any administrative agency of the Commonwealth of Pennsylvania.

B. Provide monthly to the SEO, pumping receipts and disposal receipts for the permitted tank, the same to be certified by property owner to be true and correct pumping and/or disposal receipts. Said property owner shall also provide, within 30 days of occurrence, reports of inspections or repairs.

C. Permit only persons approved in writing by the Township to collect, transport, and dispose of the contents of the holding tank.

D. As a condition precedent to the issuance of a permit for a holding tank pursuant to the provisions of this Part, the owner shall execute an escrow holding tank agreement and establish an escrow account to be held by the Township in an amount calculated at the rate of $300 per 1,000 gallons of tank capacity. Interest from the escrow account shall inure to the Township. The Township may use the funds held in said escrow account at any time and at its sole discretion to correct any maintenance, service, or pumping deficiency regarding the holding tank which the owner fails to perform as required by the terms of this Part. In the event the sum of money held in escrow by the Township is depleted below 50% of the original amount (or the then-current amount required by the Township to be maintained in the escrow account), the owner shall, within 30 days of demand by the Township, deposit with the Township sufficient funds to restore the account balance to the initial amount. In the event said amount is not deposited with the Township within the thirty-day period, all rights of the owner to the within Part or any agreement entered into in accordance therewith shall be revoked automatically.

E. As a further condition of the issuance of a permit for a portable chemical toilet pursuant to this Part, the property owner shall obtain a permit from and pay a permit fee of $5 to the Township Secretary. The permit/fee shall be filed with the Township a minimum of seven days prior to installation of the portable toilet. The property owner shall notify the Township when the portable toilet is removed. The permit fee shall also apply to renewable permits. The Township shall be exempt from all permit fees.

2. Community Subsurface and Small-Flow Treatment Systems.

A. Installation and Maintenance Agreement. The Township and the owner of the land upon which the system will be installed shall enter into an installation, maintenance, and escrow agreement which shall include the following provisions:

(1) The system shall be designed, installed, operated, and maintained in accordance with the requirements of applicable state laws and regulations and the requirements of the Township as set forth in this Part.

(2) If required, the Township shall issue a maintenance/repair order to the applicant stipulating the extent of required maintenance, the system performance criteria, and a time frame by which repairs need to be completed. The Township may issue a temporary operating permit until such time that all maintenance and repair work is completed. A temporary operating permit shall expire after 90 days of issuance.

(3) Upon failure of the system/property owner to properly repair or maintain the system, the Township shall have the right to enter the property in order to perform required maintenance or repairs, charge the cost thereof to the owner, and file a municipal lien in default of payment.

(4) The agreement will be recorded and run with the land and will be binding upon the owners, their successors, and assigns.

B. Annual Operating Permit. At least 30 days prior to each anniversary of the date on which the system is placed in operation, the owner shall apply for or obtain from the Township an annual operating permit for the system and shall pay therefor a fee of $100 per year which shall be applied against the cost to the Township of the inspections required in the installation and maintenance agreement.

§ 18-213. Exclusiveness of Rights and Privileges. [Ord. 95-2A, 12/21/1995, § 13; as amended by Ord. 2007-04, 11/8/2007]

1. The collection and transportation of all sewage from any improved property utilizing a sewage disposal system permitted under this Part shall be done by a hauler approved by the Township or the SEO. Disposal thereof shall be made only at such site or sites as may be approved by the Department of Environmental Protection of the Commonwealth of Pennsylvania.

2. The Township SEO shall receive, review and retain pumping and disposal receipts from property owners (or their designated agents) of permitted holding tanks and treatment systems. Receipts shall be maintained for a period of six years by the Township.

§ 18-214. Violations and Penalties. [Ord. 95-2A, 12/21/1995, § 14; as amended by Ord. 2007-04, 11/8/2007]

Any person, firm or corporation who shall violate any provision of this Part, upon conviction thereof in an action brought before a Magisterial District Judge in the manner provided for the enforcement of summary offenses under the Pennsylvania Rules of Criminal Procedure, shall be sentenced to pay a fine of not more than $1,000 plus costs and, in default of payment of said fine and costs, to a term of imprisonment not to exceed 90 days. Each day that a violation of this Part continues or each section of this Part which shall be found to have been violated shall constitute a separate offense.

§ 18-215. Abatement of Nuisances. [Ord. 95-2A, 12/21/1995, § 15]

In addition to any other remedies provided in this Part, any violation of § 18-212 above shall constitute a nuisance and shall be immediately abated by the Township.

§ 18-216. Automatic Indemnification. [Ord. 95-2A, 12/21/1995, § 16]

By accepting an installation and/or operating permit, the system/property owner agrees to indemnify and hold harmless the Township and its duly authorized representatives for any adverse condition, claims, or pollution resulting from or relating to the operation of the system.

§ 18-217. Scope. [Ord. 95-2A, 12/21/1995, § 17]

The standards, terms, and conditions of this Part set forth the minimum standards which are acceptable to the Township, it being recognized that no single document can fully or adequately describe or consider all specific details of every anticipated system, and it is therefore assumed that any such standards, terms, or conditions shall be supplemented by the design review and appropriate comments and communications by the Township Sewage Enforcement Officer and/or consulting engineer and the applicant's engineer.

APPENDIX F

BOROUGH OF NORTHAMPTON WASTEWATER TREATMENT PLANT EVALUATION

BOROUGH OF NORTHAMPTON
WASTEWATER TREATMENT PLANT EVALUATION

Prepared For:
Borough of Northampton
1401 Laubach Ave.
Northampton, Pa.18067

April 2018

Prepared By:
Gilmore & Associates, Inc.
Engineers ♦ Land Surveyors ♦ Planners ♦ GIS Consultants
5100 Tilghman Street, Suite 150
Allentown, PA 18104
610-366-8064

G&A File No.17-01160A

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1.0 Introduction

1.1 General Information

The Northampton Borough Sewage Plant was constructed in 1928 and has been continuously operating for nearly a century. Over that time, many conditions have changed; particularly the demands of the community and the environmental regulations for sewage treatment. To address the changing needs, the plant underwent major upgrades in 1956, 1959, and 1990.

The last major upgrade occurred almost 30 years ago. The engineering calculations for the 1990 upgrade were based on a 20 year projection. Although concrete structures can remain structurally sound for many years, changes in population or influent characteristics can result in tanks that are no longer appropriately sized to meet the current needs. The mechanical components on the other hand are more impacted by the corrosive environment and do not typically last more than 20 years without major repairs.

For the above reasons, it is typically recommended to evaluate a plant every 20 years to identify areas in need of attention. The intended purpose of this study is to perform that evaluation and to open the discussion on different alternatives available for improvements.

1.2 Scope of Plant Evaluation

Gilmore & Associates has completed an evaluation of the Northampton Borough Sewage Treatment Plant. The evaluation was limited to the following scope of work:

1. Document and assess the condition of the existing facility.
2. Prioritize and recommend specific areas for further study or improvement.
3. Investigate a known issue with excessive amount of solids produced at the plant.
4. Investigate the influent channel within the Headworks Building which has overflowed.
5. Evaluate the Main Pump Station which is aging and may require replacement.

As part of the evaluation, Gilmore & Associates conducted site visits to the treatment plant with two licensed engineers specialized in the area of wastewater treatment. The site visits included visual observations and discussions with personnel regarding the operation of the plant. It did not include structural or electrical evaluations which are beyond the scope of this study. There were reported electrical issues throughout the plant. We recommend a separate electrical study to identify the existing issues and determine the feasibility of equipment upgrades which are discussed throughout this report.

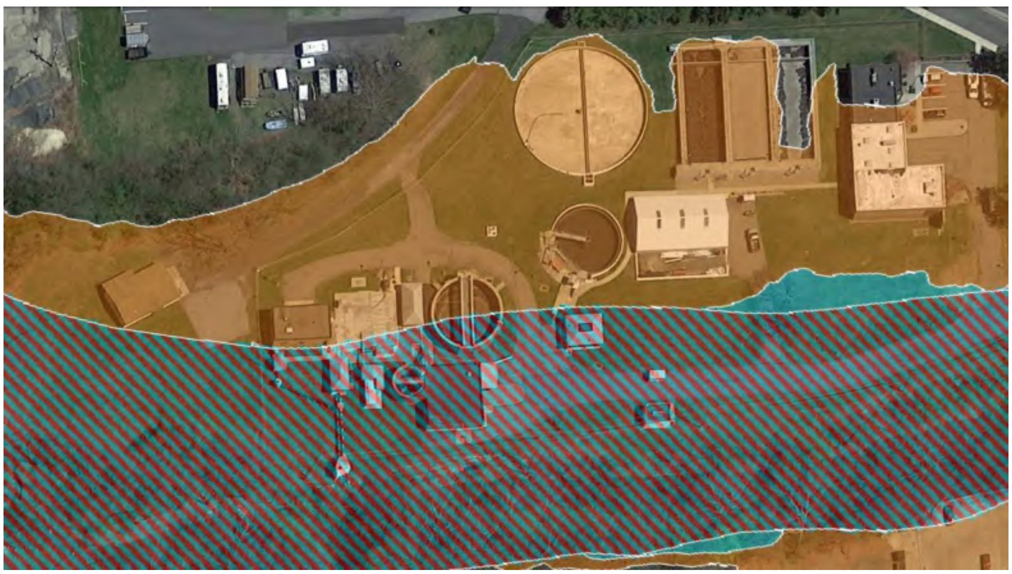
1.3 Background Information

The wastewater treatment facility serves the Borough of Northampton and part of Allen Township. The collection system consists of approximately 40 miles of gravity lines and 10 pump stations. This is the Borough's only wastewater treatment plant and the outfall is located within Hokendauqua Creek which is tributary to the Lehigh River.

The original wastewater treatment plant was constructed in 1928 as a primary treatment plant. In 1956, the plant was upgraded to include secondary treatment with the addition of a trickling filter using rock media. In 1959, a digester (anaerobic) and a vacuum filter were added. In 1990, a major upgrade occurred to replace the aging equipment and convert the process from a fixed film system to an activated sludge process. There have been no substantial modifications to the plant since the 1990 upgrade.

The wastewater generated by the Borough is both domestic and commercial in nature. There are no industrial discharges. The only significant user in the Borough is the Northampton Borough Municipal Authority Water Treatment Plant. The NBMA Water Treatment Plant discharges clarifier sludge and filter backwash which primarily consists of suspended solids, aluminum sulfate, and activated carbon.

1.4 Flood Zone



LEGEND

Cyan Area is
100-yr Flood Zone

Striped Area is
100-yr Flood Zone and
Regulated Floodway

Orange Area is
500-yr Flood Zone

Figure 1: FEMA Flood Map

The majority of the treatment plant property is situated within the flood zone of the Hokendauqua Creek (see the above FEMA map). All of the tanks and other structures within the plant were constructed with this in mind and the top of concrete elevations were set at or above the 100-year flood elevation. Although these structures should remain operable during a significant storm, the area around them would be inundated preventing access and flooding manholes. Based on our conversations with your operator, flooding from the Hokendauqua has in fact surrounded the Main Pump Station and infiltrated electrical manholes causing significant issues throughout the plant.

The area to the north of the plant was specifically identified in the 1990 upgrade as Borough owned property which could be used for a future expansion. This land is also located within the FEMA flood zone. Construction in this area is allowed but it will require special permitting. It should be discussed by the Borough whether this land is still available for improvements recommended in this study.

The entire plant is situated within the 500 year flood zone. While the likelihood of a "500 year storm" in any given year is minimal, the implications of it would be catastrophic to the facility. Based on our discussions with the operator, the plan for the 500 year storm is to abandon the plant. Although this approach appears justified based on the FEMA map, we recommend further evaluation to identify a more proactive approach.

To manage unlikely but significant events, the Borough has a PPC Plan (Preparedness, Prevention, and Contingency). We have reviewed the Borough's PPC Plan last revised June 2009 and believe it does not adequately plan for flooding from the Hokendauqua Creek. The plan indicated that there has been no damage to the plant or pump station since the 1990 upgrade and the only recommendation was to increase pump impellors to convey additional flow during wet weather. We recommend a written plan to be prepared to evaluate flooding from the Hokendauqua. This plan should include specific procedures and a list of possible improvements to minimize damage to the plant.

1.5 Description of Process

The treatment plant utilizes a combination of biological and physical treatment processes to treat the wastewater. Treatment at this facility consists of activated sludge ICEAS process (Intermittent Cycle Extended Aeration System) for suspended solids, organic removal, and nitrification. Digested solids generated within the ICEAS basins are stored within the two holding tanks for roughly 14 days before being thickened and dewatered on a belt filter press prior to disposal. The process train can be summarized as:

Figure 2: Process Diagram

Treatment Process:

Flow Metering → Screening → Grit Removal → Pre-Aeration Basin → Pumping →

ICEAS Tanks → Effluent Equalization Tank → Disinfection → Hokendauqua Creek

Sludge Process:

ICEAS Tanks → Sludge Holding Tanks → Belt Filter Press → Landfill

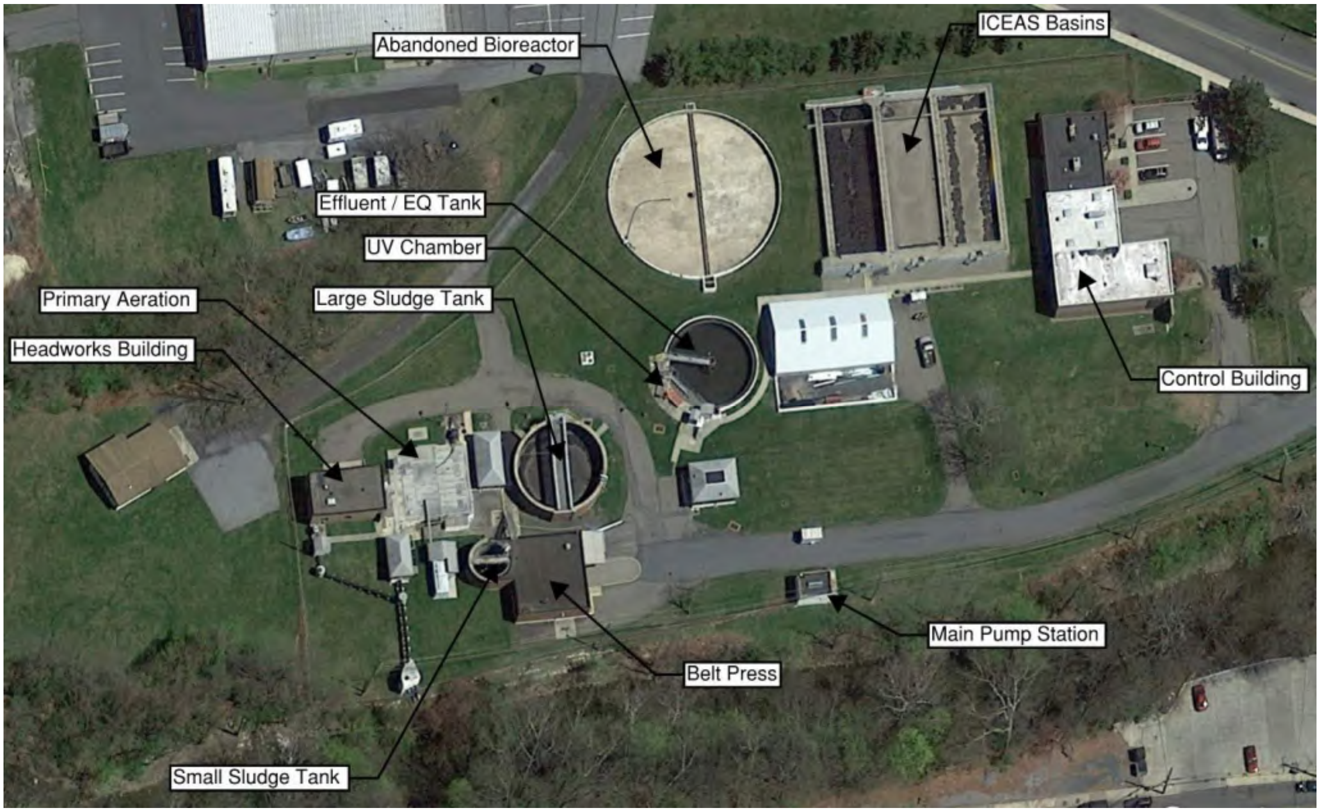


Figure 3: Overview of Equipment and Structures

2.0 Design Limits of Plant

2.1 Design Assumptions

The design calculations for the 1990 upgrade were performed by Gannett Fleming in 1986. The sizing of all equipment and process tanks were based on a design year of 2010. Since we have surpassed the design year of the facility, it is necessary to evaluate the loading into the plant and determine whether it is consistent with the original assumptions. Gannett Fleming's calculations for the sewage treatment plant were based on three major assumptions:

1. Average Flow = 1,500,000 gpd
2. Maximum Wet Weather Flow = 4,400,000 gpd
3. Organic Loading = 2,190 lbs/day

2.2 Average Flow

The sewage plant was rated for an average annual flow of 1,500,000 gpd in 1990 and increased to 1,650,000 gpd in 2014. The 2017 Chapter 94 report listed the maximum 3-month average flow at 1,127,000 gpd (DEP's required method for evaluating average flow). Based on the flows listed in the Chapter 94 Reports over the past 5 years, we do not see any issues with the daily average flow into the plant. This is an important confirmation since many of the pollutant removal calculations within the treatment plant design were based on the assumed average annual flow.

Table 1 – Monthly Average Flows for the Past 5 Years (MGD)					
	2013	**2014**	**2015**	**2016**	**2017**
January	1.099	1.282	1.058	0.944	0.957
February	1.098	1.126	1.000	1.355	0.848
March	1.077	1.174	1.326	0.871	1.038
April	1.010	1.246	1.026	0.781	1.288
May	0.882	1.272	0.768	0.851	0.991
June	1.088	1.029	0.972	0.713	1.020
July	0.954	0.928	0.996	0.759	1.179
August	1.211	0.865	0.793	0.695	1.181
September	1.050	0.828	0.752	0.688	1.021
October	0.914	0.856	0.838	0.711	0.893
November	0.919	0.902	0.773	0.759	0.868
December	1.144	1.087	0.903	0.862	0.841
Annual Average	1.037	1.050	0.934	0.832	1.010
Max 3-Month Avg.	1.091	1.231	1.128	1.067	1.127

Note: The rated capacity of the plant is 1.65 MGD

2.3 Maximum Wet Weather Flow

The average flow into a treatment plant is not necessarily indicative of the peak flow. Depending on the extent of I&I (Inflow and Infiltration), the peak flow into a plant will vary significantly between municipalities. This is particularly true for systems with older infrastructure.

To evaluate wet weather flows, engineers utilize real world observations for indications that there might be underlying hydraulic problems. During our site visit, we noticed several portable pumps which the operator said he utilizes during wet weather events to avoid overflows. The need to transfer flows by portable pumps is not typical and should not be accepted as a permanent solution. It is a clear sign that the Borough Plant is being stressed.

During 2017, the operator noted that there were two times when flow into the plant maxed out the meters (6 MGD). A review of the records for the plant confirms that the influent has exceeded the rated capacity at an average of 5 times per year over the past 10 years. When wet weather events contribute flows that exceed the capacity of a facility, inadequate treatment, operational difficulties, and/or permit violations can result. Exceeding the design capacity is why it also was necessary to use portable pumps to avoid overflows.

Addressing wet weather flows typically require a comprehensive solution that reduces I&I into the collection system, provides storage to dampen peak flows, and increases the available conveyance within the plant. Although it would be desirable to only address the source of the problem (I&I), it is often difficult to make enough progress with I&I to avoid the other measures entirely. Depending on the Borough's commitment for addressing wet weather flows and expectations for future development, we recommend the Borough consider the following improvements:

1. Scale up the existing I&I program: The majority of the Borough's collection system was constructed in the 1930s and 1950s. Many of these manholes were constructed with bricks and were situated within a floodplain. The result is a significant potential for I&I.

To address this problem, the Borough has an annual program to selectively reline 5 manholes a year. Due to the size of the Borough's collection system, relining 5 manholes is fixing less than 1% of the Borough's manholes per year. A program to more aggressively improve the existing collection system would reduce the hydraulic loads on all of the downstream pump stations and the plant. Any improvement in I&I would also reduce the operating times of these facilities and their electrical consumptions.

In February 2018, Gilmore assisted the Borough in a grant application for $150,000 to reline 30 manholes. We recommend the Borough consider annual improvements of this scale to achieve meaningful progress in I&I reduction.

It is noted that Gilmore & Associates has not been involved in evaluating the collection lines to recommend specific manholes to be relined. Depending on the progress made by the existing program and the commitment of the Borough to reducing I&I, it may warrant the assistance of an engineer to recommend specific I&I improvements. This type of approach would typically include data collection of actual wet weather flows throughout the system and hydraulic modeling/profiling of the existing lines to better understand where I&I is entering the system.

2. Install an equalization tank: The purpose of an equalization tank is to store excess volume during a wet weather event and slowly discharge it back to the plant at a reduced rate. The result is an attenuated peak flow experienced by all of the downstream components. It is important to remember that the total volume from a wet weather event is not reduced by an equalization tank. The total volume will still need to be conveyed by the pump stations to the plant and ultimately treated within the plant.

The existing Pre-Aeration Basin is currently utilized as an equalization tank during wet weather events. The problem with the existing tank is that it does not have the necessary storage to mitigate the excess wet weather volume. It was designed to attenuate the diurnal fluctuations throughout the day, not the extreme flows experienced by a plant during wet weather events.

If the Borough is interested in an equalization tank, it could be installed within the vacant field to the north of the plant (if this land is available). Although it would only be utilized a few times a year, the Borough is required by their NPDES permit to manage all wet weather flow received by the plant. DEP may enforce this requirement as part of any Act 537 approvals granted to the Borough and typically an equalization tank is the most cost efficient solution for meeting this requirement.

At this time, we do not have enough information to determine the necessary size of equalization tank. The sizing of a tank requires continuous flow data during wet weather events and a hydraulic model of the system. We believe the tank will be around 300,000 gallons and cost $500,000 to construct but this is a budgetary estimate based on our experience and not actual calculations. If the Borough is interested in investigating this alternative further, we recommend a study to determine the feasibility and specific size of equalization tank.

2.4 Organic Loading

Biologically, the sewage plant was rated in 1990 for a maximum monthly organic load of 2,190 pounds per day (lb/day). In 2012, the plant reached this limit and a CAP (Corrective Action Plan) was required to manage the organic overload. Gannet Fleming prepared a permit application in 2014 and increased the rating of the plant to 2,409 lb/day bringing it back into compliance. It is important to note that the 2014 permit increase was based on new calculations by Gannet Fleming and no physical improvements were made to the plant. The engineer who prepared the application noted that "The 2014 Rerate should be considered a temporary measure until an Act 537 Plan is completed to allow for an upgrade of the WWTP."

The most recent Chapter 94 report recorded a maximum monthly organic load of 2,078 lb/d. The following table is the organic loading into the plant over the past 5 years.

Table 2 – Monthly Average Organic Loading For the Past 5 Years (lb/day)

	2013	2014	2015	2016	2017
January	1,836	2,034	1,588	1,886	1,957
February	1,577	2,243	1,787	2,072	1,737
March	1,576	1,583	1,615	1,627	1,956
April	1,768	2,232	1,648	1,630	1,975
May	2,169	1,938	1,690	1,774	1,898
June	1,708	1,552	2,001	1,827	1,613
July	1,376	1,488	1,585	1,397	1,703
August	1,851	1,787	1,441	1,586	2,077
September	1,727	1,729	1,641	1,449	2,078
October	1,661	1,753	1,693	1,692	2,008
November	1,852	1,940	1,693	1,947	2,018
December	2,225	1,906	1,891	1,877	2,045
Annual Average	1,777	1,849	1,689	1,730	1,922
Max. Month	2,225	2,243	2,001	2,072	2,078

Note: The rated capacity of the plant is 2,409 lb/day

While the current loading is still in compliance, the plant is approaching capacity. A new industry or increase in development from Allen Township could push the Borough back under a Corrective Action Plan.

The desired increase in biological rating of the plant should be discussed by the Borough. Depending on the expectations for growth and the desire to accommodate development, different options should be considered for upgrading the capacity of the plant. The most logical upgrade would be to construct a fourth ICEAS tank. We believe a fourth tank would allow an increase in the organic rating of the plant from 2,409 lbs/day to 3,212 lbs/day. This alternative is discussed later in this report.

3.0 Main Pump Station

3.1 Background Information

The Borough's service area is divided by the Hokendauqua Creek. As a result, sewage enters the plant from two different locations. The area west of the creek enters the plant through the Borough's siphon chamber and the area east of the creek enters the plant through the Main Pump Station.

The Main Pump Station is located within the treatment plant property and situated adjacent to the creek within the 100 year flood plain. The King Street Pump Station, Newport Avenue Pump Station, parts of Allen Township, and the area east of the Hokendauqua Creek are all tributary to the Main Pump Station. The pump station was built in 1956 and the pumps have not been replaced. Parts to service these pumps have become difficult to acquire and the piping and pumps are heavily corroded.

Picture 1: Main Pump Station Pumps

3.2 Existing Hydraulic Overload

In 2017, the Main Pump Station received an average flow of 527,791 gpd with a maximum of 949,950 gpd. The pump station is rated at 1,080,000 gpd. Chapter 94 of the PA Code establishes the requirements for assessing whether a pump station is overloaded. Chapter 94 defines a "hydraulic overload" as "when the flow in a portion of the sewer system exceeds its hydraulic carrying capacity." DEP interprets this requirement as when any of the following three conditions occur:

1. If overflows occur repeatedly from manholes in gravity sewers on the upstream side of the pump station.
2. If flow rates into or out of a pump station ever exceed the station's permitted capacity on a peak flow basis.
3. If the reserve pump has to operate during peak flow times.

Table 3 - Main Pump Station
Maximum Gallons Pumped Per Day
(2017 Data)

	Pump 1	Pump 2	Total	Overload Based on adjusted Capacity of Pump Station (763,200 gpd)	Overload Based on 2 Pumps Turning on
Jan	410,750	147,000	557,750	No	Yes
Feb	476,470	165,750	642,220	No	Yes
Mar	445,200	141,750	586,950	No	Yes
Apr	445,200	504,750	949,950	Yes	Yes
May	522,580	180,000	702,580	No	Yes
Jun	555,970	249,000	804,970	Yes	Yes
Jul	383,720	332,250	715,970	No	Yes
Aug	498,730	196,500	695,230	No	Yes
Sep	361,460	265,500	626,960	No	Yes
Oct	402,800	218,250	621,050	No	Yes
Nov	420,820	138,750	559,570	No	Yes
Dec	147,340	465,000	612,340	No	Yes
Average	422,587	250,375	672,962	No	Yes
Max	555,970	504,750	949,950	Yes	Yes

During 2017, both Pump 1 and Pump 2 came online at least once every month of the year. Both pumps coming online once or twice a year is understandable but every month is strong evidence of a hydraulic overload. Furthermore, there were times during the past year when both of the pumps could not keep up and a third portable pump was necessary.

Picture 2: Portable Pump Outside Main Pump Station

One reason why the pump station could not keep up during wet weather conditions was that both pumps do not discharge at the same rate. Sometime around 2012, the operator discovered that Pump 1 was pumping 530 gpm and Pump 2 was pumping 750 gpm. He has tried to resolve this issue over the past few years with no success. The methodology for rating the capacity of a pump station is to assume the largest pump is out of service. Since the issue with Pump 1 cannot be easily resolved, the rating of the Main Pump Station should be reduced to 530 gpm (763,200 gpd).

3.3 Addressing the Hydraulic Overload

The Main Pump Station is clearly overloaded and must be replaced. Replacement of this particular pump station will be a complex process and will take time to complete. Since the pump station is already receiving peak flows at or above its capacity, the conveyance of the pump station will need to be increased. Increasing the conveyance of a pump station requires future population projections and an Act 537 plan. Since the existing pump station is also located within the 100 year flood plain, work in this area will require Army Corp. / DEP water encroachment permits and may require approval from FEMA. The total amount of time for planning and permitting will take approximately 12 months. This timeframe could be longer if DEP requires a comprehensive update to the Borough's Act 537 Plan rather than allowing individual update. There were notes in the files we received from Tom Jones of Gannett Fleming stating that previous discussions with the Borough and DEP indicated that DEP wanted a comprehensive update rather than an individual plan.

Once Act 537 planning is complete, a detailed design of the Main Pump Station can begin. Due to the size of the existing wetwell, the multiple return process pipes from the plant to the pump station, and the need to maintain continuous operation, we recommended constructing a new pump station adjacent to the existing building. This configuration will allow the existing pump station to stay online until the new facility is ready.

Finding an exact location for the new pump station will be difficult. The plant is almost 100 years old and there were many iterations of underground piping within the immediate area of the existing pump station. We recommend the Borough conduct test pits to determine exactly where the pump station could be located to avoid the existing utilities.

Replacement of the Main Pump Station may also require downstream upgrades as well. There are already problems with conveying the peak wet weather flow and this could exacerbate the existing problem. Downstream upgrades are discussed elsewhere in this report.

Based on our preliminary evaluation, we believe the new pumps should be capable of providing 1,000 gpm plus any anticipated growth within the Borough or Allen Township. The new pump station could be either a submersible pump or a wetwell / drywell configuration, depending on the operator's preference for maintenance. We also recommended VFDs (Variable Frequency Drives) to allow the operators the ability to adjust the discharge rate of the pumps as needed to protect the downstream facilities. The budgetary cost for a new pump station including a building, wetwell, pumps, and VFDs is $500,000.

4.0 Siphon Chamber

4.1 Evaluation

The service area on the west side of the Hokendauqua Creek passes through a siphon chamber located at the intersection of Washington Avenue and Laubach Avenue. This chamber is used to transport, by gravity, the wastewater under the Hokendauqua Creek and to the outlet at the treatment plant site. This system consists of three pipes, (1) 10" and (2) 12" pipes situated at different elevations. This system requires flushing to remove any accumulated solids in the low end. Our inspection did not reveal any issues with this system but it is noted that a manhole on the downstream side of the chamber (picture 4) was repaired shortly after our visit.

Picture 3: Siphon Chamber

Picture 4: Manhole Downstream of Siphon Chamber

5.0 Headworks Building

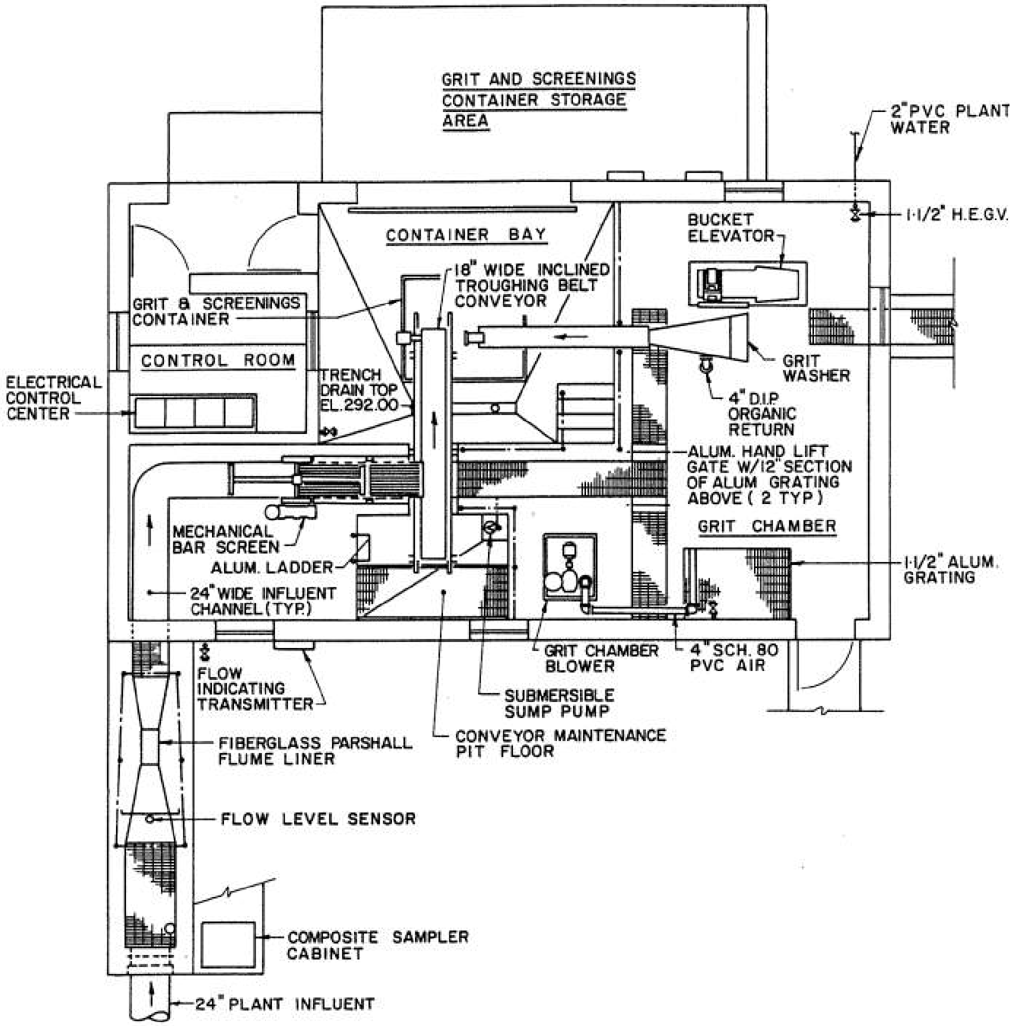


Figure 4: Existing Headworks Building Layout
(source: 1990 plan set)

The Headworks Building is situated at the northern part of the site and was constructed in 1990. The layout of this building is included in Figure 4 above.

5.1 Background Information

Domestic wastewater contains large solids, rags, and grit that can interfere with a treatment process and cause undue mechanical wear on equipment. To minimize potential problems, these materials require separate handling. Typically, this is accomplished by the installation of screening and settling devices installed at the head of a plant.

Screening is typically the first piece of equipment utilized in a wastewater treatment facility. These devices are specifically designed to remove objects such as rags, paper, plastics, and fibrous material from the influent wastewater. Screening devices are divided into two major categories: coarse and fine. Coarse screens offer the minimal amount of protection and typically have openings of 0.25 inches or larger. Fine screens offer significantly more protection with openings between 0.06 to 0.25 inches but typically require automated mechanical systems maintain flow thorough the screen.

The second treatment process in most wastewater treatment plants is some form of grit removal. Grit includes sand, gravel, cinder, or other heavy solid materials that are "heavier" (higher specific gravity) than the organic biodegradable solids in the wastewater. Grit also includes eggshells, bone chips, seeds, coffee grounds, and large organic particles, such as food waste. Removal of grit prevents unnecessary abrasion and wear of mechanical equipment, grit deposition in pipelines and channels, and accumulation of grit in digesters and aeration basins.

Grit removal facilities typically precede primary clarification and follow screening. This prevents large solids from interfering with grit handling equipment. In secondary treatment plants without primary clarification, it is recommended that grit removal should precede aeration.

5.2 Evaluation of Screening

Picture 5: Bar Screen with Mechanical Arm

Northampton's facility includes a coarse bar screen (1/2" openings) which is supplemented by a mechanical arm to rake the screen and a conveyor to transport the screenings. All solids less than 1/2 inch in size pass through the bars and enter the plant. The equipment was installed in 1990 and designed based on a maximum flow of 6.6 MGD with a velocity of 3.15 feet per second. Although the peak flow of 6.6 MGD meets the needs of the plant, the conveyor related to this screen cuts across the channel reducing the actual capacity of the channel. This issue will be discussed in the "Influent Channel Capacity" section later in this report.

Facility owners have tracked their maintenance costs and most facilities rated 1.0 MGD or larger can justify a mechanically operated fine screen. Fine screens have a significantly greater capture rate to improve downstream conditions. These devices can also wash and compress screenings to the decrease the operating expenses for disposing screenings at a landfill.

We recommend the Borough consider an automatic fine screen. It would decrease downstream maintenance and allow the removal of the existing conveyor which is contributing to the overflows of the influent channel. A new screen could be installed within the existing channel and would cost approximately $150,000 to install. These screens are available as a bar screen or a cylindrical spiral screen and we believe either configuration would be appropriate for this application.

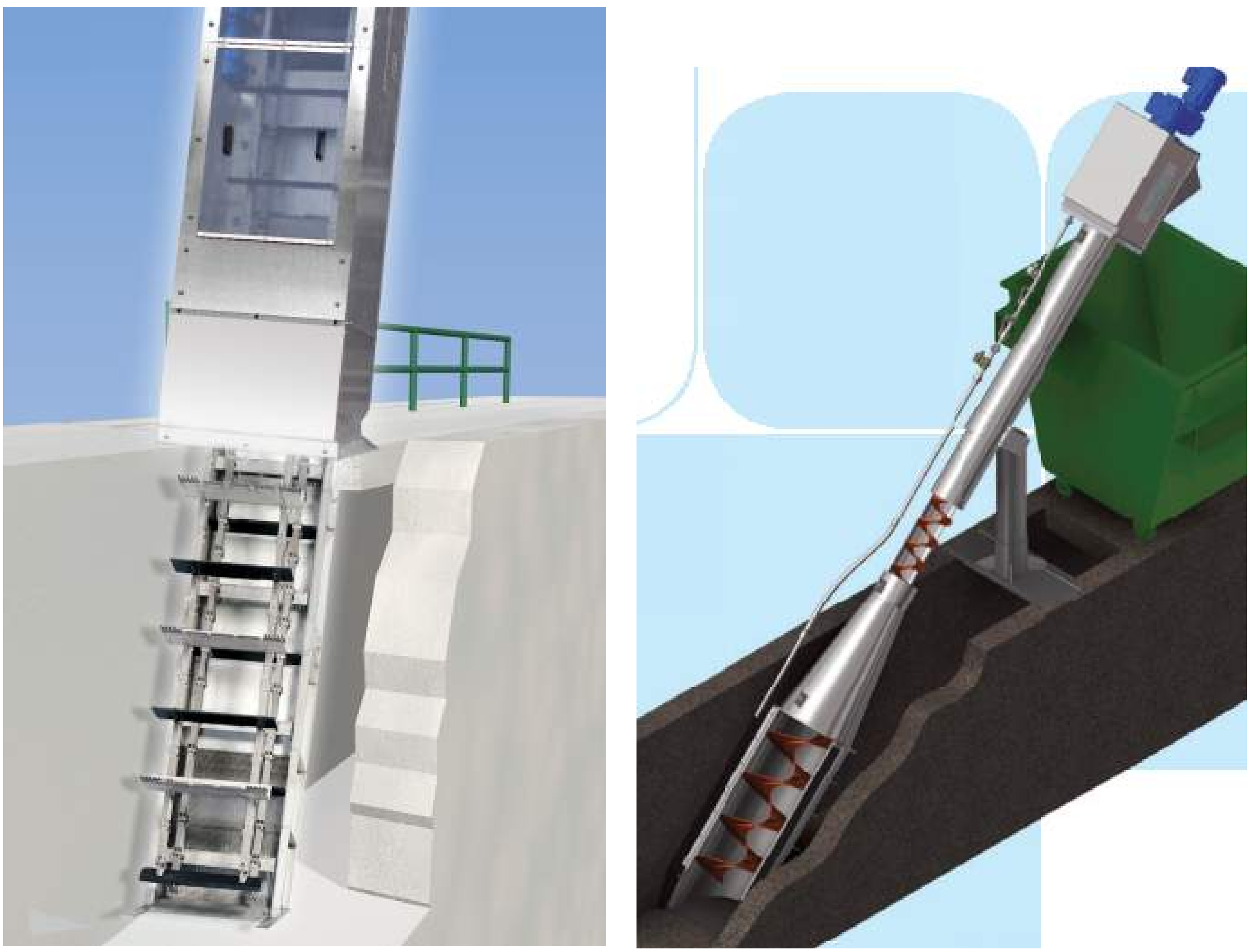


Figure 5: Possible Configurations of Automatic Fine Screens

5.3 Evaluation of Grit Removal

Picture 6: Grit System: Bucket Elevator and Dewatering Screw

The grit removal system is located downstream of the bar screen and is based on an aerated grit technology. This piece of equipment is critical due to the additional amount of grit received from the water treatment plant. The system includes a coarse bubble diffuser located at the bottom of the grit chamber. The air diffuser creates a flow pattern to settle grit while keeping lighter organic material in suspension to be processed further downstream. The settled grit is collected by a screw conveyor, elevated by a bucket elevator, and transferred by a dewatering screw to the adjacent dumpster.

The sizing of the grit removal equipment was intended to provide 3.1 minutes of setting time at the average daily flow and 1.1 minutes during wet weather. Unfortunately, during wet weather this system has surcharged at least 2.35’ above the design of the system. The grit system was designed based on a liquid level of 290.65’ (see figures 6 and 7 on the next page). Sewage within the influent channel has reached the opening for the belt conveyor (293.0’) and overflowed. With a surcharge above the design elevation, flow is primarily conveyed along the bypass channel thereby avoiding the grit system. Flow that does pass through the aerated grit portion of the chamber is surcharged to the level that we do not believe an effective circular pattern can form.

Wet weather events are when the largest amount of grit is received by the treatment plant. This is when stormwater carrying grit enters the collection system, settled grit within the collection lines is scoured by the increased flows, and when the Water Treatment Plant sends the largest amount of grit from their treatment process. The grit system should be able to accommodate the wet weather flows received by the plant.

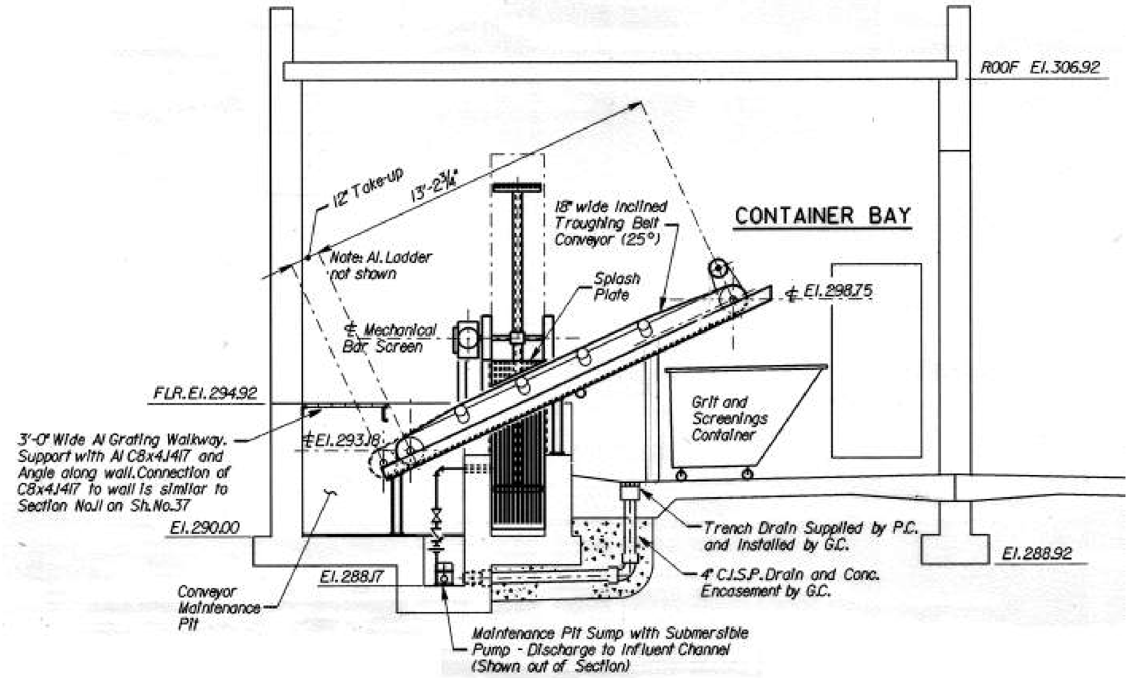


Figure 6: Section View of Influent Channel: Belt Conveyor Cutting Across Channel (source: 1990 plan set)

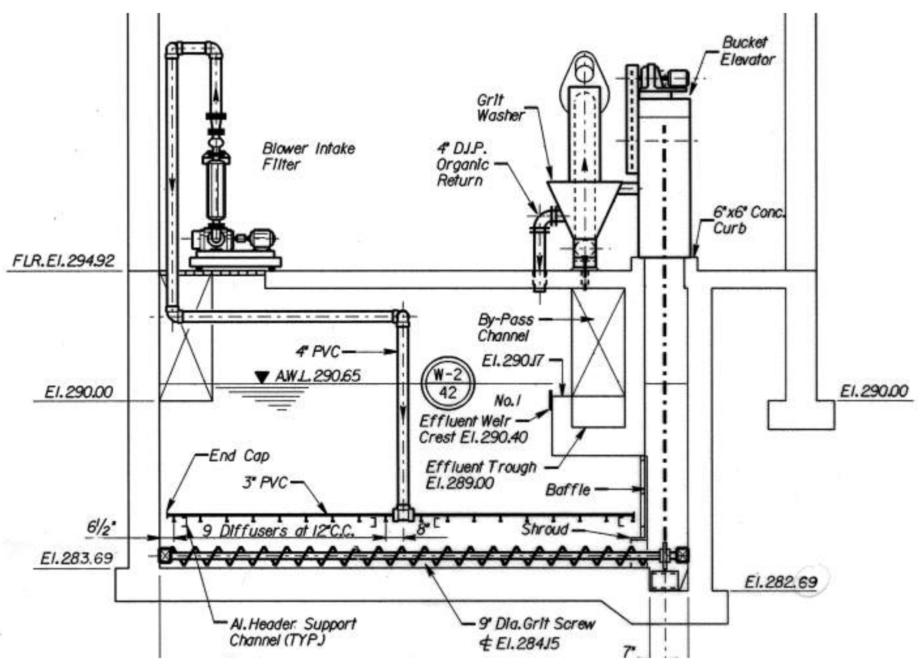


Figure 7: Section View of Grit Chamber: Design Level and Bypass Channel (source: 1990 plan set)

The 1990 design of the plant assumed the grit equipment would collect 3 cubic feet per day. This determination was based on a TSS (Total Suspended Solids) concentration of 254 mg/l into the plant. Over the past 5 years, the average TSS into the plant has been 350 mg/l. Based on the increased amount the TSS concentration and the solids from the water treatment plant, there should be more than 3 cy in the dumpster each day from the grit system. According to the operator reports, the collection of grit is substantially less. Based on this information and the grit removed from the pre-aeration tank (see picture below), we do not believe the grit equipment has been effective at removing grit.

Picture 7: Accumulated Grit in Pre-Aeration Basin

Previous correspondence between Gannet Fleming and the Borough indicated that the Borough was considering a new Headworks Building. If the Borough is interested in providing an automated fine screen, replacing the grit system, and improving the conveyance of the influent channel, all of these modifications together could justify a new building. A new Headworks Building would allow the Borough to upgrade all of these items to meet the peak wet weather flow (6.0 MGD) and improve the efficiency of the existing system.

Due to the limited space within the treatment plant, a new building could be located in the land north of the treatment plant (if available) or the grass area adjacent to the Main Pump Station. Building in either of these two areas would be subject to FEMA, DEP, and Army Corps. requirements for the development within a floodplain. We believe this work would still be allowed due to the environmental benefit to the community that a treatment plant provides. A project of this magnitude takes 2 years to permit and design plus 1 year for construction. The budgetary cost for a new Headworks Building with all related equipment is $1,000,000.

Picture 8: Possible Location 1 for New Headworks Building

Picture 9: Possible Location 2 for New Headworks Building

5.4 Influent Channel Capacity

The concrete influent channel within the Headworks Building is 24 inches wide by 52” – 57” deep (the bottom is sloped). This channel receives the combined flow from the influent pump station and the siphon chamber. According to operator records, the combined flow into this channel reaches 6.0 MGD several times each year. The hydraulic capacity of the channel was designed based on a maximum wet weather flow of 4.4 MGD. Exceeding the design peak flow of the plant is why the channel has overflowed in recent years.

The conveyance of the influent channel could be improved to avoid future overflows. The three factors that limit the capacity of the existing channel are:

1. The belt conveyor.
2. Changes in direction of the existing channel.
3. Tailwater.

1. The belt conveyor: The belt conveyor cuts across the existing channel. The opening in the channel for the belt conveyor is 33” above the bottom (293.0’). The opening for the conveyor is the lowest point and where sewage overflows once the available capacity it exceeded. Based on the existing clearances with the Mechanical Arm for the Bar Screen, we believe it is possible to raise the existing conveyor by 6”. Assuming tailwater is also addressed, this modification would increase the capacity of the channel to keep the 6.0 MGD from overflowing.

Picture 10: Conveyor cuts across channel

2. Changes in Direction: The existing channel has multiple bends changes in direction. Although multiple changes in direction reduce the effectiveness of screening and grit removal equipment, it does not have a significant impact on the hydraulic capacity of the channel. Based on our review, we estimate that a straight channel would reduce the liquid level by 2 inches. Although we would typically recommend a straight channel for new construction, it would be difficult to modify the existing channel to justify the expense.

3. Tailwater: The available conveyance through a plant is dictated by the hydraulic profile. Many times an opening downstream will restrict flow and cause a higher water level upstream. In the case of the influent channel, tailwater from the downstream channel, pre-aeration tank, and the Primary Lift Pump Station all have an effect that reduces the capacity of the influent channel. The concrete opening where the influent channel exits the Headworks Building is 24” x 24”. This opening is undersized and could be increased in height to the maximum extent practical to improve the conveyance. There are also improvements to the pre-aeration tank and Influent Pump Station that are discussed in next section of this report that can alleviate tailwater that is backing up through the Headworks Building.

It should be noted that any improvements to increase the conveyance of the influent channel could cause additional problems downstream. The existing pumps located downstream of the influent channel are rated at 4.4 MGD (Primary Lift Station). It is already necessary to supplement the Primary Lift Station with a portable pump during wet weather (see picture below). We recommend that any improvements implemented to increase the conveyance of the influent channel to include corresponding improvements to the Primary Lift Station. Improvements to the Primary Pump Station are discussed further below.

Picture 11: Portable Pump Used to Supplement Primary Lift Station

6.0 Pre-Aeration Basin / Equalization Basin / Primary Lift Station

6.1 Pre-Aeration / Equalization

The concrete tank was constructed as a primary clarifier in 1928. In 1990, this 86,000 gallon tank was converted to an equalization tank and a lift station to convey flow into the ICEAS basins. Unfortunately, this basin was designed to equalize flow into the ICEAS basins, not equalize wet weather flow into the plant. The wet weather flows are significantly larger and should be managed by either I&I improvements or an adequately sized equalization tank as discussed earlier in this report.

The tank also provides the benefit of aeration. The two blowers are located within the building adjacent to the tank. The aeration tank is covered and a filtration system provided for odor control purposes. The aeration and odor control system appear to be functioning well.

Picture 12: Pre-Aeration / Equalization Basin

6.2 Conveyance through the Basin

The channel exiting the Headworks Building splits and a slide gate allows the operator to control whether flow enters the Pre-Aeration Basin or directly into the Primary Lift Pump Station. Normally, flow will be directed into the Pre-Aeration Basin where it is aerated for a period of time based on the flow into the plant. The Pre-Aeration Basin is connected to the Primary Lift Pump Station by an 8” pipe. When heavy flows are received, the liquid within the Pre-Aeration Basin increases to an elevation of 289.50’ where a 36” wide x 12” high concrete opening allows overflow between the two basins. This opening is undersized to convey 6 MGD which is why the operator needs to open a gate to allow flow directly into the Primary Lift Station. Based on our analysis, we recommend increasing this opening from 3 square feet to 6 square feet to allow conveyance of the 6 mgd peak flow to pass through the Pre-Aeration / Equalization Basin.

6.3 Primary Lift Station

The primary lift station is located on the eastern side of the Pre-Aeration Basin and consists of three centrifugal pumps. These pumps convey flow from the Pre-Aeration Basin to the ICEAS basins.

The combined capacity of the existing pumps is 4.4 MGD which is supplemented by the portable pump to convey 6.0 MGD. The fact that the operator needs to use a portable pump is evidence that the existing pumps do not meet the current wet weather needs of the plant.

If the Borough does not proceed with the I&I improvements or a new equalization tank discussed previously in this report, the capacity of this Pump Station could be upgraded relatively easily. A preliminary analysis of the existing system reveals that is possible to either add an additional pump or upgrade the existing pumps to meet the 6.0 MGD requirement. The Borough does not need to replace the existing forcemain between the Primary Lift Station and the ICEAS Basins to convey 6.0 MGD. Only the pumps will need to be upgraded.

7.0 Abandoned Bio-Reactor Tank

Picture 13: Abandoned Bio-Reactor Tank

7.1 Evaluation

This round concrete tank was built in 1956 and served 34 years as a trickling filter. In 1990, all of the stone and related mechanical equipment was removed and the tank, officially abandoned in place. Today, the operator uses it as an emergency sludge holding tank during winter months when odor is not a concern. The tank is not permitted for this purpose and the operator does not have any means to aerate it.

Structurally, the concrete tank is in poor condition with severe deterioration and cracks in the concrete. We recommend demolishing this tank. The estimated cost to remove this tank is $50,000. Space within the treatment plant is very limited and land outside of the 100 year flood plain should be fully utilized. In its place, we recommend installing a fourth ICEAS basin to increase the biological capacity of the plant and a sludge holding tank to meet the existing need to store more solids. These alternatives will be further discussed later in this report.

8.0 Biological Treatment

Picture 14: ICEAS Basin

8.1 Background

The ICEAS (Intermittent Cycle Extended Aeration System) operation is the backbone of the treatment process. This technology has been in use for decades and is still actively used in new plants.

The Borough's ICEAS process consists of three basins operated in parallel in which the activated sludge is aerated over a number of pre-determined cycles. Solids liquid separation occurs during the air-off part of the cycle. During the latter part of the air-off cycle, treated effluent is decanted or withdrawn from the liquid surface. Flow into the tank is not interrupted at any time. Each of the ICEAS basins provide flow equalization, biological oxidation, nitrification, sedimentation, and aerobic sludge digestion.

8.2 Design Rating

We reviewed the original design assumptions for the ICEAS process equipment. Both the 1990 calculations and the 2014 rerate were based on a maximum monthly organic concentration of 175 mg/l. The organic concentration entering the plant has been consistently above this design concentration and the maximum month has averaged 283 mg/l over the past 5 years.

Table 4 – Monthly Average Organic Concentrations for the Past 5 Years (mg/l)

	2013	2014	2015	2016	2017
January	200	190	180	240	245
February	172	239	214	183	246
March	175	162	146	224	226
April	210	215	193	250	184
May	295	183	264	250	230
June	188	181	247	307	190
July	173	192	191	221	173
August	183	248	218	274	211
September	197	250	262	253	244
October	218	246	242	285	270
November	242	258	263	308	279
December	233	210	251	261	292
Annual Average	207	214	222	255	232
Max. Month	295	258	264	308	292

The design of the aeration system, timing of stages, and sizing of the ICEAS basins were all based on a lower concentration. As a result, the capacity for biological treatment will be limited by the organic loading rather than hydraulic loading. This is why the plant is approaching the permitted organic capacity but still has available hydraulic capacity.

The 2014 rerating was accomplished to bring the plant back into compliance while provisions could be made to increase the organic rating. To increase this rating, the Borough will need to provide both, additional biological treatment and sludge handling capacity within the facility. Waiting to increase the biological rating may result in a moratorium that would prevent any future connections until a new process is permitted and constructed.

To increase biological treatment, we recommend a fourth ICEAS tank. A fourth tank would allow additional time for aeration and reaction to offset the excessive organic concentrations entering the plant. A fourth tank was anticipated during the 1990 expansion and accommodations were provided for a future tank.

Based on the 2014 calculations, we believe a fourth tank would increase the organic rating of the plant from 2,409 lbs/day to 3,212 lbs/day. The anticipated timeframe for this improvement would be 1 year for permitting and 9 months for construction. The budgetary cost for a fourth tank with all related equipment is $700,000.

8.3 Existing Operation

Currently the operator is utilizing only two of the three ICEAS basins for biological treatment. Roughly two years ago the third tank was repurposed from biological treatment to sludge holding. This was intended to be a temporary measure to provide more sludge storage until a more permanent solution could be made. It was not intended to be a permanent solution.

It is important to note that ICEAS basins support a biological process which takes time to grow healthy bacteria. Based on the current organic loads into the plant and the calculations within the 1990 design and the 2014 rerate, the third tank should be online and we are recommending the Borough consider a fourth tank. At a minimum, the third tank should be readily available for the operator to utilize for the intended purpose of these tanks.

Based on our observations and the operator reports, there have been reoccurring issues within the ICEAS tanks with the buildup of foam. Foam could be a sign that the MLSS (Mixed Liquor Suspended Solids) is too high. According to the recent operator reports, the MLSS is typically around 7,000 mg/l. The recommended operating range of MLSS for an ICEAS tank is 2,000 to 5,000 mg/l (Metcalf and Eddy Wastewater 5th edition table 8-19). The operator controls this value by adjusting the wasting rate. The inability to effectively remove more solids from the plant is backing up process within the ICEAS basins. This can result in bulking of solids, reducing the biological removal efficiency of the tank, reducing oxygen absorption, and creating nuisance foams in the upper layer.

During the past two years, there have also been issues with the decanters for the ICEAS basins. It is our understanding that the decanters have been repaired but it is a sign of the age of the mechanical equipment. These tanks should be periodically emptied, inspected, and cleaned. Due to the full utilization of all available tanks and the limited time of the operators, this maintenance work has not been performed. According to the operator, Basin 1 was last emptied 2 years ago and Basin 2 was 5 years ago. As a result, the operators have limited knowledge on the condition and effectiveness of the submerged equipment. Once additional space for sludge storage is provided at the plant, we hope the operators will be able to accomplish this type of preventative maintenance.

9.0 Final Treatment

9.1 Effluent / Equalization Basin

Treated effluent leaving the ICEAS basins is cyclic in nature. To suppress the surges in flow, the final clarifier (built in 1956) was converted to an effluent / equalization basin in 1990. The sludge collection arm from 1956 was modified in 1990 when the tank was repurposed for equalization. We did not observe the condition of the arm since it is a submerged component but the operating mechanism is 62 years old and showing signs of wear (see pictures below).

The purpose of the Effluent / Equalization Basin is to provide a consistent flow into the UV Chamber. This basin has a storage capacity of 132,170 gallons is properly sized for this purpose. The UV Chamber was built on the northwestern side of the effluent tank as part of the 1990 upgrade and provides disinfection of pathogenic microorganisms. Most plants utilize either Ultraviolet irradiation or chlorine for disinfection. Due to the tightening of regulations and potential hazard of chlorine, many plants have moved away from chlorine.

The existing effluent / equalization basin operates with minimal issues. We are not aware of any violations in the amount of Fecal Coliform being discharged into the stream and your UV bulbs are experiencing a reasonable amount of life. The only issue we are aware of with the UV System is with the electrical system. Your operator has reported the UV conduits are packed full resulting in several fires. We recommend following-up on assessing the condition and implementation of permanent improvements to your electrical system.

Picture 15: Effluent / Equalization Basin


Picture 16: Drive Unit for Rake Arm


Picture 17: UV System

10.0 Sludge Management

10.1 Sludge Generation

Every day organic and inorganic solids enter the plant. To maintain mass balance, all of these solids will be either digested by bacteria or hauled offsite. The operator manages the balance of solids by adjusting the wasting rate within the ICEAS basins. Once the solids leave the ICEAS basins, it is processed in four stages:

1. Sludge Holding
2. Sludge Thickening
3. Dewatering
4. Sludge Removal

10.2 Sludge Holding

Sludge wasted from the ICEAS Basins is conveyed to the either the Small Holding Tank (51,000 gallon) or the Large Holding Tank (205,000 gallon). The primary purpose of these holding tanks is to store the sludge until it could be dewatered and hauled offsite. DEP does not require a specific amount of sludge storage to be provided within a facility and as a result, the amount of storage necessary depends on economics and how quickly the sludge can be dewatered and hauled offsite.

Picture 18: Large Sludge Holding Tank

Picture 19: Small Sludge Holding Tank

The amount of liquid sludge wasted from the ICEAS tanks over the past 5 years has been 151% of the original design and the total pounds of sludge produced was 232%. As a result, the time available for the operators to dewater and remove sludge from the plant has decreased from an average of 16.4 days to 10.8 days. To provide more time, the operators have utilized the 3rd ICEAS Basin and the abandoned Bio-Reactor Tank as additional sludge holding tanks. This was intended to be a temporarily measure and is not a permanent solution. The inability to dewater and haul away solids within 10.8 days has backed up the operation of the ICEAS basins as previously discussed. This problem is projected to get worse over time. The 2014 rerate assumed the facility would be able to remove sludge within 6.6 days.

The two sludge holding tanks permitted for this purpose have become undersized and the production from the belt filter press has not kept up with the current demands of the facility. To address this issue, we recommend the Borough consider an additional sludge holding tank. A new tank could be situated where the existing Bio-Reactor Tank is located. Depending future projections for growth within the Borough, this tank could be sized between 200,000 and 300,000 gallons. The budgetary cost for a tank of these sizes is $500,000 to $700,000.

Table 5 – Comparison of Actual Versus Design Sludge Production

	Units	2012	2013	2014	2015	2016	5-Yr Average	1990 Design
Sludge Wasted	(gal/yr)	7,216,613	8,544,036	9,436,377	8,436,377	9,465,382	**8,619,757**	**5,698,380**
	(gal/d)	19,772	23,408	25,853	23,113	25,933	**23,616**	**15,612**
	(ton/yr)	507	569	545	574	561	**551**	**238**
	(lbs/d)	2,778	3,118	2,986	3,145	3,074	**3,020**	**1,302**
Solids Conc.	(%)	1.68	1.60	1.39	1.63	1.42	**1.53**	**1.00**
Sludge Holding Time*	(days)	12.9	10.9	9.9	11.1	9.9	**10.8**	**16.4**

**Note: based on capacity of small and large holding tanks*

10.3 Sludge Thickening

Both the Small and Large Holding Tanks utilize aeration systems for odor control. This aerobic process also provides the benefit of solids reduction. As the supply of organic food material is depleted in the sludge, the microorganisms begin to consume their own protoplasm to obtain energy. When this occurs, a portion of the biomass is reduced. Typically the volatile solids of the biomass can be reduced by 40% and the residual biomass can be concentrated between 2% and 4%.

Sludge thickening is accomplished by periodically turning off the aeration system and allowing the bacteria to continue to degrade pollutants under endogenous respiration. The amount of Solids destruction is dependent on basin liquid temperature and Sludge Age. Based on the current holding time, we estimate the volatile solids reduction is only 18% (see figure below). Increasing the available sludge holding capacity within the plant would allow the process to reduce the volume of solids generated by the plant.

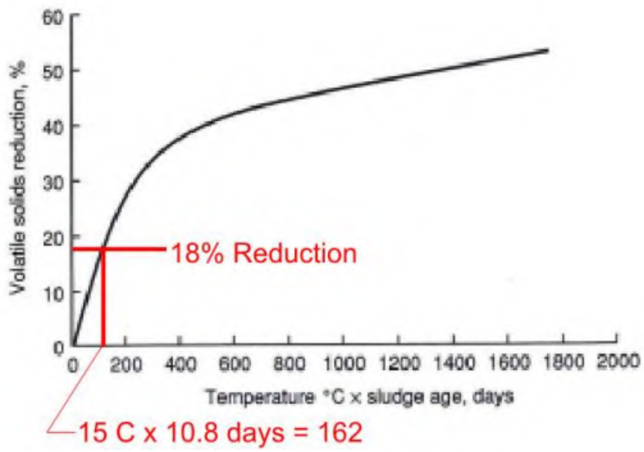


Figure 8: Solids Reduction over Time
(Source Metcalf & Eddy 3rd Edition)

Based on operator reports, the concentration of solids within the holding tanks has averaged 1.53% over the past 5 years. This is above the 1.0% solids estimated in the 1990 design. Although it is impressive for the operators to achieve a solids concentration at this level with the limitations discussed throughout this report, it is essential to investigate whether the solids could be increased even further. When a solids concentration is increased from 1.5% to 3.0%, the sludge holding volume is cut in half. For this reason any progress towards solids concentration within the holding tanks would be self-beneficial.

Providing additional sludge storage would also allow the operators to perform the necessary maintenance of the tanks. It is our understanding that the Large Sludge Holding Tank has not been taken offline to be maintained in years. According to the manufacturer of the air diffusers for this tank, their product has a life span of 8 years. After that timeframe, the rubber degrades and starts to tear apart. Since air follows the path of least resistance, any tears, cracks, or openings would allow air to concentrate at these points and starve the remaining sections of the system. The conditions of the rubber diffusers and related air piping cannot be assessed without draining the tank and the tank cannot be drained without additional sludge storage at the plant. We recommend inspecting the existing system and replacing the diffusers once additional sludge holding capacity is provided.

10.4 Dewatering

Dewatering at the Northampton Plant is provided by the Belt Filter Press. The press operates by pumping sludge mixed with polymer onto a permeable belt. An upper belt, supported by rollers forces filtrate through the accumulated filter cake and belts, leaving solids on the bottom belt. The filtrate is directed by channels, through drain ports, and back to the head of the plant. The remaining solids are transported by two conveyors to a dumpster located outside of the building. The complete system includes a feed line from the sludge holding tank, a sludge grinder, filter feed pumps, polymer system, belt filter press, conveyors, and dumpster to hold the dewatered cake.

The belt press was manufactured by Parkson Corporation and installed during the 1990 upgrade. The press is housed within the Sludge Dewatering Building adjacent to the two Sludge Holding Tanks. According to recent operator reports, the press currently produces cake between 15% and 18% solids. This concentration of solids is consistent with the manufacture's specifications and the original design of the plant.

Picture 20: Belt Filter Press with Conveyor System

In 2016, the press operated an average of 35 hours per week. The 1990 design calculations estimated the press would only be operated 16 to 24 hours per week. The additional amount of operation is due to the increased amount of sludge being generated by the facility and the decreased concentration of solids within the sludge. As previously discussed throughout this report, the inability dewater and haul away more sludge from the plant is overloading the Holding Tanks and backing up the biological process within the ICEAS Basins.

Due to the dependency of the Borough on this particular piece of equipment, our first recommendation is for the Borough to optimize the production of the press. The polymer utilized for coagulation should be reviewed if this has not been done in recent years. The manufacture should also evaluate the condition of the press. They are intimately familiar with their equipment and may be able to offer selective improvements to increase reliability or production of the equipment.

Our next recommendation is for the Borough to consider a second set of dewatering equipment. The belt filter press is 28 years old. The press could be considered the most critical single piece of equipment at the plant and there is no backup. According to the DEP's Domestic Wastewater Facilities Manual:

> *"The number of vacuum filters, centrifuges, filter presses, belt filters, or other mechanical dewater facilities should be sufficient to dewater the sludge produced with one unit out of service. If stand-by dewatering facilities are not available, adequate storage facilities equivalent to a three-month sludge production or other means of sludge disposal shall be provided."*

The press was permitted before the DEP Manual went into effect, but the real world need to meet this requirement still remains. If the press were to fail, the Borough would need to haul liquid sludge from the plant at a rate of 30,000 gallons or six 5,000 gallon trucks per day until it could be fixed. The expense and implications of downtime should be weighed by the Borough with the fact that the press has surpassed the recommended life of this equipment.

To meet the current and future dewatering needs of the plant, the Borough will need decide to either increase the production of the existing system or provide a second method of dewatering sludge. Both of these alternatives will be discussed below.

10.5 Dewatering (Alternative 1) – Upgrade Existing Production

The 1990 design of the plant assumed the dewatered sludge would be hauled away from the facility by farmers for agricultural purposes. Due to changes in regulations since the design of the plant, dewatered sludge is no longer land applied. The 1990 design also anticipated that any excess dewatered cake could be stored within the Sludge Drying Beds until it is ready for disposal. The Sludge Drying Beds were replaced with a Maintenance Building and are no longer available for use. As a result the only way dewatered cake is stored today is limited to the capacity of a single 10 cy dumpster. This limitation has backed up the operation of the entire plant. The operator said they tried a 20 cy dumpster in the past but it did not work out due to the steep slope of the pavement.

Picture 21: Existing 10 cy Dumpster

In 2016, the press operated a total of 1,792 hours averaging 35 hours per week. Each batch was run for 5-7 hours a day until the 10 cy dumpster was full. The next day a new dumpster would arrive and another batch was run. Typically, it required 6 days of dewatering per week to keep up with the amount of solids entering the plant.

To increase the hours of production from the Belt Filter Press, the Borough will need to find a way to hold more than 10 cy of dewatered cake until it is hauled away from the plant. There are several ways to provide additional capacity within the facility:

1. **Jockey two 10 cy dumpsters within the facility:** The disposal company may or may not allow moving their dumpsters within the plant. If the Borough has permission to move them and already owns equipment capable of capable of doing so, the operators could transfer the 10 cy dumpster to a temporary location and begin filling up a second dumpster. This would require additional operator time and result in additional costs for delivery / pickup of two dumpster but if feasible, could be the easiest solution for Borough.

2. Replace the dumpster with a 5 cy dumpster hopper: This would allow a larger 20 cy dumpster to be installed at a more accessible location within the facility. The operator would jockey the 5 cy hopper to fill up the 20 cy dumpster. The benefit of this configuration is a smaller hopper dumpster is easier to move but it would require more trips. A dumpster hopper of this size would cost around $2,000.

3. Install a second 10 cy dumpster: It appears that another dumpster could be installed within the stone area to the west side (left in the picture below) of the existing dumpster. This would require an auger / conveyor to automatically transfer cake between two dumpsters and an extension of the existing canopy to limit the amount of rainwater falling on the dumpster. We estimate this project would cost around $100,000.

4. Regrade the pavement in front of the existing dumpster: Based on plans from the 1956 and 1990 upgrades, we believe there is a minimal amount underground piping in front of the existing dumpster. The pavement could be dug up and the topography lowered to accommodate a 20 cy dumpster. We believe the estimated work required to lower the ground and repave the disturbed area would cost roughly $70,000.

Picture 22: Sloped Pavement in Front of Dumpster

10.6 Dewatering (Alternative 2) – Additional Equipment

If the Borough does not increase the Sludge Holding capacity of the plant, we strongly recommend a parallel dewatering process due to essential nature of this stage. The particular piece of equipment recommended for dewatering is unknown at this time. When sludge is dewatered mechanically, it is difficult or even impossible to select the optimum dewatering device and polymer dosage without conducting bench-scale or pilot studies. Bench-scale testing is usually conducted by manufacturers of dewatering equipment to narrow down the types of polymers and doses to be used in pilot testing. Trailer-mounted, full-size equipment is usually available at low or no cost from manufacturers for field-testing purposes. This allows side-by-side comparison of technologies using the exact same sludge, which is necessary to compare capital and operation costs of the various dewatering technologies. We recommend field testing different equipment before pursuing any specific dewatering technology.

Centrifuges and belt filter presses are currently the most popular dewatering methods in municipal waste water treatment plants due to their good operation and cost efficiency. Screw presses and rotary presses are also commonly utilized for municipal plants of similar size. The following is a summary and comparison of the most common of these technologies.

1. Belt Filter Press: Dewatering is accomplished by pumping sludge onto permeable belt. An upper belt, supported by rollers forces filtrate through the accumulated filter cake and belts, leaving solids on the bottom belt. The filtrate is directed by channels, through drain ports, and back to the head of a plant. This process usually requires between 10 and 20 pounds of dry polymer per ton of dry solids and can be expected to achieve between 12% and 20% solids in the dewatered cake.

2. Centrifuge: Centrifugation is the process of separating solids from liquids by the use of centrifugal force. The centrifuge is a cylindrical drum that rotates at significant speeds to develop a separating force. When sludge enters the interior of a rotating centrifuge, it is thrown out against the bowl wall. The denser materials are separated first and hug the interior wall of the rotating machine. This process usually requires between 15 and 30 pounds of dry polymer per ton of dry solids and can be expected to achieve between 16% and 25% solids in the dewatered cake.

3. Screw Press: Sludge in a screw press is fed into a screening basket with a slowly rotating screw assembly. The filtrate passes through the bottom and sides of the screen while the removing solids move up the screw. This process usually requires between 17 and 22 pounds of dry polymer per ton of dry solids and can be expected to achieve between 15% and 22% solids in the dewatered cake.

4. Rotary Press: A rotary press operates by feeding sludge into the space between two rotating cylindrical screens. The frictional force of the slow-moving screen assembly creates the back pressure that forces filtrate out through the screen. Filtrate passes through the sides of the screen and the remaining sludge continues up the screen. This process usually requires between 20 and 35 pounds of dry polymer per ton of dry solids and can be expected to achieve between 13% and 18% solids in the dewatered cake.

Table 6 - Comparison of Dewatering Technologies
(source: Metcalf & Eddy 5th Edition)

	Advantages	Disadvantages
Belt Filter Press	Low energy requirements. Relatively low capital and operating costs. Less complex mechanically and easier to maintain. High pressure machines are capable of producing very dry cake. Minimal effort required for system shut down.	Hydraulically limited in throughput. Requires sludge grinder in feed stream. Very sensitive to incoming sludge feed characteristics. Short media life as compared to other devices using cloth media. Automatic operation generally not advised.
Centrifuge	Clean appearance, minimal odor problems, fast startup and shut down capacities. Produces relatively dry sludge cake. Easy to Install. Low capital cost-to-capacity ratio.	Scroll wear potentially a high maintenance problem. Skilled maintenance personnel required. Requires grit removal and possibly sludge grinder in the feed stream. Moderately high suspended solids content in concentrate. Cannot observe dewatering zone to optimize/adjust performance.
Screw Press	Enclosed design with hinged access doors contains odors and aerosols. Low energy use drive motor ranges from 0.5 to 5 hp depending on size of unit. Lower speed 0.3 to 1.5 rev/min. Low noise < 68 dBa. Overdosing polymer does not clog screen and hinder dewatering. Low shearing force reduces odors in dewatered cake stockpile.	Washwater required periodically throughout operating cycle. Cannot observe dewater zone to optimize/adjust performance.
Rotary Press	Relatively low energy use drive motor ranges from 0.75 to 20 hp depending on size of unit. Overdosing polymer does not clog screen and hinder dewatering. Enclosed design contains odors and aerosols. Lower speed 0.5 to 2.5 rev/min. Low noise < 68 dBa. Washwater only used during shut down of system. Low shearing force reduces odors in dewatered cake stockpile.	Relatively large footprint per unit volume of dewatered capacity. Cannot observe dewater zone to optimize/adjust performance.

Due to the limited amount of space within the existing Dewatering Building, we believe that any new dewatering equipment would require a separate building. There are two locations that should be considered for a new building: the grass area between the Main Pump Station and abandoned Sludge Beds and the northeast section of the plant adjacent the abandoned Bio-Reactor.

The grass area adjacent to the Main Pump Station is within the 100 year flood plain. We are uncertain at this time whether land within the floodplain could be developed. If it can be developed, this location would provide easy access for the delivery and removal of dumpsters. A new building in this area could be combined with new Main Pump Station and/or Headworks facility for additional cost savings (if desired).

The second location for a new dewatering building is adjacent to the abandoned Bio-Reactor. This location has more available land for easier construction and is outside of the 100 year flood plain. The disadvantage of this location is that it is further away from the sludge holding tanks and provides less access for the dumpsters.

The cost for equipment installation and building construction would be similar at both locations (excluding the increase to combine the Main Pump Station and Headworks if desired). The cost for the dewatering equipment and building would be between $500,000 to $700,000, depending on the equipment selected and the size of the building.

11.0 Recommendations and Summaries

11.1 Summary of Recommendations

(See following pages)

Table 7 – Summary of Recommendations Listed by Priority

Preliminary Work	
Item 1:	Determine expectations for the next 20 years of growth within Northampton Borough and Allen Township *Note: Engineer will convert expectations to design organic and hydraulic loads*
Item 2:	Meet with DEP to determine Planning requirements *Note: The Plant is near the organic limit and hydraulically overloaded during wet weather. A new 537 Plan may be required by DEP before any improvements could be made to the Plant*
Item 3:	Discuss whether the land north of the plant is available for use *Note: If land is available, engineer will need to determine feasibility of developing land in 100 year flood plain*
Item 4:	Determine whether the Borough is interested in scaling up I&I improvements to the collection system and/or install an equalization tank
Item 5:	Determine whether the Borough is interested in providing an additional Sludge Holding Tank and/or increase the amount of sludge that could be dewatering in a day

First Priority Improvements	
Replace Main Pump Station	
Step 1:	Contact DEP and determine if an individual 537 Plan update would be allowed for just the pump station
Step 2:	Conduct test pits to verify location for new Main Pump Station
Step 3:	Construct new Pump Station (estimated cost is $500,000) *Note: Estimated 1 year for permitting and 1 year for construction* *Note: Permitting will take longer if a comprehensive 537 Plan is required* *Note: DEP may not allow the rating of the pump station to increase without downstream modifications to the plant*
Provide Additional Sludge Holding Capacity	
Note:	*The existing plant does not meet the current needs for storing sludge until it is dewatered and hauled away*
Note:	*ICEAS Basin 3 and the Bio-Reactor have been temporary utilized by the operator to provide more storage. These tanks have not been permitted for this use*
Note:	*The ICEAS Basins are backed up by the inability to increase the wasting rate*
Step 1:	Remove abandoned Bio-Reactor Tank (estimated cost is $50,000)
Step 2:	Construct additional Sludge Holding Tank (estimated cost is $500,000 / $700,000) *Note: Estimated cost is based on 200,000 or 300,000 gallon tank. The required tank size depends on projections for growth and ability of the plant to increase the current dewatering rate*

First Priority Improvements - Continued	
Provide Additional Dewatering (Alternative 1) - Increase Dewatering Production from Existing Equipment	
Note:	*The existing equipment is 28 years old and should not be run to failure without additional sludge holding capacity available at the plant*
Step 1:	Evaluate polymer utilized in press (if this has not been done in recent years)
Step 2:	Manufacturer to perform an assessment of work necessary to increase reliability and production of the press (assumed no cost by the Borough)
Step 3:	Modify press, if necessary, as recommended by manufacturer
Step 4:	Provide additional dumpster capacity by one of the following options:
Option 1:	Jockey two 10cy dumpsters
Option 2:	Provide 5 cy hopper (estimated cost is $2,000)
Option 3:	Provide a second dumpster adjacent to the existing dumpster and install auger / conveyor to direct cake into each of the dumpsters (estimated cost is $100,000)
Option 4:	Regrade pavement to allow larger size dumpsters to be delivered (estimated cost is $70,000)

Provide Additional Dewatering (Alternative 2) - Install Second Set of Equipment	
Step 1:	Perform pilot study to evaluate different sludge technologies, polymer usage, and life cycle costs
Option 1:	Install new building with dewatering equipment located within the grass area between the abandoned Sludge Drying Beds and the Main Pump Station (estimated cost is between $500,000 and $700,000 for equipment and building) *Note: A new Main Pump Station and/or Headworks facility could be combined with this building*
Option 2:	Install new building with equipment in grass area adjacent to the abandoned Bio-Reactor (estimated cost is between $500,000 and $700,000 for dewatering equipment and building)
Note:	*The estimated schedule for a new dewatering building at either of these two locations is 2 years for permitting and 1 year for construction*

Address issue with Wet Weather Flows	
Option 1:	Scale up annual I&I Program *Note: At this time, the extent of the improvements necessary to reduce wet weather peak flow into the plant from 6 mgd to 4.4 mgd has not been determined* *Note: Engineer can model and evaluate the collection system to recommend specific I&I improvements (estimated cost is $30,000 - estimate only and not a quote)*
Option 2: Step 1: Step 2:	Provide an Equalization Tank *Note: Assumes land north of plant is available and could be developed* Collect wet weather data and construct hydraulic model to determine tank size and budgetary cost (estimated cost is $5,000 - estimate only and not a quote) Construct Equalization Tank (estimated cost is $500,000) Note: The required tank size is unknown at this time. The cost estimate listed is representative of a 300,000 gallon tank *Note: Estimated 1 year for permitting and 1 year for construction*

Second Priority Improvements	
Issues Pertaining to the Headworks Building	
Option 1:	Upgrade hydraulic conveyance within the existing Headworks Building
Step 1:	Raising belt conveyor by 6 inches to reduce overflows
Step 2:	Increase opening of influent channel exiting the Headworks Building (estimated cost is $5,000)
Option 2:	Upgrade to automatic fine screen within existing channel (estimated cost is $150,000) *Note: Fine screen is optional to decrease maintenance and improve preliminary treatment for the plant*
Option 3:	Improve effectiveness of the existing grit equipment *Note: It is our opinion that the grit removal equipment is not effective. The manufacturer may be able to recommend selective improvements to improve the system*
Option 4:	Build a new Headworks Building *Note: If the Borough wants to improve screening, grit removal, and hydraulics, they should consider a new Headworks Building* *Note: This option assumes the land north of plant is available and could be developed*
Step 1:	Act 537 Planning would be necessary before a new building could be permitted
Step 2:	Construct Building including screening and grit removal (estimated cost is $1,000,000) *Note: Estimated 2 years for permitting/design and 1 year for construction* *Note: A new building will allow peak capacity and equipment upgrades to convey 6 mgd*
Primary Lift Station	
Note:	*Upgrade Primary Lift Station if no major I&I reductions are achieved and no equalization tank is constructed to reduce flows into the plant from 6 mgd to 4.4 mgd*
Step 1:	Increase concrete opening into Primary Lift Station (estimated cost is $5,000)
Step 2:	Install fourth pump or increase existing the sizes of the existing pumps (estimated cost is $30,000) *Note: Cost opinion is based on 4th pump and related piping.* *Note: The existing section of forcemain between the Primary Lift Station and ICEAS Tanks does not need to be replaced to convey 6.0 mgd*
Fourth ICEAS Basin	
Note:	*A fourth basin is necessary to increase the organic rating of the plant. Additional Sludge Holding and/or Dewatering would also be required to increase the organic rating*
Note:	*Provisions for a fourth tank were made during the 1990 upgrade*
Step 1:	Remove abandoned Bio-Reactor Tank to provide room for a fourth ICEAS Basin (estimated cost is $50,000) *Note: Tank may already be removed if an additional Sludge Holding Tank is constructed.*
Step 2:	Construct fourth ICEAS Basin (estimated cost is $700,000) *Note: Estimated 1 year for permitting and 9 months for construction*

Third Priority Improvements	
Miscellaneous Issues	
Item 1:	Perform an electrical evaluation of the plant *Note: There are multiple known electrical issues throughout the plant*
Item 2:	Drain, inspect, and replace diffuser heads within the Sludge Holding Tanks *Note: This would require additional sludge storage to be online before these tanks could be emptied*
Item 3:	Drain, inspect, and replace diffuser heads within ICEAS Basins
Item 4:	Plan for 500-year rainfall event and specifically flooding from the Hokendauqua Creek

11.2 Summary of Major Equipment

Table 8 - Summary of Major Equipment

Main Pump Station	
Location	Adjacent to Hokendauqua Creek
Description	Wetwell / Drywell configuration with 2 centrifugal pumps
Capacity	530 gpm / 750 gpm
Age	62 Years
Condition	poor
Opinion of Remaining Life	0 years
Comments	Difficulty obtaining replacement parts; Pump 1 is operating at reduced capacity; Flood level approaches doorway of pump station; station is hydraulically overloaded; wetwell is undersized

Flowmetering Equipment	
Location	Upstream side of Headworks Building (outside)
Description	9" Parshall Flume with ultrasonic level detector
Capacity	6 mgd
Age	28 Years
Condition	Good
Opinion of Remaining Life	10+ years
Comments	Meter and Parshall Flume are protected from the weather; maximum flow measurement was upgraded from 5 mgd to 6 mgd based on wet weather received by the plant

Bar Screen	
Location	Inside Headworks Building
Description	0.5 inch openings, self-cleaning with arc type mechanical arm with 18" wide conveyor rated at 60 fpm
Capacity	6.6 mgd
Age	28 Years
Condition	good
Opinion of Remaining Life	10+ years
Comments	Additional parts are available for bar screen; relatively good condition for age of equipment; 1/2" openings is large for a 1.5 mgd plant

Aerated Grit System	
Location	Inside Headworks Building
Description	Screw conveyor, rotary lobe blower, bucket elevator, and dewatering screw
Capacity	4.4 mgd
Age	28 Years
Condition	mechanically good condition
Opinion of Remaining Life	10+ years
Comments	Suspected issue with effectiveness of equipment; large amount of grease build-up; did not inspect submerged components; visible equipment is showing signs of wear; screw replaced in 2017; operator reports only 2 cf of grit removed per month

Influent Equalization / Pre-Aeration	
Location	Adjacent to Headworks Building
Description	Equalization tank for ICEAS basins with rotary lobe blowers inside adjacent building and DP-75 coarse bubble (rubber) diffusers
Capacity	86,000 gallons for equalization
Age	28 Years aeration equipment / 90 Years concrete Tank
Condition	good
Opinion of Remaining Life	10+ years
Comments	No major issues with aeration diffusers and blowers; tank is covered with filtration for odor control; blowers in adjacent building appear in good condition

Primary Lift Station	
Location	Attached to Influent Equalization Tank
Description	3 Hydromatic submersible centrifugal pumps
Capacity	1,040 gpm each pump - rated 3 mgd total
Age	28 Years Pumps / 90 Years concrete Tank
Condition	fair
Opinion of Remaining Life	5-10 years
Comments	Re-Occurring issue with bubbler system, portable pump necessary to supplement lift station during wet weather; did not inspect submerged pumps; operator reported the impellors were replaced a few years ago

ICEAS Basins	
Location	Eastern side of plant, located outside the 100-year and top of concrete above the 500-yr floodplains situated between the Bio-Reactor and Operations Building
Description	3 Tanks with an individual maximum volume of 362,290 gallons. One 100 hp centrifugal blower per tank plus one standby, D-24 coarse bubble air diffusers, decant mechanism, and waste sludge pumps
Capacity	3 tanks have a combined rating of: 1.5 mgd average, 4.4 mgd peak, and 2,409 lb/day organic
Age	28 Years for all related equipment and tanks
Condition	fair
Opinion of Remaining Life	10+ years
Comments	2 of 3 decanters failed recently and were replaced, operators have not drained tank in recent years to maintain or inspect aeration system

Effluent Equalization Tanks	
Location	Middle of site, situated beyond the 100-year floodplain
Description	1 round 123,500 gallon tank with 3 large and 1 small pump for a combined capacity of 3500 gpm
Capacity	Three 1,000 gpm pumps and one 500 gpm pump. All submersible centrifugal
Age	28 Years Pumps / 90 Years concrete Tank
Condition	Unknown condition of submerged components
Opinion of Remaining Life	< 5 years
Comments	Stilling well is rusted with holes; rake arm and drive unit is original from 1956; operator drains tank twice a year to maintain tank

Disinfection System	
Location	Attached to Effluent Equalization Tank
Description	Ultraviolet Radiation - 4 banks of 28 lamps
Capacity	4.4 mgd
Age	28 Years UV equipment / 90 Years concrete Tank
Condition	fair
Opinion of Remaining Life	5-10 years
Comments	UV lamps are experiencing a reasonable amount of life; no violations with disinfection; reported electrical issues with packed conduits

Small Sludge Holding Tank	
Location	Attached to Sludge Dewatering Building
Description	Concrete tank with aeration provided by a ring of DP-75 (rubber) coarse bubble diffusers and an inactive floating mechanical mixer
Capacity	51,000 gallon round tank
Age	28 Years aeration equipment / 90 Years concrete Tank
Condition	blowers are good; condition of diffusers is unknown
Opinion of Remaining Life	10+ years (excluding diffusers)
Comments	Reported air leaks between control building and holding tank, additional blower provided in 2017 adjacent to holding tank, floating mixer stopped working in 2012 and was not replaced; rubber diffusers are beyond their rated life

Large Sludge Holding Tank	
Location	Adjacent to Small Sludge Holding Tank
Description	Concrete tank with aeration provided by a ring of DP-75 (rubber) coarse bubble diffusers and an inactive floating mechanical mixer
Capacity	205,000 gallon round tank
Age	28 Years aeration equipment and concrete Tank
Condition	blowers are good; condition of diffusers is unknown
Opinion of Remaining Life	10+ years (excluding diffusers)
Comments	Tank has not been drained in 8 years. Reported air leaks between control building and holding tank, additional blower provided in 2017 adjacent to holding tank, floating mixer stopped working in 2012 and was not replaced; rubber diffusers are beyond their rated life

Dewatering Equipment	
Location	Within the Sludge Dewatering Building
Description	Parkson 1.5 meter belt filter press with 2 belt conveyors and 10 cy dumpster
Capacity	588 lbs dry solids per hour, 80 gpm feed rate
Age	28 years
Condition	fair
Opinion of Remaining Life	< 10 years
Comments	This component is critical to the plant operation and should not be run to failure without a backup; issue with tracking system has caused excessive belt damage; belts replaced 2-3 times a year

APPENDIX G

NORTHAMPTON BOROUGH

2021 CHAPTER 94

MUNICIPAL WASTELOAD

REPORT

2020 ANNUAL CHAPTER 94 REPORT
MUNICIPAL WASTELOAD MANAGEMENT

BOROUGH OF NORTHAMPTON
NORTHAMPTON COUNTY, PA
FILE NO. 2101026A1

March 2021

Prepared For:

Borough of Northampton
1401 Laubach Ave.
Northampton, Pa.18067

COMMONWEALTH OF PENNSYLVANIA
REGISTERED
PROFESSIONAL
THOMAS J. DUFFY
ENGINEER
PE075708

TJDuffy 3-24-21

Prepared by:

G&A 100 YEARS
ENGINEERING & CONSULTING SERVICES

5100 Tilghman St.
Suite 150
Allentown, PA 18104
610-366-8064
(fax) 610-366-0433

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2020

☒ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☐ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**Borough of Northampton**	Permit No.:	**PA-0031127**
Mailing Address:	**1401 Laubach Ave.**	Effective Date:	**September 1, 2017**
City, State, Zip:	**Northampton, PA 18067**	Expiration Date:	**August 31, 2022**
Contact Person:	**LeRoy Brobst**	Renewal Due Date:	**March 4, 2022**
Title:	**Borough Manager**	Municipality:	**Borough of Northampton**
Phone:	**(610) 262-2576**	County:	**Northampton**
Email:	**LeRoyB@enter.net**	Consultant Name:	**Gilmore & Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☒ Line graph for flows attached (**Attachment 2**)
   ☒ DEP Chapter 94 Spreadsheet used (**Attachment 1**)
   ☐ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☒ Line graph for organic loads attached (**Attachment 3**)
   ☒ DEP Chapter 94 Spreadsheet used (**Attachment 1**)
   ☐ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   The DEP Chapter 94 Spreadsheet has been provided.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment 4**)

☒ List summarizing each extension or project attached (**Attachment 4**)

☒ Schedules describing how each project will be completed over time and effects attached (**Attachment 4**)

Comments:

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

See Attachment 5A.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☒ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☐ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The existing conveyance system is in fair condition. Many of the lines were built in the 1930s and 1950s. See the discussion in Attachment 5B regarding the SSO that occurred in August 2020.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

   Check the appropriate boxes:

   ☐ The collection system does not contain pump stations
   ☒ The collection system does contain pump stations (Number – **10**)
   ☒ Discussion of condition of each pump station attached (**Attachment 6**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

   Check the appropriate boxes:

   ☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment 7**)
   ☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

   Check the appropriate boxes:

   ☐ This report demonstrates an existing hydraulic overload condition.
   ☐ This report demonstrates a projected hydraulic overload condition.
   ☐ This report demonstrates an existing organic overload condition.
   ☐ This report demonstrates a projected organic overload condition.

   If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

   ☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

    ☒ Sewage Sludge Management Inventory attached (**Attachment 8**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

    ☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

    ☒ Flow calibration report attached (**Attachment 9**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

LEROY E BROBST	
Name of Responsible Official	Signature
610-262-2576	3/23/2021
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Thomas Duffy	
Name of Preparer	Signature
610-366-8064	3-24-21
Telephone No.	Date

COMMONWEALTH OF PENNSYLVANIA
REGISTERED
PROFESSIONAL
THOMAS J. DUFFY
ENGINEER
PE075798

Attachment 1

PA DEP Chapter 94 Spreadsheet

pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spreadsheet
Sewage Treatment Plants

Reporting Year: 2020

Facility Name: Borough of Northampton Wastewater Treatment Facility | **Permit No.:** 0031127 | **Persons/EDU:** 2.45

Existing Hydraulic Design Capacity:	1.65	MGD	**Existing Organic Design Capacity:**	2,409	lbs BOD5/day	
Upgrade Planned in Next 5 Years?	NO	**Year:**	**Upgrade Planned in Next 5 Years?**	NO	**Year:**	2020
Future Hydraulic Design Capacity:		MGD	**Future Organic Design Capacity:**		lbs BOD5/day	

Monthly Average Flows for Past Five Years (MGD)

Month	2016	2017	2018	2019	2020
January	0.944	0.957	1.063	1.558	0.943
February	1.355	0.848	1.431	1.308	1.046
March	0.871	1.038	1.277	1.357	0.979
April	0.781	1.288	1.151	1.294	1.12
May	0.851	0.991	1.322	1.731	0.941
June	0.713	1.02	0.958	1.17	0.883
July	0.759	1.179	1.175	1.281	0.86
August	0.695	1.181	1.922	0.886	1.13
September	0.688	1.021	1.415	0.731	0.91
October	0.711	0.893	1.257	0.937	0.863
November	0.759	0.868	1.824	1.066	0.823
December	0.862	0.841	1.566	1.064	1.187
Annual Avg	0.832	1.01	1.363	1.199	0.974
Max 3-Mo Avg	1.057	1.127	1.549	1.649	1.048
Max : Avg Ratio	1.27	1.12	1.14	1.38	1.08
Existing EDUs	5,637.0	5,647.0	5,691.0	5,723.0	5,799.0
Flow/EDU (GPD)	147.6	178.9	239.5	209.5	168.0
Flow/Capita (GPD)	60.2	73.0	97.8	85.5	68.6
Exist. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2016	2017	2018	2019	2020
January	1,886	1,957	1,812	2,221	2,023
February	2,072	1,737	1,829	1,967	1,955
March	1,627	1,956	1,771	1,921	2,122
April	1,630	1,975	1,995	1,930	2,381
May	1,774	1,898	1,810	1,830	2,309
June	1,827	1,613	1,485	1,683	2,214
July	1,397	1,703	1,910	1,208	2,089
August	1,586	2,077	1,890	1,570	1,756
September	1,449	2,078	2,401	1,296	2,005
October	1,692	2,008	1,804	1,653	1,807
November	1,947	2,018	1,927	1,625	1,779
December	1,877	2,045	2,051	1,914	1,955
Annual Avg	1,730	1,922	1,890	1,735	2,033
Max Mo Avg	2,072	2,078	2,401	2,221	2,381
Max : Avg Ratio	1.20	1.08	1.27	1.28	1.17
Existing EDUs	5,637	5,647	5,691	5,723	5,799
Load/EDU	0.307	0.340	0.332	0.303	0.351
Load/Capita	0.125	0.139	0.136	0.124	0.143
Exist. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Projected Flows for Next Five Years (MGD)

	2021	2022	2023	2024	2025
New EDUs	90.0	90.0	61.0	60.0	44.0
New EDU Flow	0.017	0.017	0.0115	0.0113	0.0083
Proj. Annual Avg	1.093	1.11	1.1215	1.1328	1.1411
Proj. Max 3-Mo Avg	1.306	1.326	1.34	1.353	1.363
Proj. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Projected BOD5 Loads for Next Five Years (lbs/day)

	2021	2022	2023	2024	2025
New EDUs	90	90	61	60	44
New EDU Load	29.398	29.398	19.925	19.599	14.372
Proj. Annual Avg	1,892	1,921	1,941	1,960	1,975
Proj. Max Avg	2,270	2,305	2,329	2,353	2,370
Proj. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

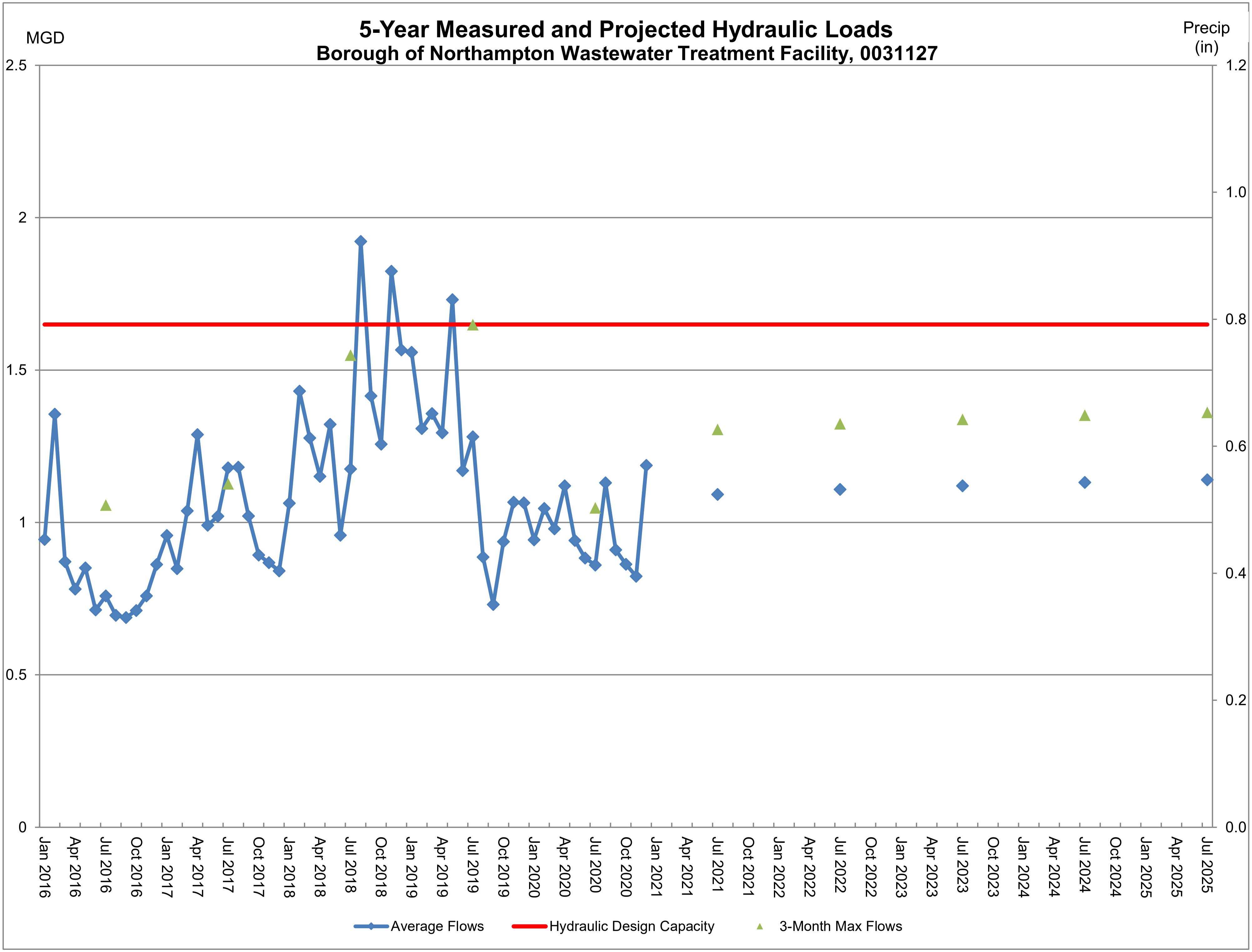
Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2016	2017	2018	2019	2020
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

Attachment 2

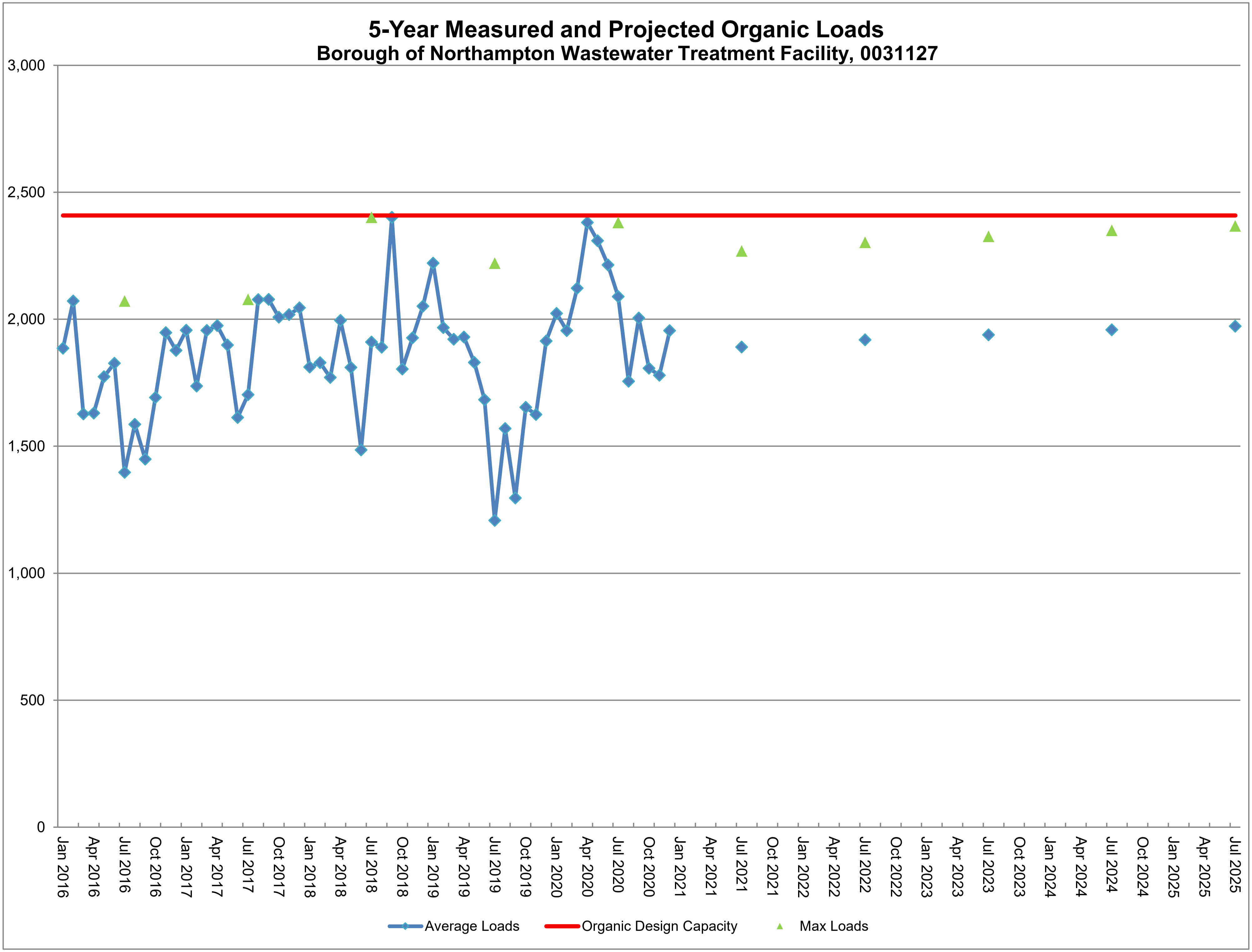
Line Graph for Flows



5-Year Measured and Projected Hydraulic Loads
Borough of Northampton Wastewater Treatment Facility, 0031127
MGD
Precip (in)
2.5
2
1.5
1
0.5
0
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Oct 2023
Jan 2024
Apr 2024
Jul 2024
Oct 2024
Jan 2025
Apr 2025
Jul 2025
Average Flows
Hydraulic Design Capacity
3-Month Max Flows

Attachment 3

Line Graph for Organic Loads



5-Year Measured and Projected Organic Loads
Borough of Northampton Wastewater Treatment Facility, 0031127
3,000
2,500
2,000
1,500
1,000
500
0
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
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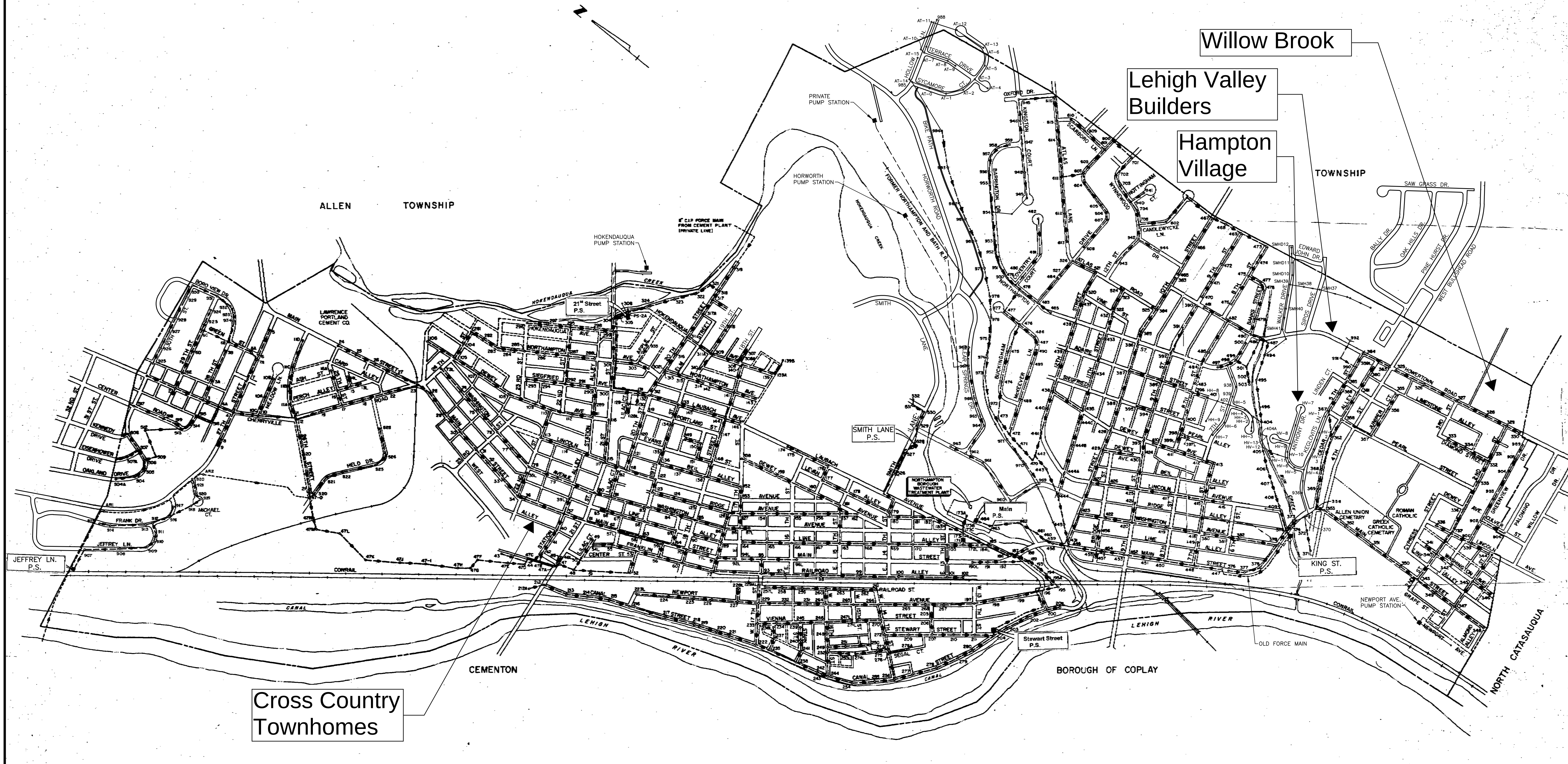
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Oct 2023
Jan 2024
Apr 2024
Jul 2024
Oct 2024
Jan 2025
Apr 2025
Jul 2025
Average Loads
Organic Design Capacity
Max Loads

Attachment 4

Proposed Projects

Projected Development							
	Total EDU's	**EDU's Remaining**	**2021**	**2022**	**2023**	**2024**	**2025**
Borough of Northampton							
L.V. Builders	26	22	3	3	3	3	0
Castle (Hampton Village)	23	2	0	0	0	0	0
Cross Country Townhomes	40	40	20	20	0	0	0
Willow Brook Farms	61	61	10	10	10	10	0
Other							
Allen Township							
Developments within Allen Township (refer to Tributary Report for more detail)	2,146	664	57	57	48	47	44
Total EDU's		**789**	**90**	**90**	**61**	**60**	**44**



SITE PLAN

SCALE: 1" = 500'

SHEET LEGEND

- EXISTING INFORMATION
- REVISED INFORMATION
- FORCE MAIN
- SANITARY SEWER (8" PVC UNLESS OTHERWISE NOTED)

FILE: W:\W&WW ERD\50670 BOROUGH OF NORTHAMPTON\PROJECT DELIVERABLES\201007 - MISC ASSIST\SEWER INDEX MAP.DWG
DATE: 05/15/2012 TIME: 1:23:56 pm
NETWORK PATH W:\W&WW ERD\50670 Borough of Northampton\Project Deliverables\201007–Misc Assist

No.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
X.X.X.	D.R.F.	AS NOTED
CHECKED	APPROVED	APPROVED
X.X.X.	X.X.X.	X.X.X.

Gannett Fleming
HARRISBURG, PENNSYLVANIA

BOROUGH OF NORTHAMPTON
NORTHAMPTON COUNTY, PENNSYLVANIA

SEWER SYSTEM
INDEX MAP

JOB No. 50670
DATE MARCH 2011
SHEET No. 1

Attachment 5A

Sewer System Maintenance, Monitoring, Repair and Rehabilitation

Sewer System Maintenance, Monitoring, Repair and Rehabilitation

The Borough street crew is responsible for maintenance of the wastewater collection system. The preventative maintenance program consists of flushing sewer lines annually by using nearby fire hydrants and a sewer flusher. During a typical year, the Borough staff may flush approximately 20% of the sewer lines within the Borough. This program generally results in a 5- to 6-year elapsed time between cleaning for any sewer line. Those lines that are more prone to problems are given a high priority and are flushed more frequently. The Borough staff has installed manhole inflow control inserts in numerous manholes throughout the collection system.

Borough records indicate that during 2020, a total of **16,000 feet** of sewer lines were flushed or cleaned. The Borough has a sewer television system that is used on an as-needed basis to locate problems within the wastewater collection system. During 2020, a total of **500 feet** of sewer line were televised.

Manholes are inspected during the flushing program. If surface water is observed flowing into a manhole, the Borough staff will install an insert. Inserts will continue to be installed in manholes on an as-needed basis. The Borough street crew performs minor repairs and removes collection system blockages by using a power flusher. Large repairs are performed by contractors.

The Borough staff owns five I/I (I/I Spy®) sensors to evaluate the depth of flow through manholes. If flow through a specific manhole exceeds acceptable levels, as determined by Borough staff, a follow-up investigation may be conducted. The Borough uses a laptop computer and three Sigma Model 910 portable flowmeters to selectively monitor manholes. If the inflow into the manhole is determined to significant, the Borough will consider relining the manhole. Typical the Borough is able to reline a few manholes a year. In 2020, the Borough relined **2 manholes**.

An estimated 35% of the Borough wastewater collection system was constructed in the 1930s and another 40% during 1953. Due to line replacement and installation of new lines, the remaining 25% of the lines are less than 20 years old. There are no known combined storm/sanitary sewers within the Borough. Furthermore, the I/I program over the past decade has resulted in rehabilitation of numerous lines through the use of an in-place internal sewer lining process or replacement of lines. As with most aged systems, I&I is a problem and the Borough continues to explore ways to manage wet weather flows.

The overall condition of the collection system is considered fair. A sewer line collapsed in Line Alley during 2020 and was immediately repaired by the Borough. There was also an SSO that occurred on August 4th, 2020. Please see Attachment 5B for details.

Attachment 5B

Sanitary Sewer Overflow Reports

Sanitary Sewer Overflow Reports

There was an overflow at the plant on August 4th, 2020 due to Tropical Storm Isaias. This storm dropped just over 5-inches of rain during an 8-hour period. The rainfall event exceeded the 100-year storm. As a result, there was significant flooding from the Hokendauqua River into the plant and overflows within the plant. The plant operator estimated 500,000 gallons overflowed during the event.

During this Tropical Storm, there was also one observed SSO of the sewer conveyance system at Manhole #204. The duration and quantity of the overflow is unknown. Excessive rainfall from the Tropical Storm caused the overflow onto the roadway which was also extensively flooded. The overflow consisted of sewerage diluted with infiltration, which washed away during and after the event. In order to prevent a re-occurrence the Borough has an ongoing program to replace leaking sewer mains, manholes, and laterals, as well as installing inserts on manholes with a potential of inflow.

Sanitary Sewer Overflow (SSO) Report to PADEP

1. Date, Name, Phone # of person completing this report	Date: 8/5/20 Name: Scott Gillespie Phone #: 610-262-6131 Signature: Scott Gillespie
2. Your organization name and address ?	Borough of Northampton 1401 Laubach Ave Northampton, PA 18067
3. Date found and specific location of SSO ?	① Aug 4, 2020 - Sewer plant 2 Leichenmiller Drive ② Aug 4 2020 manhole 204 Canal/Stewart St.
4. How was SSO discovered? By who ?	① Sewer plant Staff ② Roadcrew
5. Start and end time of SSO (actual or estimate?)	① 10:00 AM to 4:00 PM - 4:30-7:30 PM ② - unknown
6. Date, time and name of person who notified PADEP of SSO ?	Date: 8/4/20 Time: 10:00 AM / 5:00 PM Name: Scott Gillespie
7. Description and actual or estimated volume of SSO	① 500,000 gallons - see attached write-up ② - unknown
8. Where, precisely, did SSO go ? (land, roadway, basement, swale, storm sewer, creek, etc)	① creek ② Road
9. What caused SSO ? How was it stopped ?	Tropical Storm Isaias over 5" of Rain (8" in 3 day)
10. Describe extent of contamination and how it was cleaned up	Limed area - Creek overflowed plant and washed everything away
11. What actions will be taken to prevent a re-occurrence ? When ?	Not sure - damage at sewer plant - currently evaluating situation
12. Other comments ?	at the sewer plant - the Hokendauqua Creek flooded the sewer plant and for a short while - lost main pump station - made plans to abandon plant

Attachment 6

Pump Station Capacity

Condition of Existing Sewage Pump Stations

There are eight (8) Pump Stations owned and operated by the Borough and two (2) Pump Stations Tributary to Northampton Borough which are Owned by Allen Township but operated by Northampton Borough. Elapsed time meters are installed at all Pump Stations. Simultaneous hour meters and cycle counters are also installed at the major Pump Stations. Meter readings are recorded daily and evaluated by Borough personnel to review operation of the equipment. The King Street Pump Station has the Omni-Site Pump Station monitoring system which allows the staff to obtain operational time and current capacity information on each pump from a remote server.

Borough of Northampton Pumping Station Information						
Pump Station	**Capacity (MGD)[1]**	**2020 Avg. Daily Flow (MGD)[2]**	**2020 Max. Daily Flow (MGD)**	**2020 Peaking Factor**	**2022 Projected Avg. Daily Flow (MGD)**	**2022 Projected Max. Daily Flow (MGD)**
Main Plant	1.360	0.476	1.116	2.34	0.494[4]	1.157[4]
Canal Street (a.k.a.Stewart St.)	0.612	0.146	0.490	3.35	0.146	0.490
21st Street	0.533	0.086	0.382	4.44	0.086	0.382
Smith Lane (a.k.a. Vo-Tech)	0.144	0.003	0.008	3.00[3]	0.003	0.008
King Street (a.k.a. Washington Ave.)	0.920	0.289	0.484	1.68	0.294[4]	0.492[4]
Jeffrey Lane (a.k.a. Hampton Ridge)	0.360	0.077	0.230	3.00[3]	0.085[4]	0.255[4]
Newport Avenue	0.058	0.004	0.013	3.00[3]	0.004	0.012
Generator Pump Station	0.108	0.005	0.015	3.00[3]	0.005	0.015
Horwith (Owned by Allen Twp)	0.072	0.001	0.004	3.00[3]	0.001	0.003
Willow Green (Owned by Allen Twp)	0.173	0.010	0.029	3.00[3]	0.010	0.030

NOTES:

1 Calculated with largest pump out of service. All station consists of two pumps. Based on pumping station drawdown tests conducted in 1996 and 2003.

2 Calculated flows based on elapsed time meter readings and conditions observed by Borough staff.

3 Peak flow for these pump stations was not measured and is based on an assumed Peaking Factor of 3.00.

4 2022 Projected flows are based on an anticipated 70 EDUs to Main Plant P.S, 20 EDUs to King Street P.S., and 30 EDUs to Jeffrey Lane P.S. Projected Average Flows are based on an assumed 250 gpd per EDU. Projected Max. Daily Flows are based on the 2020 Peaking Factor.

Comments on Main Pump Station:

Contractors finished work on the renovation of the Main pump station in February 2021. The pump station was upgraded from 1.08 MGD to 1.36 MGD, allowing for additional flow capacity.

Comments on 21st Street Pump Station:

This pump station recorded an exceptional amount of flow on August 4th (0.551 MGD) during Tropical Storm Isaias. However, to alleviate basement flooding, the discharge manhole has an overflow that goes back to the pump station. As a result, the same sewage was pumped again and again until the flow subsided. It is believed that this occurred on August 4th. The flow recorded included recycled flow and occurred during an extreme event. Therefore, the next highest peak flow for the year (0.382 MGD) was used for reporting purposes.

Attachment 7

Industrial Wastes

Industrial Waste Report

There were no problems reported with the collection system or at the treatment plant that could be associated with an industrial discharge. Due to the domestic nature of the discharges, monitoring for non-conventional parameters is performed within the collection system on an infrequent basis.

The Borough WWTP continues to accept filter backwash and clarifier blowdown from the Northampton Borough Municipal Authority (NBMA) Water Treatment Plant (WTP). The NBMA WTP wastes received for each month during 2020 is tabulated below. Annual total and average daily discharges from the NBMA WTP for 1999 to 2020 are tabulated on the following page. As evident in these tables, the total volume of NBMA WTP discharged to the WWTP has decreased significantly since the new NBMA WTP went into service during 2007. However, the amount of dry solids continues to increase in the WTP discharge.

The nature of the waste stream from the NBMA WTP is such that it contributes a substantial loading of relatively inert solids to the WWTP. Water plant personnel have modified their solids handling practices to accommodate the removal and treatment of these solids. Personnel at both plants continue to coordinate their efforts to minimize the effects at the WWTP.

Northampton Borough Municipal Authority
Water Treatment Plant Discharge
for 2020

Month	**Flow (Million Gallons)**
January	0.798
February	0.599
March	0.681
April	0.909
May	0.869
June	1.153
July	1.111
August	1.140
September	1.086
October	0.983
November	0.824
December	1.100
Total	**11.253**

Northampton Borough Municipal Authority
Water Treatment Plant Discharge
from 1999 to 2020

Year	Total (Million Gallons)	Average Daily (Gallons per Day)
1999	31.805	87,140
2000	24.979	68,250
2001	25.057	68,650
2002	25.340	69,420
2003	27.497	75,330
2004	28.101	76,780
2005	28.369	77,720
2006	22.723	62,250
2007	33.107	90,700
2008	14.975	40,920
2009	12.900	35,340
2010	12.404	33,980
2011	11.755	32,210
2012	11.166	30,510
2013	13.877	38,020
2014	13.135	35,990
2015	16.055	43,990
2016	13.897	38,070
2017	11.950	32,740
2018	12.614	34,559
2019	12.524	34,312
2020	11.253	30,830

<u>Attachment 8</u>

Sludge Management Inventory

Sludge Management Inventory

Dewatered Sludge generated at the Borough of Northampton Treatment Plant is trucked to the Grand Central Sanitary Landfill, Inc. in Pen Argyl Pennsylvania (DEP Permit No. 100265). During the past year, a total of **405.88 Dry Tons** of sludge was hauled from the plant.

Sludge Hauled Offsite	
Date	Dry Tons
January	35.63
February	28.15
March	28.19
April	27.92
May	37.98
June	34.07
July	40.45
August	35.70
September	37.28
October	37.27
November	31.59
December	30.12
TOTAL	**404.35**

<u>Attachment 9</u>

Meter Calibration Report

Certificate # 5159

ACS

ALLIED CONTROL SERVICES, INC.

611 Garfield Avenue • P.O. Box 234, West Point, PA 19486

24 Hour Emergency Service 800-441-4844

Fax 215-699-9030

CERTIFICATE OF CALIBRATION

CUSTOMER: Borough of Northampton

LOCATION: Sewage Treatment Plant

LOOP OR SYSTEM ID: Final Influent Flow

CALIBRATED RANGE: 0-6 MGD TOTALIZER MULTIPLIER 100

The following equipment has been accurately calibrated under ambient conditions at an ambient temperature of ______ deg. F, in accordance with the manufacturers documented procedures and specifications.

ITEM	MANUFACTURER	MODEL #	SERIAL #	DESCRIPTION
1	Milltronics	HydroRanger	090902157	Ultrasonic
2	Honeywell	DR4300	N/A	sludge Flow Recorder
3	Honeywell	DR45AT	0246425154	Raw wastewater Recorder
4	Honeywell	DR4300	N/A	waste sludge Recorder

REMARKS:

CALIBRATION DATE: 11 / 4 / 2020 TECHNICIAN: [signature]

TEST EQUIPMENT USED:

MANUFACTURER	DESCRIPTION	MODEL	SERIAL #
Isco	HandBook	5th	N/A
Fluke	DVM	787	7701022
Empire	Calibrated Rule	403	-

WHITE – ORIGINAL YELLOW – CUSTOMER COPY

Attachment 10

Tributary Report (Allen Township)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2020

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**Allen Township**	Permit No.:	**PA**
Mailing Address:	**4714 Indian Trail Road**	Effective Date:	
City, State, Zip:	**Northampton, Pa 18067**	Expiration Date:	
Contact Person:	**Ilene M. Eckhart**	Renewal Due Date:	
Title:	**Township Manager**	Municipality:	**Allen Township**
Phone:	**610-262-7012**	County:	**Northampton**
Email:	**manager@allentownship.org**	Consultant Name:	**Barry Isett & Associates**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   The wastewater flow for Allen Twp to the Northampton Borough collection system in 2020 was calculated to be 334,583 gpd which is based on the total # of connected EDU's (1,593.25) multiplied by 210 gpd/EDU. Future flows are not projected to exceed capacity within the collection system or the Willow Green or Horwith pump stations. The flow projections were calculated based on approved subdivisions and estimated future connections within the public sewer service area.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment A**)

☒ List summarizing each extension or project attached (**Attachment B**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

No change to the 2018 Sewer map or 2019 data. The list of approved/proposed subdivisions is included as an attachment. The list includes the status of connected and proposed EDUs from approved subdivisions. Note: Not all planned EDUs have purchased capacity at this time. The subdivisions are labeled on the attached map.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

The Township rehabilitated approximately 35 manholes in the Willow Green Development in 2020. The manhole rehabilitation consisted of resetting frames and covers and lining manholes as necessary. The Township will be evaluting other areas to investigate for I&I through manhole inspections and mainline televising if warranted. The Township also intends on adding flow meters into the graity system in 2021 to monitor and record flows from certain areas.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

   Check the appropriate boxes:
   - ☐ The collection system does not contain pump stations
   - ☒ The collection system does contain pump stations (Number – **2**)
   - ☒ Discussion of condition of each pump station attached (**Attachment C**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.

   c. A discussion of specific problems in the sewer system or at the plant, known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.

   Check the appropriate boxes:
   - ☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)
   - ☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

   Check the appropriate boxes:
   - ☐ This report demonstrates an existing hydraulic overload condition.
   - ☐ This report demonstrates a projected hydraulic overload condition.
   - ☐ This report demonstrates an existing organic overload condition.
   - ☐ This report demonstrates a projected organic overload condition.

   If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

   - ☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

    - ☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

    ☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

    ☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Ilene M. Eckhart	
Name of Responsible Official	Signature
610-262-7012	29 March 2021
Telephone No.	Date

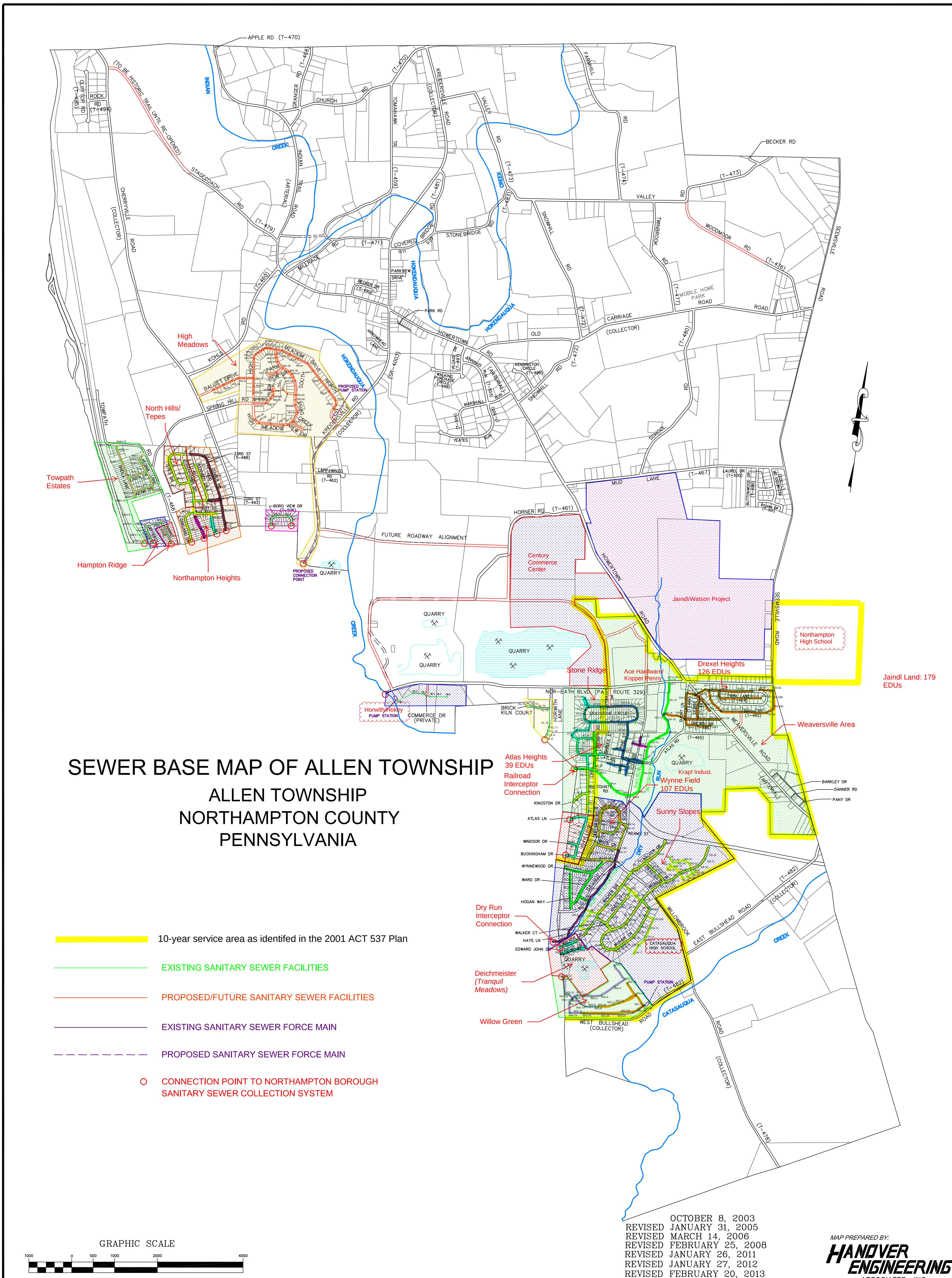
PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Andrea J. Martin	Andrea J. Martin (electronic signature)
Name of Preparer	Signature
610-398-0904	3/29/2021
Telephone No.	Date

BARRY ISETT & associates INC
MULTI-DISCIPLINE ENGINEERS AND CONSULTANTS

Appendix A


SEWER BASE MAP OF ALLEN TOWNSHIP
ALLEN TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA
10-year service area as identifed in the 2001 ACT 537 Plan
EXISTING SANITARY SEWER FACILITIES
PROPOSED/FUTURE SANITARY SEWER FACILITIES
EXISTING SANITARY SEWER FORCE MAIN
PROPOSED SANITARY SEWER FORCE MAIN
CONNECTION POINT TO NORTHAMPTON BOROUGH SANITARY SEWER COLLECTION SYSTEM
GRAPHIC SCALE
1000
0
500
1000
2000
4000
OCTOBER 8, 2003
REVISED JANUARY 31, 2005
REVISED MARCH 14, 2006
REVISED FEBRUARY 25, 2008
REVISED JANUARY 26, 2011
REVISED JANUARY 27, 2012
REVISED FEBRUARY 20, 2013
REVISED JANUARY 26, 2015
MAP PREPARED BY:
HANOVER ENGINEERING ASSOCIATES, INC.
High Meadows
North Hills/ Tepes
Towpath Estates
Hampton Ridge
Northampton Heights
Century Commerce Center
Jaindl/Watson Project
Northampton High School
Jaindl Land: 179 EDUs
Drexel Heights 126 EDUs
Stone Ridge
Ace Hardware/ Kopper Penny
Weaversville Area
Horwith Hokey Pump Station
Atlas Heights 39 EDUs
Railroad Interceptor Connection
Krapf Indust.
Wynne Field 107 EDUs
Sunny Slopes
Dry Run Interceptor Connection
Deichmeister (Tranquil Meadows)
Willow Green
PROPOSED PUMP STATION
PROPOSED CONNECTION POINT
QUARRY
APPLE RD (T-470)
BECKER RD
FUTURE ROADWAY ALIGNMENT
CATASAUQUA HIGH SCHOOL
PUMP STATION
WEST BULLSHEAD ROAD (COLLECTOR)
EAST BULLSHEAD ROAD
HOKENDAUQUA CREEK
CATASAUQUA CREEK
INDIAN CREEK

BARRY ISETT & associates INC
MULTI-DISCIPLINE ENGINEERS AND CONSULTANTS

Appendix B

Attachment B

Allen Township EDUs Connected To Borough of Northampton

Current and Projected Subdivision and Development Status

5-Year Projection

2020 EDU List

Fully Built Out Subdivisions with no remaining EDUs

Subdivision/Development	Total Planned EDUs	Total Connected as of 12-31-19	EDUs Connected During 2020	Remaining EDUs 12-31-20
Fully Built Developments				
Cherryville Heights	50	50		0
Center Street sewer Extension	4	4		0
Boro View	32	32		0
Atlas Estates 1	30	30		0
*Atlas Estates 2	27	27		0
Atlas Estates Twins 1	8	8		0
Atlas Estates Twins 2	44	44		0
Graver Lateral	1	1		0
Atlas Heights	39	38		0
Drexel Heights	126	126		0
Kopper Penny	5	5		0
Zangl Minor	3	3		0
Accent Homes Minor	4	4		0
Atlas Terrace	4	4		0
*Penns Chase	142	142		0
*Catasauqua High	16	16		0
Horwith Trucking	8	8		0
Wolfers	2	2		0
*Summer Glen	125	125		0
*Willow Ridge	270	270		0
*Willow Green	164	164		0
Abbey Road Vet Center	1	1		0
Subtotal	**1105**	**1104**	**0**	**0**

Attachment B
Allen Township EDUs Connected To Borough of Northampton
Current and Projected Subdivision and Development Status
5-Year Projection
2020 EDU List

Subdivisions with remaining EDUs

Subdivision/Development	Planned EDUs	Connected 19 of 12-31-20	Connected During 2020	Remaining EDUs 12-31-20	Planned Connections				
					2021	2022	2023	2024	2025
I. Covered Under Agreements Prior to March 8, 2001									
North Hills, Phases 1-6	186	115		71	5	5	5	5	5
Hampton Ridge North I	52	39		13	4	4	4	1	0
Towpath Estates	93	40	6	47	20	10	10	10	10
Gangoung/Budin	1	0		1	1	0	0	0	0
II. Covered Under March 8, 2001 Agreement and/or January 1, 2012 Agreement									
*Wynne Field Estates	107	97		10	0	0	0	0	0
Moyer Minor	2	1		1	1	0	0	0	0
Stauffer Minor	3	2		1	1	0	0	0	0
Horwith Industrial Park, Phase I	10	0		10	0	0	0	0	0
Keglovitz Minor	1	0		1	1	0	0	0	0
Palmerton Bank Subdivision	12	10		2	0	1	0	1	0
Horwith I/C Park	12	10.25		1.75	0	1	0	0.75	0
Atlas Road Townhomes	4	0		4	2	2	0	0	0
*Jaindl N/C-shops at willowbrook(?)	5	0		5	0	0	1	1	1
Stone Ridge	116	84		32	2	2	3	3	3
Atlas Twins Commercial	5	0		5	0	0	1	1	1
*Quarry Hill Estates	46	5		41	0	1	2	2	2
High Meadow Estates	135	0		135	0	2	2	2	2
Century Commerce Center	109	10	70	29	20	9	0	0	0
Jaindl Watson Project	142	0		142	0	20	20	20	20
~~Tranquil Meadows~~									
Subtotal	**1,041**	**413**	**76**	**552**	**57**	**57**	**48**	**47**	**44**
TOTAL	**2,146**	**1,517**	**76**	**552**	**1,650**	**1,707**	**1,755**	**1,802**	**1,846**

*Indicates flow contribution to Washington Avenue Pump Station:

Washington St PS analysis

proposed EDUs	Connected prior	connected this year	total currently connected
902	846	0	846

Total connected EDUs	Flow @ 210 gpd
1,593.25	334,583

\\biaces.com\Work\Projects\2021\362121.000_Allen_Township_Municipal_.002_San_Sewer_Eng\Updated EDU List for 2020.xlsx

BARRY ISETT & associates INC
MULTI-DISCIPLINE ENGINEERS AND CONSULTANTS

Appendix C

Allen Township Pump Station Discussion

Horwith Pump Station

The pump station has a defined service area that is nearly built out and there is minimal opportunity for expansion. The service area is primarily south of Route 329 and consists of all commercial and industrial properties.

The average daily flow through the pump station in 2020 was 1,065 gpd. The monthly flow readings are as follows:

2020 Horwith PS Flow Meter Readings		
Month	Total Gallons per Month	Avg GPD
January	32,714	1,055
February	37,376	1,289
March	29,628	956
April	31,382	1,046
May	31,277	1,009
June	32,272	1,076
July	40,757	1,315
August	32,623	1,052
September	29,726	991
October	32,209	1,039
November	28,838	961
December	29,864	963
Total	388,666	1,065

With minimal opportunity for development in the service area, this pump station is not expected to exceed capacity, or even see a significant difference in flows in the next 2 years.

Willow Green Pump Station

This pump station was installed by a private developer and turned over to the Township, along with the operation and maintenance of the gravity system in the Willow Green Development. This pump station is not equipped with a flow meter. The operational area of the wet well is severely limited and as such, the pumps are not operating very efficiently. The engineer will be discussing alternatives with the Township in 2021 to improve the efficiency and operations of the pump station. The pump station will not see any additional flow due to the isolated service area and location in the private community.

APPENDIX H

SUMMARY OF EVENTS FROM HURRICANE ISAIAS IN NORTHAMPTON BOROUGH

On August 4, 2020, Tropical Storm Isaias impacted the Lehigh Valley. Over five inches of rain fell between 5 am and 1 pm on August 4. Prior to this, the area received another three inches of rain from August 1 – 3, 2020. The flow rate was high and at approximately 10 am the headworks overflowed. Additional pumping was used throughout the day, up to an extra 2,000 – 3,000 gpm. Said overflow lasted until about 4 pm. At this point, the Hokendauqua Creek began to flood the plant. The flooding of the plant lasted until 11 pm. At 5 pm, sewer plant and road crew personnel moved pumps outside the plant to pump sewage directly into creek and sandbag buildings that were taking in water. During the day, I called the PA DEP office and Allentown water plant and notified them of the overflows. At 5 pm, I called the PA DEP office and informed them that the sewer plant might need to be abandoned. The flood waters covered the electrical access manholes and tripped out the main pump station. A pump was moved outside the plant to pump sewage directly to the creek. Said pumping lasted 2 – 3 hours. At 6 pm, I reset the plant pump station main breaker and the pumps reset. The pump station dry well was filled to the top with water. However, we could not pump it out until about 1 am. All our pumps were in use. Once the flood waters receded, the electrical access manholes were pumped out, some took 3 – 4 hours, others took 6 – 8 hours. As of this writing, we are still pumping them out around the clock. The pump station dry well was pumped out between 1 – 3 am. Since the plant went online in 1990, this is the first time flood waters entered the buildings. As for the damage, the main issue is structural. The fence located on the creek side on the north end was completely flattened. The retaining wall on the creek side is partially torn away. Mechanically, all items in the plant are good. However, with all the underground wires submerged, there could be some serious issues and they may occur intermittently over time.

The only other time plans to abandon the plant were made was during Hurricane Sandy.

There was one manhole that was seen surcharging, manhole 204, by the Stewart Street pump station.

The plant recorded 3.8 MGD; however, flow levels got so high that it blanked out the flow transducer. I estimate flows to be about 4.1 MGD and about 500,000 gallons of overflow and pumping when the plant pump station was lost.

APPENDIX I

TOWPATH LEGAL AGREEMENT BETWEEN NORTHAMPTON BOROUGH AND ALLEN TOWNSHIP

INTERMUNICIPAL AGREEMENT

THIS INTERMUNICIPAL AGREEMENT (the "Agreement") made this THIRD day of FEBRUARY, 2022 by and between:

Borough of Northampton, a Pennsylvania Municipal Corporation with a business address of 1401 Laubach Avenue, Northampton, Northampton County, Pennsylvania, 18067 ("Northampton Borough"); and

Allen Township, a Pennsylvania Municipal Corporation with a business address of 4714 Indian Trail Road, Northampton, Northampton County, Pennsylvania 18067 (Collectively with Northampton Borough the "Participants").

PURPOSE

WHEREAS, a construction program identified as Tow Path Estates has begun construction and Allen Township has requested fifty (50) additional Equivalent Dwelling Unit ("EDU') sewer hookups; and

WHEREAS, Northampton Borough provides sewer EDU services to Allen Township; and

WHEREAS, Northampton Borough has agreed to provide fifty (50) additional EDU's to Allen Township for the price of Five Thousand and Seventy Dollars ($5,070.00) per EDU;

NOW, THEREFORE, it is agreed, by and between the Participants, and all parties hereto, that:

1. **Incorporation.** The above clauses including the above WHEREAS clauses are hereby made a part of this Agreement as if set forth at length.

2. **EDU Allocation.** It is agreed that Northampton Borough shall provide fifty (50) additional EDU's to Allen Township for the purpose of servicing Tow Path Estates only.

3. **Price Per EDU.** It is agreed that Allen Township shall pay Northampton Borough Five Thousand and Seventy Dollars ($5,070.00) per EDU allocated pursuant to this agreement, with a total sum of Two Hundred, Fifty-Three Thousand Five Hundred Dollars ($253,500.00). Payment shall be made prior to the EDU's being provided.

4. **Complete Agreement.** This Intermunicipal Agreement constitutes the entire agreement between the Participants with respect to the matters referred to herein.

5. **Follow up Documentation.** The Participants agree to sign all of the necessary documents to effectuate the terms of this agreement. Each party shall take any steps and shall execute, acknowledge and deliver to the other party any instruments and documents that the other party may reasonably require for the purpose of implementing this Agreement and, to the extent that any documentation is reasonably required to evidence the consent of the parties in connection with the ownership of the aforementioned property, he or she shall promptly take **all** steps to give appropriate documentation.

6. **Counterparts.** This Agreement may be executed in one or more counterparts, each of which will be deemed an original but all of which together will constitute one and the same instrument. This Agreement may be executed by facsimile signatures which, upon such execution, shall, for all purposes, be deemed original signatures of the parties.

7, **Entire Agreement.** This Agreement contains the entire understanding of the parties. There are no representations, warranties, promises, or undertakings, oral or otherwise, other than those expressly set forth herein.

8. **Binding Nature.** This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, executors, administrators, successors and assigns.

9. **Applicable law.** This Agreement is entered into in the Commonwealth of Pennsylvania and shall be construed under and in accordance with the laws of the Commonwealth of Pennsylvania and this shall in no way be affected by any change in domicile of either of the parties.

10. **Drafting of Agreement.** For purposes of contract interpretation and for the purpose of resolving any ambiguity herein, the parties agree that this Agreement was prepared jointly by the parties.

11. **Authorizations.** The individuals signing below are authorized to sign on behalf of the respective municipalities and their signature hereby binding on their respective municipality.

IN WITNESS WHEREOF, and intending to be legally bound hereby, the Participants have hereto set their hands and seals as indicated below.

BOROUGH OF NORTHAMPTON

LeRoy E Brobst ____________________ 02/03/2022 ____________________
Leroy Brobst Date
Northampton Borough Manager

ALLEN TOWNSHIP

Dale N. Hassler ____________________ 1/18/2022 ____________________
Dale N. Hassler Date
Chairman Allen Township
Board of Supervisors

[Notary Page to Follow, Remainder of Page Left Intentionally Blank]

COMMONWEALTH OF PENNSYLVANIA

) SS:

COUNTY OF NORTHAMPTON

On the 10 day of February , 2022, before me, a Notary Public in and for the county and state aforesaid, the undersigned officer, personally appeared LEROY BROBST, known to me (or satisfactorily proven) to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same for the purposes therein contained, and desired the same might be recorded as such.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commonwealth of Pennsylvania - Notary Seal
Bradley James Miller, Notary Public
Northampton County
My commission expires May 19, 2023
Commission number 1190448
Member, Pennsylvania Association of Notaries

Notary Public

COMMONWEALTH OF PENNSYLVANIA

) SS:

COUNTY OF NORTHAMPTON

On the 18 day of January , 2022, before me, a Notary Public in and for the county and state aforesaid, the undersigned officer, personally appeared DALE N. HASSLER, known to me (or satisfactorily proven) to be the persons whose names are subscribed to the within instrument, and acknowledged that they executed the same for the purposes therein contained, and desired the same might be recorded as such.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Commonwealth of Pennsylvania - Notary Seal
Yohanna Vega, Notary Public
Northampton County
My commission expires April 30, 2025
Commission number 1396227
Member, Pennsylvania Association of Notaries

YVega

Notary Public (Yohanna Vega)

APPENDIX J

INTERMUNICIPAL LEGAL AGREEMENT BETWEEN NORTHAMPTON BOROUGH AND ALLEN TOWNSHIP

****

INTER-
MUNICIPAL
AGREEMENT
PAGE

****

APPENDIX K

NORTHAMPTON BOROUGH MUNICIPAL AUTHORITY WATER TREATMENT PLANT RESIDUAL WASTE STUDY

NORTHAMPTON BOROUGH MUNICIPAL AUTHORITY

NEW 8 MGD WATER TREATMENT PLANT
AND RELATED FACILITIES

DESIGN MEMORANDUM

APPENDIX D

RESIDUALS WASTE TREATMENT

A. General

Several process wastewater sidestreams will be generated at the proposed Northampton Borough Municipal Authority (NBMA) Treatment Plant from various treatment processes and operations. The primary wastewater sources generated by the water treatment processes are the clarifier sludge and filter backwash wastewater. Additional process wastewater sidestreams include sample sink and water quality analyzer drains, drainage and overflow from process basins and certain plant floor drains.

Sludge collected from the clarifiers will be pumped to the sanitary sewer. Provisions will be included in the piping to pump to onsite drying facilities as an emergency provision and for future dewatering facilities. Wastewater treatment facilities are designed and provided at the plant site for filter backwash wastewater collection, settling, solids separation and storage and discharge of supernatant to the Spring Creek. Separate wastewater systems are provided for sanitary wastes, certain plant floor drains, chemical contaminated wastes and stormwater.

B. Wastewater Treatment Process

The facilities proposed at the NBMA Treatment Plant to process wastewater include two wastewater clarification basins for the filter backwash and rinse water and a sludge holding basin for settling basin blowdown sludge. The operation of these facilities would be as follows:

1. Solids removed from the clarifier will flow by gravity to a sludge holding basin below the process clarifiers. The sludge will be pumped to the Borough of Northampton Wastewater Treatment Plant (WWTP) via some new, but primarily existing, sludge transfer line across the Lehigh River. The flow will be metered. Provisions in the piping will allow pumping sludge directly from the process clarifiers to the WWTP.

2. The filter backwash wastewater, filter to waste (rinse water), tank and basin drains, sample line drains and plant overflow will be directed to one of two wastewater clarification basins also located below the process clarifiers.

3. Intermittent tank and basin draining for maintenance will be scheduled on off-peak days.

4. The wastewater clarification basins will be operated in batch sequence. Each operating cycle includes filling, settling, sludge blowdown and discharging clarified decant water to the river. The sludge blowdown step can be deferred until adequate solids have collected at the bottom of the basin.

5. The supernatant from the wastewater clarifiers will be metered and discharged to Spring Creek by gravity. The settled sludge will be metered and pumped either to the sanitary sewer or the sludge holding basin.

6. The wastewater system will be controlled by a programmable logic controller (PLC) interfaced with the Supervisory Control and Data Acquisition (SCADA) system at the water treatment plant.

The solids generation rate is computed based on the expected raw water quality characteristics and prechemical addition.

A. Average Solids removed from treated stream, mg/l

1.	Suspended solids (1.4 x avg. turbidity of 5.1 NTU)	7.14
2.	Iron oxides (iron oxidized by chlorine)	
	(2.64 x average Fe of 0.33 mg/l)	0.87
3.	Manganese oxides (manganese oxidized by potassium permanganate)	
	(2.43 x average Mn of 0.12 mg/l)	0.29
4.	Aluminum sulfate (0.44 x avg. alum dosage of 15 mg/l)	6.60
5.	Powdered activated carbon	5.50
6.	Filter aid polymer	0.04
7.	Coagulant aid polymer	0.50
8.	Total	20.94

B. Maximum Solids removed from treated stream mg/l

1.	Suspended solids (1.4 x max turbidity of 200 NTU)	280.00
2.	Iron oxides (iron oxidized by potassium chlorine)	
	(2.64 x maximum Fe of 1.08 mg/l)	2.85
3.	Manganese oxides (manganese oxidized by potassium permanganate)	
	(2.43 x maximum Mn of 0.50 mg/l)	1.22
4.	Aluminum sulfate (0.44 x maximum dosage of 30 mg/l)	13.20
5.	Powdered activated carbon	10.00
6.	Filter aid polymer	0.15
7.	Coagulant aid polymer	1.00
8.	Total	308.42

C. Solids Production

Treated Flow (mgd)		Solids Production (lbs/day)	
		Average Solids (21 mg/l)	Maximum Solids (308 mg/l)
Minimum	3.0	525	7,706
Average	5.3	928	13,614
Maximum	8.0	1,401	20,549
Ultimate	12.0	2,102	30,825

A. Type of Waste Streams

1. Process clarifier sludge
2. Filter backwash and filter to waste (filter rinse water)
3. Sample sink and analyzer drains
4. Process unit overflows
5. Basin cleaning and drainage
6. Chemical unloading area drains
7. Plant floor drains
8. Sanitary waste
9. Stormwater

B. Sedimentation Basin and Wastewater Clarifier Sludge (Total solids)

1. Estimated solids concentration 1.0% - 2.0%
2. Estimated sludge specific weight 1.0
3. Total sludge volume, gallons per day

	Sludge Production (gpd)	
Solids Concentration	**1.0%** (1)	**2.0%** (2)
a. Minimum flow	6,290	46,199
b. Average flow	11,112	81,618
c. Maximum flow	16,773	123,197
d. Ultimate flow	25,160	184,796

(1) Sludge production based on average solids

(2) Sludge production based on maximum solids production

4. Estimated solids removal in sedimentation basins 90%

5. Sludge from sedimentation basin blow down

	Sludge Production (gpd)	
Solids Concentration	**1.0% (1)**	**2.0% (2)**
a Minimum	5,661	41,579
b. Average	10,001	73,456
c. Maximum	15,096	110,877
d. Ultimate	22,644	166,316

(1) Sludge production based on average solids

(2) Sludge production based on maximum solids production

6. Estimated solids removal in filters 10%

7. Sludge from wastewater clarifiers

	Sludge Production (gpd)	
Solids Concentration	**1.0% (1)**	**2.0% (2)**
a. Minimum	629	4,620
a. Average	1,111	8,162
b. Maximum	1,677	12,320
d. Ultimate	2,516	18,480

(1) Sludge production based on average solids

(2) Sludge production based on maximum solids production

C. Filter Backwash and Filter Rinse Water - Discharged to Wastewater Clarifiers

1. Number of filters 4
2. Filter area - each, sf 468
3. Minimum filter run length, hours 24
4. Average filter run length, hours 48
5. Maximum filter run length, hours 72
6. Washwater flow per average filter wash and filter to waste

	Flow (gpm/sf)	Time (min)	Volume (gal)

a. Low wash	6	5	14,404
b. High wash	20	8	74,880
c. Low wash	6	5	14,404
d. Filter to waste (1)	4	27	50,544
Total		45	153,504

(1) Approximately one filter volume

7. Number of washes per day at 8 mgd with 4 filters
    a. Minimum 1.3
    b. Average 2.0
    c. Maximum 4.0
8. Washwater and rinse water volume, gpd
    a. Minimum 199,555
    b. Average 307,008
    c. Maximum 614,016
9. Solids concentration in backwash, mg/l
    a. Average flow/ Average solids 36.2
    b. Average flow/ Max solids 532
    c. Maximum flow/ Maximum solids 402

D. Sample Sink and Analyzers - Discharged to Wastewater Clarifier assuming sample sinks operated 4 hours per day

1. Total estimated flow, gpd 5,000

E. Plant Overflow - Discharged to Wastewater Clarifier

1. Maximum flow rate, 8 mgd, 10+/- min 56,000

F. Basin Drainage and Cleaning

Assume clean and drain each basin once per year

1. Flocculation Basin Volume, gal 50,000
2. Clarifier Basin Volume, gal 54,800

NOTE: Each cleaning will drain one train of Flocculation/sedimentation basin unit and discharge 104,800 gallons to waste.

G. Plant Floor Drains

1. Sources

a. Cleaning and flushing of chemical storage or feed area floors - discharged to sanitary waste system via sump pumps.

b. Chemical tank overflow and spills - discharged to chemical spill containment.

c. Operations and administrative areas - discharged to sanitary waste system.

d. Process pipe gallery - discharged to process wastewater system.

e. Pump lubrication water - discharged to process wastewater system.

2. Average estimated daily flow to process wastewater system, gpd 100

3. Maximum estimated daily flow to process wastewater system, gpd 1,000

H. Chemical Unloading Area Drain

Stormwater - discharged to stormwater catchment through a bypass.

Chemical Spills - discharged to chemical spill containment.

I. Sanitary Waste - Discharged to sanitary waste system.

1. Average, 5 persons @ 60 gallons 300

2. Maximum, 10 persons @ 60 gallons 600

J. Stormwater - Separate system.

K. Total Wastewater Volumes, gpd.

Items	Avg	Max	Ultimate
1. Wastewater directed to wastewater clarifiers			
a. Filter backwash and filter to waste water	307,000	614,000	921,000
b. Sample sink and analyzers	5,000	5,000	5,000
d. Basin cleaning and drainage[1]	----	104,800	104,800
Subtotal	312,000	723,800	1,030,800
2. Process wastewater directed to sanitary system			
a. Clarifier sludge	11,100	123,200	185,000
b. Plant floor drains	100	1,000	1,000
c. Sanitary waste (after holding basin)	300	600	600
Subtotal	11,500	124,800	186,600
3. Process wastewater directed to spill containment basin			
a. Chemical tank overflow	----	100	100
b. Unloading area drain	----	4,000	4,000
Subtotal	----	4,100	4,100
4. On site overflow holding basin			
a. Plant overflow	----	56,000	56,000
Subtotal		56,000	56,000

(1) Flocculator/sedimentation basin would not be drained during maximum wastewater flow event.

		Design	Ultimate
A.	Average dried solids production		
	1. Solids generated per day, lbs/day	930	1,400
	2. Solids generated per year, lbs/year	339,500	511,000
B.	Sludge volume, ft^3/year		
	1. 1.0% solids	544,000	819,000
	2. 2.0% solids	272,000	409,500

The wastewater treatment facilities designed for the NBMA Water Treatment Plant include two wastewater clarification basins and one sludge holding basin. The wastewater clarifiers are designed based on the maximum wastewater generation rate tabulated in the previous section. The sludge holding basin is provided to collect, store and equalize the clarifier sludge flow prior to discharging to the sanitary sewer.

A. Wastewater Clarifiers

1. Design Considerations

   a. Two clarifiers designed to treat filter backwash wastewater, tank and basin drains and sample line drains. Provisions are included to discharge the filter to waste directly to river or to basin.

   b. Each clarifier sized to store one filter backwash and rinse plus solids.

   c. Basins designed as fill, settle, draw, and decant batch clarifiers. Decant is discharged to Spring Creek by gravity at a controlled rate.

   d. Settled sludge pumped to the sanitary sewer or sludge holding basin.

   e. The system is designed to allow filter wastewater to be conveyed to the wastewater clarifiers or the sludge holding basin.

   f. Two wastewater clarifiers will be operated in batch mode. Each operation will consist of 4 stages:

      1) Fill tank

      2) Settle suspended solids

      3) Pump sludge to sewer or holding basin (optional each cycle)

      4) Discharge decanted supernatatant

2. Wastewater clarifiers

a. Type — Rectangular tankage below process basins

b. Influent volume including filter to waste, gallons — 155,000

c. Influent volume without filter to waste, gallons — 103,000

d. Basin volume, gallons — 180,700

e. Dimensions, feet

1) Length — 72.8

2) Width — 24.0

3) Water depth — 13.8 +/-

f. Discharge flow rate, mgd — 2.67

g. Decant Equipment

1) Number valves, each basin — 2

2) Diameter, inches — 6

3) Type — Butterfly

4) Discharge pipe size, inch — 6

5) Provide decant lines at two elevations

h. Sludge removal equipment

1) Type — Siphon type, cable driven dual header

2) Number per basin — 2

3) Discharge rate, gpm (Verify with manufacturers) — 250

4) Blowdown valves, type — plug

i. Operating time periods, minutes

1) Fill including rinse — 50 +/-

2) Settling period — 60

3) Decant period at 2.67 mgd — 84

4) Sludge removal at 5 fpm speed — 15

5) Operations notes:

a. Decant can commence prior to completion of settling period as clarified water descends below first decant takeoff

b. Sludge removal is not required after each wash

j. Instrumentation

1) Ultrasonic level sensor

B. Sludge Holding Basin

1. Design considerations
    a. The sludge handling system shall be designed to hold maximum daily flow from the sedimentation basins.
    b. The system is designed to allow sludge to be conveyed to the wastewater clarifiers or the sludge holding basin.
    c. Sludge transfer pumps will discharge the solids to the sewer system. These pumps will also serve the wastewater clarifier's sludge blow down.
    d. Bypass piping will be provided to allow sludge to be pumped directly from the sedimentation basins to the sewer system
2. Sludge Holding Basin
    a. Type — Rectangular tankage below process basins
    b. Influent flow, sludge

	Sludge Production (gpd)	
Solids Concentration	**1.0%** (1)	**2.0%** (2)
a. Minimum flow	6,290	46,199
b. Average flow	11,112	81,618
c. Maximum flow	16,773	123,197
d. Ultimate flow	25,160	184,796

    c. Basin volume, gallons — 180,700
    d. Dimensions, feet
        1) Length — 72.8
        2) Width — 24.03
        3) Depth — 13.8 +/-
    e. Discharge flow rate, mgd — 2.67
    f. Decant Equipment
        1) Number valves, each basin — 2
        2) Diameter, inches — 6
        3) Type — Butterfly
        4) Discharge pipe size, inch — 6
        5) Provide decant lines at two elevations
    g. Sludge removal equipment

1)	Type	Siphon type, cable driven header lateral
2)	Number per basin	2
3)	Discharge rate, gpm (Verify with manufacturers)	250
4)	Blowdown valves, type	plug

3. Sludge transfer pumps

a.	Number of pumps	3
b.	Type	Non clog centrifugal sewage pump
c.	Pump capacity (each), gpm	250

4. Instrumentation

   a. Ultrasonic level sensor

APPENDIX L

NORTHAMPTON BOROUGH
ON-LOT DISPOSAL SYSTEM AREAS
MAPPING INFORMATION

75°30'W 40°41'21.62"N

75°28'7.08"W 40°39'15.94"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **6/10/2021 1:56 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NGVD29, NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

N

Meters 0 50 100 200 300 400

Figure L-1: FEMA FIRM Map of Northampton Borough

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTHAMPTON COUNTY, PENNSYLVANIA
ALL JURISDICTIONS

PANEL **236** OF **355**

Panel Contains:

COMMUNITY	NUMBER	PANEL
BOROUGH OF CATASAUQUA	420586	0236
TOWNSHIP OF WHITEHALL	420595	0236
TOWNSHIP OF ALLEN	421928	0236
BOROUGH OF COPLAY	421807	0236
BOROUGH OF NORTH CATASAUQUA	420727	0236
BOROUGH OF NORTHAMPTON	420726	0236

MAP NUMBER
42095C0236E
EFFECTIVE DATE
July 16, 2014

Figure L-2: FEMA FIRM Map of OLDS Area 1 (North)

Figure L-3: FEMA FIRM Map of OLDS Area 1 (South)

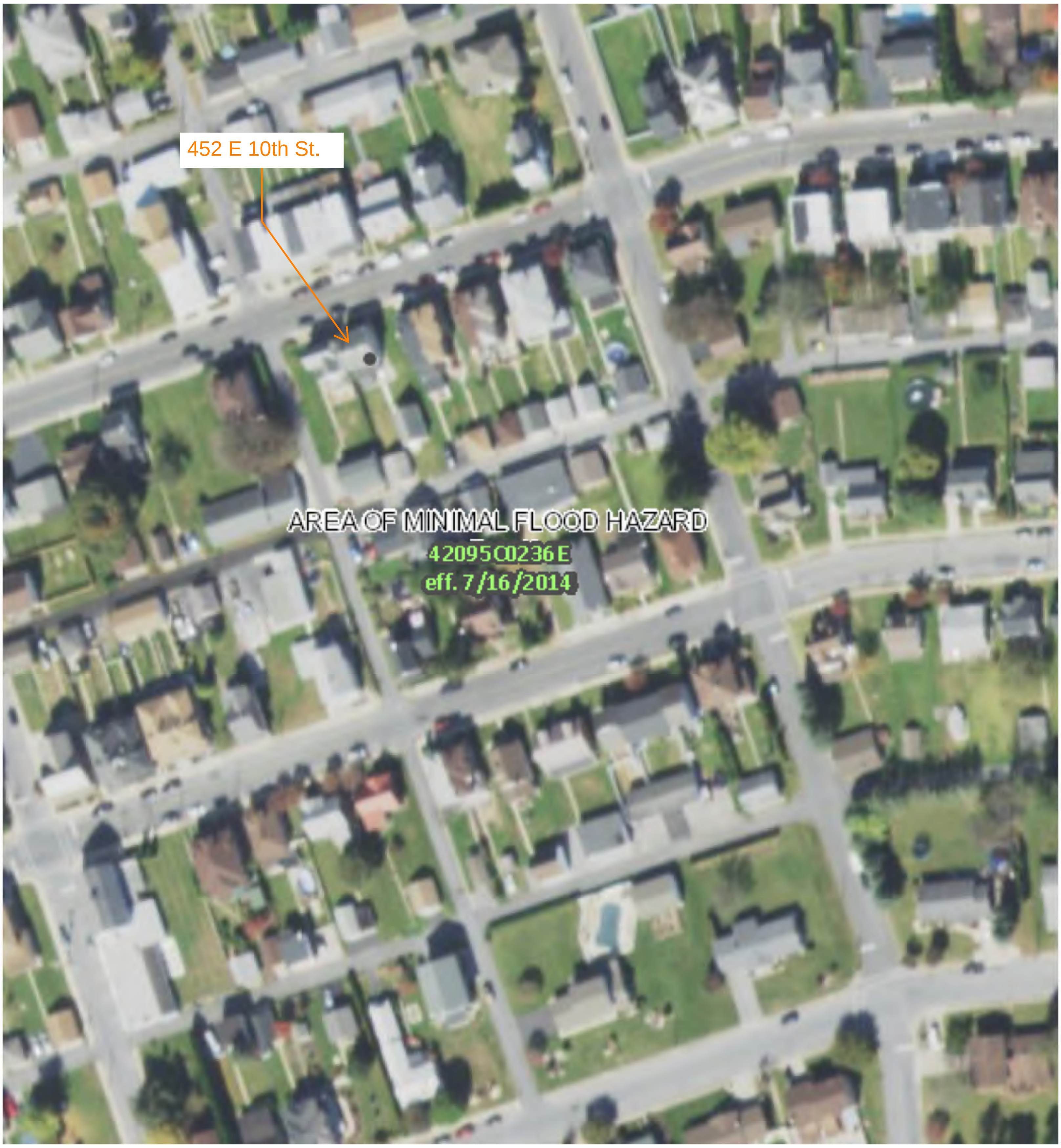


Figure L-4: FEMA FIRM Map of OLDS Area 2

Figure L-5: FEMA FIRM Map of OLDS Area 3

Figure L-6: FEMA FIRM Map of OLDS Area 4

Figure L-7: FEMA FIRM Map of OLDS Area 5

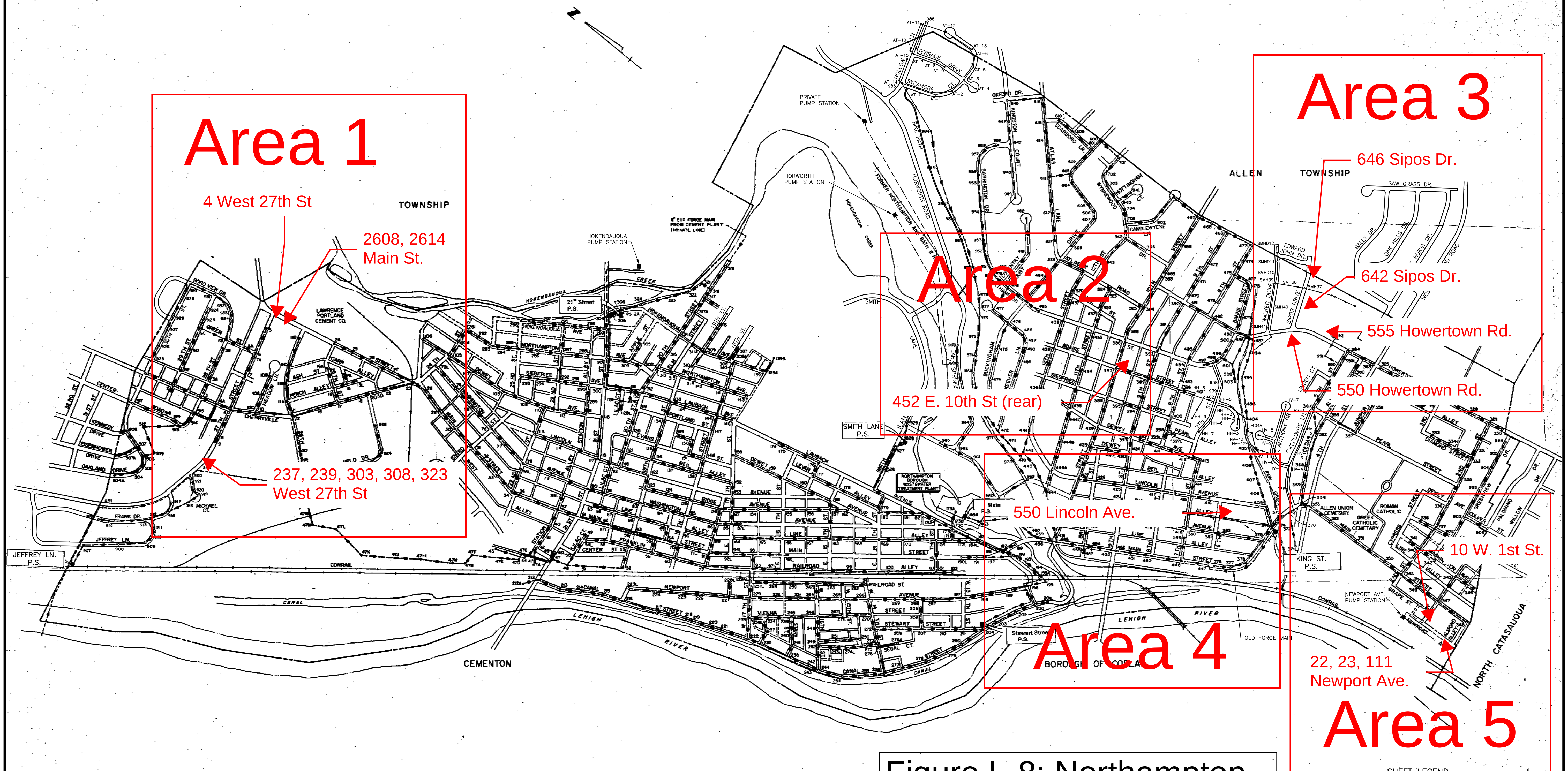


Figure L-8: Northampton Borough Overall On-Lot System Map

SITE PLAN

SCALE: 1" = 500'

SHEET LEGEND

- EXISTING INFORMATION
- REVISED INFORMATION
- FORCE MAIN
- SANITARY SEWER (8" PVC UNLESS OTHERWISE NOTED)

FILE: W:\W&WW ERD\50670 BOROUGH OF NORTHAMPTON\PROJECT DELIVERABLES\201007 - MISC ASSIST\SEWER INDEX MAP.DWG
DATE: 05/15/2012 TIME: 1:23:56 pm
NETWORK PATH W:\W&WW ERD\50670 Borough of Northampton\Project Deliverables\201007-Misc Assist

No.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
X.X.X.	D.R.F.	AS NOTED
CHECKED	APPROVED	APPROVED
X.X.X.	X.X.X.	X.X.X.

Gannett Fleming
HARRISBURG, PENNSYLVANIA

BOROUGH OF NORTHAMPTON
NORTHAMPTON COUNTY, PENNSYLVANIA

SEWER SYSTEM INDEX MAP

JOB No. 50670
DATE MARCH 2011
SHEET No. 1

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
16	40.700748, -75.506442	~20 ft	~60 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed North towards West 27th St. to connect into a gravity line extension to the sewer main located in Michael Court. (OLDS Area 1)

SOIL TYPE:
BkB- Berks-Weikert complex, 3 to 8 percent slopes
BkC- Berks-Weikert complex, 8 to 15 percent slopes
BkF- Berks-Weikert complex, 25 to 60 percent slopes
UusB- Urban land-Udorthents, shale and sandstone complex, 0 to 8 percent slopes

REVISION DATE

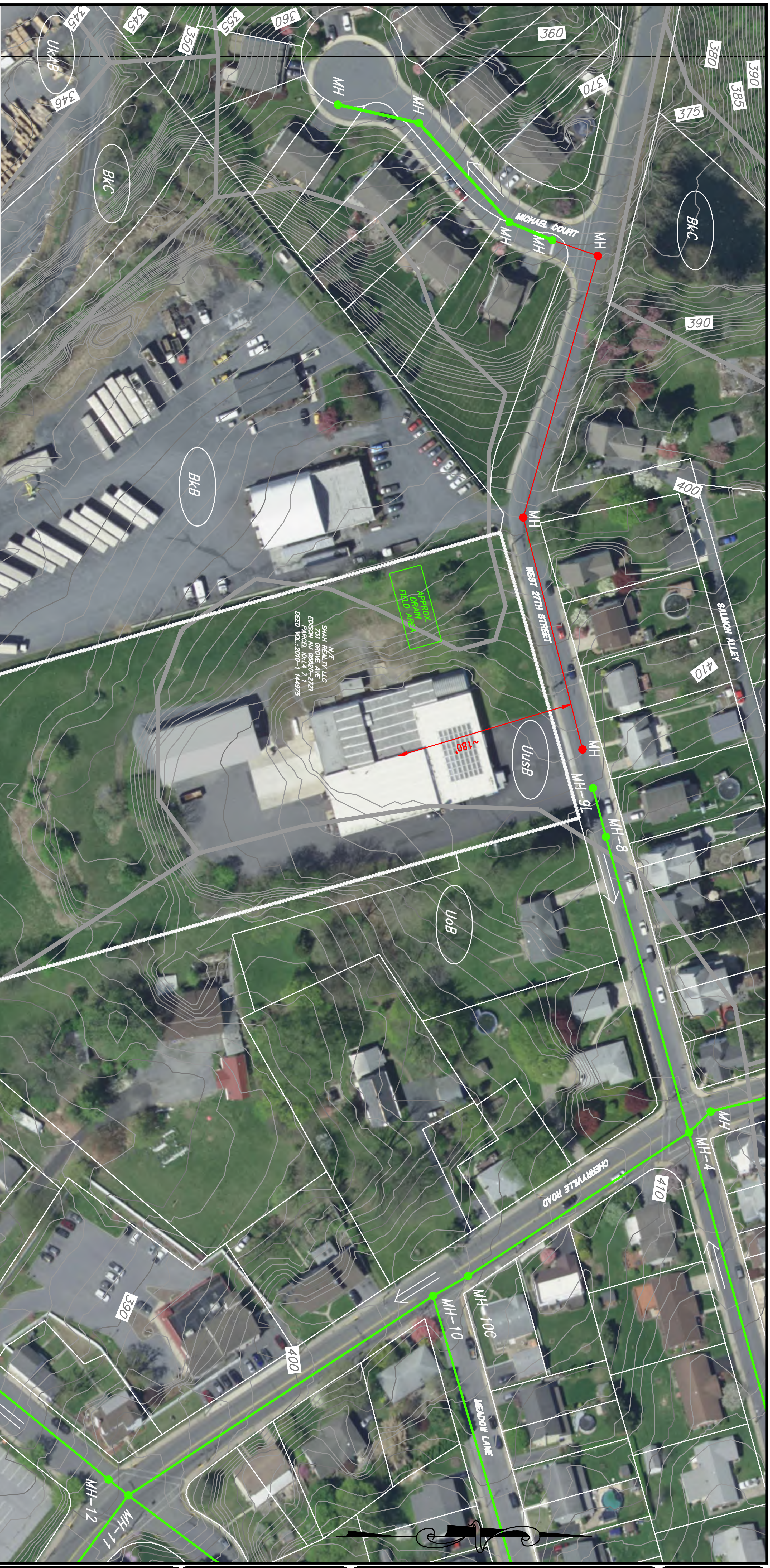
LEHIGH ENGINEERING ASSOCIATES, INC.
499 RIVERVIEW DRIVE, P.O. BOX 68
WALNUTPORT, PA 18088
610 767 8545 FAX 610 767 5798

LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-9: 323 W 27th St

DATE: 11/11/21
SCALE : 1 =60'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1



Northampton Borough On-Lot Sewage Systems

No.	Coordinates	Distance to nearest Main	Distance to Connect	On-Lot Well?	Notes
17	40.700518, -75.505884	~20 ft	~180 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed North towards West 27th St. to connect into a gravity line extenstion to the sewer main located in Michael Court. (OLD Area 1)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
BkB– Berks–Weikert complex, 3 to 8 percent slopes
BkC– Berks–Weikert complex, 8 to 15 percent slopes
UusB– Urban land–Udorthents, shale and sandstone complex, 0 to 8 percent slopes
UkaB– Urban land, 0 to 8 percent slopes

SHEET 1 of 1

DATE: 11/10/21
SCALE: 1"=100'
DWN BY: DBL
JOB: 6745

Figure L-10: 308 W 27th St

LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

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Walnutport, PA 18088
610 767 8545 Fax 610 767 5798

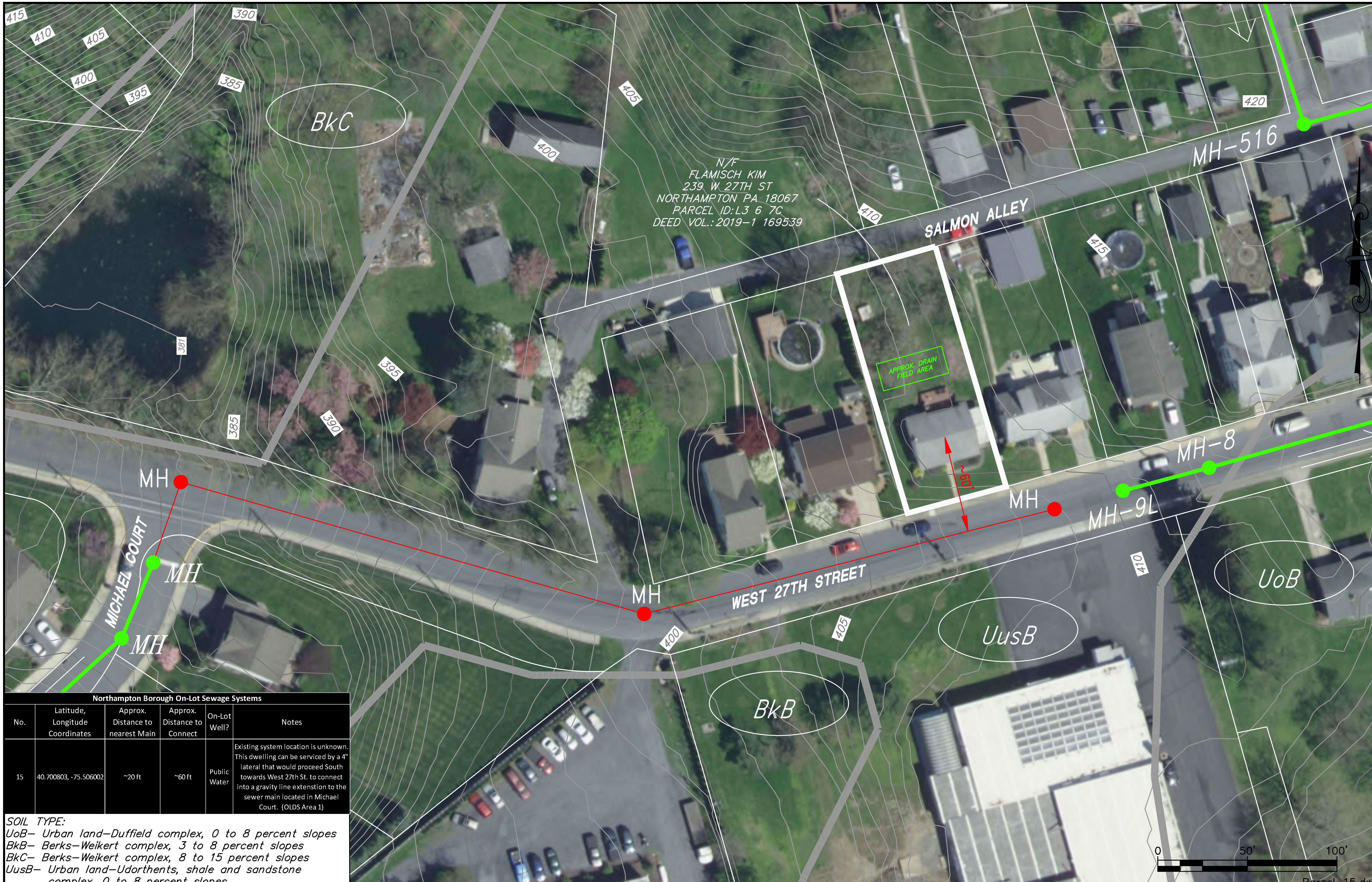
REVISION	DATE

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
16	40.700748, -75.506442	~20ft	~60ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed North towards West 27th St. to connect into a gravity line extenstion to the sewer main located in Michael Court. (OLDS Area 1)

SOIL TYPE:
UoB–Urban land–Duffield complex, 0 to 8 percent slopes
BkB–Berks–Weikert complex, 3 to 8 percent slopes
BkC–Berks–Weikert complex, 8 to 15 percent slopes
UusB–Urban land–Udorthents, shale and sandstone complex, 0 to 8 percent slopes

SHEET	DATE / SCALE / JOB		LOCATED IN:		REVISION DATE
1 of 1	DATE: 11/1/21 SCALE: 1"=50' DWN BY: DBL JOB: 6745	Figure L-11: 303 W 27th St	BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	**LEHIGH ENGINEERING ASSOCIATES, INC.** 499 Riverview Drive, P.O. Box 68 Walnutport, PA 18088 610 767 8545 Fax 610 767 5798	



Northampton Borough On-Lot Sewage Systems					
No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
15	40.700803, -75.506002	~20 ft	~60 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed South towards West 27th St. to connect into a gravity line extenstion to the sewer main located in Michael Court. (OLDS Area 1)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
BkB– Berks–Weikert complex, 3 to 8 percent slopes
BkC– Berks–Weikert complex, 8 to 15 percent slopes
UusB– Urban land–Udorthents, shale and sandstone complex, 0 to 8 percent slopes

REVISION DATE

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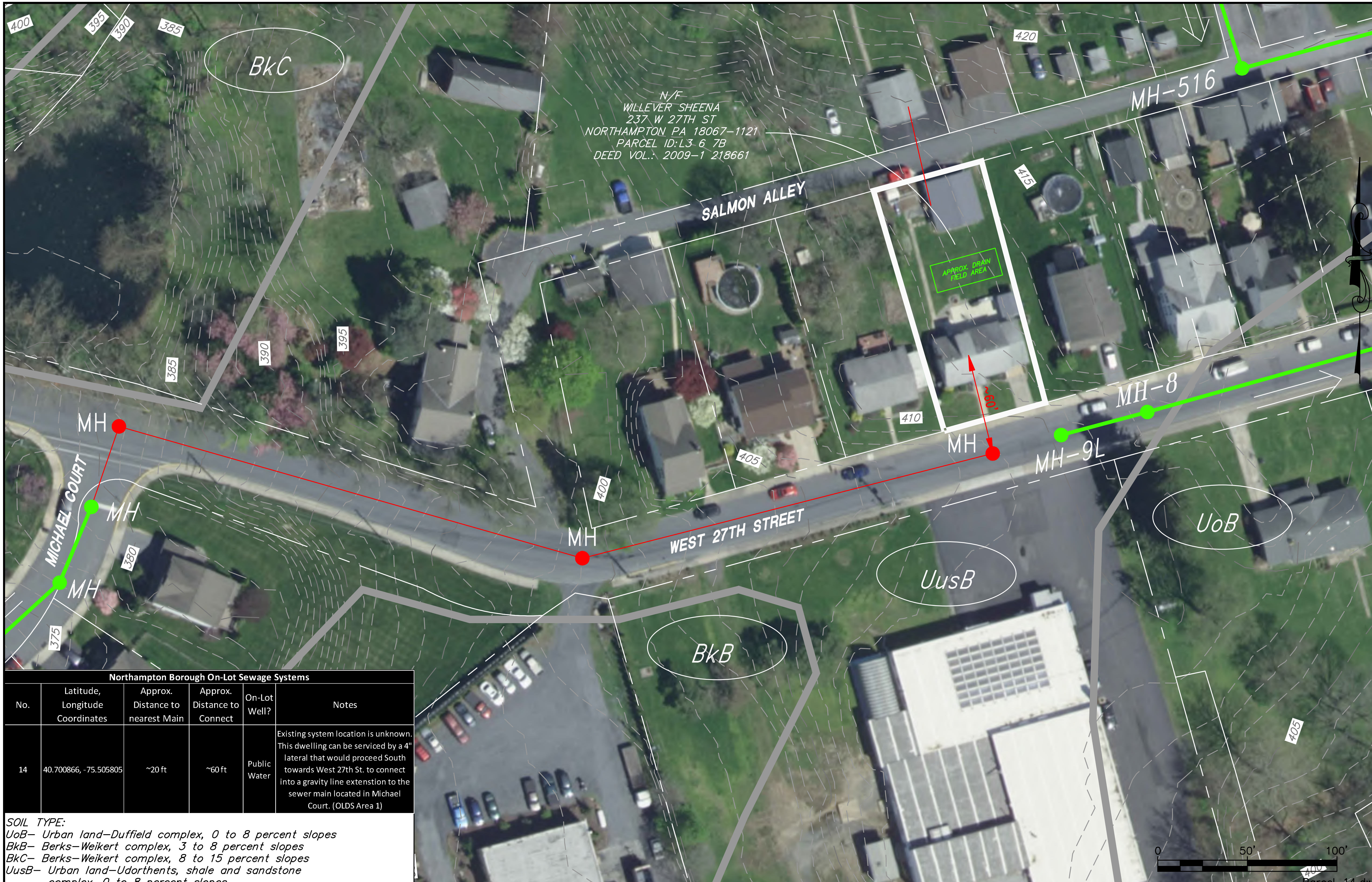
LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-12: 239 W 27th St

DATE: 11/11/21
SCALE : 1 =50'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1



Northampton Borough On-Lot Sewage Systems					
No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
14	40.700866, -75.505805	~20 ft	~60 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed South towards West 27th St. to connect into a gravity line extension to the sewer main located in Michael Court. (OLDS Area 1)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
BkB– Berks–Weikert complex, 3 to 8 percent slopes
BkC– Berks–Weikert complex, 8 to 15 percent slopes
UusB– Urban land–Udorthents, shale and sandstone complex, 0 to 8 percent slopes

REVISION DATE

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LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-13: 237 W 27th St

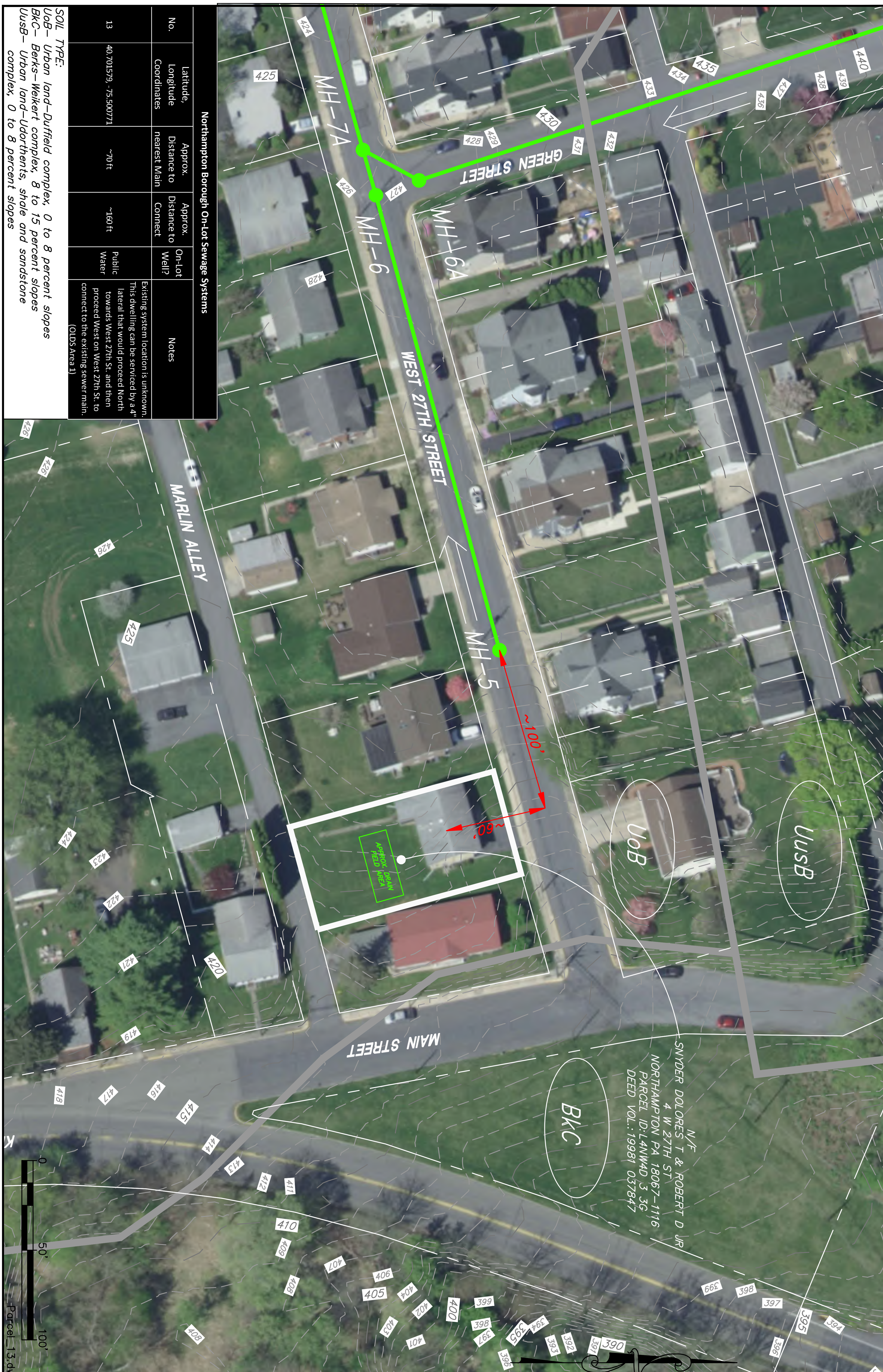
DATE: 11/11/21
SCALE : 1"=50'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
13	40.701579, -75.500771	~70ft	~160 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed North towards West 27th St. and then proceed West on West 27th St. to connect to the existing sewer main. (OLDS Area 1)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
BkC– Berks–Weikert complex, 8 to 15 percent slopes
UusB– Urban land–Udorthents, shale and sandstone complex, 0 to 8 percent slopes



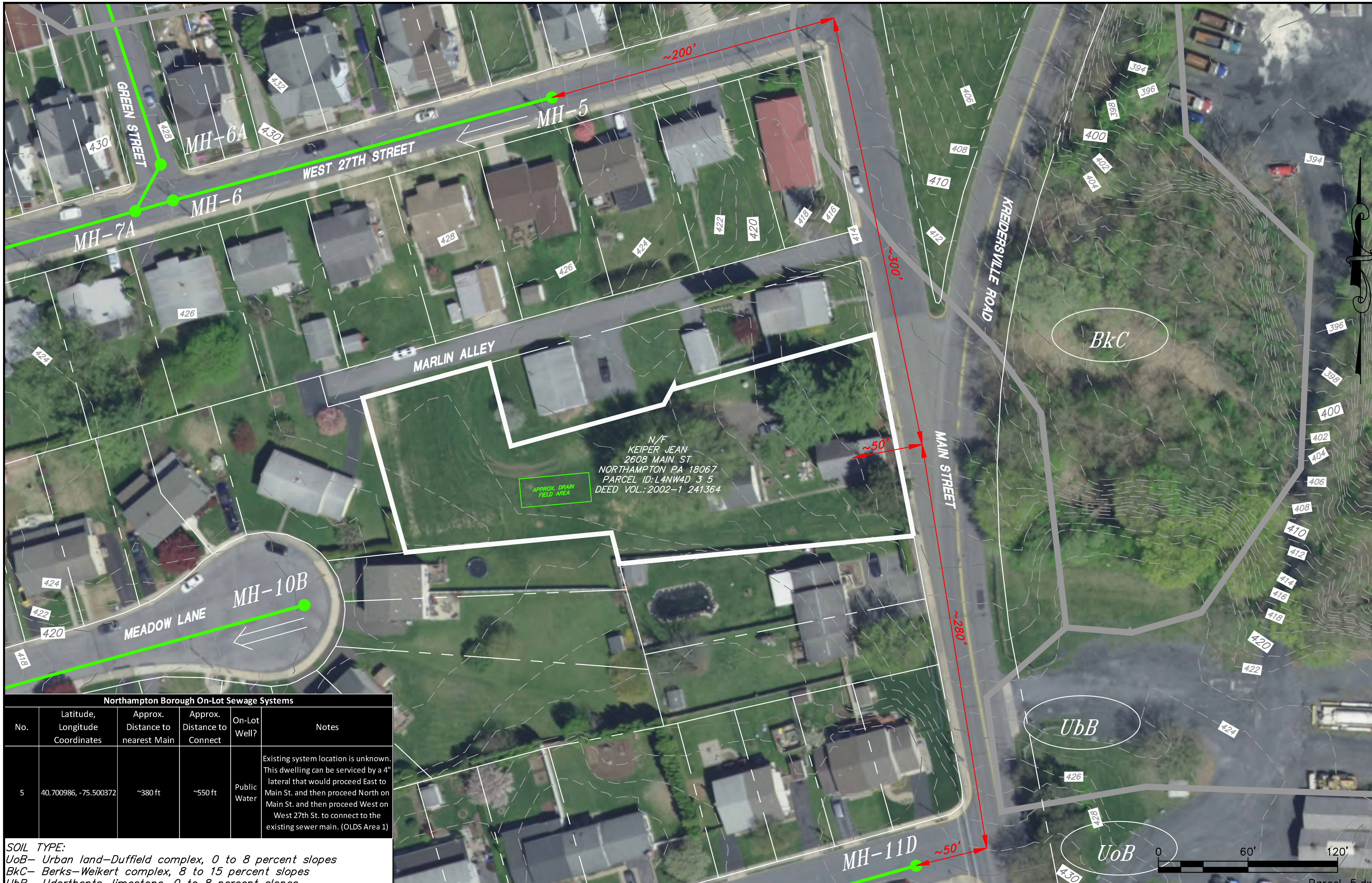
SHEET 1 of 1	DATE: 11/11/21 SCALE: 1"=50' DWN BY: DBL JOB: 6745	Figure L-14: 4 W 27th St	LOCATED IN: BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	LEHIGH ENGINEERING ASSOCIATES, INC. 499 Riverview Drive, P.O. Box 68 Walnutport, PA 18088 610 767 8545 Fax 610 767 5798	REVISION DATE

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
6	40.701239, -75.500522	~390 ft	~450 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed East to Main St. and then proceed North on Main St. and then proceed West on West 27th St. to connect to the existing sewer main. (OLDS Area 1)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
BkC– Berks–Weikert complex, 8 to 15 percent slopes
UusB–Urban land–Udorthents, shale and sandstone complex, 0 to 8 percent slopes

SHEET 1 of 1	DATE: 11/1/21 SCALE: 1"=60' DWN BY: DBL JOB: 6745	Figure L-15: 2608 Main St	LOCATED IN: BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	LEHIGH ENGINEERING ASSOCIATES, INC. 499 Riverview Drive, P.O. Box 68 Walnutport, PA 18088 610 767 8545 Fax 610 767 5798	REVISION DATE



Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
5	40.700986, -75.500372	~380 ft	~550 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed East to Main St. and then proceed North on Main St. and then proceed West on West 27th St. to connect to the existing sewer main. (OLDS Area 1)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
BkC– Berks–Weikert complex, 8 to 15 percent slopes
UbB– Udorthents, limestone, 0 to 8 percent slopes

REVISION DATE

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Walnutport, PA 18088
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LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-16:
2614 Main St

DATE: 11/11/21
SCALE : 1 =60'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
1	40.679971, -75.480855	~40 ft	~160 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed South to Bridge Alley and then proceed West to the sewer main Located in Adaire. (OLDS Area 2)

SOIL TYPE: UoB–Urban land–Duffield complex, 0 to 8 percent slopes

SHEET 1 of 1	DATE: 11/1/21 SCALE: 1"=50' DWN BY: DBL JOB: 6745	Figure L-17: 452 E 10th St	LOCATED IN: BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	LEHIGH ENGINEERING ASSOCIATES, INC. 499 Riverview Drive, P.O. Box 68 Walnutport, PA 18088 610 767 8545 Fax 610 767 5798	REVISION DATE

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
11	40.677220, -75.474443	~20 ft	~70 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed Northwest to Sipos Drive to an existing sewer main. (OLDS Area 3)

SOIL TYPE:
UbB– Udorthents, limestone, 0 to 8 percent slopes
UkaB– Urban land, 0 to 8 percent slopes
UudB– Urban land–Udorthents, limestone complex, 0 to 8 percent slopes
WaB– Washington silt loam, 3 to 8 percent slopes

REVISION DATE

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LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-18: 646 Sipos Dr

DATE: 11/11/21
SCALE : 1 =50'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Distance to nearest Main	Distance to Connect	On-Lot Well?	Notes
10	40.67702, -75.475069	~20 ft	~90ft	Well	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed Northwest to Sipos Drive to an existing sewer main. (OLDS Area 3)

SOIL TYPE:
UbB– Udorthents, limestone, 0 to 8 percent slopes
UkaB– Urban land, 0 to 8 percent slopes
UudB– Urban land–Udorthents, limestone complex, 0 to 8 percent slopes
WaB– Washington silt loam, 3 to 8 percent slopes
WaC– Washington silt loam, 8 to 15 percent slopes

REVISION DATE

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Walnutport, PA 18088
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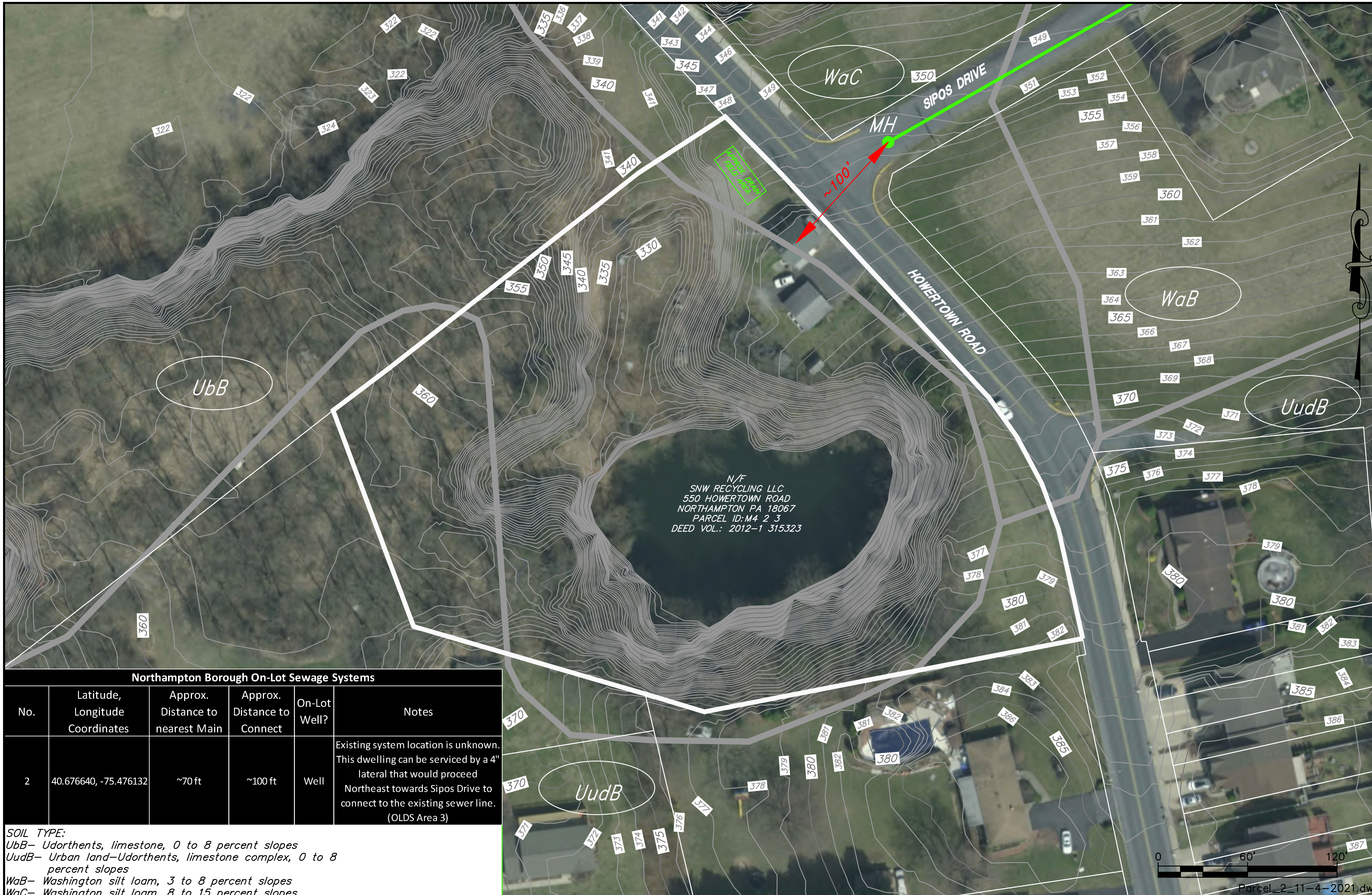
LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-19: 642 Sipos Dr

DATE: 11/11/21
SCALE : 1 =50'
DWN BY: DBL
JOB: 6745

SHEET 1 of 1



Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
2	40.676640, -75.476132	~70 ft	~100 ft	Well	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed Northeast towards Sipos Drive to connect to the existing sewer line. (OLDS Area 3)

SOIL TYPE:
UbB– Udorthents, limestone, 0 to 8 percent slopes
UudB– Urban land–Udorthents, limestone complex, 0 to 8 percent slopes
WaB– Washington silt loam, 3 to 8 percent slopes
WaC– Washington silt loam, 8 to 15 percent slopes

REVISION DATE

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Walnutport, PA 18088
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LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-20: 550 Howertown Rd

DATE: 11/11/21
SCALE : 1 =60'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
3	40.676037, -75.475206	~360 ft	~430 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed East onto Howertown Road, then north/ Northwest along Howertown road to Sipos Drive to existing sewer lines. (OLDS Area 3)

SOIL TYPE:
UbB– Udorthents, limestone, 0 to 8 percent slopes
UdB– Urban land–Udorthents, limestone complex, 0 to 8 percent slopes
WaB– Washington silt loam, 3 to 8 percent slopes
WaC– Washington silt loam, 8 to 15 percent slopes

SHEET 1 of 1	DATE: 11/1/21 SCALE: 1"=50' DWN BY: DBL JOB: 6745	Figure L-21: 555 Howertown Rd	LOCATED IN: BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	LEHIGH ENGINEERING ASSOCIATES, INC. 499 RIVERVIEW DRIVE, P.O. BOX 68 WALNUTPORT, PA 18088 610 767 8545 FAX 610 767 5798	REVISION DATE

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
4	40.674578, -75.483122	~30 ft	~90 ft	Public Water	There is a 4" PVC access that runs through the grass section between the road sections of Lincoln Ave. thisproperty can be serviced by a 4" lateral that would proceed Northeast to the current connection. (OLDS Area 4)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
WaC– Washington silt loam, 8 to 15 percent slopes
Ho– Holly silt loam

SHEET 1 of 1	DATE: 11/1/21 SCALE: 1"=50' DWN BY: DBL JOB: 6745	Figure L-22: 550 Lincoln Ave	LOCATED IN: BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	LEHIGH ENGINEERING ASSOCIATES, INC. 499 Riverview Drive, P.O. Box 68 Walnutport, PA 18088 610 767 8545 Fax 610 767 5798	REVISION DATE

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
12	40.667950, -75.481840	~200 ft	~320 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed North to West 1st Street and then proceed East along West 1st Street to the sewer main located in the Main Street interesection. (OLDS Area 5)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
UpD– Urban land–Gladstone complex, 8 to 25 percent slopes

SHEET 1 of 1

DATE: 11/1/21
SCALE: 1"=50'
DWN BY: DBL
JOB: 6745

Figure L-23: 10 W 1st St

LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

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REVISION DATE

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
7	40.667802, -75.482101	~400-ft	~460-ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed East to Newport Ave and then proceed North along Newport Ave and then proceed East on West 1st St. to the existing sewer main. Individual dwelling grinder pump will be required. (OLDS Area 5)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
UpD– Urban land–Gladstone complex, 8 to 25 percent slopes

REVISION DATE

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LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-24: 22 Newport Ave

DATE: 11/11/21
SCALE : 1 =50'
DWN BY: DBL
JOB: 6745

SHEET 1 of 1

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
8	40.667384, -75.481615	~200 ft	~250 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed South to Almond Street and then proceed East along Almond Street to the existing sewer main in Main Street. Individual dwelling grinder pump will be required. (OLDS Area 5)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
UpD– Urban land–Gladstone complex, 8 to 25 percent slopes

SHEET					REVISION DATE
1 of 1	DATE: 11/1/21 SCALE: 1"=50' DWN BY: DBL JOB: 6745	Figure L-25: 23 Newport Ave	LOCATED IN: BOROUGH OF NORTHAMPTON COUNTY OF NORTHAMPTON COMMONWEALTH OF PENNSYLVANIA	LEHIGH ENGINEERING ASSOCIATES, INC. 499 Riverview Drive, P.O. Box 68 Walnutport, PA 18088 610 767 8545 Fax 610 767 5798	

Northampton Borough On-Lot Sewage Systems

No.	Latitude, Longitude Coordinates	Approx. Distance to nearest Main	Approx. Distance to Connect	On-Lot Well?	Notes
9	40.668778, -75.481848	~300 ft	~520 ft	Public Water	Existing system location is unknown. This dwelling can be serviced by a 4" lateral that would proceed East to North Grape Street and then proceed South along North Grape Street to West 1st Street and the proceed East to the existing sewer main in Main Street. Individual dwelling grinder pump will be required. (OLDS Area 5)

SOIL TYPE:
UoB– Urban land–Duffield complex, 0 to 8 percent slopes
WaB– Washington silt loam, 3 to 8 percent slopes
WaC– Washington silt loam, 8 to 15 percent slopes
UpD– Urban land–Gladstone complex, 8 to 25 percent slopes

REVISION DATE

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LOCATED IN:
BOROUGH OF NORTHAMPTON
COUNTY OF NORTHAMPTON
COMMONWEALTH OF PENNSYLVANIA

Figure L-26: 111 Newport Ave

DATE: 11/11/21
SCALE : 1 =50'
DWN BY: DBL
JOB: 6745

SHEET
1 of 1

APPENDIX M

NORTHAMPTON BOROUGH PENNSYLVANIA NATURAL DIVERSITY INVENTORY RESULTS AND DOCUMENTATION

1. PROJECT INFORMATION

Project Name: **Northampton Borough Act 537**
Date of Review: **2/16/2022 08:11:58 AM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **6.22 acres**
County(s): **Northampton**
Township/Municipality(s): **NORTHAMPTON**
ZIP Code:
Quadrangle Name(s): **CATASAUQUA**
Watersheds HUC 8: **Lehigh**
Watersheds HUC 12: **Hokendauqua Creek**
Decimal Degrees: **40.681084, -75.489421**
Degrees Minutes Seconds: **40° 40' 51.9033" N, 75° 29' 21.9138" W**

2. SEARCH RESULTS

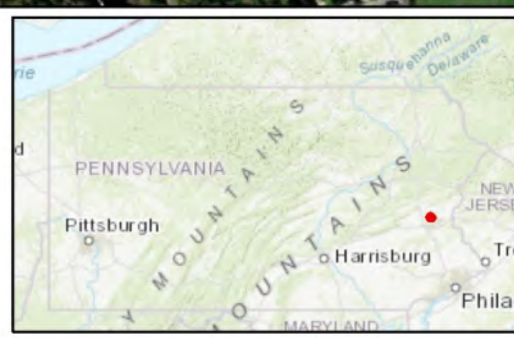
Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Northampton Borough Act 537

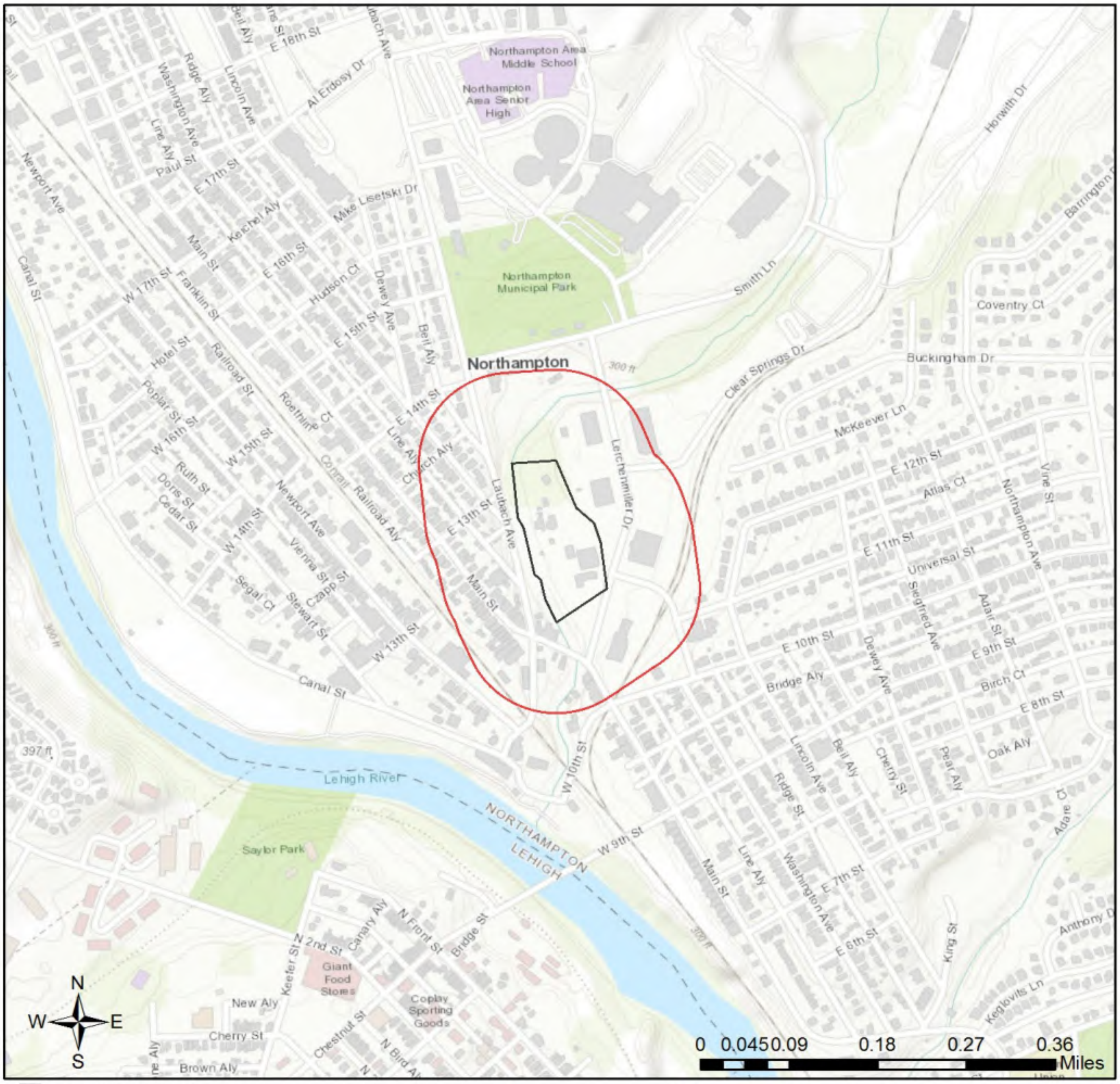
Project Boundary

Buffered Project Boundary



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Northampton Borough Act 537



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: The project area (or land parcel) has not been investigated by someone qualified to identify and delineate wetlands, or it is currently unknown if the project or project activities will affect wetlands.

Q2: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats?
Your answer is: Yes

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission
RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service
RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email the following information to the agency(s) (see AGENCY CONTACT INFORMATION). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies (but not USFWS).
*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Thomas J Duffy
Company/Business Name: Gilmore & Associates, Inc.
Address: 5100 W. Tilghman St. Suite 150
City, State, Zip: Allentown, PA 18104
Phone:(610) 366-8064 Fax:(610) 366-0433
Email: tduffy@gilmore-assoc.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

Thomas J Duffy 02 - 16 - 2022
applicant/project proponent signature date

Division of Environmental Services
Natural Diversity Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823
814-359-5237

February 28, 2022

IN REPLY REFER TO
SIR# 55751

Gilmore & Associates, Inc.
Thomas Duffy
5100 Tilghman Street
Allentown , Pennsylvania 18104

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 751276_1
Northampton Borough Act 537
NORTHAMPTON County: Northampton Borough

Dear Thomas Duffy:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Kathy Gipe at 814-359-5186 and refer to the SIR # 55751. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Christopher A. Urban

Christopher A. Urban, Chief
Natural Diversity Section

CAU/KDG/dn

APPENDIX N

NORTHAMPTON BOROUGH PENNSYLVANIA MUSEUM AND HISTORICAL COMMISSION RESULTS AND DOCUMENTATION

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

January 28, 2022

Kevin Beyer
Gilmore & Associates
5100 Tilghman St
Suite 150
Allentown PA 181040000

RE: ER Project # 2022PR00376.001, Northampton Borough Act 537 Plan , Department of Environmental Protection, Northampton Borough, Northampton County

Dear Kevin Beyer:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Above Ground Resources
No Above Ground Concerns - Environmental Review - No Effect - Above Ground

Based on the information received and available within our files, it is our opinion that the proposed project will have No Effect on above ground historic properties, including historic buildings, districts, structures, and/or objects, should they exist. Should the scope of the project change and/or should you be made aware of historic property concerns, you will need to reinitiate consultation with our office using PA-SHARE.

For questions concerning above ground resources, please contact Sara-Ladd Clark at saralclark@pa.gov.

Archaeological Resources
No Archaeological Concerns - Environmental Review - No Effect - Archaeological

Based on the information received and available in our files, in our opinion, the proposed project should have No Effect on archaeological resources. Our analysis indicates that archaeological resources are potentially located in this project area. Should the scope of the project be amended to include additional ground-disturbing activity and/or should you be made aware of historic property concerns, you will need to reinitiate consultation with our office using PA-SHARE.

For questions concerning archaeological resources, please contact Sara-Ladd Clark at saralclark@pa.gov.

Sincerely,

Emma Diehl

Emma Diehl
Environmental Review Division Manager

APPENDIX O

SANITARY SURVEY RESULTS FOR NORTHAMPTON BOROUGH FROM LEHIGH ENGINEERING

SANITARY SURVEY RESULTS TO BE SUPPLIED WITH FINAL ACT 537 PLAN

APPENDIX P

SANITARY SURVEY RESULTS FOR ALLEN TOWNSHIP FROM BARRY ISETT & ASSOCIATES

SANITARY SURVEY RESULTS TO BE SUPPLIED WITH FINAL ACT 537 PLAN

APPENDIX Q

LEGAL AGREEMENT BETWEEN ALLEN TOWNSHIP AND CATASAUQUA BOROUGH

REMINGTON
& VERNICK
ENGINEERS

Lower Makefield Corporate Center, North Campus
1010 Stony Hill Road, Suite 175, Yardley, PA 19067
O: (267) 394-4500
F: (267) 394-4501

March 3, 2022

Mr. Steve Travers
Borough Manager
Borough of Catasauqua
90 Bridge Street
Catasauqua, PA 18032

RE: **Allen Township**
Willowbrook Farms Development
Capacity Review
Our File# PLCBT054

Dear Mr. Travers,

Remington & Vernick Engineers, on behalf of the Borough of Catasauqua (Borough), has reviewed the request from Allen Township (Township) to determine if the Borough's WWTP has capacity to support the Willowbook Farms Development. Per the Township, the development would require approximately 775 EDUs to serve the project.

Currently, there are no moratoriums on new sanitary sewer connections in the portion of the collection system serving this property. Additionally, collection, conveyance, and treatment capacity are available for the stated project and no overload condition is anticipated within 5 years.

Approval for treatment at the Borough's sewage treatment plant will require the following:

- Submission of the Pennsylvania Department of Environmental Protection's (PADEP's) approval of a sewer facilities plan revision or planning exemption. Please note that the NPDES Permit # for the Catasauqua Borough WWTF is PA0021580.
- Submission of plan approval from Allen Township.
- Submission of proof of payment of the applicable tapping fees to Allen Township. This fee and the basis for it are subject to change at any time.

This response is not intended to guarantee capacity at the Borough's wastewater treatment facility for the proposed development nor does it eliminate any requirement to submit all appropriate documentation to obtain approval for connection from Allen Township, DEP, and the Borough. Capacity at the wastewater treatment facility is only guaranteed once all applicable tapping fees have been paid.

Should there be any additional questions, please feel free to contact me at 267-394-4500

Sincerely,
REMINGTON & VERNICK ENGINEERS
By

Digitally signed by Vanessa Nedrick, P.E.
DN: cn=Vanessa Nedrick, P.E., o=RVE, ou,
email=vanessa.nedrick@rve.com, c=US
Date: 2022.03.03 16:02:31 -05'00'

Vanessa Nedrick, P.E., Principal, Regional Manager
Borough Engineer

VN\jm

cc: Andrea Martin, EIT, Allen Township Engineer
Christopher J. Fazio, P.E., C.M.E., Executive Vice President